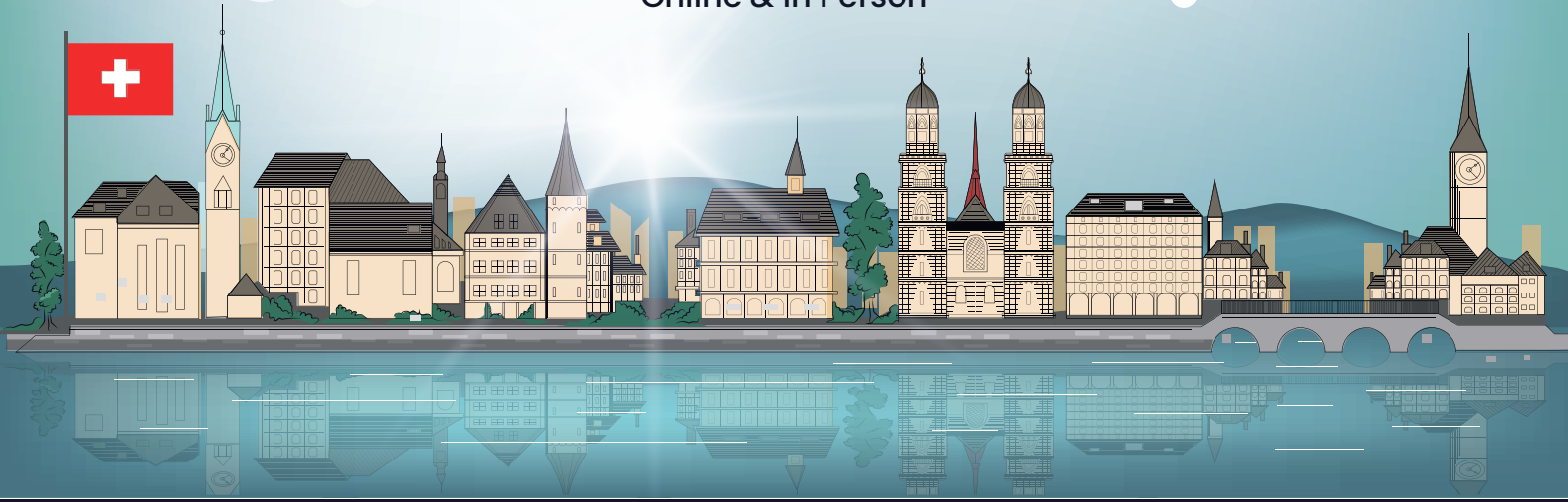


10th International European Conference on Interdisciplinary Scientific Research

August 27-29, 2024 / Zurich, Switzerland
Online & in Person



FULL TEXT BOOK-II

Editor
Assoc. Prof. Dr. Mehmet Emin KALGI

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X-INTERNATIONAL EUROPEAN CONFERENCE ON INTERDISCIPLINARY SCIENTIFIC RESEARCH

August 27-29, 2024/Zurich, Switzerland

FULL TEXTS BOOK-II

Editor

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CONFERENCE ID

CONFERENCE TITLE

10th INTERNATIONAL EUROPEAN CONFERENCE ON INTERDISCIPLINARY SCIENTIFIC RESEARCH

DATE and PLACE

August 27-29, 2024 / Zurich, Switzerland

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10th International European Conference on Interdisciplinary Scientific Research



August 27-29, 2024 / Zurich, Switzerland
Online & in Person participation



August 10, 2024

Deadline of Abstract
Submission



August 18, 2024

Conference Program
Announcement Date



August 28, 2024

In Person Presenta-
tions in Switzerland



August 27-29, 2024

Online Presentations
via Zoom



September 1, 2024

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Submission



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Proceedings Book
Publication Date

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ONLINE PRESENTATIONS

27.08.2024 / HALL-1, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Assoc. Prof. Dr. Semra TETİK

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Aslı KARATAŞ	Muğla Sıtkı Koçman University (TÜRKİYE)	AN EVALUATION ON DEVELOPMENT, GENDER EQUALITY AND TELEVISION SERIES
Vasila ABASLI	Baku State University (AZERBAIJAN)	TAX POLICY IN THE FOREIGN ECONOMIC ACTIVITY OF AZERBAIJAN
Assoc. Prof. Dr. Semra TETİK	Manisa Celal Bayar University (TÜRKİYE)	EXAMINATION OF UNIVERSITY STUDENTS' INTERPERSONAL RELATIONSHIP DIMENSIONS IN TERMS OF GENDER VARIABLE
Assoc. Prof. Dr. Semra TETİK	Manisa Celal Bayar University (TÜRKİYE)	A STUDY ON THE RELATIONSHIP BETWEEN SELF-CONFIDENCE AND CREATIVITY
Lect. Hale Tuğçe ALTUNAY Dilan ALKAÇ	Isparta University of Applied Sciences (TÜRKİYE) Akdeniz University (TÜRKİYE)	THE EFFECT OF SOCIAL MEDIA CRISIS ON BRAND IMAGE: THE PATISWISS CHOCOLATE EXAMPLE
Dilan ALKAÇ	Akdeniz University (TÜRKİYE)	BIBLIYOMETRIC ANALYSIS OF GRADUATE THESIS WRITTEN ON TAX EVASION IN TURKEY

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ONLINE PRESENTATIONS

27.08.2024 / HALL-2, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Dr. Mehmet MUTLU

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Mehmet MUTLU	Karabuk University (TÜRKİYE)	OUR VANISHING ARCHITECTURAL HERITAGE: KONYA LAUNDRY HOUSES
Mustafa Şafak BULUT Assist. Prof. Dr. Ömer Fatih SAK	Doğuş University (TÜRKİYE) Doğuş University (TÜRKİYE)	INVESTIGATION OF THE RELATIONSHIP BETWEEN NUMBER OF FLOOR AND COST IN THE USE OF SEISMIC ISOLATOR
S. Reyhan İLERİ Semra ARSLAN SELÇUK	Gazi University (TÜRKİYE) Gazi University (TÜRKİYE)	GREEN DESIGN IN INDUSTRIAL BUILDINGS: AN EVALUATION ON LEED CERTIFIED BUILDINGS
Lect. Neriman Gül ÇELEBİ Assoc. Prof. Dr. Ümit ARPACIOĞLU	Istanbul Nişantaşı University (TÜRKİYE) Mimar Sinan Fine Arts University (TÜRKİYE)	WASTE MANAGEMENT FROM THE LOAD-BEARING SYSTEMS' LIFE CYCLE ENVIRONMENTAL IMPACT PERSPECTIVE
Bashar BADAWI Assoc. Prof. Dr. Zülal AKBAY ARAMA	Istanbul University-Cerrahpaşa (TÜRKİYE) Istanbul University-Cerrahpaşa (TÜRKİYE)	THE BEHAVIOR OF ADJACENT SHALLOW FOUNDATIONS LOCATED ON SLOPES
Assist. Prof. Dr. Tolga YILMAZ	Konya Technical University (TÜRKİYE)	DEVELOPING PRACTICAL SOFTWARE TO CALCULATE LATERAL-TORSIONAL BUCKLING LOAD OF WEB TAPERED BEAMS WITH I-SECTION
Prof. Dr. Arın YILMAZ Alperen KAMAN Eylül Deniz ACAR	Balıkesir University (TÜRKİYE) Balıkesir University (TÜRKİYE) Balıkesir University (TÜRKİYE)	INVESTIGATION OF THE MECHANICAL AND DURABILITY PERFORMANCE OF PET WASTE SUBSTITUTED FOR AGGREGATE
Prof. Dr. Arın YILMAZ Hatice AYDIN	Balıkesir University (TÜRKİYE) Balıkesir University (TÜRKİYE)	OĞUL PAŞA TOMB REPAIR AND STRENGTHENING WORKS
Dr. H S ABDULRAHMAN Dr. Ali ALMUSAWI Dr. Syed Shah Sultan Mohiuddin QADRI Mustafa ALBDAIRI	Federal University of Technology (NIGERIA) Çankaya University (TÜRKİYE) Çankaya University (TÜRKİYE) AL-Qalam University College (IRAQ)	QUANTIFYING THE IMPACT OF TRAFFIC VOLUME ON TRAVEL TIME IN MALAYSIA USING THE BPR MODEL A STUDY IN SKUDAI

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ONLINE PRESENTATIONS

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ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Assoc. Prof. Dr. Abdülhalim Serden Ay

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Abdülhalim Serden Ay	Konya City Hospital (TÜRKİYE)	IS ADVANCED BREAST CANCER DETECTED BY RDW VALUE?
Assoc. Prof. Dr. Abdülhalim Serden Ay	Konya City Hospital (TÜRKİYE)	THE EFFECT OF BARIATRIC SURGERY ON INFLAMMATORY MARKERS
Dr. Pırılıtı ÖZCAN	Istanbul University (TÜRKİYE)	MANAGEMENT OF GASTRIC CANCER ANASTOMOTIC LEAKS WITH ENDOSCOPIC STENTING
Rabia TÜRKOĞLU Assist. Prof. Cansu IŞIK	University of Health Sciences (TÜRKİYE)	AN IMPORTANT CONCEPT IN OBSTETRIC: OBSTETRIC VIOLENCE
Sevgi Koç Ayşegül Öztürk	Sivas Cumhuriyet University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	EFFECT OF PROBIOTICS AGAINST GLUTAMATE-INDUCED CYTOTOXICITY IN C6 CELL LINE
Burcu ÇÖDEL Ayşegül Öztürk	Sivas Cumhuriyet University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	THE EFFECT OF PASSIFLORA INCARNATA AGAINST GLUTAMATE TOXICITY IN ASTROGLIAL CELLS
Assist. Prof. Dr. Durmuş Hatipoğlu Res. Assist. Göktuğ Şentürk Assoc. Prof. Dr. Mehmet Burak Ateş Ayşegül Bulut Prof. Dr. Nurcan Dönmez Oguzcan Koca	Selcuk University (TÜRKİYE) Aksaray University (TÜRKİYE) Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE)	NIGELLA SATIVA SEED OIL REDUCES BPA-INDUCED NEURODEGENERATION: MOLECULAR AND HISTOPATHOLOGICAL ANALYSIS

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ONLINE PRESENTATIONS

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ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Prof. Dr. Bülent Cercis TANRITANIR

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Bülent Cercis TANRITANIR Şeyda BEYDE	Yüzüncü Yıl University (TÜRKİYE) Yüzüncü Yıl University (TÜRKİYE)	CRADLE OF CARNIVAL: CAT'S CRADLE AND CARNIVALESQUE IMAGINATION
Lect. Huriye YAŞAR Lect. Vasıf Karagüçük	Gaziantep Islam Science and Technology University (TÜRKİYE)	USING CHATGPT AS AN AUTOMATED ESSAY SCORER
Lect. Vasıf Karagüçük Lect. Huriye YAŞAR	Gaziantep Islam Science and Technology University (TÜRKİYE)	CAN ARTIFICIAL INTELLIGENCE TAKE THE RESPONSIBILITY OF BUILDING NEW GENERATIONS: AN OVERVIEW
Fatbardha KUME Prof.As.Dr. Ema KRISTO	Tirana University (ALBANIA) Tirana University (ALBANIA)	THE ROLE AND CHALLENGE OF THE TRANSLATOR IN THE DIGITAL ERA
Isida SHEHU	Polytechnic University of Tirana (ALBANIA)	IDIOM IN ESP TEXTBOOKS
Assist. Prof. Dr. Sinan ÖZYURT	Gaziantep Islam Science and Technology University (TÜRKİYE)	CROSS-LINGUISTIC PRAGMATICS: A COMPARATIVE STUDY OF PRAGMATIC MARKERS IN ENGLISH AND GERMAN
Assist. Prof. Dr. Sinan ÖZYURT	Gaziantep Islam Science and Technology University (TÜRKİYE)	CROSS-CULTURAL METAPHORS IN LANGUAGE: A STUDY ON CONCEPTUAL METAPHORS IN ENGLISH AND GERMAN THROUGH COGNITIVE LINGUISTICS

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ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Prof. As. Dr. Fleura SHKËMBI

AUTHORS	AFFILIATION	TOPIC TITLE
Valbona TRESKA Prof. As. Dr. Fleura SHKËMBI	Mediterranean University of Albania (ALBANIA) Mediterranean University of Albania (ALBANIA)	COPING STRATEGIES AND RESILIENCE IN FAMILIES EXPERIENCING CONFLICT: A REVIEW OF THE LITERATURE
Prof. As. Dr. Fleura SHKËMBI Msc. Romina Çaushaj	Mediterranean University of Albania (ALBANIA) Mediterranean University of Albania (ALBANIA)	THE PSYCHOLOGICAL IMPACT OF ONLINE EDUCATION ON STUDENT WELL-BEING AND MOTIVATION
Dana-Maria MOTFOLEA	State University of Moldova (REPUBLIC OF MOLDOVA)	WHY DO STUDENTS NEED TO LEARN ENGLISH LANGUAGE FROM A YOUNG AGE: ESPECIALLY FROM PRIMARY SCHOOL?
Prof. Dr. Manoj Sharma Md. Sohail Akhter Dr. Asma Awan	University of Nevada (USA) University of Nevada (USA) University of Nevada (USA)	UTILIZING THE RQFSM MODEL TO CONDUCT A PARTICIPATORY PROCESS EVALUATION OF HEALTH DISPARITY REDUCTION ENDEAVORS IN NEVADA, USA
Etibar VAZIROV Ali ALIYEV	ADA University (AZERBIJAN) Ankara School (AZERBIJAN)	PREDICTING FINAL EXAM SUCCESS IN A DATA COURSE USING ENSEMBLE LEARNING MODELS
Etibar VAZIROV Tunjay AKBARLI	ADA University (AZERBIJAN) Modern Innovation Lyceum (AZERBIJAN)	PREDICTING HUMAN WELL-BEING: ANALYZING JOB SATISFACTION, WORK-LIFE BALANCE, AND JOB-RELATED STRESS USING ENSEMBLE LEARNING MODELS
Anna Sharif Maryam Asif	University of Sialkot (PAKISTAN)	EXPLORING THE ROLE OF WORKING MEMORY AND STRATEGIC MEMORY ON SOCIAL CONNECTEDNESS AND MORAL SENSITIVITY IN INDUCING INNER PEACE
Silvija ŽUKAITĖ Andrius Kazimieras MINELGA	Lithuanian University of Health Sciences (LITHUANIA)	THE ROLE OF ARTIFICIAL INTELLIGENCE IN IDENTIFYING AND PREDICTING COGNITIVE DECLINE IN ALZHEIMER'S DISEASE PATIENTS

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27.08.2024 / HALL-6, SESSION-1



ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Javad KHAZAEI

AUTHORS	AFFILIATION	TOPIC TITLE
Moses Adeolu AGOI Oluwakemi Racheal OSHINOWO Benjamin Johnson OLASIJU Aminat Oloruntoyin ABDULRASAK	Lagos State University of Education (NIGERIA)	EXPLORING THE SIGNIFICANCE, IMPACT AND CHALLENGES ASSOCIATED WITH THE USE OF COMPUTER MODELING IN EDUCATION: IMPLICATION FOR INSTRUCTIONAL MANAGEMENT
Dr. Binyam Zigta	Wachemo University (ETHIOPIA)	NUMERICAL STUDY OF PHYSIOLOGICAL BLOOD FLOW WITH STRETCHING CAPILLARY ON MHD MICROPOLAR FLUID
Moses Adeolu AGOI Oluwakemi Racheal OSHINOWO Benjamin Johnson OLASIJU Solomon Abraham UKPANAHAH	Lagos State University of Education (NIGERIA)	THE SIGNIFICANCE, APPLICATION AND IMPACT OF INTERNET OF THINGS (IoT) ON INNOVATIVE TEACHING AND LEARNING: A SURVEY ON EDUCATIONAL DEVELOPMENT
Assoc. Prof. Dr. Javad KHAZAEI Mohammad KHAZAEI	University of Tehran (IRAN) Semnan University (IRAN)	THEORETICAL CONSIDERATIONS AND ADVANCEMENTS IN MAGNETOHYDRODYNAMIC PUMPS AND THEIR APPLICATION IN AGRICULTURE AND FOOD PROCESSING SYSTEMS
Bendaoudi Zeid	University Ahmed Zabana (ALGERIA)	AN INNOVATIVE METHOD OF ELECTRIC WIND-BASED CLEANING FOR PHOTOVOLTAIC PANELS
Ikegwu Emmanuel M. Karakatose Gbenga B. Dan Saviour U.	Yaba College of Technology (NIGERIA)	MULTIVARIATE TIME SERIES MODELLING OF DOLLAR TO NAIRA EXCHANGE RATES ON SOME SELECTED ECONOMIC VARIABLES
Govinda Prasad Dhungana Pradip Raj Tiwari	Tribhuvan University (NEPAL)	BAYESIAN MODELLING FOR ASSESSING LEARNING OUTCOMES AMONG UNIVERSITY STUDENTS IN NEPAL
Muzamal HUSSAIN	University of Sahiwal (PAKISTAN)	ESTIMATION OF YOUNG'S MODULUS WITH SMART STRUCTURE: AN INTELLIGENT CONTROL SYSTEM
Dhulasiraman M	R.M.K.ENGINEERING COLLEGE (INDIA)	EMPOWERING HEALTH THROUGH IOT- DRIVEN PREDICTIVE MONITORING FOR COST-EFFICIENT CARE

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ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Siddhant

AUTHORS	AFFILIATION	TOPIC TITLE
F.B. Kende D.Y. Kanya D.D. Attah I. Iliya LS. Sule	Kebbi State University of Science and Technology (NIGERIA)	STUDY OF EIMERIA INFECTION AND RELATED RISK FACTORS IN POULTRY AND RUMINANT ANIMALS ACROSS LOCAL GOVERNMENTS IN GWANDU EMIRATE
Funmilayo Grace ADEBIYI Olayele Joseph OGUNNUSI Tolulope Dorcas AKINADE Olubunmi ADEJOH Olufemi Adebukola ADEBIYI	University of Ibad (NIGERIA) Forestry Research Institute of Nigeria (NIGERIA) University of Ibad (NIGERIA)	PHYTOCHEMICAL PROFILE AND POTENTIAL BIOACTIVITY OF NYMPHAEA LOTUS LEAVES
Ifeanyi Famous Ossamulu Theresa Yebo Gara Maureen Nwamaka Odu	Federal University of Technology (NIGERIA)	ANTIMICROBIAL EFFICACY OF CHITOSAN- TRIDAX PROCUMBENS EXTRACT COMPOSITE ON SELECTED WOUND SURFACE MICROORGANISMS
Halid Sheriff Adegbusi	Nigeria Police Academy Wudil (NIGERIA)	EFFECT OF COMBINED PROCESSING METHODS ON PROXIMATE AND SOME ANTINUTRIENTS COMPOSITION FROM NIGERIAN YELLOW MAIZE AND SOYBEAN
NEHA	I. K. Gujral Punjab Technical University (Main Campus) (INDIA)	EFFECT OF FORTIFICATION OF LETTUCE AND GERMINATED CHICKPEA FLOUR ON COOKING, FUNCTIONAL AND TEXTURAL PROPERTIES OF PASTA
Assist. Prof. Dr. Siddhant Lavanya Singh Shranya Maurya Tripti Tiwari	Durgesh Nandini Degree College (INDIA) NEET Aspirant (INDIA) Anil Sarasvati Vidya Mandir Senior Secondary School (INDIA)	SEVERE INFECTIONS OF INSECT-INDUCED VEIN GALL IN FICUS RELIGIOSA TREES: A FIRST REPORT FROM AYODHYA, (U.P.) INDIA
Muhammad Mazhar Iqbal Malik Muhammad Akram Hafiz Qaiser Yasin Tehmena Rashid	Agriculture Mechanization Research Institute (AMRI) (PAKISTAN)	IMPACT OF THE BILLION TREE TSUNAMI IN KHYBER PAKHTUNKHWA PROVINCE, PAKISTAN
Muhammad Mazhar Iqbal Malik Muhammad Akram Hafiz Qaiser Yasin	Agriculture Mechanization Research Institute (AMRI) (PAKISTAN)	EFFECTS OF LASER LAND LEVELING ON CROP YIELD, WATER PRODUCTIVITY, AND ECONOMIC GAINS IN SEMI-ARID REGIONS OF PUNJAB, PAKISTAN

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ONLINE PRESENTATIONS

27.08.2024 / HALL-1, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Dr. Uğur TÖLÜ

AUTHORS	AFFILIATION	TOPIC TITLE
Assist. Prof. Dr. Fatmagül KALE ÖZÇELİK	Ondokuz Mayıs University (TÜRKİYE)	EXPRESSIONS NOT PROTECTED WITHIN THE SCOPE OF FREEDOM OF EXPRESSION
Lect. Dr. Yener YILDIRIMKAL	Doğuş University (TÜRKİYE)	17 MARCH 2023 DECISION OF THE ICC PRE-TRIAL CHAMBER II ON THE ARREST OF VLADIMIR PUTIN: LEGAL ISSUES AND CONSIDERATIONS
Lect. Dr. Asiye KÜÇÜKOSMAN	Gumushane University (TÜRKİYE)	THE RELATIONSHIP BETWEEN LOGISTICS PERFORMANCE, ECONOMIC FREEDOM and FOREIGN TRADE BALANCE: A STUDY on EU COUNTRIES
Dr. Uğur TÖLÜ	Piri Reis University (TÜRKİYE)	RISK OF VIOLATION OF PERSONAL RIGHTS AND PRIVATE LIFE OF SHIPMAN BY CAMERA SURVEILLANCE ON SHIPS
Assist. Prof. Dr. Yasemin TAŞDEMİR	Sakarya University (TÜRKİYE)	TERMINATION OF LEGAL STRIKE BY COURT DECISION DUE TO LOSS OF MEMBERS OF THE LABOR UNION
Dr. Sevtap YÜCEL	Anadolu University (TÜRKİYE)	DIGITAL INHERITANCE IN TURKISH INHERITANCE LAW
Dr. İpek B. ALDEMİR TOPRAK	Ankara Yıldırım Beyazıt University (TÜRKİYE)	DETERMINATION OF THE AMOUNT OF POST-MARITAL MAINTENANCE UNDER TURKISH AND SWISS LAW

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ONLINE PRESENTATIONS

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ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Dr. Kemal NURVEREN

AUTHORS	AFFILIATION	TOPIC TITLE
Selma SOYSAL Taha PENOL Prof. Dr. Rıza ATAV	Gülle Entegre Textile Enterprises (TÜRKİYE) Tekirdağ Namık Kemal University (TÜRKİYE) Tekirdağ Namık Kemal University (TÜRKİYE)	INVESTIGATION OF FACTORS AFFECTING VERY DARK COLOR ACHIEVEMENT IN POLYAMIDE FABRICS
Mert ÖZCAN Assoc. Prof. Dr. Meral AKKOYUN KURTLU	Bursa Technical University (TÜRKİYE) Bursa Technical University (TÜRKİYE)	EFFECTS OF DIFFERENT FILLER MATERIALS ON RHEOLOGICAL AND MECHANICAL PROPERTIES IN VINYL METHYL SILICONE COMPOUNDS
Güven NERGİZ Prof. Dr. Kadri Turgut GÜRSEL	Dokuz Eylül University (TÜRKİYE) Dokuz Eylül University (TÜRKİYE)	DETERMINATION OF FIXED AND FLOATING WIND TURBINE TYPES FOR THE AEGEAN SEA: A LITERATURE REVIEW
Ömer Faruk GÜLCEMAL Prof. Dr. Kadri Turgut GÜRSEL	Dokuz Eylül University (TÜRKİYE) Dokuz Eylül University (TÜRKİYE)	LIMITING GREENHOUSE GAS EMISSIONS IN MARITIME TRANSPORTATION
Ayşenaz KARA Assoc. Prof. Dr. Ceyhan YÜCEL	Erciyes University (TÜRKİYE) Erciyes University (TÜRKİYE)	THE ANALYSES OF CAPPADOCIA AS A CULTURAL LANDSCAPE
Dr. Kemal NURVEREN Lect. Ülüver BOZKURT	Nigde Omer Halisdemir University (TÜRKİYE) Başkent University (TÜRKİYE)	INVESTIGATION OF THE MECHANICAL PROPERTIES VIA ANSYS OF SHAPE MEMORY ALLOY SPIRAL SPRING

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HEAD OF SESSION: Dr. Erdi Can Aytar

AUTHORS	AFFILIATION	TOPIC TITLE
Mustafayeva Nigar Adil Gasimova Tarana Mubariz Ganiyeva Guney Musa Dr. Kerimova Rena Jabbar	Azerbaijan Medical University (AZERBAIJAN) Azerbaijan Medical University (AZERBAIJAN) Azerbaijan Medical University (AZERBAIJAN) Azerbaijan Medical University (AZERBAIJAN)	BILE COAGULATION - ANATOMIC STRUCTURE OF BILIARY TRACT DYSKINESIA, CAUSES AND PATHOLOGICAL REFUTATION
Mehriban Farhad gizi Rustamova Nigar Vali gizi Malikova Narmin Vali gizi Baghirova Assoc. Prof. Dr. Fatima Dursun gizi Abdulkarimova Assoc. Prof. Dr. Khanum Aydın gizi Assoc. Prof. Dr. Elshan Azer oglu Shadlinski	Azerbaijan Medical University (AZERBAIJAN)	STUDY OF CHANGES IN THE AMOUNT OF LIPID PEROXIDE PRODUCTS IN THE FRONTAL CORTEX AGAINST THE BACKGROUND OF CHRONIC ADMINISTRATION OF CLOZAPINE TO WHITE RATS
Dr. Erdi Can Aytar Dr. Alper Durmaz Emine İncilay Torunoglu	Usak University (TÜRKİYE) Artvin Coruh University (TÜRKİYE) Necmettin Erbakan University (TÜRKİYE)	COMPARATIVE ANALYSIS OF ANTIOXIDANT ACTIVITY AND PHENOLIC COMPOUNDS IN DIFFERENT COFFEE PREPARATIONS
Res. Assist. Rukiye TANIŞIR DİŞÇİ Res. Assist. Melek Başak ÖZKAN Res. Assist. Şeyma Nur TABAK	Istanbul Aydın University (TÜRKİYE) Istanbul Aydın University (TÜRKİYE) Istanbul Aydın University (TÜRKİYE)	AUDITORY BEHAVIOR SCALE: ADAPTATION TO TURKISH, VALIDITY AND RELIABILITY STUDY

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HEAD OF SESSION: Dr. Orkida KOSTA

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Orkida KOSTA	Sports University of Tirana (ALBANIA)	SPORT ACTIVITY FOR STUDENTS IN UST
Dr. Orkida KOSTA	Sports University of Tirana (ALBANIA)	IMPACT OF AIR POLLUTANTS ON ATHLETIC PERFORMANCE .REVIEW
Dr. Galia Taller Azulay Shaden Shuhaiber Rizik	The Arab Academic College for Education in Israel-Haifa (ISRAEL)	BUILDING CONFIDENCE: COPING WITH CHALLENGES FACED BY ARAB PRESERVICE TEACHERS IN SPECIAL EDUCATION WITHIN JEWISH SCHOOLS
Shaden Shuhaiber Rizik Professor Asaid Khateb	The Arab Academic College for Education in Israel-Haifa (ISRAEL) University of Haifa (ISRAEL)	ASSESSING EXECUTIVE FUNCTIONS AMONG ARABIC-SPEAKING CHILDREN: INSIGHTS INTO COGNITIVE DEVELOPMENT IN EARLY CHILDHOOD
Fr. Baiju Thomas	Ramakrishna Mission Vivekananda Educational and Research Institute (INDIA)	FOSTERING THE ROLE OF GAMIFICATION TECHNIQUES ENHANCES EFFECTIVE COMMUNICATION FOR STUDENTS WITH AUTISM SPECTRUM DISORDER IN THE 21ST CENTURY INCLUSIVE CLASSROOM SETTINGS
Dr. Asahngwa Constantine Tanywe Khan Utabella Wenji Dr. Ngambouk Vitalis Pemunta	University of Yaounde 1 (CAMEROON) Cameroon Center for Evidence-Based Health Care (CAMEROON) Covenant University (CAMEROON)	STRUCTURAL VIOLENCE IN HEALTHCARE: EXAMINING HOSPITAL DETENTION PRACTICES AND HUMAN RIGHTS VIOLATIONS IN CAMEROON
Dr. Asahngwa Constantine Tanywe	University of Yaounde 1 (CAMEROON)	COPING STRATEGIES AND HEALTH RISKS: FOOD SEEKING BEHAVIOUR AMONG URBAN STREET CHILDREN IN YAOUNDE, CAMEROON
Assist. Prof. Dr. Edison IKONOMI Redon ZOTAJ	Sports University of Tirana (ALBANIA) Sports University of Tirana (ALBANIA)	PHYSICAL ABILITY OF YOUNG PRE-YOUGH SOCCER PLAYERS

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HEAD OF SESSION: Major Gheorghe GIURGIU

AUTHORS	AFFILIATION	TOPIC TITLE
Manal Adnani Samah Ourras Naila El Hazzat Karima Selmaoui Moulay Abdelaziz El Alaoui Amina Ouazzani Touhami Allal Douira	IBN TOFAIL University (MOROCCO)	MASS PRODUCTION OF TRICHODERMA ASPERELLUM USING AGRICULTURAL WASTES
Ali H Dosky	University of Duhok (IRAQ)	IMPACT OF VITAMIN D DEFICIENCY ON CORNEAL HEALTH UPON CHILDREN WITH RICKETS
Shazia Perveen Sumaira Kanwal	The Women University Multan (PAKISTAN) Comsats University Islamabad (PAKISTAN)	IDENTIFICATION OF SOLANUM NIGRUM (LEAVES EXTRACT) PHENOLIC COMPOUNDS, THEIR EFFECTS ON BEHAVIOR AND BLOOD BIOCHEMISTRY OF ROTENONE INDUCED PARKINSON'S RAT MODEL
Ranen Hashim Rida Dr. Rafid M. Hashim Zainab Haithem Kadhim	Al- Iraqi University (IRAQ) Uruk University (IRAQ) Al- Iraqi University (IRAQ)	SYNTHESIS, MOLECULAR DOCKING STUDY AND BIOLOGICAL ACTIVITY OF NOVEL SEVEN RINGS (OXAZEPINE) DERIVATIVES FROM INDOMETHACIN
Major Gheorghe GIURGIU Prof. Dr. Med Manole COJOCARU	Biomedicine (ROMANIA) Titu Maiorescu University (ROMANIA)	GUT DYSBIOSIS IN DOGS WITH SPINAL CORD INJURY: IMPACT OF POLENOPLASMIN
A.Dinesh Babu Md.Shanur Rahman E.Velmurugan S.Kalaivanan G.Premanand G.Akash Kumar Dr. R.Srinivasan	Bharath Institute of Higher Education and Research Chennai (INDIA)	SOME NATURAL ISOLATED COMPOUNDS AS ANTICANCER AGENTS
A.Dinesh babu E.Velmurugan MD.Shanur Rahman Dr. Srinivasan	Bharath Institute of Higher Education and Research Chennai (INDIA)	NEUROPROTECTIVE AGENTS, NATURAL PLANT HERBS & DRUGS IN ISCHEMIC STROKE: A REVIEW
Ms. Safia Irshad Ahmad	Batterjee Medical College (SAUDI ARABIA)	HEALTHCARE PROFESSIONALS LEADERSHIP- DOES IT REQUIRE SPECIAL QUALITIES?

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HEAD OF SESSION: Dr. Danylyuk Nina

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Marsiel PACÍFICO João Alisson Nunes SILVA	Universidade Estadual de Mato Grosso do Sul (BRAZIL)	DIDACTIC SEQUENCES: A DECOLONIAL TOOL
Ashike Md. Nurudden Shams Al Galib Uthpal Chandra Paul	University of Rajshahi (BANGLADESH)	TEACHER ATTITUDES TOWARDS THE INCLUSION OF STUDENTS WITH SPECIAL NEEDS IN BANGLADESH: THE SIGNIFICANCE OF TEACHERS' CHARACTERISTICS
Jasurbek Iminov	Andijan State University (UZBEKISTAN)	THE PARTICIPATION OF TURKESTAN JADIDS IN THE 1ST CONGRESS OF THE PEOPLES OF THE EAST
Azizbek Makhkamov	Andijan State University (UZBEKISTAN)	JADID ABDURAKHIM YUSUFZADA AND HIS TRAGIC FATE
Phyllis Moraa Magoma	Kenyatta University (KENYA)	ENTRANCE AGE AND TYPE OF SCHOOL ATTENDED AS DETERMINANTS OF STANDARD ONE PUPILS' READINESS TO LEARN MATHEMATICS IN PRIMARY SCHOOLS IN KASARANI SUB-COUNTY, KENYA
SREERAG NAIR Assist. Prof. Dr. Dr Zheer Ahmed	Vishwanath Karad MIT World Peace University (INDIA)	DEVELOPMENTAL AID INTO SOUTH-EAST ASIA POST PANDEMIC AND ITS RELATIONSHIP WITH THE SDGs
Dr. Danylyuk Nina	Lesya Ukrainka Volyn National University (UKRAINE)	CHANGES IN THE FUNCTIONS OF THE UKRAINIAN LANGUAGE AT THE MODERN STAGE
Umm-e-Rumman Syed Arooj Nasreen	National University of Modern Languages (PAKISTAN)	THE REPRESENTATION OF SUFI- COSMOPOLITANISM THROUGH THE PROLIFERATION OF RUMI'S TEACHINGS: ANALYSIS OF A MIRRORED LIFE

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HEAD OF SESSION: Assoc. Prof. Dr. Neha Singh

AUTHORS	AFFILIATION	TOPIC TITLE
Mubashir Mehdi Rajendra Adhikari Haseeb Raza	Business Incubation and Agri. Entrepreneurship Center (BIAEC) (PAKISTAN)	DIGITAL VALUE CHAIN SOLUTIONS AND IMPLICATION FOR THE RURAL ENTERPRISE DEVELOPMENT IN DEVELOPING COUNTRIES: A CASE OF CHICKPEA VALUE CHAIN IN PAKISTAN
Arashie Blessing Olubeke Jamilu Lawal Ajija	Federal University Dutsin- Ma (NIGERIA)	AWARENESS OF MOTHERS ON THE CAUSES AND PREVENTION OF INFANT MORTALITY IN DUTSIN-MA, NORTH-WESTERN NIGERIA
Abuhay Mihret Asres Amare Sahile Abebe	Bahir Dar University (ETHIOPIA) Bahir Dar University (ETHIOPIA)	TEACHERS' COMPETENCE IN THE EDUCATIONAL ASSESSMENT OF STUDENTS IN A COMPETENCE BASED EDUCATION IN AMHARA REGION, ETHIOPIA: THE CASE OF TVET TEACHERS AND ASSESSORS
Maryam Razawi	Balkh University (AFGHANISTAN)	IDENTIFYING THE ISLAMIC EMIRATE OF AFGHANISTAN (TALIBAN) FROM THE PERSPECTIVE OF INTERNATIONAL LAW
Ayesha Batool Farkhanda Anjum	University of Agriculture (PAKISTAN)	IMPACT OF ECONOMIC DISPARITIES AND POVERTY ON WOMEN'S OPPORTUNITIES IN PAKISTAN: A SYSTEMATIC REVIEW
Lect. Henos, E Assoc. Prof. Dr. Dawit A Assoc. Prof. Dr. Tiruwork, T	Bahir Dar University (ETHIOPIA) Bahir Dar University (ETHIOPIA) Bahir Dar University (ETHIOPIA)	LINGUISTIC FEATURES AND STUDENTS' INVOLVEMENT IN LEARNING SCIENCE: TEXT BASED ANALYSIS OF 7TH GRADE TEXTBOOK LINGUISTIC COMPLEXITY
Assoc. Prof. Dr. Neha Singh	Mangalayatan University (INDIA)	A REVIEW: CHOLESTEROL AND ITS MANAGEMENT
Dhivya C R Arunkumar	Tamil Nadu Agricultural University (INDIA)	A STUDY ON IMPACT OF FEMALE ENTREPRENEURSHIP ON RURAL DEVELOPMENT
EZZAAMARI Laila Dr. RHIHILAbdallah	Hassan II University Casablanca (MOROCCO)	PLASTIC WASTE MANAGEMENT IN MOROCCO

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HEAD OF SESSION: Burak URUCU

AUTHORS	AFFILIATION	TOPIC TITLE
Zhansaya TEMIRKHAN Aisultan Baurzhanuly YELUBAY Nuraiym Daurenkyzy KENZHEBAYEVA	Al-Farabi Kazakh National University (KAZAKHSTAN) Al-Farabi Kazakh National University (KAZAKHSTAN) Satbayev University (KAZAKHSTAN)	FORMATION OF ASSOCIATIVE MEMORY IN ENGLISH LANGUAGE TEACHING
Dr. Hynd KAID SLIMANE	Tlemcen University (ALGERIA)	THE ENGAGING JOURNEY OF LEARNING ENGLISH THROUGH GAMIFICATION
Burak URUCU	İstanbul Univerity- Cerrahpaşa (TÜRKİYE)	FROM QUANTUM RELATIONSHIPS TO APOCALYPTIC LAUGHTER: THE REPRESENTATION OF THEATRICAL DYSTOPIA IN SELECTED TURKISH PLAYS
Burak URUCU	İstanbul Univerity- Cerrahpaşa (TÜRKİYE)	REINTERPRETING EXCLUSION: MARGINALIZATION AND PRECARITY IN ÖTEKİ VENEDİK TACİRİ
Zahra Abdullayeva	Baku Slavic University (AZERBAIJAN)	USE OF DIDACTIC GAMES IN PRE-SCHOOL CHILDREN

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HEAD OF SESSION: Assoc. Prof. Dr. Ali Sinan ÇABUK

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. İsa AVCI Dr. Murat KOCA	Karabuk University (TÜRKİYE) Van Yuzuncu Yil University (TÜRKİYE)	CHOOSING THE BEST DATA MINING TOOL USING MULTIPLE-CRITERIA DECISION MAKING METHOD
Dr. Murat KOCA Dr. İsa AVCI	Van Yuzuncu Yil University (TÜRKİYE) Karabuk University (TÜRKİYE)	BLOCKCHAIN AND DIGITAL TWINS FOR SMART GRID
Dr. Cevahir PARLAK	Fenerbahçe University (TÜRKİYE)	HASTA LA VISTA MFCC
Hasari KAŞKAN Assoc. Prof. Dr. Hasan BADEM	Kahramanmaraş Sütçü İmam University (TÜRKİYE) Kahramanmaraş Sütçü İmam University (TÜRKİYE)	A NEW DECISION SUPPORT SYSTEM BASED ON COGNITIVE COMPUTING FOR DETECTION OF PARKINSON'S DISEASE
Dr. Ayşegül ACAR Assoc. Prof. Dr. Kaya OĞUZ Assoc. Prof. Dr. Zafer DERİN	İzmir University of Economics (TÜRKİYE) İzmir University of Economics (TÜRKİYE) Ege University (TÜRKİYE)	DIGITAL NATIVES IN A NEOLITHIC SETTLEMENT: EVALUATING THE OPINIONS OF DIGITAL NATIVES ON INFORMATION COMMUNICATION IN MUSEUMS FOR THE PROCESS OF DEVELOPING TOOLS FOR CULTURAL HERITAGE EDUCATION
Hatice ÖZDEMİR Adem SELLER Nazlı GENÇEL Yasemin HOR Aytaç YANIK Prof. Dr. M. Fatih AKAY	Universal Software (TÜRKİYE) Cukurova University (TÜRKİYE)	ARTIFICIAL INTELLIGENCE AND STATISTICS BASED ELECTRICITY CONSUMPTION ESTIMATION
R.A. Mazlum ÖZÇAĞDAVUL Prof. Dr. Hasan Hüseyin SAYAN	Ankara Yıldırım Beyazıt University (TÜRKİYE) Gazi University (TÜRKİYE)	THE INTEGRATION OF GDPR COMPLIANCE INTO SMART CITY DIMENSIONS: A FRAMEWORK FOR ENHANCING DATA PRIVACY AND SECURITY
Assoc. Prof. Dr. Ali Sinan ÇABUK	Istanbul Technical University (TÜRKİYE)	MONITORING INDOOR AIR QUALITY with LOW-COST IOT SENSORS: A PRACTICAL IMPLEMENTATION

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HEAD OF SESSION: Assoc. Prof. Dr. Mehmet SARGIN

AUTHORS	AFFILIATION	TOPIC TITLE
Rafiye CIFTCILER	Selcuk University (TÜRKİYE)	EVALUATION OF TREATMENT EFFICACY IN GERIATRIC MULTIPLE MYELOMA PATIENTS
Rafiye CIFTCILER	Selcuk University (TÜRKİYE)	EVALUATION OF HEMATOLOGICAL MALIGNANCIES IN IMMUNODEFICIENT PATIENTS
Selinay Kalyon Assist. Prof. Dr. Ahmet Murat Şenışık	Altınbaş University (TÜRKİYE) Altınbaş University (TÜRKİYE)	EVALUATION OF PROFESSIONAL PERSONNEL DOSES EXPOSED TO RADIOTHERAPY TECHNICIANS WORKING AT ALTINBAŞ UNIVERSITY RADIOTHERAPY CENTER
Ulviyya SIRACLI	Azerbaijan Medical University (AZERBAIJAN)	RISK FACTORS AND CAUSES OF INTRAUTERINE GROWTH RESTRICTION
Noor Abdelghani Prof. Dr. Cagatay BARUT Assoc. Prof. Dr. Eren OGUT	Bahçeşehir University (TÜRKİYE) Istanbul Mdeniyet University (TÜRKİYE)	THE INVESTIGATION OF CRANIAL FOSSAE IN THE INTRACRANIAL CAVITY OF FIXED CADAVERIC SKULL BASES: ASSOCIATIONS WITH SEX, LATERALITY, AND CLINICAL SIGNIFICANCE
Seval ÖZMEN ÜLÜK Firat AŞIR	Dicle University (TÜRKİYE) Dicle University (TÜRKİYE)	HISTOPATHOLOGICAL ALTERATIONS IN PRETERM AND TERM PLACENTAS WITH PREMATURE MEMBRANE RUPTURE
Assoc. Prof. Dr. Mehmet SARGIN	Selcuk University (TÜRKİYE)	A BIBLIOMETRIC ANALYSIS OF PUBLICATIONS ON PEDIATRIC ANESTHESIA FROM TURKEY BETWEEN 1980-2023: CONTRIBUTION TO GLOBAL PRODUCTIVITY AND PUBLICATION TRENDS
Assoc. Prof. Dr. Mehmet SARGIN	Selcuk University (TÜRKİYE)	BIBLIOMETRIC ANALYSIS OF FRAILTY-RELATED PUBLICATIONS IN JOURNALS IN THE FIELD OF ANESTHESIOLOGY

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HEAD OF SESSION: Assoc. Prof. Dr. Rozina Khattak

AUTHORS	AFFILIATION	TOPIC TITLE
Salah Eddine SBIAA Ahmed ELAKKAOUI Hicham BEN EL AYOUCHE Hafid ANANE	Analytical and Molecular /LCAM (MOROCCO)	HIGH PERFORMANCE AND GREEN MAGNETIC CATALYSTS FOR NITROARENE CATALYTIC REDUCTION
Sintayehu Assefa Yirga Misrak Ayalew Beshir	Hawassa University (ETHIOPIA)	THE EFFECT OF TOTAL QUALITY MANAGEMENT PRACTICES ON INNOVATION: EVIDENCE FROM SELECTED AGRICULTURAL TECHNICAL AND VOCATIONAL EDUCATION TRAINING COLLEGES IN ETHIOPIA
Assoc. Prof. Dr. Rozina Khattak	Shaheed Benazir Bhutto Women University (PAKISTAN)	BIOSORPTION OF HAZARDOUS SOLID GREEN O DYE BY POLYINDOLE@WALNUT SHELL BIOCOMPOSITE
Assoc. Prof. Dr. Rozina Khattak	Shaheed Benazir Bhutto Women University (PAKISTAN)	COMBINATION OF QUATERNARY SOLVENTS AS AN ULTRA-EFFICIENT MEDIATING AGENT FOR SENSITIZER- MEDIATOR REACTION IN DYE-SENSITIZED SOLAR CELLS
Muslim Yusuf Sulaiman Sani Yusuf Abdulaziz Hassan Maidabino	Umaru Musa Yar'adua University Katsina (NIGERIA)	PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY ON THE ETHANOLIC EXTRACT OF GUIERA SENEGALENSIS LEAVES
R. Thiruchelvi Dr. P.Saravanan Assoc. Prof. Dr. M.Chamundeeswari	St. Josephs College of Engineering (INDIA)	NANOCELLULOSE-BASED PLATFORMS AS A MULTIPURPOSE CARRIER FOR DRUG AND BIOACTIVE COMPOUNDS: FROM ACTIVE PACKAGING TO TRANSDERMAL AND ANTICANCER APPLICATIONS
Noura AFLAK Fatima-Ezzahraa ESSEBBAR Salah Eddine SBIAA Lahoucine BAHSIS Hicham Ben El AYOUCHE Hafid ANANE Salah-Eddine STIRIBA	Faculté des Sciences, Université Ibn Zohr (MOROCCO) Université Cadi Ayyad (MOROCCO) Universidad de Valencia (SPAIN)	SUSTAINABLE COPPER-CATALYZED 1,2,3- TRIAZOLE SYNTHESIS USING BIOMASS WASTE-DERIVED CATALYSTS: AN ECO- FRIENDLY APPROACH

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HEAD OF SESSION: Assist. Prof. Dr. Nevzat Birand

AUTHORS	AFFILIATION	TOPIC TITLE
Olha Prybyla Olesia Zynych Nataliia Kushnarova Alla Kovalchuk	SI V.P. Komisarenko Institute of Endocrinology & Metabolism NAMS Ukraine (UKRAINE)	PECULARITIES OF THE ANABOLIC- CATABOLIC BALANCE DEPENDING ON THE BODY COMPOSITION AND HORMONAL-METABOLIC PHENOTYPE IN PATIENTS WITH TYPE 2 DIABETES
Dr. Katerina P KOMISARENKO Angela A SHUPROVICH Olesya V ZYNYCH Natalia M KUSHNAROVA Alla V KOVALCHUK	State institution "V. P. Komissarenko Institute of Endocrinology and Metabolism of the National Academy of Medical Science (UKRAINE)	POLYMORPHISMS OF THE FOLATE CYCLE GENES WHICH AFFECT SERUM LEVELS OF HOMOCYSTEINE AS RISK FACTORS OF CARDIO-METABOLIC DISORDERS IN THE ACUTE PERIOD OF COVID-19
Assist. Prof. Dr. Ahmet Sami Boşnak Assist. Prof. Dr. Nevzat Birand	Cyprus International University (Turkish Republic of Northern Cyprus)	EVALUATIONS OF STUDENTS' OPINIONS ON THE NECESSITY OF THE ONCOLOGY PHARMACY COURSE IN THE PHARMACY FACULTY CURRICULUM
Dr. Cornelia NICHITA	University of Bucharest (ROMANIA)	DESIGN AND SYNTHESIS OF ANTIOXIDANT PHYTOTHERAPEUTIC SYSTEMS BASED ON PLANT EXTRACTS
G. AKASHKUMAR	INDIA	THE PHARMACIST'S ROLE IN MEDICATION THERAPY COUNSELING
Farzana Iftikhar Waqar Ahmad Tanveer Ahmad	The Women University (PAKISTAN) Bahauddin Zakariya University (PAKISTAN) Bahauddin Zakariya University (PAKISTAN)	IDENTIFICATION OF SOLANUM NIGRUM (LEAVES EXTRACT) PHENOLIC COMPOUNDS, THEIR EFFECTS ON BEHAVIOR AND BLOOD BIOCHEMISTRY OF ROTENONE INDUCED PARKINSON'S RAT MODEL

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HEAD OF SESSION: Prof. Dr. Ivan PAVLOVIC

AUTHORS	AFFILIATION	TOPIC TITLE
Redona DUDUSHI Esmeralda Meta Marsela Robo Valbona Sauku Arblin Dafa Valmira Skëndi Silva Ibrahim	University of Tirana (ALBANIA)	NEUROCOGNITIVE DISORDERS IN HIV+ PATIENTS: EVIDENCE FROM ALBANIA
Najlae ADADI Abdelali ZRHIDRI Dr. Ibtissam FELLAT Dr. Hicham BOUZELMAT Dr. Dounia BENZAROUAL Dr. Rachida BOUHOUGH Dr. Fatima Zohra RADJ Jaber LYAHYAI Ilham RATBI Abdelaziz SEFIANI	Dakhla ISPITS (MOROCCO) Mohammed V University in Rabat(MOROCCO) CHU Ibn Sina (MOROCCO) Hôpital Militaire d'instruction Mohamed V (MOROCCO) CHU Mohamed VI (MOROCCO)	FIRST APPLICATION OF NEXT-GENERATION SEQUENCING IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY IN MOROCCO AND REPORT OF A NOVEL FRAMESHIFT MUTATION OF MYBPC3 GENE
Panagiota DOUROU Dr. Antigoni SARANTAKI	West Attica University (GREECE) West Attica University (GREECE)	THE IMPACT OF MULTIPLE SCLEROSIS AND DISABILITY ON WOMEN'S SEXUALITY
Aikaterini SOUSAMLI Assoc. Prof. Dr. Antigoni SARANTAKI	University of West Attica (UniWA) (GREECE) University of West Attica (UniWA) (GREECE)	PERINATAL FACTORS RELATED TO THE APPEARANCE OF ASD IN THE CHILD
Dr. Rudina ÇUMASHI Romina HALA	Institute of Public Health (ALBANIA) Institute of Public Health (ALBANIA)	BREAKFAST CONSUMPTION OF SCHOOLCHILDREN IN ALBANIA: RESULTS FROM HBSC STUDY 2022
Inke Malahayati Lenny Nainggolan Tengku Sri Wahyuni	Politeknik Kesehatan Kementerian Kesehatan Medan (INDONESIA)	A PREGNANT MOTHER'S KNOWLEDGE OF EXCLUSIVE BREASTFEEDING
MSc Ivanka Hadzic Avcademimician Prof.Dr Ivan PAVLOVIC	Care and Therapy of Cattle Foot of Serbia (SERBIA) Scientific Institute of Veterinary Medicine of Serbia (SERBIA)	HEALTH IMPORTANCE OF HEEL HORN EROSION IN CATTLE

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ONLINE PRESENTATIONS

27.08.2024 / HALL-7, SESSION-3



ZURICH LOCAL TIME



14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME



15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Dr. Imane MOKHTARI

AUTHORS	AFFILIATION	TOPIC TITLE
Zaara Nabil	Ibn Tofail University (MOROCCO)	POMOLOGICAL CHARACTERISTICS OF THE PICHOLINE OLIVE (OLEA EUROPEAE L.) VARIETY GROWN IN NORTHERN AND CENTRAL MOROCCO
Dr. Daniela TRIFAN Dr. Emanuela LUNGU Ionel IVAN Ioana Andreea GORGOVAN	Agricultural Research and Development Station of Braila (ROMANIA)	RESEARCH ON THE REUSE OF IRRIGATION WATER AND OBTAINING NEW WATER SOURCES IN THE CONDITIONS OF DESERTIFICATION IN THE ROMANIAN PLAIN
Prof. Dr. Milivoje Urošević Assoc. Prof. Dr. Milosava Matejević Branislav Živković	Center for Preservation of Indigenous Breeds University of Novi Sad "Jovan Šurbanović" (SERBIA)	COMPARATIVE ANALYSIS OF MORPHOLOGICAL PARAMETERS OF RED DEER ANTLERS (CERVUS ELAPHUS MONTANUS, BOTEZAT, 1903)
Mohammed Fassar Jamila Dahmani Meriem Benharbit	Ibn Tofail University (MOROCCO) National Institute of Archeology and Heritage (MOROCCO)	COLONIZATION OF VASCULAR PLANTS IN THE MAZAGAN FORTRESS, MOROCCO
Dr. Imane MOKHTARI Dr. Hicham HARNAFI	Mohamed First University (MOROCCO) Mohamed First University (MOROCCO)	BIOCHEMICAL COMPOSITION, ANTI- OXIDATIVE STRESS AND LIPID METABOLISM RESTAURATION OF LOQUAT JUICE (ERIOBOTRYA JAPONICA L. VAR. MKARKEB) IN HIGH-FAT/HIGH FRUCTOSE DIET FED MICE
Dr. Sabina Lachowicz- Wiśniewska MSc. Klaudia Sochacka	University of Kalisz (POLAND)	SYMBIOTIC PASTA - THE IMPACT OF MICROENCAPSULATION ON PRODUCT QUALITY

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ONLINE PRESENTATIONS

28.08.2024 / HALL-1, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Prof. Dr. Osman BAYRAKTUTAN

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Ruhattin YAZOĞLU	Atatürk University (TÜRKİYE)	ANTHROPOMORPHISM AND CHRISTIANITY
Prof. Dr. Ruhattin YAZOĞLU	Atatürk University (TÜRKİYE)	A COMPARISON OF MEVLÂNÂ'S LOVE FOR HUMANITY AND WESTERN THOUGHT
Prof. Dr. Osman BAYRAKTUTAN Assoc. Prof. Dr. Mehmet Emin KALGI	Atatürk University (TÜRKİYE) Ardahan University (TÜRKİYE)	GONCA KEÇECİ, PELİN YILDIRIM, "THE TURKISH-ISLAMIC SCIENTIFIC HERITAGE AND SCIENCE EDUCATION: A JOURNEY FROM THE PAST TO THE FUTURE", İKSAD PUBLISHING HOUSE, ANKARA: 2023, pp. 64
Prof. Dr. Osman BAYRAKTUTAN Assoc. Prof. Dr. Mehmet Emin KALGI	Atatürk University (TÜRKİYE) Ardahan University (TÜRKİYE)	ŞAHBAZ, MEHİBE (2019). THE CRAZY CENTER IN THE OTTOMAN MILITARY ORGANIZATION. İKSAD PUBLISHING, 2ND EDITION, ISBN: 978-605-7875-23-5, 126 P.
Dr. İsa YALÇIN	Bitlis Eren University (TÜRKİYE)	A WESTERN WOMAN IN THE SUFI TRADITION: IRINA TWEEDIE'S SPIRITUAL JOURNEY
Dr. İsa YALÇIN	Bitlis Eren University (TÜRKİYE)	GAYOMART AND MYSTICAL PERSPECTIVES IN ZOROASTRIAN MYTHOLOGY
Assoc. Prof. Dr. Vesile ŞEMŞEK	Kırşehir Ahi Evran University (TÜRKİYE)	ISLAMIC CULTURAL HERITAGE- AHILIK AND ANATOLIAN SISTERS ORGANIZATION

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ONLINE PRESENTATIONS

28.08.2024 / HALL-2, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Dr. Aras YOLUSEVER

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Aras YOLUSEVER	Istanbul Kültür University (TÜRKİYE)	THE FUTURE OF THE EVOLUTIONARY GAME THEORY (EGT): POSSIBILITIES AND LIMITATIONS
Lect. Hanife YEŞİLYURT Assist. Prof. Dr. Yavuz Selim GÜLMEZ	Mardin Artuklu University (TÜRKİYE) Mardin Artuklu University (TÜRKİYE)	A RESEARCH ON DETERMINING THE BRANDING BARRIERS OF BUSINESSES GEOGRAPHICAL INDICATION PRODUCTS
Assist. Prof. Dr. Esra Nur GÖKHAN	Beykoz University (TÜRKİYE)	EFFECT OF DIGITAL TECHNOLOGIES ON LOGISTICS EFFICIENCY AND THEIR CONTRIBUTION TO COMPANIES' MARKETING OUTPUTS
Əliyeva Elnarə Yaşar qızı	Ministry of Finance of the Republic of Azerbaijan (AZERBAIJAN)	LABOR RIGHTS AND MODERN WORKING CONDITIONS
Assist. Prof. Dr. Vildan Bayram Assist. Prof. Dr. Şükrü Mustafa Kaya	Istanbul Aydın University (TÜRKİYE) Istanbul Aydın University (TÜRKİYE)	THE EFFECTS OF ARTIFICIAL INTELLIGENCE APPLICATIONS IN BUSINESS ON QUALITY MANAGEMENT
Dr. Hasan ŞAKA	Dokuz Eylül University (TÜRKİYE)	A STUDY ON THE IMPACT OF CIRCULAR ECONOMY PRACTICES ON RETURN ON ASSETS AND EQUITY IN THE ANTHROPOCENE
Prof. Dr. Halim TATLI Assist. Prof. Dr. Doğan BARAK	Bingöl University (TÜRKİYE) Bingöl University (TÜRKİYE)	IMPACT OF INDUSTRIAL PRODUCTION, ENERGY CONSUMPTION, AND EXPORTS ON ENVIRONMENTAL POLLUTION IN TURKEY: A SHORT-TERM AND LONG-TERM ANALYSIS
Assist. Prof. Dr. Doğan BARAK Prof. Dr. Halim TATLI	Bingöl University (TÜRKİYE) Bingöl University (TÜRKİYE)	ANALYZING THE IMPACT OF DIRECT AND PORTFOLIO INVESTMENTS ON ECONOMIC GROWTH AND UNEMPLOYMENT IN TURKEY

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ONLINE PRESENTATIONS

28.08.2024 / HALL-3, SESSION-1



ZURICH LOCAL TIME

09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME

10⁰⁰ : 12⁰⁰

HEAD OF SESSION Assist. Prof. Dr. Zeynep ÖZTÜRK

AUTHORS	AFFILIATION	TOPIC TITLE
Lect. Semih Ercan AKGUN	Ondokuz Mayıs University (TÜRKİYE)	EFFECTS OF GENETIC POLYMORPHISMS ON DENTAL CARIES
Assist. Prof. Dr. Büşra TOSUN Nur UYSAL	Abant İzzet Baysal University (TÜRKİYE) Abant İzzet Baysal University (TÜRKİYE)	REHABILITATION OF MAXILLA AND MANDIBULA WITH ZYGOMATIC AND DENTAL IMPLANTS AFTER TRAUMA: A CASE REPORT
Assist. Prof. Dr. Zeynep ÖZTÜRK Res. Assist. Beyza Nur ÇELİKKAYA	Bolu Abant İzzet Baysal University (TÜRKİYE) Bolu Abant İzzet Baysal University (TÜRKİYE)	TREATMENT APPROACHES IN TRAUMATIC ROOT FRACTURE INJURIES: CASE REPORT
Demet ATAĞ	Sakarya Oral and Dental Health Hospital (TÜRKİYE)	USES OF PROBIOTICS IN DENTISTRY
Dr. Dt. Ezgi AYDIN VAROL	Cappadocia University (TÜRKİYE)	TREATMENT OPTIONS FOR ANTERIOR TEETH WITH UNCOMPLICATED CROWN FRACTURES DUE TO TRAUMA: A REPORT OF TWO CASES
Lect. Cihat Gülerüz	Altınbaş University (TÜRKİYE)	INVESTIGATION ELECTRONIC PROPERTIES OF STABLE B3B MOLECULE: A DFT STUDY

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ONLINE PRESENTATIONS

28.08.2024 / HALL-4, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Assist. Prof. Dr. Nazan Eras

AUTHORS	AFFILIATION	TOPIC TITLE
Ümmügülsüm KAYA Burcu Kübra SÜHA	Sivas Cumhuriyet University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	COMPLEMENTARY THERAPIES AND INTEGRATIVE MEDICINE IN NURSING CARE FOR MASTECTOMY PATIENTS
Ümmügülsüm KAYA Burcu Kübra SÜHA	Sivas Cumhuriyet University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	TRANSITION TO A CHRONIC ADULT DISEASE: NURSING CARE OF ADULT CYSTIC FIBROSIS PATIENTS
Res. Assist. Kadriye OLĞAÇ	Mardin Artuklu University (TÜRKİYE)	PUBLIC HEALTH NURSE'S APPROACH IN DISASTERS AND DISASTER LITERACY
Res. Assist. Kadriye OLĞAÇ Res. Assist. Ebru KARACA	Mardin Artuklu University (TÜRKİYE) Mardin Artuklu University (TÜRKİYE)	NURSING APPROACH TO THIRD-HAND SMOKE
Assist. Prof. Dr. Nazan Eras	Mersin University	DETERMINATION OF THE KNOWLEDGE AND AWARENESS LEVELS OF 3RD YEAR STUDENTS OF MERSIN UNIVERSITY MEDICINE FACULTY ABOUT SMA DISEASE
Dr. Sevgin SAMANCIOGLU BAGLAMA Dr. Ercan BAKIR Dr. Mehmet AŞAM	Muğla Sıtkı Koçman University (TÜRKİYE) Adıyaman University (TÜRKİYE) University of Health Sciences (TÜRKİYE)	EFFECTS OF GINGER GIVEN IN DIFFERENT WAYS ON NAUSEA, PAIN AND SLEEP AFTER CORONARY BYPASS GRAFT SURGERY
Dr. Ercan BAKIR Assist. Prof. Dr. Esra KEŞER Dr. Sevgin SAMANCIOGLU BAGLAMA	Adıyaman University (TÜRKİYE) Osmaniye Korkut Ata University (TÜRKİYE) Muğla Sıtkı Koçman University (TÜRKİYE)	RELATIONSHIP BETWEEN DISEASE UNCERTAINTY AND SELF-CARE BEHAVIORS IN INDIVIDUALS WITH RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL STUDY
Nardane BOLAT Atiye KARAKUL	Tarsus University (TÜRKİYE) Tarsus University (TÜRKİYE)	THE CHILD WITH GASTROINTESTINAL TRACT DISEASE AND ENDOSCOPY PROCEDURE AND NURSING CARE

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ONLINE PRESENTATIONS

28.08.2024 / HALL-5, SESSION-1



ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Dr. Z. Zareen Zohara

AUTHORS	AFFILIATION	TOPIC TITLE
Santosh Kumar Maurya Shashank Kumar	Central University of Punjab (INDIA)	DEVELOPING NOVEL COMBINATION TO TARGET TRIPLE-NEGATIVE BREAST CANCER
Dr. Z. Zareen Zohara Dr. Abdul Jaffar Azad Ajeeth Rehman Dr. Nidhi Chandra Ponath Sivan	Independent Researcher (UNITED KINGDOM) West Suffolk NHS Foundation Trust (UNITED KINGDOM) Thrissur Medical College Hospital (UNITED KINGDOM)	METFORMIN'S EFFECTIVENESS IN TREATING PCOS AND THE COURSE OF INSULIN RESISTANCE IN PCOS - A SHORT REVIEW
Ajiboye, A. E. Olakunle, O. J.	Kwara State University (NIGERIA)	ISOLATION AND IDENTIFICATION OF MICROORGANISMS FROM HERBAL MIXTURE SOLD IN MALETE METROPOLIS
B.P.PREETHI Dr.Antony Sundhran	Malankara Catholic College (INDIA)	BREAST MILK MICROBIOME AND ITS POTENTIAL THERAPEUTIC ROLE IN TARGETING TUMORIGENESIS PATHWAYS
Dr. Ishwar Mittal Dr. Rosy Dhall Mikul	Maharshi Dayanand University (INDIA) Gandhinagar University (INDIA) Maharshi Dayanand University (INDIA)	EXPLORING FACTORS SHAPING HOSPITAL REPUTATION: INSIGHTS FROM INDIAN HEALTHCARE
Tasawar IQBAL Sidra ALTAF	University of Agriculture Faisalabad (PAKISTAN)	IMPACT OF MEDICINAL PLANT-DERIVED NANOCARRIERS ON DRUG DELIVERY EFFICIENCY IN RHEUMATOID ARTHRITIS
Mehmet Salih Ilbay Fatih Mehmet Findik	University of Dicle (TÜRKİYE) University of Dicle (TÜRKİYE)	A SPONTANEOUS TERM PREGNANT WOMAN WITH INTACT MICROPERFORATE HYMEN
Hasnim Naznin Hima Jannatul Naima Fardusi Lima Nayeem Uddin Khan	Bangabandhu Sheikh Mujib Medical College Hospital (BANGLADESH) Golden Harvest Infotech Ltd. (BANGLADESH)	ABORTION ACCOUNTS FOR HALF OF ALL HOSPITALISED GYNAECOLOGY PATIENTS: TYPES AND CAUSES BEHIND THIS ALARMING FIGURE
Chrysoula – Rozalia Athanasiadou Assoc. Prof. Dr. Antigoni Sarantaki	University of West Attica (UniWA) (GREECE) University of West Attica (UniWA) (GREECE)	DIGITAL HEALTH AND NEW TECHNOLOGIES FOR PARENTS WITH A DEAF MOTHER – LITERATURE REVIEW

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ONLINE PRESENTATIONS

28.08.2024 / HALL-6, SESSION-1



ZURICH LOCAL TIME

09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME

10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Dr. Andrea Celeste BASILE

AUTHORS	AFFILIATION	TOPIC TITLE
Mohammed OUALI Dr. Mahfoud TOUHARI	Khemis Miliana University (ALGERIA)	EARTHQUAKE RESPONSE OF MULTI-STOREY BUILDINGS ACCORDING TO ALGERIAN CODE REQUIREMENTS
M. Tsikarishvili G. Kaladze K. Tsikarishvili	Georgian Technical University (GEORGIA)	MODULAR BUILDING EVALUATION AND MONITORING
Sulaiman Mustafa Khazaal Szávai Szabolcs	Miskolc University (HUNGARY) Miskolc University (HUNGARY)	INVESTIGATION OF THE DEEP DRAWING TECHNICAL USED PUNCH MADE FROM HYBRID METAL MATRIX COMPOSITE
Msc.Tiziana Ceka	Aleksander Moisiu" University (ALBANIA)	THE ROLE AND INFLUENCE OF TEACHING IN HEALTH AWARENESS IN THE EDUCATIONAL SYSTEM
Engr. Adzua Peter Terseer Engr. Adejoh Monday Salami Akighirga Luter Richard	Transmission Company of Nigeria (NIGERIA) Federal University Lafia (NIGERIA) Joseph Sarwuan Tarka University (NIGERIA)	INNOVATIVE SOLUTIONS FOR SCADA-COMMUNICATION FAILURES: LEVERAGING VPN TECHNOLOGY FOR RELIABLE SUB-STATION DATA TRANSFER
Dr. Andrea Celeste BASILE	Università degli studi di Milano (ITALY)	ART, MUMMIES AND DNA. STUDY AND ANALYSIS ON THE ROLE AND EVOLUTION OF THE CAT DURING THE ANCIENT EGYPT
Dr. Ervis KRYMBI	University of Shkoder "Luigj Gurakuqi" (ALBANIA)	FOREST FIRE RISK IN ALBANIA
Kübra GÜLTEKİN KÖKÇÜ Assist. Prof. Dr. Aytekin ERDOĞAN	Ege University (TÜRKİYE) Ege University (TÜRKİYE)	THE CITY IN THE NEAR EAST AND HELLENIC GEOGRAPHY: AN EVALUATION ON SIMILARITIES AND DIFFERENCES

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ONLINE PRESENTATIONS

28.08.2024 / HALL-7, SESSION-1



ZURICH LOCAL TIME

09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME

10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Prof. Dr. Ahmet Niyazi ÖZKER

AUTHORS	AFFILIATION	TOPIC TITLE
PhD. MIMOZA KOTOLLAHU MSc Ina Sallo Sc. Megi Fetah MSc. Eris Sallo	University of Elbasan "Aleksandër Xhuvani" (ALBANIA) Finance Manager TRANVIX GROUP INC. (CANADA) Aleksander Xhuvani University (ALBANIA)	CONSUMER SATISFACTION AND LAW REGULATIONS IN E-COMMERCE -THE CASE OF ALBANIA-
MSc. Megi Fetah MSc. Ylgersa Cara MSc. Erjeta Deda MSc. Endi Duhaxhiu	Aleksander Xhuvani University (ALBANIA)	BENEFITS OF ARTIFICIAL INTELLIGENCE AND HUMAN RIGHTS
Prof. Dr. Ahmet Niyazi ÖZKER	Bandirma Onyeddi Eylül University (TÜRKİYE)	COUNTRY RISK PREMIUM AND THE FISCAL EXPECTATIONS FOR TRADE DEFICIT POST COVID-19 IN TÜRKİYE
Luca ESPOSITO	University of Salerno (ITALY) University of Eastern Finland (FINLAND)	CAN RENEWABLE ENERGY CONSUMPTION DRIVE SUSTAINABLE ECONOMIC GROWTH? EVIDENCE FROM ITALY THROUGH A GRANGER CAUSALITY TEST
Albion Kopani Xhevdet Kopani	Luarasi University (ALBANIA) Luarasi University (ALBANIA)	THE USE OF PESTEL ANALYSIS IN PLANNING AND RISK MANAGEMENT OF INSURANCE INDUSTRY IN ALBANIA
Albion Kopani Xhevdet Kopani	Luarasi University (ALBANIA) Luarasi University (ALBANIA)	THE IMPACT OF EMPLOYMENT ON THE DEMAND FOR LIFE AND NON-LIFE INSURANCE IN THE PREFECTURES OF ALBANIA
Prof. Dr. Satish Menon Assoc. Prof. Dr. Kavita Singh Komal	SRM University (INDIA) SRM University (INDIA) SRM University (INDIA)	PARENTAL EXPECTATIONS, ACADEMIC STRESS, AND SUICIDAL IDEATION: A STUDY OF KOTA STUDENTS
Assist. Prof. Dr. Kamaljit Singh Prof. Dr. Satish Menon	SRM University (INDIA) SRM University (INDIA)	VOLATILITY SPILLOVER AMONG CLIMATE CHANGE, SUSTAINABLE FINANCE AND RENEWABLE ENERGY MARKET: A DCC- GARCH APPROACH

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ONLINE PRESENTATIONS

28.08.2024 / HALL-1, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Prof. Dr. Muhittin ELİAÇIK

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. Dr. Duysal Askun Celik	Istanbul Topkapi University (TÜRKİYE)	UNVEILING THE CONSCIOUSNESS GAP IN ORGANIZATIONS THROUGH LEADERSHIP AS A CONSCIOUSNESS TOOL
Meltem SUBAŞI İlke TURGUT Prof. Dr. Ulaş Başar GEZGİN	T.C. Gedik University (TÜRKİYE) T.C. Gedik University (TÜRKİYE) İstanbul Galata University (TÜRKİYE)	SLEEP AND DREAM THEORIES
Ayşe Tülin ALBAYRAK Özge ŞAHİN GÖDELEZLİ Prof. Dr. Ulaş Başar GEZGİN	T.C. Gedik University (TÜRKİYE) T.C. Gedik University (TÜRKİYE) İstanbul Galata University (TÜRKİYE)	INVESTIGATION OF ORGANIZATIONAL BEHAVIOR WITH EMOTION MANAGEMENT
Prof. Dr. Nurcihan KİRİŞ Şerif KESKİN Berk YAŞUK Prof. Dr. Mustafa Agah TEKİNDAL	Izmir Katip Celebi University (TÜRKİYE)	RELATIONSHIPS BETWEEN OBJECTIVE SLEEP QUALITY, SUBJECTIVE SLEEP QUALITY AND COGNITIVE FUNCTIONS IN YOUNG WOMEN WITH PREMENSTRUAL SYNDROME
Assist. Prof. Dr. Özge ERDURAN TEKİN	National Defense University (TÜRKİYE)	RUMINATION AND SOCIAL MEDIA ADDICTION IN FIRST-YEAR UNIVERSITY STUDENTS: THE MEDIATING ROLE OF LONELINESS AND SUBJECTIVE HAPPINESS
Cemile Edibe OKUR Prof. Dr. Halil EKŞİ	Marmara University (TÜRKİYE) Marmara University (TÜRKİYE)	ADAPTATION OF THE GRATITUDE IN WORKING LIFE SCALE INTO TURKISH (THE WORK GRATITUDE SCALE)
Res. Assist. Sultan KİREMİTCİ Assoc. Prof. Dr. Doğa BAŞER	Selçuk University (TÜRKİYE) Selçuk University (TÜRKİYE)	AN EVALUATION ON UNIVERSITY STUDENTS WHO ARE BOTH IN EDUCATION AND EMPLOYMENT IN THE CONTEXT OF SOCIAL WORK
Prof. Dr. Muhittin ELİAÇIK	Kirikkale University (TÜRKİYE)	A WORK BY MISTAKE SHOWN AS BELONGING TO ŞİFÂÎ ŞABAN EFENDİ: HULÂSATU'L-EBDÂN
Prof. Dr. Muhittin ELİAÇIK	Kirikkale University (TÜRKİYE)	ON THE STRANGE STORIES IN THE MEDICAL WORK CALLED ŞİFÂİYYE

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ONLINE PRESENTATIONS
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ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Şükufe Valiyeva

AUTHORS	AFFILIATION	TOPIC TITLE
Aygun Aliyeva	Baku State University (AZERBAIJAN)	ROLE OF PUBLIC LIBRARIES IN CONTINUOUS EDUCATION OF ELDERS
Ayten MURADZADEH	Baku State University (AZERBAIJAN)	REPRESENTATION OF ANTHROPOMORPHIC CULTURAL CODE BY MEANS OF ABSTRACT LEXICON IN ANTHROPONYMS (ON THE MATERIAL OF AZERBAIJANI AND RUSSIAN LANGUAGES)
Şükufe Valiyeva	AMIA Nizami Ganjavi Literature Institute (AZERBAIJAN)	FORMATION OF THE IMAGE OF "LITTLE MAN" IN THE LITERATURE OF THE USA
Huseynova GULNUR	Baku State University (AZERBAIJAN)	THE PROBLEM OF LACUNARITY IN THE TRANSLATION OF I. SHYHLY'S NOVEL "DƏLI KÜR" INTO RUSSIAN LANGUAGE
Gülnarə Mustafayeva	Azerbaijan State Pedagogical University (AZERBAIJAN)	ROMANTIC PESSIMISM IN HUSEYN JAVID'S WORKS
Aytac ABBASOVA	ANAS Institute of Folklore (AZERBAIJAN)	DERVISH MOTIF IN AZERBAIJAN AND KYRGYZ MYTHOPOETIC SYSTEM
Aytaç Hamidova	National Azerbaijani Literature Museum named after Nizami Ganjavi (AZERBAIJAN)	RUFAT AHMADZADEH'S CREATIVE ACTIVITY IN THE "KIRPI" MAGAZINE

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ONLINE PRESENTATIONS

28.08.2024 / HALL-3, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Dr. Cansu VATANSEVER

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Ceyhan HACIOGLU Dr. Didem ORAL	Duzce University (TÜRKİYE) Duzce University (TÜRKİYE)	EFFECTS OF CAPSAICIN on THE AUTOPHAGY SIGNALING PATHWAY in HUMAN GLIOMA CELLS
Dr. Didem ORAL Dr. Ceyhan HACIOGLU	Duzce University (TÜRKİYE) Duzce University (TÜRKİYE)	EFFECTS OF CAPSAICIN on THE AUTOPHAGY SIGNALING PATHWAY in HUMAN HEPG2 CELLS
Prof. Dr. Fatih ALGI Muhammet AVAN	Aksaray University (TÜRKİYE) Aksaray University (TÜRKİYE)	SYNTHESIS OF A CHEMILUMINOGENIC PHOTOSENSITIZER
MSc. Bio. Mustafa SAĞLAM Dr. Esra ÖZ Lect. Dr. Saliha Gökçe ALAGÖZ Prof. Dr. Tekin KARSLIGİL Prof. Dr. Yasemin ZER	Gaziantep University (TÜRKİYE)	EVALUATION OF HIGHLY ONCOGENIC Human papillomavirus (HPV) GENOTYPES DETECTED IN SERVICAL SAMPLES IN A THIRD-STAGE HOSPITAL
Dr. Cansu VATANSEVER	Altınbaş University (TÜRKİYE)	INVESTIGATION OF THE EFFECTS OF ESSENTIAL OILS ON ANTIBIOTIC SENSITIVITY OF PLANKTONIC AND BIOFILM BACTERIA
MISRA CAVLAK Assist. Prof. Dr. MUAZZEZ GÜRGAN ESER Lect. Dr. ÇETİN YAĞCILAR	Tekirdağ Namık Kemal University (TÜRKİYE)	CAN ZEBRAFISH BE A CURE FOR HEART DISEASE?
Olçayhan YILDIRIM	KTO Karatay University (TÜRKİYE)	SHOPPING CENTERS AND DIGITAL TRANSFORMATION IN TURKEY

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ONLINE PRESENTATIONS

28.08.2024 / HALL-4, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Dr. Ömer DOĞAN

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Ömer DOĞAN	Ministry of National Education (TÜRKİYE)	COMPARISON OF CONTINUATION METHODS IN KERNEL SYNCHRONIZATION
Adem POLAT Assist. Prof. Dr. Fidan ÖZBEY GÖKÇE	Duzce University (TÜRKİYE) Duzce University (TÜRKİYE)	COMPARISON OF STUDIES CONDUCTED BETWEEN 2008-2023 ON TEACHER CANDIDATES' ATTITUDES TOWARDS DISABLED INDIVIDUALS
Res. Assist. Esra Tuğba ÇOBAN SÖYLEMEZ Res. Assist. Beyza DEMİREL	Hacettepe University (TÜRKİYE) Muş Alparslan University (TÜRKİYE)	TRENDS IN THESES ON 'EFFECTIVE SCHOOL' IN TURKEY: A BIBLIOMETRIC ANALYSIS STUDY
Res. Assist. Beyza DEMİREL Res. Assist. Esra Tuğba ÇOBAN SÖYLEMEZ	Hacettepe University (TÜRKİYE) Muş Alparslan University (TÜRKİYE)	REVIEW OF METHODOLOGY PARTS OF STUDIES CONDUCTED ABROAD IN THE FIELD OF PRESCHOOL EDUCATION RELATED TO 'DIGITAL STORY'
Emelya SULEYMANOVA	(AZERBAIJAN)	PEDAGOGICAL REQUIREMENTS OF THE TEACHING PROFESSION
Lect. Davut AÇAR Dr. Cumhuri DEMİRALP	Hakkari University (TÜRKİYE) Hakkari University (TÜRKİYE)	INTERGENERATIONAL TRANSMISSION OF TOXIC STRESS
Dr. İlyas BALCI İlyas YAŞAR	Ministry of Education (TÜRKİYE)	ARTIFICIAL INTELLIGENCE AND EDUCATION MANAGEMENT: STRATEGIES FOR FUTURE SCHOOLS
Dr. İlyas BALCI Serhat KAYDI İlyas YAŞAR	Ministry of Education (TÜRKİYE)	AN ANALYSIS OF MANDATORY SCHOOL UNIFORM IMPLEMENTATION BASED ON THE PERSPECTIVES OF TEACHERS AND EDUCATIONAL ADMINISTRATORS
Zülfiye KOÇASLAN Assoc. Prof. Dr. Bestami Buğra ÜLGER	Bursa Uludag University (TÜRKİYE) Bursa Uludag University (TÜRKİYE)	THE ASSESSMENT OF SPECIAL EDUCATION SELF-EFFICIENCY AND PROFESSIONAL FEELINGS OF PERSPECTIVE COUNSELORS WORKING OR HAVE WORKED IN REHABILITATION CENTERS

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ONLINE PRESENTATIONS
28.08.2024 / HALL-5, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Dr. Arben PRIFTI

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Arben PRIFTI	The Mediterranean University of Albania (ALBANIA)	ADDRESSING LUDOPATHY AND CRIMINAL JUSTICE: A SYSTEMATIC REVIEW OF LITERATURE
Nguyen Huy Hoang	Tra Vinh University (VIETNAM)	PROTECTION OF INTERESTS OF BONA FIDE THIRD PARTIES WITH RESPECT TO INVALID CIVIL TRANSACTIONS UNDER VIETNAMESE LAW
Nguyen Huy Hoang	Tra Vinh University (VIETNAM)	GROUND FOR INVALIDITY OF FAKE CIVIL TRANSACTIONS UNDER VIETNAMESE LAW
Dr. Indrit SHTUPI	Mediterranean University of Albania (ALBANIA)	REFERENDUMS IN THE EUROPEAN UNION: LEGAL CHALLENGES IN THE CONTEXT OF THE EUROPEAN CONSTITUTION, POLITICAL UNIFICATION, AND NATIONAL SOVEREIGNTY
Dr. Doris DODA	Barleti University (ALBANIA)	THE RINGS OF REAL VALUED e-CONTINUOUS FUNCTIONS
Dr. Minh Truong The	Thu Dau Mot University (VIETNAM)	LAW ON ONLINE COMMERCIAL DISPUTE RESOLUTION OUT OF COURT
Dr. Oljana HOXHAI	Ismail Qemali University of Vlora (ALBANIA)	HUMAN RIGHTS VIOLATION THROUGH HATE SPEECH AND DISCRIMINATION LANGUAGE IN ONLINE MEDIA COMMUNICATION

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ONLINE PRESENTATIONS

28.08.2024 / HALL-6, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Assist. Prof. Dr. Deepamol Thomas

AUTHORS	AFFILIATION	TOPIC TITLE
Merga Feyera Wekjira	University of Pannonia (HUNGARY)	MULTILINGUALISM AS A RESOURCE IN ENGLISH LANGUAGE LEARNING WITH FOCUS TO OROMIA SCHOOLS, ETHIOPIA
Mirzabayeva Aigul	Kazakh National University in Almaty (KAZAKHSTAN)	THE PHENOMENON OF SPEECH MANIPULATION: A LINGUISTIC AND PSYCHOLINGUISTIC PERSPECTIVE
Nasir Abba Yusuf	Kampala International University Western Campus (UGANDA)	MARKETING AND THE GENERAL SIGNIFICANCE OF BLACKSMITHING INDUSTRY IN KATSINA CITY, 1904-1907
Yerezhpekzy Roza A.B. Ibragim	Al-Farabi Kazakh National University (KAZAKHSTAN) International Educational Corporation (KAZAKHSTAN)	ENVIRONMENTAL DISPUTES: PRACTICE AND PROBLEMS OF LEGAL REGULATION IN THE REPUBLIC OF KAZAKHSTAN
Aura Marcela PREDA	Romanian Academy (ROMANIA)	INTERDISCIPLINARY APPROACHES REGARDING THE PROTECTION OF VICTIMS IN ROMANIA
Assist. Prof. Dr. Anitha Daisy Winfred Assoc. Prof. Dr. Venum Cecilia P.A.A.	Thiruvalluvar University (INDIA) Thiruvalluvar University (INDIA)	UNDERSTANDING CHOICE AND FREEDOM: AN EXISTENTIAL STUDY OF KAZUO ISHIGURO'S NEVER LET ME GO
Chithra P Sneha P Dr. P C Santhosh Babu	MES Keveeyam College Valanchery (INDIA)	EXPLORING THE RELATIONSHIP BETWEEN HEDONISM AND WORK ENGAGEMENT AMONG ACADEMIC FACULTIES
Assist. Prof. Dr. Deepamol Thomas	Mar Ivanios College (INDIA)	NAVIGATING SCREEN TIME: THE EFFECTS OF YOUTUBE ON TODDLERS AND PRE- SCHOOLERS

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ONLINE PRESENTATIONS

28.08.2024 / HALL-7, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Assoc. Prof. Dr. Rajiv Chauhan

AUTHORS	AFFILIATION	TOPIC TITLE
Mr. Abderrahim GUETTECHE Dr. Salah Eddine BENSEBTI Pr. samy MEZHOUD Dr Abdelhafid CHABANE Pr. mohamed nacer GUETTECHE Dr .Tien-tung NGO Pr. El Hadj KADRI	Université Constantine 1 (ALGERIA) Université de Cergy Pontoise (FRANCE)	STUDY OF SEGREGATION IN SELF-COMPACTING CONCRETE BASED ON LOCAL MATERIALS
Kinga Korniejenko Marek Nykiel	Cracow University of Technology (POLAND)	REVIEW OF THE APPLICATIONS OF ZEOLITES AS SORPTION MATERIALS
Oussama MOUSSA Lallouani HELLALI Ali BOUZIDI	Technology, Ghardaia (ALGERIA) University of M'sila (ALGERIA)	INTERVAL TYPE 2 FUZZY LOGIC REGULATORS OF BRUSHLESS DOUBLY FED INDUCTION GENERATOR ON WIND ENERGY CONVERSION SYSTEM
Assoc. Prof. Dr. Rajiv Chauhan Assist. Prof. Dr. Sudheer Kumar J Assist. Prof. Dr. Honey Sharma	Technical University (INDIA) DAV Institute of Engineering and Technology (INDIA)	DURABILITY PROPERTIES OF CONCRETE PRODUCED USING WASTE BRICK POWDER AS A PARTIAL REPLACEMENT FOR CEMENT
Vandana GUPTA Assist. Prof. Dr. Kunal JAIN Maninder SINGH	Punjabi University Patiala (INDIA)	EFFECT OF WASTE SOYBEAN AND TALL OIL AS REJUVENATORS ON RECLAIMED ASPHALT BINDER
Mohammad Farhad AYZI Assist. Prof. Dr. Maninder SINGH Rajiv KUMAR	Punjabi University (INDIA) Punjabi University (INDIA) Central Road Research Institute of India (INDIA)	TALL OIL AS A BIO-BASED SOLUTION FOR REVITALIZING AGED ASPHALT
R.O. ANYASI	University of South Africa (SOUTH AFRICA)	INDOLE BUTYRIC ACID GROWTH HORMONE AND ITS ABILITY TO MODEL THE FORMATION OF ROOTS IN CHROMOLAENA ODORATA
Fatima Ezzahra LAHNINE Lahcen BIH Abdeslam El Bouari	Hassan II University of Casablanca (MOROCCO) Moulay Ismail University (MOROCCO)	COMPARATIVE STUDY OF AMORPHOUS AND NON-AMORPHOUS CATHODE MATERIALS IN LITHIUM AND POST-LITHIUM BATTERIES

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ONLINE PRESENTATIONS

28.08.2024 / HALL-1, SESSION-3



ZURICH LOCAL TIME



14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME



15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Ahmed Hamza ALPAY

AUTHORS	AFFILIATION	TOPIC TITLE
Lect. Dr. Ali KOSAT	Kütahya Dumlupınar University (TÜRKİYE)	RELATIONSHIP BETWEEN NATIONAL BRAND VALUE AND HUMAN DEVELOPMENT INDEX
Assist. Prof. Dr. Ahmed Hamza ALPAY	Bayburt University (TÜRKİYE)	AN ANALYSIS ON THE NATURE OF THE SOCIOLOGY OF KNOWLEDGE AND SCIENCE
Dr. Bilge AÇAN İrem DEĞİRMENÇİ Semanur YEL Rabia ATAMAN Hicran SOYKAN Ayşenur ÇELİK Zeynep YILANCI	29 Mayıs University (TÜRKİYE)	EFFECT OF ALCOHOL AND DRUG ADDICTION REHABILITATION ON SOCIAL ADJUSTMENT
Sekine YILMAZ	Hatay Mustafa Kemal University(TÜRKİYE)	THE EFFECT OF SOCIAL MEDIA ON THE PURCHASING BEHAVIORS OF FOREIGN TOURISTS RECEIVING TOURISM AND ACCOMMODATION SERVICES IN THE NORMALIZATION PERIOD AFTER THE HATAY EARTHQUAKE IN THE CONTEXT OF SUSTAINABLE COMMUNICATION
Nurşah AKÇA Dr. Nihan KALKANDELER ÖZDİN	Üsküdar University (TÜRKİYE) Üsküdar University (TÜRKİYE)	ANALYSIS OF HEGEMONIC MASCULINITY IN VIOLENCE AGAINST WOMEN WITHIN THE FRAMEWORK OF ERICH FROMM'S THEORY OF VIOLENCE

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ONLINE PRESENTATIONS

28.08.2024 / HALL-2, SESSION-3



ZURICH LOCAL TIME

14 00 : 16 00



ANKARA LOCAL TIME

15 00 : 17 00

HEAD OF SESSION: Assoc. Prof. Dr. Bahar Sarıboğa Akca

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Aliyeva Maralxanim Tofiq gizi	Azerbaijan State Pedagogical University	DEVELOPMENT OF STUDENTS' CREATIVE ABILITIES IN CONDUCTING LESSONS
Mehmet Salih ÖZYAŞAR Assoc. Prof. Dr. Gönenç HONGUR	Van Yüzüncü Yıl University (TÜRKİYE) Van Yüzüncü Yıl University(TÜRKİYE)	THE ROLE OF THE PIANO IN TURKISH MUSIC EDUCATION AND STUDENT ATTITUDES
Sevil DOLAŞIR AKTÜRK Assoc. Prof. Dr. Gönenç HONGUR	Van Yüzüncü Yıl University (TÜRKİYE) Van Yüzüncü Yıl University (TÜRKİYE)	THE DIVERSITY AND CULTURAL SIGNIFICANCE OF LULLABIES IN THE CIZRE REGION
Lect. Vesile Deniz Yücel	Istanbul University (TÜRKİYE)	EXPERIMENTAL APPROACHES TO BOW TECHNIQUES FOR ON STAGE VIOLA PERFORMANCES
Benan KANBER Assoc. Prof. Dr. Umur Burcu TASA YURTSEVER Hakan Karaardıç	Yıldız Technical University (TÜRKİYE) Yıldız Technical University (TÜRKİYE) Alaaddin Keykubat Üniversitesi (TÜRKİYE)	BIRDS AS ARTISTS: A STUDY ON NEST DESIGNS
Assoc. Prof. Dr. Mucahit Yalçın Öztüfekci Assoc. Prof. Dr. İsmail Hakkı Parlak	İzmir Katip Çelebi University (TÜRKİYE) Bolu Abant İzzet Baysal University (TÜRKİYE)	DISCOVERING THE RELATIONSHIPS BETWEEN THE PITCHES WITH WORD EMBEDDING TECHNIQUE IN TURKISH MAKAM MUSIC
Assist. Prof. Dr. Elif KANTARCI GÜDÜCÜ	Istanbul University State Conservatorium (TÜRKİYE)	TRANSITION PROCESS FROM VIOLIN TO VIOLA
Assist. Prof. Dr. Ayşin Pelin KİREMİTÇİ	Istanbul University State Conservatorium (TÜRKİYE)	IMPORTANCE OF BREATHING TECHNIQUE IN OBOE TRAINING AND WORKING SUGGESTIONS
Assoc. Prof. Dr. Bahar Sarıboğa Akca	Ordu University (TÜRKİYE)	FREDERICK THE GREAT, KING OF PRUSSIA AS A FLUTIST AND COMPOSER

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HEAD OF SESSION: Assoc. Prof. Dr. Yasin BAYKALIR

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Gülten Özgün Dr. Serçin Sun İpekeşen	Dokuz Eylül University (TÜRKİYE) Dokuz Eylül University (TÜRKİYE)	THE PLACE OF CORPORATE SOCIAL MEDIA ACCOUNTS IN UNIVERSITIES: THE EXAMPLE OF DOKUZ EYLÜL UNIVERSITY VOCATIONAL SCHOOL OF HEALTH SERVICES
Assoc. Prof. Dr. Oktay YANIK	Yüksek İhtisas University (TÜRKİYE)	DETERMINANTS OF BRAIN DRAIN IN THE HEALTHCARE SECTOR IN TURKEY
Dr. Pelin DEMİR Assoc. Prof. Dr. Yasin BAYKALIR	Firat University (TÜRKİYE) Balıkesir University (TÜRKİYE)	INVESTIGATION OF TOTAL PROTEIN AND CASEIN CONTENT OF FRUIT YOGHURTS SOLD IN ELAZIĞ PROVINCE BY ELECTROPHORETIC METHOD
Res. Assist. Aysenur Tural Cifci Osman Dagar Gokhan Akcakavak Mehmet Tuzcu	Aksaray University (TÜRKİYE) Aksaray University (TÜRKİYE) Aksaray University (TÜRKİYE) Selcuk University (TÜRKİYE)	A CASE OF CHOLESTEROL GRANULOMA IN A MARE
Dr. Kerim Kaan GÖKÜSTÜN Dr. Kübra KAYAOĞLU	Malatya Turgut Ozal University (TÜRKİYE) Malatya Turgut Ozal University (TÜRKİYE)	EVALUATION OF EATING BEHAVIORS IN YOUNG PEOPLE ACCORDING TO SOME PSYCHOLOGICAL FACTORS: A CROSS-SECTIONAL SURVEY
Assist. Prof. Dr. Selin İLSAY Assist. Prof. Dr. Nilgün KARAMAN	Balıkesir University (TÜRKİYE) Balıkesir University (TÜRKİYE)	LOCAL CULINARY CULTURE OF BALIKESİR: THE CASE OF BIGADIC

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ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Melike ERTEM

AUTHORS	AFFILIATION	TOPIC TITLE
Seda KILIÇ Duygu SÖNMEZ DÜZKAYA Atiye KARAKUL	Tarsus University (TÜRKİYE)	NURSING CARE OF CHILDREN WITH EPILEPSY
Seda KILIÇ Atiye KARAKUL Duygu SÖNMEZ DÜZKAYA	Tarsus University (TÜRKİYE)	CHILDHOOD EMERGENCY PROBLEMS AND NURSING
Prof. Dr. Tülin YILDIZ Res. Assist. Çağla AVCU	Tekirdag Namik Kemal University (TÜRKİYE)	PRANAYAMA BREATHING EXERCISES AND NURSING CARE IN SURGERY: A SYSTEMATIC REVIEW
Dr. Zeynep TEMEL MERT Assoc. Prof. Dr. Nurcan AKGÜL GÜNDOĞDU Pınar ATEŞ	Sivas Cumhuriyet University (TÜRKİYE) Bandırma Onyediy Eylül University (TÜRKİYE) Sivas Provincial Public Health Directorate (TÜRKİYE)	BREASTFEEDING A BABY WITH CONGENITAL HEART DISEASE: A CASE REPORT
Assoc. Prof. Dr. Melike ERTEM	İzmir Katip Çelebi University (TÜRKİYE)	CYBERCHONDRIA AND HEALTH ANXIETY OF STUDENTS STUDYING IN HEALTH SCIENCES
Funda BULUT ARIKAN Aziz AKSOY Zeynep EKTİREN	Kirikkale University (TÜRKİYE) Malatya Turgut Özal (TÜRKİYE) Metin Sabancı Baltalimanı Bone Diseases Training and Research Hospital (TÜRKİYE)	INVESTIGATION OF THE RELATIONSHIP BETWEEN NUTRITION AND SOME CHRONIC DISEASES ACCORDING TO BLOOD TYPES

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ZURICH LOCAL TIME



14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME



15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Prof. Dr. Lamara Kadagidze

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Soumya T VARGHESE	O P Jindal Global University (INDIA)	EDUCATIONAL TECHNOLOGY ADOPTION – SCOPING REVIEW
Dr. Soumya T VARGHESE Ms. Jonah Angeline	O P Jindal Global University (INDIA) Hindustan Institute of Technology and Science (INDIA)	EMBRACING EDTECH: A COMPREHENSIVE SCOPING REVIEW ON ADOPTION TRENDS AND CHALLENGES
Prof. Dr. Lamara Kadagidze Assoc. Prof. Dr. Maka Piranashvili Lizi Dzimistarishvili	Grigol Robakidze University (GEORGIA) Georgian Technical University (GEORGIA) Grigol Robakidze University (GEORGIA)	FOSTERING NATIONAL PRIDE AND GLOBAL CITIZENSHIP THROUGH INTEGRATING RELIGIOUS HISTORICAL SITE VISITS INTO TOURISM EDUCATION: INSIGHTS FROM STUDENTS AT GRIGOL ROBAKIDZE UNIVERSITY
Prof. Asoc. Dr. Enida KUME	“Aleksandër Moisiu” University (ALBANIA)	THE PSYCHO-SOCIAL SERVICE IN PRE-UNIVERSITY SCHOOLS IN ALBANIA
Marian AMBROZY	College of International Business ISM Slovakia in Prešov (SLOVAKIA)	DIALECTICS IN THE WORD OF PHYSICS
Elona Hasmuajaj	University of Shkoder “Luigj Gurakuqi” (ALBANIA)	INVESTIGATING EMPATHETIC TENDENCIES IN PSYCHOLOGY STUDENTS AT THE UNIVERSITY OF SHKODER, ALBANIA
MD. Florian Dashi Arba Cecia Tedi Mana	University of Medicine in Tirana (ALBANIA) Loyola University Chicago (USA) University of Medicine in Tirana (ALBANIA)	DIABETIC NEUROPATHY AND THE ROLE OF SURGICAL DECOMPRESSION OF PERIPHERAL NERVES ON COMMON SITES OF ENTRAPMENT FOR PAIN AND FOOT ULCER TREATMENT

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ZURICH LOCAL TIME

14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Prof. Dr. Daa Ayoub Ibrahim

AUTHORS	AFFILIATION	TOPIC TITLE
Yassine BALLOUT Mohamed Loutou	Mohamed First University (UMP) (MOROCCO)	ECYCLING MINING TAILINGS IN ECOLOGICAL MATERIALS; SUSTAINABLE DEVELOPMENT AND GREEN CIRCULAR ECONOMY
Yassine BALLOUT Mohamed Loutou	Mohamed First University (UMP) (MOROCCO)	PHOSPHORIC ACID CONCENTRATION EFFECTS ON MECHANICAL AND MICROSTRUCTURAL PROPERTIES OF IRON ORE TAILINGS BASED GEOPOLYMERS
Yassine BALLOUT Mohamed Loutou Soukaina El Bourachdi	Mohamed First University (UMP) (MOROCCO) Sidi Mohamed Ben Abdellah University (MOROCCO)	RECYCLING MINING TAILINGS IN ECOLOGICAL MATERIALS; SUSTAINABLE DEVELOPMENT AND GREEN CIRCULAR ECONOMY
Tanzeela Asghar Abdul Ghaffar Muhammad Yasin Naz Shazia Shukrullah	University of Agriculture Faisalabad (PAKISTAN)	OPTIMIZATION STRATEGIES FOR METAL NANOPARTICLE-ASSISTED HYPERThERMIa USING COMSOL MULTIPHYSICS
Faisal Nazir	The university of Agriculture (PAKISTAN)	PRODUCTION AND CHARACTERIZATION OF CARBON NANOTUBES FROM BIOCHAR UNDER MICROWAVE IRRADIATION
Rabbia Shahid Shanza Abbas	Comsats University (PAKISTAN) Comsats University (PAKISTAN)	RENEWABLE ENERGY TECHNOLOGIES AND THEIR ENVIRONMENTAL IMPACT
Prof. Dr. Daa Ayoub Ibrahim	Duhok University (IRAQ)	PRODUCTION OF Vicia faba INTERSPECIFIC HYBRID THROUGH In vitro PROPAGATION TECHNIQUE
Ode Jonathan Acha Dr. Donald Dehiin Hile Agada Felix Ojochegbe	J.S Tarka University Makurdi (NIGERIA) Federal University of Agriculture Makurdi (NIGERIA)	ESTIMATION OF DAILY AND GLOBAL EXTRATERRESTRIAL SOLAR RADIATION AT MAKURDI BENUE STATE
Humam Kareem Jalghaf Endre Kovács	University of Miskolc (HUNGARY) University of Technology (IRAQ)	TRANSIENT HEAT TRANSFER IN BUILDING WALL INTEGRATION WITH PHASE CHANGE MATERIAL AND THERMAL INSULATION FOR ECONOMIC OPTIMIZATION

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28.08.2024 / HALL-7, SESSION-3



ZURICH LOCAL TIME

14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Ping Yu

AUTHORS	AFFILIATION	TOPIC TITLE
Željka Nikitović	University of Belgrade (SERBIA)	FOUR-WAVE MIXING BY MODELS THAT DESCRIBE PROPAGATION OF COHERENT RADIATION THROUGH MATERIAL ENVIRONMENTS
Ketana K Dr. T S L Radhika	BITS Pilani (INDIA) BITS Pilani (INDIA)	NON-PARAMETRIC AND NON-LINEAR APPROACHES FOR MEDICAL DATA ANALYSIS
Dr. Hayatem Hamal	Tripoli University (LIBYA)	THE MAIN RESULTS OF THE MOMENTS AND CENTRAL MOMENTS OF KANTOROVICH TYPE OF BERNSTEIN OPERATORS VIA CALCULUS
Blerina Boçi Aurora Simoni	University Aleksandër Moisiu Durrës (ALBANIA) University of Tirana (ALBANIA)	ENHANCING RANDOM FOREST PERFORMANCE THROUGH BAYESIAN OPTIMIZATION: A STUDY ON HYPERPARAMETER TUNING
Assist. Prof. Dr. Ping Yu	Chinese Culture University (TAIWAN)	THE WEAKNESSES OF HAJIAN ET AL.'S LIGHTWEIGHT AUTHENTICATION AND KEY AGREEMENT PROTOCOL FOR HETEROGENEOUS IOT
Ia Kurashvili Giorgi Darsavelidze Marina Kadaria Nargiza Gogolashvili	Ilia Vekua Sukhumi Institute of Physics and Technology (GEORGIA)	EFFECT OF ⁶⁰ Co GAMMA IRRADIATION ON THE INELASTIC PROPERTIES IN SIGE ALLOYS
Imene LARIBI Dr. Ali KRELIFA Dr. Houcine BOUKABCHA Dr. Djamel OUCHENANE Dr. Salah BOULAARAS Dr. Salah ZITOUNI	Khemis Miliana University (ALGERIA) Laghouat University (ALGERIA) Qassim University (ALGERIA) Souk Ahras University (ALGERIA)	EXPONENTIAL STABILITY AND NUMERICAL RESULTS OF A THERMOELASTIC TIMOSHENKO SYSTEM WITH DIFFUSION EFFECT, MEMORY AND DISTRIBUTED DELAY

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29.08.2024 / HALL-1, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Assoc. Prof. Dr. Sara DEMİR

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Başak YURTSEVEN Dr. Umut GÜLER	Ankara University (TÜRKİYE) Ankara University (TÜRKİYE)	EXAMINING THE CONCEPTS OF CLIMATE JUSTICE AND ECOLOGICAL SECURITY FROM THE PERSPECTIVE OF LANDSCAPE ARCHITECTURE
Assoc. Prof. Dr. Sara DEMİR	Bursa Technical University (TÜRKİYE)	WATER AWARENESS IN URBANS: WATER MANAGEMENT WITH BLUE-GREEN INFRASTRUCTURE STRATEGIES
Dr. Nurcihan AKDAĞ Prof. Dr. Şefika Gülin BEYHAN	Süleyman Demirel University (TÜRKİYE) Süleyman Demirel University (TÜRKİYE)	THE TRANSFORMATION OF ISPARTA İSTASYON STREET RESIDENCES ON SUSTAINABILITY AND LIFESTYLES IN THE HISTORICAL PROCESS
Zeynep Ceylan GEZER CATALBAS Prof. Dr. İpek AKPINAR	Istanbul Technical University (TÜRKİYE) Izmir Institute of Technology (TÜRKİYE)	URBAN RENEWAL STORY OF TESVİKİYE
Res. Assist. Veli Mustafa YÖNDER	Kütahya Dumlupınar University (TÜRKİYE)	SCIENTIFIC MAPPING ON THE INTEGRATION OF BLOCKCHAIN TECHNOLOGY AND HERITAGE BUILDING INFORMATION MODELLING (HBIM) TECHNIQUES
Yasemin BAL Assoc. Prof. Dr. Zuhâl ŞİMŞEK	Bursa Uludağ University (TÜRKİYE) Bursa Uludağ University (TÜRKİYE)	ANALYSIS AND RATING METHOD FOR FIRE RISKS IN HEATHCARE BILDINGS: EXAMPLE OF SMALL-SCALE HOSPITAL BUILDING
Özlem İNAN Prof. Dr. Kasım YENİGÜN	Kastamonu University (TÜRKİYE) Kastamonu University (TÜRKİYE)	GENERAL EVALUATION OF RAINWATER HARVESTING PRACTICES
Dr. Cenk CİHANGİR	(TÜRKİYE)	GREEN BUILDING AND CERTIFICATION SYSTEMS

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ONLINE PRESENTATIONS

29.08.2024 / HALL-2, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Dr. Serkan Özdemir

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Serkan Özdemir	Isparta University of Applied Sciences (TÜRKİYE)	BIBLIOMETRIC ANALYSIS OF ECOLOGICAL MODELING FROM 1980 TO 2024
Assist. Prof. Dr. Tuba UZUN BAYRAKTAR Ali Yusuf KAYA	Siirt University (TÜRKİYE) İzmir Aegean Agricultural Research Institute (TÜRKİYE)	1103 PAULSEN AMERICAN GRAPEVINE ROOTSTOCKS UNDER-DISTILLATION THYME JUICE APPLICATION AND ITS EFFECT ON SHOOT GROWTH
Rumeyse ÖNAL Assist. Prof. Dr. Derya DURSUN SAYDAM Prof. Dr. Ali Coşkun DALGIÇ	University of Gaziantep (TÜRKİYE) Istanbul Yeni Yüzyıl University (TÜRKİYE) University of Gaziantep (TÜRKİYE)	SURVIVAL OF LACTOBACILLUS ACIDOPHILUS LA-5 IN FREEZE-DRIED BLACK CARROT POMACE USING VARIOUS ENCAPSULATION MATERIALS
Rumeyse ÖNAL Assist. Prof. Dr. Derya DURSUN SAYDAM Prof. Dr. Ali Coşkun DALGIÇ	University of Gaziantep (TÜRKİYE) Istanbul Yeni Yüzyıl University (TÜRKİYE) University of Gaziantep (TÜRKİYE)	TRANSFORMING FOOD WASTE INTO VALUE: THE ROLE OF FUNCTIONAL FOODS AND PROBIOTICS
Dr. İbrahim KARATAŞ	Osmaniye Korkut Ata University (TÜRKİYE)	BENEFITS AND CHALLENGES OF TECHNOLOGY FOR OCCUPATIONAL HEALTH AND SAFETY ON CONSTRUCTION SITES
Melike Halime KILIÇ Aysun CAVUSOGLU	Kocaeli University (TÜRKİYE) Kocaeli University (TÜRKİYE)	THYMUS SPP. USAGE AGAINST DISEASES IN FIELD CROP PLANTS

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ONLINE PRESENTATIONS

29.08.2024 / HALL-3, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Assist. Prof. Dr. Mehmet ÖZSAN

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Melek GÖKBULUT	Tokat Gaziosmanpasa University (TÜRKİYE)	ANALYSIS OF CRITICAL POINT SYMMETRY X(5) MODEL WITH YUKAWA POTENTIAL
Lect. Saliha KURT Assist. Prof. Dr. Tugce DURAN	Selçuk University (TÜRKİYE) KTO Karatay University (TÜRKİYE)	DIAGNOSTIC ROLE OF VEMP TEST IN GENETIC SYNDROMES WITH INNER EAR ANOMALIES
Assist. Prof. Dr. Tugce DURAN Lect. Saliha KURT	KTO Karatay University (TÜRKİYE) Selçuk University (TÜRKİYE)	AUTOSOMAL RECESSIVE HEARING LOSS AND VEMP TEST: NEW APPROACHES IN GENETIC DIAGNOSIS
Assist. Prof. Dr. Mehmet ÖZSAN	Niğde Ömer Halisdemir University (TÜRKİYE)	INTERMITTENT FASTING: PHYSIOLOGICAL REFLECTIONS OF METABOLIC, HORMONAL, AND NEUROLOGICAL CHANGES
Assist. Prof. Dr. Mehmet ÖZSAN Prof. Dr. Nurcan DÖNMEZ	Niğde Ömer Halisdemir University (TÜRKİYE) Selçuk University (TÜRKİYE)	HOMEOSTATIC IMBALANCE IN CANCER
Dr. Demet BATMAN	Trabzon University (TÜRKİYE)	BIBLIOMETRIC PROFILE OF MEDICAL IMAGING LITERATURE IN THE CONTEXT OF POSTGRADUATE THESES IN TURKEY
Dr. Demet BATMAN	Trabzon University (TÜRKİYE)	THE READINESS LEVELS OF STUDENTS FOR FIELD COURSES OF MEDICAL IMAGING TECHNIQUES

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ONLINE PRESENTATIONS

29.08.2024 / HALL-4, SESSION-1



ZURICH LOCAL TIME

09 00 : 11 00



ANKARA LOCAL TIME

10 00 : 12 00

HEAD OF SESSION: Esra YÜZGEÇ ÖZDEMİR

AUTHORS	AFFILIATION	TOPIC TITLE
Aslı ARSLAN Uğur TALAŞ Dr. Burakhan ÇUBUKÇU	Bilecik Seyh Edebali University (TÜRKİYE)	ARTIFICIAL INTELLIGENCE SUPPORTED LEGAL ADVISOR REFERENCE APPLICATION: LAWNAV
Levent ASLAN Uğur TALAŞ Dr. Burakhan ÇUBUKÇU	Bilecik Seyh Edebali University (TÜRKİYE)	DRIVER SIMULATOR TO ASSIST WITH DRIVER'S LICENSE EXAM
Dr. Sümeyye BAYRAKDAR Dr. M. Enes BAYRAKDAR	Duzce University (TÜRKİYE) Duzce University (TÜRKİYE)	NETWORK SLICING SECURITY APPROACH BASED ON THE VIRTUAL NETWORK FUNCTIONS FOR COGNITIVE RADIO NETWORKS
Esra YÜZGEÇ ÖZDEMİR Canan KOÇ Assoc. Prof. Dr. Fatih ÖZYURT	Bingöl University (TÜRKİYE) Firat University (TÜRKİYE) Firat University (TÜRKİYE)	CNN-BASED FEATURE EXTRACTION AND MACHINE LEARNING CLASSIFICATION APPROACH FOR DIAGNOSIS OF PARKINSON'S DISEASE
Canan KOÇ Esra YÜZGEÇ ÖZDEMİR Assoc. Prof. Dr. Fatih ÖZYURT	Firat University (TÜRKİYE) Bingöl University (TÜRKİYE) Firat University (TÜRKİYE)	PERFORMANCE EVALUATION IN ALZHEIMER'S DIAGNOSIS: COMPARISON OF MODELS
Bengisu UNGAN EKER Assist. Prof. Dr. Fatma Zehra SOLAK	Konya Technical University (TÜRKİYE) Konya Technical University (TÜRKİYE)	DEEP LEARNING APPROACHES FOR GASTROINTESTINAL DISEASE CLASSIFICATION
Assist. Prof. Dr. Fatih TOPALOĞLU	Malatya Turgut Özal University (TÜRKİYE)	LINEAR REGRESSION BASED APPROACH FOR REGIONAL PRECIPITATION FORECASTING

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ONLINE PRESENTATIONS

29.08.2024 / HALL-5, SESSION-1



ZURICH LOCAL TIME

09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME

10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Manjushri Sharma

AUTHORS	AFFILIATION	TOPIC TITLE
Muhammad Taufiq Abadi Ayatullah Sadali	State Islamic University (INDONESIA) State Islamic University (INDONESIA)	PERFORMANCE ANALYSIS OF UIN KH ABDURRAHMAN WAHID PEKALONGAN USING BALANCED SCORECARD METHOD BASED ON FINANCIAL PERSPECTIVE
Adil Benabou Fatima Touhami	Sultan Moulay Slimane University (MOROCCO) Sultan Moulay Slimane University (MOROCCO)	BOOSTING PUBLIC ADMINISTRATION EFFICIENCY THROUGH INFORMATION SYSTEMS
Prof. Dr. Nana Shonia Lili Maglaferidze	Akaki Tsereteli State University (GEORGIA) Akaki Tsereteli State University (GEORGIA)	GLOBAL TRENDS OF SUSTAINABLE FINANCING AND GEORGIAN REALITY
Youssef REHALI Fatima TOUHAMI Naima IDOUAARABE	University of Sultan Moulay Slimane (MOROCCO)	A COMPREHENSIVE META-ANALYSIS OF INTELLECTUAL CAPITAL INVESTMENTS IN SMALL AND MEDIUM-SIZED ENTERPRISES (SMES) USING STRUCTURAL EQUATION MODELING (SEM) - A PRISMA REVIEW
Slađana Milenković	College of Vocational Studies - Sirmium (SERBIA)	CHILDREN'S UNDERSTANDING OF ANIMAL STORIES BASED ON READER RESPONSE THEORY
Dr. Keshab Chandra MANDAL	S.M. Nagar Derozio Smriti Vidyalaya (INDIA)	INDIAN DEMOCRACY: THE ISSUES AND CHALLENGES
Martin Likeing	Federal University of Lafia (NIGERIA)	MEASURES TAKEN BY GOVERNMENT TO MEET THE NEEDS OF INTERNALLY DISPLACED PERSONS IN NORTH CENTRAL ZONE OF NIGERIA
Assist. Prof. Dr. Manjushri Sharma Aastha	Panjab University (INDIA)	STRATEGIC ENTREPRENEURSHIP: AN INTEGRATIVE LITERATURE REVIEW
Dr. Gina Ionela BUTNARU Dr. Cristiana MELINTE	Alexandru Ioan Cuza University of Iasi (ROMANIA)	ECOTOURISM OR TOURISM BASED ON ECOTOURISM?

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ONLINE PRESENTATIONS

29.08.2024 / HALL-6, SESSION-1



ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Tran Kim Anh

AUTHORS	AFFILIATION	TOPIC TITLE
Soukaina El Bourachdi Yassine Ballout Amal Lahkimi	Sidi Mohamed Ben Abdellah University (MOROCCO) Materials and Environment (LCM2E) (MOROCCO)	GRAPHENE OXIDE SYNTHESIS AND ITS EFFICACY IN ADSORBING CATIONIC DYE: AN IN-DEPTH STUDY OF THERMODYNAMICS, KINETICS, AND DFT ANALYSIS
Soukaina El Bourachdi Yassine Ballout Amal Lahkimi	Sidi Mohamed Ben Abdellah University (MOROCCO) Materials and Environment (LCM2E) (MOROCCO)	DFT THEORETICAL ANALYSIS, EXPERIMENTAL APPROACH, AND RSM PROCESS TO UNDERSTAND CONGO RED ADSORPTION MECHANISM ON COMPOSITE-BASED BIOPOLYMER
L. Mllaoui	Université Ibn Zohr (MOROCCO)	EFFICIENT ROOM TEMPERATURE SYNTHESIS OF BISMUTH OXOBROMIDE PHOTOCATALYSTS WITH {001} FACET EXPOSURE: STRUCTURAL, OPTICAL, AND PHOTOCATALYTIC PROPERTIES
Oumaima Chajji	University of Hassan II (MOROCCO)	ECOLOGICAL DYEING WITH A NATURAL COLORANT EXTRACTED FROM THE RHIZOMES OF RUBIA TINCTORUM L. FROM MOROCCO
Hanfeng Liang	Xiamen University (CHINA)	ELECTROCHEMICAL PRODUCTION OF HYDROGEN AND AMMONIA
Assoc. Prof. Dr. Tran Kim Anh	Institute of Materials Science Vietnam Academy of Science and Technology (VIETNAM)	UPCONVERSION NANOMATERIALS CONTAINING RARE EARTH IONS FOR BIOMEDICINE APPLICATION
Nataninda Elsi Sola Gratia	Christian University of Indonesia (INDONESIA)	ECOLOGICAL AWARENESS FROM TONOT WIYAT'S SCREAM AS A TRIGGER FOR TODAY'S ECOLOGY-BASED EDUCATION
PhD. Fatima Zahra ERRAJI Dr. Abdelkader DABBAGH Abdelkrim EL KADIB Fatima EL BAZ	Ibn Zohr University (MOROCCO) Ibn Zohr University (MOROCCO) Euro-Med University of Fes (UEMF) (MOROCCO) Ibn Zohr University (MOROCCO)	REMOVAL OF A CATIONIC DYE BY A HIGH EFFICIENT COMPOSITE USING FISH CO-PRODUCTS

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ZURICH LOCAL TIME



09⁰⁰ : 11⁰⁰



ANKARA LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Dr. Ágnes Sántha-Malomsoki

AUTHORS	AFFILIATION	TOPIC TITLE
Hala RAAD	Université Saint Joseph (LEBANON)	TEACHERS' KNOWLEDGE, PERCEPTION AND PRACTICES REGARDING STUDENTS WITH ATTENTION DEFICIT AND HYPERACTIVITY DISORDER (ADHD)
Dr. Džana Rahimić Ramić Dr. Minela Kerla	University of Sarajevo (BOSNIA HERZEGOVINA) The Association of Online Educators (BOSNIA HERZEGOVINA)	TECHNICAL ROLE OF PRODUCED KNOWLEDGE IN THE REAL WORLD - ORGANIZATION OF UONEDU
Dr. Aurela ZISI Prof. As. Dr. Florinda TARUSHA	Quality Assurance Agency of Pre-University Education (ALBANIA) "Aleksander Xhuvani" University (ALBANIA)	PROFESSIONAL STANDARDS FOR TEACHERS IN THE IMPLEMENTATION OF CURRICULUM REFORM
Mohd Sualh Saifullah Rehmani	Aligarh Muslim University (INDIA) Aligarh Muslim University (INDIA)	DIVERGENCE AND EVOLUTION: EXPLORING VARIED PERSPECTIVES ON HOMOSEXUALITY IN ISLAM
Katerina Katsarska	Bulgarian Academy of Sciences (BULGARIAN)	WOMEN PROGRAMMERS UNDER 35 IN BULGARIA: CAREER DEVELOPMENT, EDUCATION AND STRATIFICATION
Jana Hassan	Universite Saint-joseph de Beyrouth (LEBANON)	THE EFFECTS OF CONNECTING READING AND WRITING ON SECONDARY STUDENTS' WRITING PERFORMANCE, ATTITUDES, AND BELIEFS
Dr. Ágnes Sántha-Malomsoki	University of Pannonia (HUNGARY)	ENHANCING CRITICAL THINKING: THEORETICAL INSIGHTS AND PRACTICAL STRATEGIES FOR EDUCATION
Maira Asghar Dr. Afshan Naseem Dr. Irfan Bashir	University of Management and Technology (PAKISTAN)	AN EXAMINATION OF THE EXPERIENCES AND CHALLENGES ENCOUNTERED BY PROSPECTIVE TEACHERS DURING TEACHING PRACTICUM-1

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29.08.2024 / HALL-1, SESSION-2



ZURICH LOCAL TIME

11³⁰ : 13³⁰



ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Assoc. Prof. Dr. N. Nevra ESENTÜRK

AUTHORS	AFFILIATION	TOPIC TITLE
Biröl ALTUN	Bandırma Onyedİ Eylöl University (TÜRKİYE)	COVID-19, REMOTE WORK AND THE RIGHT TO DISCONNECT
Koray AYDIN Prof. Dr. İsmail BEKÇİ	Uşak University (TÜRKİYE) Süleyman Demirel University (TÜRKİYE)	USE OF TECHNOLOGICAL DOPING IN SPORTS ENVIRONMENTS AND THE CONCEPT OF NEURALINK
Dr. Deniz ÇINAR	(TÜRKİYE)	EFFECT OF INFORMATION MANAGEMENT ON EFFICIENCY IN SMALL AND MEDIUM-SIZED ENTERPRISES: A CASE STUDY
Dr. Deniz ÇINAR	(TÜRKİYE)	DIGITALIZATION, TRANSFORMATION AND FUTURE PERSPECTIVES IN THE HEALTHCARE SECTOR: SWOT ANALYSIS
Assist. Prof. Dr. Müzeyyen GELİBOLU	Mustafa Kemal University (TÜRKİYE)	FACTORS AFFECTING THE INTENTION TO USE SMART VOICE ASSISTANTS FOR SHOPPING PURPOSES: CONSUMER RESISTANCE AND PERCEIVED CREEPINNESS
Ömer Faruk GÜVEN Assoc. Prof. Dr. Bulut GÜRPINAR	Gebze Technical University (TÜRKİYE) Gebze Technical University (TÜRKİYE)	THE ROLE OF AVIATION DEFENSE INDUSTRY IN TURKISH FOREIGN POLICY: A STUDY IN THE CONTEXT OF THE KARABAKH ISSUE
Assoc. Prof. Dr. Esen ŞAHİN Nurgöl SELEK Lect. Sümeyye Nur KARA	Selçuk University (TÜRKİYE) Selçuk University (TÜRKİYE) KTO Karatay University (TÜRKİYE)	EVALUATION OF THE EFFECTIVENESS OF ACADEMY AWARDS (OSCAR) FOR THE BEST PICTURE WITH DATA ENVELOPMENT ANALYSIS
Assoc. Prof. Dr. N. Nevra ESENTÜRK	Yalova University (TÜRKİYE)	EU FOREIGN AID DURING THE COVID-19 PANDEMIC: KEY ASPECTS AND CHALLENGES
Dr. Mehmet Akif Gündoğdu	Social Sciences University of Ankara (TÜRKİYE)	TRADE INTERDEPENDENCE AND ECONOMIC DEVELOPMENT: A COMPARATIVE STUDY

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12³⁰ : 14³⁰

HEAD OF SESSION: Assoc. Prof. Dr. Rumeysa AKGÜN

AUTHORS	AFFILIATION	TOPIC TITLE
Zeynep Öztürk	Bursa Uludag University (TÜRKİYE)	REFLECTIONS OF THE EFFECTS OF CLIMATE CHANGE IN THIRD WORLD COUNTRIES ON EUROPE'S SECURITY
Assist. Prof. Dr. Özden ÖZLÜ	Maltepe University (TÜRKİYE)	SUSTAINABLE DEVELOPMENT AND DISTANCE EDUCATION: THE IMPACT OF ONLINE PLATFORMS AND DIGITAL TOOLS
Assoc. Prof. Dr. Rumeysa AKGÜN Ümmügülsüm KARAMANLI Derya ÖZDEMİR	Kırıkkale University (TÜRKİYE) Social Worker (TÜRKİYE) Social Worker (TÜRKİYE)	EFFECTS of PSYCHODRAMA GROUP THERAPY on STUDENTS in UNIVERSITY WHO EXPOSED to SENSITIVE DISABLICATION
Seda Nur BAYINDIR Semanur ÇERİZ Assoc. Prof. Dr. Rumeysa AKGÜN	Social Worker (TÜRKİYE) Social Worker (TÜRKİYE) Kırıkkale University (TÜRKİYE)	EFFECTS of ART THERAPY on the PSYCHOSOCIAL WELL-BEING of PATIENTS and RELATIVES TREATED in the BEDROOM of the PHYSIOTHERAPY AND REHABILITATION CENTRE: EBRU ART
Nigar Taghiyeva	ADA University (AZERBAIJAN)	THE EFFECTS OF ALGORITHMIC BIAS DERIVED FROM AI ON THE MEDIA LITERACY
Dr. Serap BOZKURT Fırat Yılmaz	Beykoz University (TÜRKİYE) Beykoz University (TÜRKİYE)	ÜLKER'S SUSTAINABILITY-FOCUSED CSR PROJECTS: MANAGERIAL PERCEPTION and STRATEGIC IMPLEMENTATIONS
Assoc. Prof. Dr. Arzu Al Sadiye Tuğba Kendirli Horoz Museyib Hayat	Marmara University (TÜRKİYE) Marmara University (TÜRKİYE) Marmara University (TÜRKİYE)	2023 ISRAEL- PALESTINE EVENTS IN THE ECONOMY- POLITICS- ENERGY TRIANGLE
Talibzade Elmira Sahib kizi	Baku State University (AZERBAIJAN)	GEOPOLITICAL ACTIVITY OF THE EU IN THE SOUTH CAUCASUS AFTER THE END OF THE SECOND KARABAKH WAR (2020-2024)

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29.08.2024 / HALL-3, SESSION-2



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ANKARA LOCAL TIME

12³⁰ : 14³⁰

HEAD OF SESSION: Assoc. Prof. Dr. Zeynep BIYIK

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Zeynep BIYIK Prof. Dr. Murat BIYIK	Selcuk University (TÜRKİYE) Necmettin Erbakan University (TÜRKİYE)	RELATIONSHIP BETWEEN BLOOD UREA NITROGEN (BUN) ALBUMIN RATIO WITH ACUTE KIDNEY INJURY AND MORTALITY IN PATIENTS WITH CIRRHOSIS
Assoc. Prof. Dr. Zeynep BIYIK	Selcuk University (TÜRKİYE)	EVALUATION OF HALP SCORE IN DIFFERENT STAGES OF CHRONIC KIDNEY DISEASE
Musayeva Tarana Mammadzada Aytan Muradova Samira Ibrahimova Shafag Huseynova Natavan Karimova Nazakat	Azerbaijan Medical University (AZERBAIJAN)	PHYSICAL REHABILITATION OF PATIENTS AFTER KIDNEY TRANSPLANTATION
Ismayilova Shalala Mammadova Samira Mammadzada Aytan Ahadova Fidan Karimova Nazakat Musayeva Tarana	Azerbaijan Medical University (AZERBAIJAN) University (AZERBAIJAN)	PHYSICAL ACTIVITY AND CARDIOVASCULAR RISK AMONG KIDNEY TRANSPLANT RECIPIENTS
Assist. Prof. Dr. Nurdan YILDIRIM	Mersin University (TÜRKİYE)	CALLY INDEX AS AN INFLAMMATION BIOMARKER IN PATIENTS WITH PSORIATIC ARTHRITIS
Assoc. Prof. Dr. Nurullah Peker Prof. Dr. Murat Akkuş Eda Yıldızhan Assist. Prof. Dr. Fırat Aşır Dr. Süreyya Özdemir Başaran	Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Diyarbakir Gazi Yaşargil Health Research Center (TÜRKİYE)	EXAMINATION OF HISTOPATHOLOGIC STRUCTURES IN PLACENTAS OF PREGNANT PATIENTS WITH COVID-19
Zuhal Çankırı Prof. Dr. Murat Akkuş Dilara AKINCI Eda Yıldızhan Assist. Prof. Dr. Fırat Aşır Dr. Zeynep Türe	Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE) Dicle University (TÜRKİYE)	EFFECT OF CRYOPRESERVATION OF HUMAN SPERM ON SPERM VITALITY
Bişar AMAÇ Murat Ziya BAĞIŞ Ömer GÖÇ	Harran University (TÜRKİYE)	THE EFFECT OF SEVOFLURANE USE IN PERFUSION DURING CARDIOPULMONARY BYPASS ON PERFUSION PARAMETERS

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29.08.2024 / HALL-4, SESSION-2



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11³⁰ : 13³⁰



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12³⁰ : 14³⁰

HEAD OF SESSION: Paula Cobzaru

AUTHORS	AFFILIATION	TOPIC TITLE
Elira Dani	Transmission System Operator (OST sh.a) of Albania (ALBANIA)	THE ROLE OF EMOTIONAL INTELLIGENCE IN LEADERSHIP: IMPACT ON TEAM PERFORMANCE AND JOB SATISFACTION
Xhulia MUSTA Assist. Prof. Dr. Rudina RAMA	University of Tirana (ALBANIA) University of Tirana (ALBANIA)	SHIFTING PARADIGMS TO BUILD A FAIRER DISABILITY ASSESSMENT SYSTEM IN ALBANIA
Paula Cobzaru Alexandru Țugui	Alexandru Ioan Cuza University (ROMANIA)	THERE IS VIRTUAL MONEY, VIRTUAL ECONOMY, VIRTUAL SOCIETY, AND VIRTUAL HUMANS. WHAT'S NEXT IN THE DIGITAL ERA?
Paula Cobzaru Daniela Mardari	Alexandru Ioan Cuza University (ROMANIA)	TOWARDS A UNIFIED DIGITAL EUROPE: COMPARATIVE ANALYSIS AND STRATEGIC INSIGHTS FROM GLOBAL DIGITALIZATION PRACTICES IN PUBLIC ADMINISTRATION
Dr. Mugaahed Abdu Kaid Saleh Prof. Harold Andrew Patrick	Jain University (INDIA) Jain University (INDIA)	(HOW) DOES PERFORMANCE EVALUATION PROMOTE SMES PERFORMANCE IN LOWER INCOME ECONOMIES? ANN APPROACH
PhD. Candidate Enkeleda MEMISHA	Mediterranean University of Albania (ALBANIA)	HUMAN RESOURCES- CHALLENGES FACING THE TOURISM SECTOR IN ALBANIA
Assoc. Prof. Dr. Borko Baraban	Josip Juraj Strossmayer University of Osijek (REPUBLIC OF CROATIA)	LINGUISTIC DURABILITY: THE FATE OF NEOLOGISMS IN CROATIAN MEDICAL LITERATURE
Mohammed Waheeb	Hashemite University (JORDAN)	SUGAR MILLS ROUTE & TOURISM DEVELOPMENT IN JORDAN VALLEY SOUTHERN LEVANT
Dr. Walid SHIRPOR Dr. Olwyn PIGGOTT Dr. Saeid TAKARLI	Kings College LONDON (UK) National University of Ireland (IRELANDA)	THE ROLE OF MEDICINE IN THE ECONOMY OF A COUNTRY

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29.08.2024 / HALL-5, SESSION-2



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11³⁰ : 13³⁰



ANKARA LOCAL TIME



12³⁰ : 14³⁰

HEAD OF SESSION: Prof. Dr. Ilirjan Malollari

AUTHORS	AFFILIATION	TOPIC TITLE
Abdelilah MECHNINE Prof. Ahmed AARAB	Abdelmalek Essaadi University (MOROCCO)	BIOINFORMATIC ANALYSIS OF ADAM-17 GENE VARIANTS
Ilirjan Malollari Terkida Prifti Kleha Haxhiasllani	University of Tirana (ALBANIA)	STUDY ON THE MODELING AND SIMULATION OF THE BIOACTIVE COMPONENTS EXTRACTION FROM SOME MEDICINAL PLANTS
Abdeljalil HAMDJ M'hamed AHARI Abdelmalik EL AATIAOUI	Abdelmalek Essaâdi University (MOROCCO) Abdelmalek Essaâdi University (MOROCCO) University Mohamed (MOROCCO)	SYNTHESIS AND CHARACTERIZATION OF BASE SCHIFF. APPLICATION BIOLOGICAL, ELECTROCHEMICAL AND COMPUTATIONAL INVESTIGATION
M. Sadik Z. Yamkane S. Elkhoud R. Moubah H. Lassri M. Moutataouia M. Abdellaoui	Hassan II University of Casablanca (MOROCCO)	STRUCTURAL AND MICROSTRUCTURAL ANALYSIS OF Ba _{0.54} Ca _{0.46} Fe _{6.5} Al _{5.5} O ₁₉ M-TYPE HEXAFERRITE: EFFECTS OF ANNEALING TREATMENT
Ayoub Eddari Dr. Noureddine Dlimi Abdelkader Boulezhar Dennoun Saifaoui	Laboratory of Renewable Energie and System Dynamics (LERDYS) (MOROCCO)	THE IMPACT OF VISCOSITY ON TOROIDAL VELOCITIES IN A TOKAMAK
Fatima Zohra ZEGGAÏ Masika BRADAÏ Massilia AÏT RADÏ Noureddine KARKACHÏ Rachid MEGHABAR	Centre de Recherche Scientifique et Technique en Analyses Physico-chimiques (CRAPC) (ALGERIA) Université d'Oran 1 Ahmed Benbella (ALGERIA)	HIGHLY POTENT ANTIBACTERIAL COPPER-BASED MOFS/NA- ALGINATE COMPOSITE BEADS
Youssef El Hilali Alaoui Said Bouda Houria Ben Amar Eimad Dine Tariq Bouhlali Siham Khoulassa Adil Essarioui	Sultan Moulay Slimane University (MOROCCO) National Institute of Agricultural Research (MOROCCO)	BAYOUD DISEASE OF DATE PALM (PHOENIX DACTYLIFERA L.): CHALLENGES AND MITIGATION STRATEGIES FOR THE PRESERVATION OF OASIS ECOSYSTEMS IN MOROCCO
Khadija OUTALB Hassan CHAAIR Soumia BELOUFA	University Hassan II of Casablanca (MOROCCO)	COMPARISON OF EXTRACTION METHODS FOR CAROB SWEET JUICE: TRADITIONAL APPROACHES AND TECHNOLOGICAL INNOVATIONS
Omirzak Aruzhan	Bilim Innation Lyceum (KAZAKHSTAN)	TEACHERS' WELL-BEING: WHY 'BURNOUT' HAPPENS AND HOW IT AFFECTS STUDENT LEARNING

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ONLINE PRESENTATIONS

29.08.2024 / HALL-6, SESSION-2



ZURICH LOCAL TIME



11³⁰ : 13³⁰



ANKARA LOCAL TIME



12³⁰ : 14³⁰

HEAD OF SESSION: Assoc. Prof. Dr. Katalin LIPTÁK

AUTHORS	AFFILIATION	TOPIC TITLE
Prof. As. Dr. Mateo SPAHO	Governance and Law "Barleti University" (ALBANIA)	ACCOUNTABILITY AND PERFORMANCE AS SOCIAL RESPONSIBILITY OF THE PUBLIC ADMINISTRATION: A PROPOSAL FOR CAPACITY BUILDING
Lect. Ana GORENCA	Mediterranean University of Albania (ALBANIA)	INNOVATION AND CREATIVITY AS ANTECEDENTS DENOMINATIVES OF THE ORGANIZATIONAL DEVELOPMENT
Assoc. Prof. Dr. Katalin LIPTÁK Ivana KOCSICSKA	University of Miskolc (HUNGARY) University of Miskolc (HUNGARY)	REDUCING UNEMPLOYMENT IN SMALL VILLAGES IN HUNGARY
Assoc. Prof. Dr. Ilir TOMORRI Prof. Dr. Remzi KECO Joana SHIMA	Agricultural University of Tirana (ALBANIA) Agricultural University of Tirana (ALBANIA) European University of Tirana (ALBANIA)	EXAMINING THE RELATIONSHIP BETWEEN E- GOVERNMENT AND GOOD GOVERNANCE, IN ALBANIA
Prof. Ass. Dr. Kushtrim GASHI Frederika MORINA	University "Ukshin Hoti" Prizren (KOSOVO) University "Ukshin Hoti" Prizren (KOSOVO)	THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE DEVELOPMENT AND MANAGEMENT OF E-BUSINESSES: A CASE STUDY OF TRAVEL AGENCIES
Assoc. Prof. Dr. Rrezarta GASHI Dr. Violeta SMAJLAJ	AAB College (KOSOVO) University of Islamic Studies (KOSOVO)	THE ROLE OF EDUCATION AND TRAINING IN THE DEVELOPMENT OF WOMEN ENTREPRENEURS IN KOSOVO
Blerta Haliti Baruti Hana Gashi Ahmeti	AAB College (KOSOVO) Pjeter Budi Collage (KOSOVO)	THE IMPACT OF INFLATION ON WELFARE AND ECONOMIC STABILITY IN THE WESTERN BALKANS
Aida Makas Prof. Dr. Sanela Pasic	Sarajevo School of Science and Technology (BOSNIA AND HERZEGOVINA)	WOMEN ROLE AND IMPACT IN THE GOVERNANCE, RISK AND COMPLIANCE
Bianca-Florentina Nistoroiu Ovidiu CONDEIANU Iuliana NICOLAE	Bucharest University of Economic Studies (ROMANIA) Romanian Academy House (ROMANIA)	INTEGRATING SUSTAINABLE PRACTICES IN AGRICULTURE: STRATEGIES FOR RURAL DEVELOPMENT IN RESPONSE TO GLOBAL ENVIRONMENTAL GOALS

● Zoom Meeting ID: 897 0755 8402 / ● Zoom Passcode: 272829

ONLINE PRESENTATIONS

29.08.2024 / HALL-1, SESSION-3



ZURICH LOCAL TIME

14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Adem YILMAZ

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Fidan ALHAS	İnönü University (TÜRKİYE)	INVESTIGATION OF THE RELATIONSHIP BETWEEN ORGANIZATIONAL EXTRACTION AND CYBERLOFING
Dr. Ömer ÖZKAN Prof. Dr. Nezih Metin ÖZMUTAF	SOCAR Türkiye İzmir Katip Çelebi University	EMPLOYEE PERCEPTIONS TOWARDS THE QUALITY OF QUALITY PROCESSES IN ORGANIZATIONS: A RESEARCH IN THE AEGEAN REGION
Dr. Belma UZUN	Istanbul Gedik University (TÜRKİYE)	INVESTIGATION OF GLOBAL FACTORS AFFECTING THE MANAGEMENT PROCESS IN HEALTH INSTITUTIONS
Assoc. Prof. Dr. Gülay ÖZDEMİR YILMAZ Cihangir TEKLİ	Balikesir University (TÜRKİYE) Balikesir University (TÜRKİYE)	DESTINATION PREFERENCE REASONS OF MEDICAL TOURISTS: THE CASE OF ISTANBUL
Şeymanur KORUCUK SÖĞÜT	Karamanoğlu Mehmetbey University (TÜRKİYE)	PARENTAL ROLE IN DIGITAL LITERACY: HOW TO GUIDE CHILDREN'S MEDIA USE
Assoc. Prof. Dr. Pınar AYYILDIZ	Ankara Medipol University (TÜRKİYE)	LEADERSHIP OF WOMEN SCHOOL ADMINISTRATORS
Assoc. Prof. Dr. Adem YILMAZ	Kastamonu University (TÜRKİYE)	THE IMPACT OF CREATIVE WRITING SKILLS AND ARTIFICIAL INTELLIGENCE APPLICATIONS IN SCIENCE EDUCATION ON GRADUATE STUDENTS' ACADEMIC DEVELOPMENT
Assist. Prof. Dr. Burcu AYDEMİR ŞENAY	Atatürk University (TÜRKİYE)	INFORMATION RETRIEVAL PROBLEMS IN ARCHIVES: A THEORETICAL EVALUATION

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ONLINE PRESENTATIONS

29.08.2024 / HALL-2, SESSION-3



ZURICH LOCAL TIME



14 00 : 16 00



ANKARA LOCAL TIME



15 00 : 17 00

HEAD OF SESSION: Assoc. Prof. Dr. Reyhan DEMİR

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Reyhan DEMİR	Aydın Adnan Menderes University (TÜRKİYE)	REALITY AND ALLEGORY IN CASPAR DAVID FRIEDRICH'S ARTWORKS
Assoc. Prof. Dr. Merva KELEKÇİ OLGUN	Beykoz University (TÜRKİYE)	THE IMPACT OF EXPERIMENTAL TYPOGRAPHY AS A FORM OF ARTISTIC EXPRESSION ON DIGITAL MEDIA
Dr. Serhan KARANFİL	Anadolu University (TÜRKİYE)	GALLERIES FROM THE STREETS: THE EVOLUTION OF KEITH HARING ART
Assoc. Prof. Dr. Banu YÜCEL Assoc. Prof. Dr. Esra ERTUĞRUL TOMSUK	Ankara Hacı Bayram Veli University (TÜRKİYE) Çankırı Karatekin University (TÜRKİYE)	THE TRANSFORMATION OF AESTHETIC PERSPECTIVES INTO THE ART OF DESTRUCTION IN THE PROCESS
Assoc. Prof. Dr. Esra ERTUĞRUL TOMSUK Assoc. Prof. Dr. Banu YÜCEL	Çankırı Karatekin University (TÜRKİYE) Ankara Hacı Bayram Veli University (TÜRKİYE)	EMPHASIS ON HUMAN, NATURE AND CULTURAL MEMORY IN JANNIS KOUNELLIS ART
Res. Assist. Gülten Berrak Erbahçeci	Bartın University (TÜRKİYE)	MORAL DAMAGE CASES ARISING FROM WORK ACCIDENTS AND OCCUPATIONAL DISEASES
Yakup ÇALIŞKAN Assoc. Prof. Dr. Adnan ALGÜL	Gaziantep University (TÜRKİYE) Gaziantep University (TÜRKİYE)	THE IDEA OF EDITING AL-AHKÂM AL-FIQHİYYA: AN ANALYSIS OF ITS PAST, PRESENT AND FUTURE
Yakup ÇALIŞKAN Assoc. Prof. Dr. Adnan ALGÜL	Gaziantep University (TÜRKİYE) Gaziantep University (TÜRKİYE)	AN ANALYSIS OF THE POLITICAL THEORY OF ISLAM OR THE ISLAMIC SYSTEM
Assist. Prof. Dr. Zeynep Dönmez	Ankara Yıldırım Beyazıt University (TÜRKİYE)	EVALUATION OF THE SURVIVING SPOUSE'S PARTICIPATION CLAIM IN THE LIQUIDATION OF INHERITANCE IN LIGHT OF JUDICIAL DECISIONS

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ONLINE PRESENTATIONS

29.08.2024 / HALL-3, SESSION-3



ZURICH LOCAL TIME



14 00 : 16 00



ANKARA LOCAL TIME



15 00 : 17 00

HEAD OF SESSION: Assoc. Prof. Dr. Emine Hatun DİKEN

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Emine Hatun DİKEN Elif YÜREK	Kafkas University (TÜRKİYE) Sarıkamış Yayıklı Atatürk Secondary School (TÜRKİYE)	THE EFFECT OF SONG AND MUSIC SUPPORTED TEACHING OF THE "PHASES OF THE MOON" TO GRADE 5TH ON SOME VARIABLES
Assoc. Prof. Dr. Emine Hatun DİKEN Elif YÜREK	Kafkas University (TÜRKİYE) Sarıkamış Yayıklı Atatürk Secondary School (TÜRKİYE)	STUDENTS OPINIONS ON SONG AND MUSIC SUPPORTED TEACHING OF 5TH GRADE "PHASES OF THE MOON"
Muhammet ÇUBUK Assoc. Prof. Dr. Gökhan ÇAKIR	Recep Tayyip Erdoğan University (TÜRKİYE) Recep Tayyip Erdoğan University (TÜRKİYE)	USE AND IMPORTANCE OF WEB 2.0 TOOLS IN PHYSICAL EDUCATION AND SPORTS TEACHING
Assoc. Prof. Dr. Mehmet Şerif ÖKMEN Assoc. Prof. Dr. Metin POLAT	Mardin Artuklu University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	INVESTIGATION OF THE EFFECT OF STRENGTH TRAINING APPLIED TO TENNIS PLAYERS ON DELAYED ONSET MUSCLE SORENESS VALUES AFTER A TENNIS MATCH
Assist. Prof. Dr. Bedriye Seda KURŞUN AKTAR	Malatya Turgut Özal University (TÜRKİYE)	SYNTHESIS, BIOLOGICAL ACTIVITIES AND IN SILICO STUDIES OF N-(CYCLOHEXYLCARBAMOYL)-4-(5-(4-(4-SUBSTITUTEPHENOXY) PHENYL)-4,5-DIHYDRO-1H-PYRROL-3-YL) BENZENESULFONAMIDE COMPOUNDS
Selim BAHADIR	Ankara Yıldırım Beyazıt University (TÜRKİYE)	TOTAL DOMINATION AND MATCHINGS IN REGULAR GRAPHS
F.Sh. Ahmadova Ildris Mammadov	Baku State University (AZERBAIJAN) Baku State University (AZERBAIJAN)	SEMICONDUCTOR [Cu] _3 [In] _5 [Se] _9 COMPOUND
Dr. Gül KARADUMAN Assist. Prof. Dr. Feyza KELLEÇİ ÇELİK	Karamanoğlu Mehmetbey University (TÜRKİYE) Karamanoğlu Mehmetbey University (TÜRKİYE)	PREDICTIVE MODELING OF LD50 VALUES FOR NITRO-AROMATIC COMPOUNDS WITH MULTIPLE LINEAR REGRESSION

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ONLINE PRESENTATIONS

29.08.2024 / HALL-4, SESSION-3



ZURICH LOCAL TIME

14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Serap SARIBAŞ

AUTHORS	AFFILIATION	TOPIC TITLE
Assist. Prof. Dr. Aytan MAMMADLI	Istanbul Aydin University (TÜRKİYE)	TEACHING GRAMMAR IN RUSSIAN CLASSES AS A FOREIGN LANGUAGE
Elçin NAKIŞ	Hacettepe University (TÜRKİYE)	CORPUS STYLISTIC ANALYSIS OF GENDER AND TEXTUAL FUNCTIONS: THE SHIRT OF FLAME AND THE WILD
Assoc. Prof. Dr. Serap SARIBAŞ	Karamanoğlu Mehmetbey University (TÜRKİYE)	TRUE CRIME AND CINEMA: MURDER OF SLYVIA LIKENS AN AMERICAN CRIME, THE GIRL NEXT DOOR
Assoc. Prof. Dr. Serap SARIBAŞ	Karamanoğlu Mehmetbey University (TÜRKİYE)	NORTH IRELAND'S TROUBLED TIMES ON THE ETHNIC AND POLITICAL GROUND: A LIFE UNDER THE SHADOW OF ARMS, BELFAST
Sophio Guliashvili Tinatin Jikurashvili	The University of Georgia (GEORGIA) The University of Georgia (GEORGIA)	THE PROCESS OF ESTABLISHING BOUNDARIES OF THE INDIVIDUAL IN THE EARLIEST GEORGIAN LITERARY TEXT THE MARTYRDOM OF THE HOLY QUEEN SHUSHANIK
Arsena Shkurti	University "Aleksandër Moisiu" Durrës (ALBANIA)	IMPROVING LANGUAGE LEARNING THROUGH AUTHENTIC ASSESSMENT: INVESTIGATING THE EFFICACY OF REAL-WORLD TASKS IN ASSESSING ORAL, WRITTEN, AND INTERACTIVE LANGUAGE SKILLS

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ONLINE PRESENTATIONS

29.08.2024 / HALL-5, SESSION-3



ZURICH LOCAL TIME



14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME



15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Blessy V Rajan

AUTHORS	AFFILIATION	TOPIC TITLE
Shaymaa Sahib Abdul-Hur Saher Mahmood Jwad	University of Kufa (IRAQ) University of Kufa (IRAQ)	EVALUATION OF THE ANTIOXIDANT EFFICIENCY OF ALCOHOLIC EXTRACT OF GREEN APPLE PEELS MALUS DOMESTICA AGAINST DRUG-INDUCED HEPATOTOXICITY AND RENAL TOXICITY ACETAMINOPHEN IN MALE ALBINO RATS
Prof. Dr. Mirkozimjon Nishonov Assoc. Prof. Dr. Shuhratjon Askarovich Mamajonov	Fergana State University (UZBEKISTAN) Fergana State University (UZBEKISTAN)	THE ROLE AND SIGNIFICANCE OF CHEMISTRY IN THE FORMATION OF ECOLOGICAL CULTURE
Dr. Saima Shaheen Prof. Dr. Nabila Sher Muhammad Dr. Sosan Rauf	Khyber Girls Medical College (PAKISTAN)	THYROID HORMONE LEVELS AND THEIR ASSOCIATION WITH PLASMA ZINC LEVELS AMONG ADOLESCENT AFGHAN REFUGEES; A CROSS-SECTIONAL STUDY
Rafid M. Hashim Sumaya J. Abid Raneen H. Ridha Zainab Haithem Kadhim	Uruk University (IRAQ) Al- Iraqi University (IRAQ) Al- Iraqi University (IRAQ) Al- Iraqi University (IRAQ)	SYNTHESIS, MOLECULAR DOCKING STUDY AND BIOLOGICAL ACTIVITY OF NOVEL 1,2,4-TRIAZOLE DERIVATIVES FORM CIPROFLOXCIN
Assist. Prof. Dr. Blessy V Rajan	St Xavier's College Vaikom (INDIA)	SHIFTS IN FISH CATCH COMPOSITION IN VEMBANAD LAKE: IMPACTS OF FLOODING ON INDIGENOUS SPECIES
Tahsin Muhtady Md Mostakur Rahman Md.Yeamain Hossain	Institute of Natural Resources Research and Development (BANGLADESH) University of Rajshahi (BANGLADESH) University of Rajshahi (BANGLADESH)	LIFE HISTORY TRAITS OF HILSHA (TENUALOSA ILISHA): NEEDED FOR SUSTAINABLE MANAGEMENT

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ONLINE PRESENTATIONS

29.08.2024 / HALL-6, SESSION-3



ZURICH LOCAL TIME

14⁰⁰ : 16⁰⁰



ANKARA LOCAL TIME

15⁰⁰ : 17⁰⁰

HEAD OF SESSION: Dr. Emine BAŞ

AUTHORS	AFFILIATION	TOPIC TITLE
Gjovalin DEDA Assoc. Prof. Dr. Orgest ZAKA	Aleksander Moisiu University (ALBANIA) Agricultural University of Tirana (ALBANIA)	ENHANCING AGRITOURISM EFFICIENCY IN SHKODRA REGION THROUGH GIS AND ROUTE OPTIMIZATION: A QGIS AND ORS TOOLS APPROACH
Dargahgulyev Rasim Ahmad	Azerbaijan High School named after Heydar Aliyev (AZERBAIJAN)	HIGH TECHNOLOGY: IMPORTANCE OF CLOUD TECHNOLOGIES
Zahra Jabeen Khushboo Mishra Prof. Dr. Binay Kumar Mishra	Veer Kunwar Singh University (INDIA)	COMBINING SIGNATURE-BASED AND AI- POWERED ANTIVIRUS PROTECTION TECHNIQUES: A REVIEW DONE FOR A SUPERIOR LEVEL OF SECURITY
Ikram Ullah Shaheen Saqib Shahid Rahim Fahad Masood	Abasyn University Peshawar (PAKISTAN)	AN IMPROVED HYBRID APPROACH FOR THE PREDICTION OF BLOOD-BRAIN BARRIER PENETRATION USING DEEP LEARNING
Dr. Emine BAŞ	Konya Technical University (TÜRKİYE)	CHAOTIC ZEBRA OPTIMIZATION ALGORITHM FOR CEC_C06_2019 FOR TEST FUNCTIONS
Dr. Emine BAŞ	Konya Technical University (TÜRKİYE)	A NEW BINARY OSPREY OPTIMIZATION ALGORITHM BASED ON TAPER-SHAPED TRANSFER FUNCTIONS

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IN-PERSON PRESENTATIONS

28.08.2024



ZÜRICH LOCAL TIME

09³⁰ : 11⁰⁰



Hotel IBIS Styles

Address: Stampfenbachstrasse 60
8006 Zürich City Center

HEAD OF SESSION: Assoc. Prof. Dr. Özlem FIRTINA

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Özlem FIRTINA	Gazi University (TÜRKİYE)	ON THE WOMEN IN KAFKA'S LIFE
Sophiko Tabatadze Melano Beridze	Tbilisi State University (GEORGIA) Tbilisi State University (GEORGIA)	THE TRANSFER OF POLITICAL COURSE IN THE POST-SOVIET SPACE: AN EXAMPLE OF THE LAW ON CURBING FOREIGN INFLUENCE IN GEORGIA
Waheeduallah Zahid Assoc. Prof. Dr. Preethi Keerthi Dsouza	Mangalore University (INDIA) Mangalore University (INDIA)	WOMEN'S EDUCATION IN AFGHANISTAN; A PATHWAY TO PROGRESS AND EQUALITY
Prof. Dr. Baran ARSLAN Gamze KAYA Yonca BAKIR Assoc. Prof. Dr. Volkan YAKIN	Harran University (TÜRKİYE) Mersin University (TÜRKİYE) Harran University (TÜRKİYE) Manisa Celal Bayar University (TÜRKİYE)	THE EFFECT OF THE LEVEL OF CYNICISM OF HOSPITALITY CONSUMERS ON CONSUMER BOYCOTT BEHAVIOR
Assoc. Prof. Dr. Guida MAN	York University (CANADA)	CHINESE IMMIGRANT WOMEN AND SOCIAL REPRODUCTION: AN INTERSECTIONAL ANALYSIS OF ELDERCARE WORK
WÓJCIK-CZERNIAWSKA Agnieszka Prof Dr. GRZYMALA Zbigniew M.A Albina Łubian	Warsaw School of Economics (SGH) (POLAND) Warsaw School of Economics (SGH) (POLAND)	THE EFFECTIVENESS OF EDUCATION MODELS ON THE EXAMPLE OF SELECTED COUNTRIES
Assoc. Prof. Dr. Bayram DOĞAN	Kahramanmaraş Sütçü İmam University (TÜRKİYE)	RIGHT TO LIFE AN EVALUATION IN THE LIGHT OF THE DECISIONS OF THE ECHR AND THE CONSTITUTIONAL COURT
Assoc. Prof. Dr. Mehmet Emin KALGI	Ardahan University (TÜRKİYE)	BEYOND TRADITION: A STUDY ON THE RADICAL EVOLUTION OF RELIGION INTO SOCIAL CAPITAL OR MARKET ECONOMY

IN-PERSON PRESENTATIONS

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ZURICH LOCAL TIME

12³⁰ : 14⁰⁰



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Adress: Stampfenbachstrasse 60
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HEAD OF SESSION: Assoc. Prof. Dr. Serap Yiğit GEZGİN

AUTHORS	AFFILIATION	TOPIC TITLE
Assoc. Prof. Dr. Serap Yiğit GEZGİN Assoc. Prof. Dr. Yasemin GÜNDOĞDU KABAKCI Prof. Dr. Hamdi Şükür KILIÇ	Selcuk University, Faculty of Science, Department of Physics (TÜRKİYE)	A THEORETICAL STUDY ON CIGS SOLAR CELL PRODUCED USING PULSE LASER DEPOSITION TECHNIQUE
Assoc. Prof. Dr. Yasemin GÜNDOĞDU KABAKCI Prof. Dr. Hamdi Şükür KILIÇ Assoc. Prof. Dr. Serap Yiğit GEZGİN	Selcuk University (TÜRKİYE) Kadınhanı Faik İçil Vocational High School (TÜRKİYE)	THE NONLINEARITY OF MoS ₂ NANOPARTICLES DEPENDING ON FEMTOSECOND LASER BASED Z-SCANNING
Prof. Dr. Hamdi Şükür KILIÇ Assoc. Prof. Dr. Yasemin GÜNDOĞDU KABAKCI Assoc. Prof. Dr. Serap Yiğit GEZGİN	Selcuk University, Faculty of Science, Department of Physics (TÜRKİYE)	AN INVESTIGATION OF OPTICAL PROPERTIES OF CADMIUM SULFATE (CdS) THIN FILMS PRODUCED BY PULSED LASER DEPOSITION (PLD) TECHNIQUE
Dr. Fikret KABAKCI	Zonguldak Bülent Ecevit University (TÜRKİYE)	INVESTIGATION OF 9Cr-1Mo % STEEL WELD METAL MICROSTRUCTURE AND MECHANICAL PROPERTIES
Dr. Banu ABBASOĞLU	Bahcesehir University (TÜRKİYE)	EXAMINING OF DIGITAL LITERACY SKILLS ALPHA GENERATION STUDENTS
Dr. Ayse YUKSEKDAG	Istanbul Technical University (TÜRKİYE)	DEVELOPMENT OF INNOVATIVE HYDROPHOBIC NANOFIBER MEMBRANE WITH BIOMATERIAL ADDITIVE FOR MEMBRANE DISTILLATION APPLICATION
Dr. Bahar YAVUZTURK GUL	Istanbul Technical University (TÜRKİYE)	REMOVAL OF HEAVY METALS FROM INDUSTRIAL WASTEWATERS THROUGH MYCOREMEDIATION AND MBR HYBRID SYSTEM

IN-PERSON PRESENTATIONS

28.08.2024



ZURICH LOCAL TIME

15⁰⁰ : 16³⁰



Hotel IBIS Styles

Adress: Stampfenbachstrasse 60
8006 Zürich City Center

HEAD OF SESSION: Prof. Dr. Ümit M. KOÇYİĞİT

AUTHORS	AFFILIATION	TOPIC TITLE
Dr. Oyku MUTLU SALMANLI	Istanbul Technical University (TÜRKİYE)	CINNAMON AS A MODIFIER FOR ANTIBACTERIAL MEMBRANE IN WASTEWATER TREATMENT
Sinan BÜLBÜL Assist. Prof. Dr. Uğur BAŞER	Ondokuz Mayıs University (TÜRKİYE) Ondokuz Mayıs University (TÜRKİYE)	PRODUCERS' WILLINGNESS TO GROW LENTILS: THE CASE OF KURŞUNLU DISTRICT OF ÇANKIRI PROVINCE, TÜRKİYE
Zekeriya Can ERBİL Büşra ALTAY Assoc. Prof. Dr. Nurgül ARISOY	Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE)	A BIBLIOMETRIC PERSPECTIVE ON AI APPLICATIONS IN LANDSCAPE ARCHITECTURE
Büşra ALTAY Zekeriya Can ERBİL Prof. Dr. Serpil ÖNDER	Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE) Selcuk University (TÜRKİYE)	LANDSCAPE ARCHITECTURE CLIMATE CHANGE RESEARCH, A BIBLIOMETRIC APPROACH
Nurcan ÖZTÜRK Prof. Dr. Ümit M. KOÇYİĞİT	Sivas Cumhuriyet University (TÜRKİYE) Sivas Cumhuriyet University (TÜRKİYE)	DETERMINATION OF ANTIEPLEPTIC ACTIVITIES OF SOME N-ACETYL PYRASOLE DERIVATIVES IN VITRO CONDITIONS
Prof. Dr. Ümit M. KOÇYİĞİT	Sivas Cumhuriyet University (TÜRKİYE)	CONDITIONS THAT MAY BE ENCOUNTERED DURING PURIFICATION OF CARBONIC ANHYDRATE BY AFFINITY CHROMATOGRAPHY
İbrahim KANSU	Cyprus Science University (TURKISH REPUBLIC of NORTHERN CYPRUS)	THE RELATIONSHIP BETWEEN PSYCHOLOGICAL RESILIENCE, FUTURE ANXIETY AND LIFE SATISFACTION IN EARTHQUAKE VICTIMS: THE CASE OF KAHRAMANMARAŞ













Toplantı DOĞAN SARAK adı ile ilgili ekran Kaydediliyor... Katan: 09.29.02 Gözetim

observer hall 2 observer hall 2 DOĞAN SARAK İZMİRİN SAKI Dr. Arçhan Güler elvare hiyeva Hal Zihane YERLÜ

Observer Hall 2 Tuba Uzun Başaklar 09.29.02

Neden bunu konu seçildi ?
Çünkü,

- Kişi başına gelir (1991 5 bin dolar; 2023 14 bin dolar)
- İhracat (1991 %13.8 ; 2023 %32.3)
- Sanayi üretimi (1991 %32.38; 2023%144.46)
- Karbondiyoksit (CO₂ emisyonu) (1991 4.45 ton; 2022 6.79 ton)
- Yenilenebilir enerji (2023 yılında 58 bin 462 megavat)
- Fosil yakıt tüketimi (1991 27.476 bin ton eşdeğer petrol (TEP); 2022 85.889 bin TEP)

Kaydediliyor... 09.29.02 Gözetim

Observer H-1

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TUBA UZUN BA...

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Seviye Videyo Başlat Katılımcılar Sesli Mesajlar Ekran Paylaşımı Yeni Ortam Göster Ana Duvar Arkaplanlar Uygulamalar Başlat Tutarlar

Özetle Çık

Zoom Workplace | Meeting ID: 849 084 4 004 000 | Meeting: HALL 4 - Boris KARAKAP... | 10:32 AM, 18.09.2024

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THE ROLE OF EMOTIONAL INTELLIGENCE IN LEADERSHIP: IMPACT ON TEAM PERFORMANCE AND JOB SATISFACTION

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FOSTERING NATIONAL PRIDE AND GLOBAL CITIZENSHIP THROUGH INTEGRATING RELIGIOUS HISTORICAL SITE VISITS INTO TOURISM EDUCATION: INSIGHTS FROM STUDENTS AT GRIGOL ROBAKIDZE UNIVERSITY

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ABSTRACT

Religious tourism, a significant sector in global travel, holds profound cultural and historical value across diverse regions. Georgia, renowned for its Orthodox Christian heritage, boasts a wealth of religious sites integral to its identity and tourism potential. The present study investigates the perspectives of tourism students at Grigol Robakidze University on integrating visits to these religious historical sites into their educational curriculum. The research explores whether such experiences foster national pride, deepen cultural heritage appreciation, and contribute to students' development as global citizens. Employing a mixed-methods approach, the study administered surveys and conducted interviews with students. Survey results revealed highly positive perceptions among students regarding the educational benefits and cultural insights gained from site visits. Interviews provided detailed perspectives, highlighting personal experiences and suggesting curriculum enhancements. The findings emphasize the educational value of incorporating religious site visits into tourism education, advocating for a strategic approach to utilize Georgia's religious heritage for global tourism. The research contributes practical insights for educators and policymakers aiming to enrich tourism education and promote cultural understanding in a global context.

Keywords: Tourism Education, Religious Tourism, cultural heritage, religious historical site visits, global citizenship, student survey and interviews, Georgia.

Introduction

Religious tourism is a complex and ever-evolving phenomenon that, despite its diversification, has retained its vital core—religion (Vorzsak & Gut, 2009). As one of the oldest forms of

tourism, religious tourism dates back to the emergence of various religious branches worldwide. According to the Oxford Business Group (2023), religious tourism ranks among the most promising sectors within the broader tourism industry. In Georgia, the relationship between religion and tourism is deeply intertwined with the country's rich history and cultural heritage. This introduction aims to explore the importance of religious tourism in Georgia, particularly in the context of incorporating religious site visits into educational curricula at Grigol Robakidze University.

With a statehood spanning nearly 3,500 years and a Christian heritage of approximately 2,000 years, Georgia stands as a testament to the enduring influence of faith. The spread of Christianity in Georgia is believed to have begun with the Apostle Saint Andrew the First-Called, who preached the Christian gospel under the commission and blessing of the Blessed Virgin Mary. This profound historical connection continues to shape the national identity of Georgia, where the robe of Jesus Christ, brought to Georgia by Jews from Mtskheta after the crucifixion, remains a significant religious relic (GNTA, 2017; Kadagidze, 2020). The significance of religious tourism in Georgia is further underscored by the presence of numerous world-renowned religious sites, such as the Svetitskhoveli Cathedral in Mtskheta, where the robe of Jesus Christ is believed to be buried. These sacred sites have historically attracted not only Georgian pilgrims but also Christians from neighboring regions. Moreover, Georgia's architectural and monumental heritage, deeply influenced by Christian symbolism, has produced some of the world's most exquisite examples of ecclesiastical art, many of which are considered masterpieces of global significance (Metreveli, 2008).

Religious topics are introduced at the school level in Georgia, adjusted to the age-appropriate understanding of students. In higher education institutions, such as Grigol Robakidze University, the study of religious tourism is incorporated into various courses within the tourism program, including Cultural Tourism, Ethno-culture and Tourism, and Excursion Studies. Within the framework of the Tour Operating course, students collaborate with their professor to design and develop cultural-religious and educational tours, both within Georgia and in neighboring countries like Turkey, Azerbaijan, and Armenia. Through an interactive selection process, students choose destinations with cultural and religious significance and conduct an educational tour once per semester. These tours serve multiple purposes: they familiarize students with Georgia's diverse tourist and recreational resources, enable them to prepare and present educational topics, and allow for the practical application of tourism management as they study and analyze the tours as tourism products. Through the integration of religious tourism into educational curricula, students at Grigol Robakidze University are not only gaining a deeper understanding of their cultural and religious heritage but are also developing a sense of national pride. This educational approach equips them with the knowledge and skills necessary to appreciate and respect various cultures and religions, ultimately shaping them into global citizens who can navigate and contribute to an increasingly interconnected world.

As religious tourism continues to evolve and influence cultural and educational practices, it is crucial to examine the perspectives of the youth who are actively engaged in this field. Understanding how students at Grigol Robakidze University perceive the integration of religious site visits into their educational experience can provide valuable insights into the impact of these visits on national pride, cultural heritage, and global citizenship. The paper hereafter will focus on the survey and interview methodology used to gather these perspectives, the findings related to national pride and heritage, and the broader implications for developing global citizenship among students.

Literature Review

Religious tourism, also known as faith-based tourism, has been recognized as a significant and growing segment within the broader tourism industry. Vorzsak and Gut (2009) highlight that religious tourism is one of the oldest forms of tourism, dating back to the emergence of various religious branches worldwide. The Oxford Business Group (2023) emphasizes that religious tourism is among the most promising sectors, reflecting its substantial impact on cultural and economic aspects of the tourism industry. In particular, religious tourism has played a crucial role in shaping national identities and fostering a sense of national pride (Park, 2010).

In Georgia, religious tourism is deeply embedded in the country's history and cultural heritage. Metreveli (2008) discusses how Georgia's rich historical tapestry and Christian heritage have shaped its religious tourism landscape. The historical presence of sacred relics, such as the robe of Jesus Christ, brought to Georgia by Mtskheta Jews, underscores the profound significance of religious sites in the national consciousness (GNTA, 2017). These sites have been central to Georgia's religious identity and continue to attract both domestic and international pilgrims (Kadagidze, 2020).

The integration of religious tourism into educational curricula has been explored as a means to enhance students' understanding and appreciation of cultural and religious heritage. At Grigol Robakidze University, the study of religious tourism is incorporated into various tourism-related courses, including Cultural Tourism and Ethno-culture and Tourism. This educational approach aims to provide students with practical experience in designing and developing cultural-religious tours, which are essential for understanding the broader context of tourism (Malaescu, 2020).

The impact of religious site visits on national pride and global citizenship has been a subject of interest in recent studies. Research suggests that exposure to cultural and religious heritage can foster a deeper sense of national pride and cultural identity among students. For instance, exploring historical and religious sites can enhance students' understanding of their own cultural background and promote a greater appreciation for diverse cultures and religions (Moaven, 2017; Rahman et al., 2021). This, in turn, contributes to their development as global citizens who are more aware of and sensitive to different faiths and cultures (Hernández-Rojas et al., 2021).

Methodology

The study employed a mixed-methods approach, combining quantitative surveys and qualitative interviews to gather insights into the perspectives of youth on religious historical site visits and their impact on national pride, heritage, and global citizenship. The research targeted students enrolled in the tourism department at Grigol Robakidze University, with a particular focus on their experiences and views regarding the educational value of these visits.

The survey was designed to capture a broad range of student opinions on the integration of religious site visits into their academic curriculum. The questionnaire consisted of multiple-choice and Likert-scale questions, aiming to quantify students' perceptions of how these visits impact their sense of national pride, understanding of cultural heritage, and development as global citizens.

A total of 54 students (which is 52% of the total number of learners having an active academic status, in total 103) participated in the survey, representing a diverse cross-section of the tourism department. The survey was administered online through a university portal, ensuring easy access and a higher response rate. The demographic information collected included students' academic year, major, and prior experiences with religious tourism.

In addition to the survey, semi-structured interviews were conducted with 31 (30% of the whole number of students involved in the tourism program) students selected based on their active participation in university-organized religious historical site visits. These interviews provided in-depth qualitative data on the students' personal experiences, thoughts on the significance of these visits, and their educational impact. The interview guide included open-ended questions aimed at exploring students' detailed views on the role of religious tourism in fostering national pride, understanding cultural heritage, and contributing to their development as informed global citizens. The interviews were conducted in person and via video calls, depending on the students' availability.

The participants in both the survey and interviews were primarily between the ages of 17 and 23, reflecting the typical age range of university undergraduate program students in Georgia. Most participants were in their second or third year of study, specializing in various aspects of tourism, including cultural and heritage tourism. The majority had previously participated in at least one religious historical site visit organized by the university, providing them with relevant experience to draw upon during the survey and interviews.

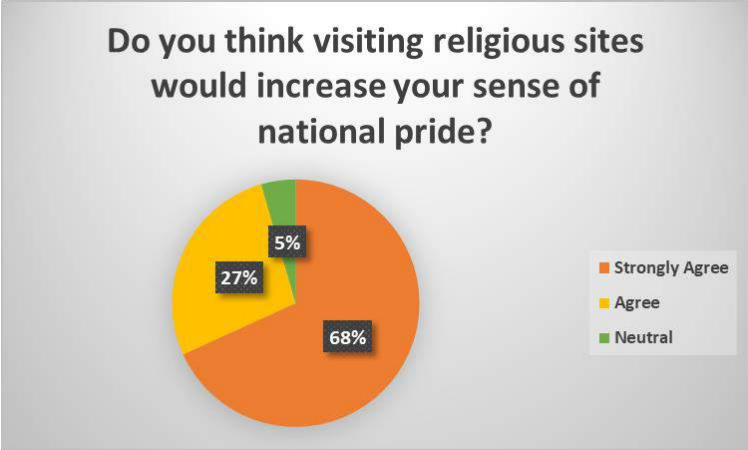
This methodological approach ensured a comprehensive understanding of youth perspectives on religious tourism, balancing quantitative data from the surveys with qualitative insights from the interviews.

Findings

The survey results revealed that a significant majority of the students viewed religious historical site visits as a valuable component of their education in tourism. These students expressed that such visits deepened their appreciation for Georgia's rich cultural heritage, with 95% indicating

that these experiences strengthened their sense of national pride (see Figure 1.). Students frequently mentioned how witnessing the architectural grandeur and historical significance of sites like Mtskheta and Gelati Monastery made them feel more connected to their national identity and history.

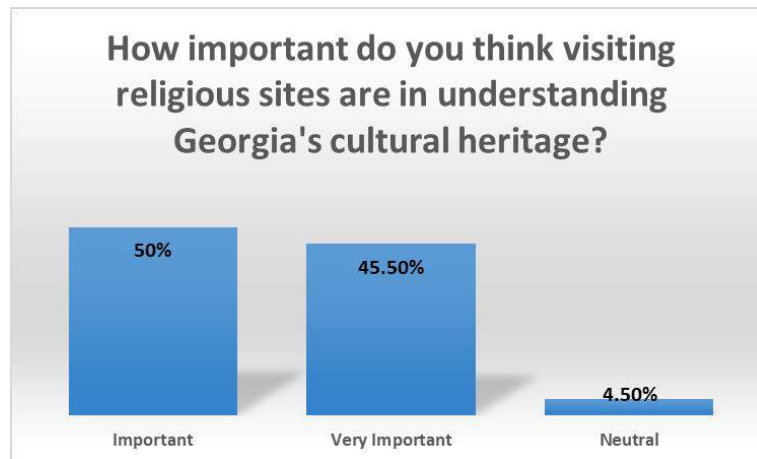
Figure 1.



Additionally, the interviews echoed these sentiments, with participants describing the profound impact of experiencing the sites firsthand. Many students articulated that the visits provided a tangible connection to historical events and religious practices that shaped Georgian culture, which textbooks alone could not convey. One interviewee stated, “Standing in the same place where important historical figures once stood makes you feel part of something greater, something deeply rooted in our national identity.”

The findings also highlighted that religious historical site visits are perceived as instrumental in fostering a collective sense of heritage among students. Nearly 96% of survey respondents agreed that these visits contribute to a shared understanding of cultural and religious history, which in turn reinforces national unity (see Figure 2.). Furthermore, students pointed out that such experiences serve as a reminder of Georgia's resilience and continuity as a nation, especially in the face of historical challenges.

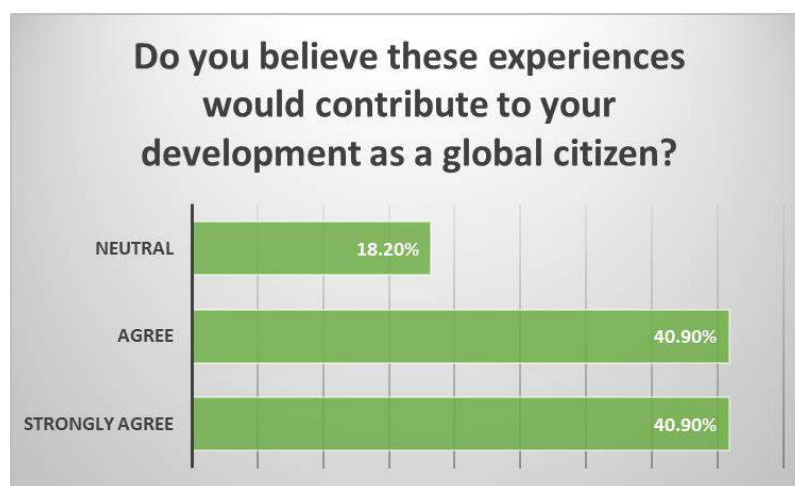
Figure 2.



Interviewees emphasized that these visits offered an immersive learning experience, allowing them to witness the preservation efforts and religious traditions that continue to thrive in modern times. This exposure not only solidified their knowledge but also inspired a commitment to preserving and promoting Georgia's cultural heritage in their future careers in tourism.

A key finding from the survey was that 82% of students believed that visiting religious historical sites contributes significantly to their development as global citizens (See Figure 3.). This belief was rooted in the idea that these visits foster a broader understanding of diverse cultural and religious practices, which is essential for anyone pursuing a career in tourism. Students noted that these experiences enhance their ability to empathize with and respect different cultures, a critical skill in the increasingly globalized tourism industry.

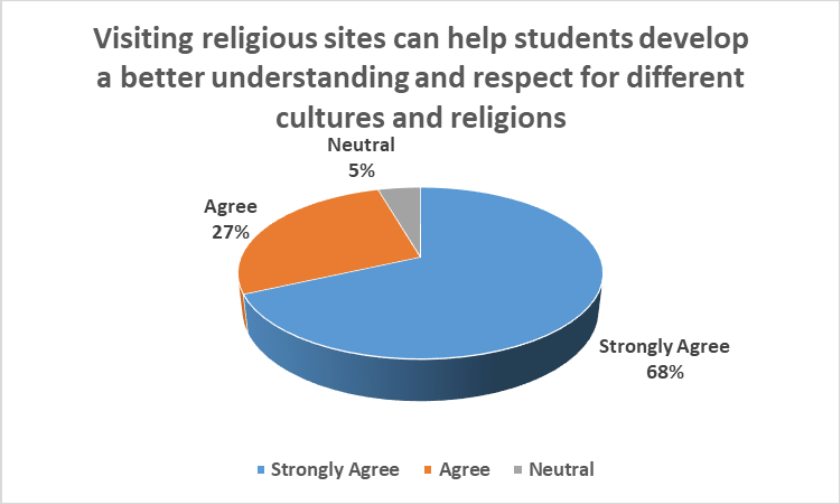
Figure 3.



Interview data supported this view, with several students describing how the visits challenged their preconceived notions about religion and culture. One student mentioned, “These visits make you realize that while we have our unique traditions, they are part of a larger human experience that transcends borders.” Such reflections indicate that the site visits not only reinforce national identity but also cultivate a global perspective.

The findings underlined the importance of understanding and respecting different faiths and cultures as a crucial outcome of these site visits. About 70% of students felt that being exposed to the rituals, symbols, and history of various religious sites enhanced their cultural sensitivity (see Figure 4.). This exposure was seen as particularly valuable in preparing them to interact with international tourists who may come from different religious backgrounds.

Figure 4.



Interviews revealed that students often left these visits with a heightened awareness of the need for tolerance and respect in their future professional interactions. Many expressed that learning about the shared values and historical intersections between different religions helped them develop a more inclusive worldview, which they considered vital for their personal and professional growth.

Discussion

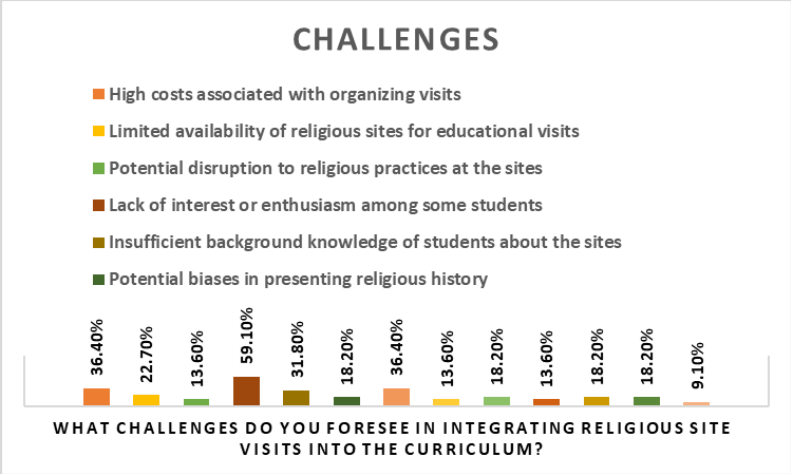
The findings of the study highlight the multifaceted educational benefits of integrating religious historical site visits into tourism education. These visits not only deepen students' understanding of Georgia's cultural heritage but also play a critical role in shaping their identities as both national citizens and global participants in the tourism industry.

The strong positive responses from students regarding their sense of national pride and heritage emphasize the effectiveness of experiential learning. By physically engaging with historical sites, students are able to internalize lessons in a way that surpasses traditional classroom learning. This supports the argument that experiential education, particularly in the context of cultural heritage, is essential for fostering a well-rounded and deeply rooted understanding of national identity.

Furthermore, the development of global citizenship skills through these visits cannot be overstated. As the findings indicate, exposure to diverse cultural and religious practices equips students with the empathy and cultural sensitivity necessary to thrive in the global tourism market. This aligns with existing literature that suggests experiential learning in culturally significant sites enhances both national pride and global awareness among students.

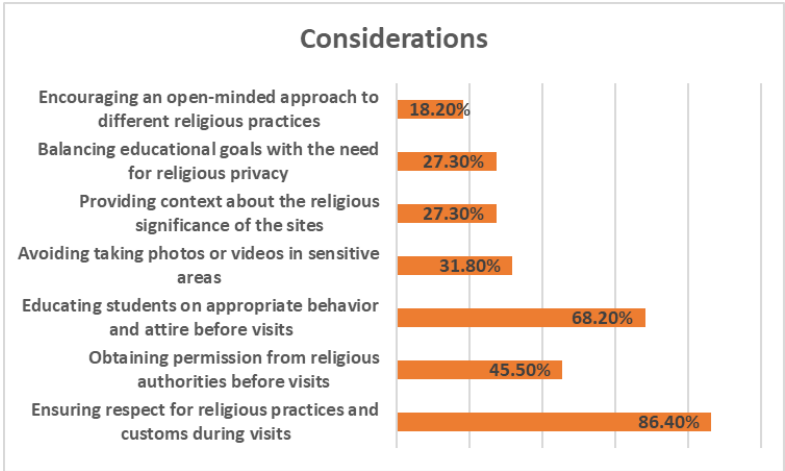
Despite the clear educational benefits, the study identifies several potential challenges in incorporating religious site visits into the curriculum. Logistical issues, such as coordinating visits and ensuring accessibility for all students, must be addressed to maximize participation. Participants highlighted specific concerns, including high costs (36.4%), lack of interest among students (59.1%), and insufficient background knowledge (31.8%). These factors could impact the feasibility and effectiveness of integrating such visits into the educational framework (see Figure 5.).

Figure 5.



Ethical considerations are also crucial. The need to balance educational use with the preservation of sacred sites is paramount. Overcrowding and commercialization of these sites can detract from their spiritual significance and potentially lead to degradation. To address these concerns, students overwhelmingly supported the establishment of ethical guidelines for site visits (see Figure 6.). Key suggestions included ensuring respect for religious practices (86.4%), educating students on appropriate behavior and attire (68.2%), and obtaining permission from religious authorities (45.5%).

Figure 6.



The study suggests that educational institutions must carefully design these visits to respect both the cultural and religious sensitivities associated with these sites. This includes fostering a respectful and informed attitude among students, ensuring that they approach these sites not just as tourists, but as learners and custodians of cultural heritage.

In conclusion, while the integration of religious historical site visits into tourism education offers significant benefits, careful planning and adherence to ethical considerations are essential to fully realize these benefits without compromising the integrity of the sites themselves.

Recommendations

To maximize the educational benefits of religious historical site visits, it is recommended that these visits be integrated into a structured educational framework. This framework should include pre-visit preparation, such as background readings and discussions on the significance of the sites, as well as post-visit reflections through individual, pair or group presentations and/or discussions. Such an approach would ensure that students not only gain factual knowledge but also engage in critical thinking about the cultural and historical implications of these sites.

It is crucial to ensure that all students, regardless of physical ability or religious background, can participate in these educational experiences. Institutions should consider providing alternative assignments or virtual tours for students unable to visit the sites in person. Additionally, fostering an inclusive environment where students of different faiths feel comfortable discussing their perspectives can enhance the educational value of these visits.

Educational institutions should collaborate closely with cultural and religious authorities to design site visits that are respectful and informative. This collaboration can help address ethical concerns about preserving the sanctity of religious sites while allowing educational access. Engaging these authorities in the planning process can also ensure that the information provided during the visits is accurate and culturally sensitive.

Limitations

One of the primary limitations of the study is the relatively small and homogenous sample size, which primarily includes students from a single university's tourism department. As a result, the findings may not be generalizable to a broader population of students in different disciplines or from other regions. Future studies should aim to include a more diverse group of participants to provide a more comprehensive understanding of youth perspectives on religious historical site visits.

Another limitation is the reliance on self-reported data, which can be subject to social desirability bias. Students may have provided responses they believed were expected or viewed favorably by their peers or instructors. This could lead to an overestimation of the positive impact of site visits on national pride and global citizenship. To mitigate this, future research could include more objective measures, such as observational data or assessments of student knowledge before and after the visits.

The study's focus on religious historical sites may limit its applicability to other types of cultural or historical site visits. The findings might differ if the study were to include a broader range of sites, such as those related to secular history, arts, or natural heritage. Expanding the scope of research to include various types of cultural sites could provide a more holistic view of the educational impact of site visits in tourism education.

Further Research

Future research should consider comparative studies across different academic disciplines to determine whether the positive impacts of site visits observed in tourism students are consistent among students in other fields of study. Such research could explore how students in history, religious studies, or international relations perceive the value of religious historical site visits and whether these visits contribute similarly to their educational outcomes.

Longitudinal studies tracking the long-term impact of religious historical site visits on students' career development and personal growth would provide valuable insights. These studies could examine whether the experiences gained during these visits continue to influence students' professional practices, cultural sensitivity, and global citizenship years after graduation.

With advancements in virtual reality (VR) and augmented reality (AR), future research could explore the potential of these technologies to enhance or replace physical site visits. Studies could compare the educational outcomes of students who visit sites in person with those who experience them through VR or AR, assessing whether these technologies can replicate the immersive learning experiences provided by physical visits.

Conclusion

The study has highlighted the significant educational benefits of integrating religious historical site visits into tourism education, particularly in fostering national pride, cultural heritage appreciation, and global citizenship among students. The findings suggest that these visits offer a unique and valuable opportunity for experiential learning, allowing students to engage deeply with Georgia's cultural and religious history while developing the skills and perspectives necessary for their future careers in tourism.

However, the study also identifies important challenges and considerations that must be addressed to fully realize these benefits. Ensuring inclusivity, respecting the sanctity of religious sites, and overcoming logistical constraints are critical to the successful implementation of site visits as an educational tool. By addressing these challenges and building on the recommendations provided, educational institutions can enhance the impact of religious historical site visits, contributing to the holistic development of their students.

In conclusion, while religious historical site visits offer significant potential as a component of tourism education, their successful integration requires careful planning, collaboration, and ongoing research. By continuing to explore and refine these educational practices, educators can ensure that students receive a well-rounded and culturally enriching education that prepares them for the complexities of the global tourism industry.

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Appendices:

Appendix 1.

Survey Questions

1.Demographic Information:

What is your gender?

Which year of study are you currently in?

2.General Views on Religious Tourism:

How familiar are you with the concept of religious tourism?

- Very familiar
- Somewhat familiar
- Not familiar

How important do you think religious sites are in understanding Georgia's cultural heritage?

- Very important
- Important
- Neutral
- Not important
- Not important at all

3.Educational Integration:

Do you believe that visiting religious historical sites should be part of the tourism education curriculum at Grigol Robakidze University?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

How beneficial do you think these site visits would be for your education in tourism?

- Extremely beneficial
- Very beneficial
- Somewhat beneficial
- Not beneficial

- Not beneficial at all

4.Impact on National Pride and Cultural Heritage:

To what extent do you believe visiting religious sites would enhance your understanding of Georgian culture and history?

- Greatly enhance
- Somewhat enhance
- Neutral
- Not enhance at all

Do you think these visits would increase your sense of national pride?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

5.Global Citizenship and Cultural Understanding:

How much do you agree with the statement: "Visiting religious sites can help students develop a better understanding and respect for different cultures and religions"?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Do you believe these experiences would contribute to your development as a global citizen?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

6.Logistical and Ethical Considerations:

What challenges do you foresee in integrating religious site visits into the curriculum?

(Select all that apply)

- costs associated with organizing visits.
- Limited availability of religious sites for educational visits.
- Potential disruption to religious practices at the sites.
- Lack of interest or enthusiasm among some students.
- Insufficient background knowledge of students about the sites.
- Potential biases in presenting religious history.
- Difficulty in maintaining respect and decorum during visits.
- Ensuring safety and security during visits.
- Balancing educational objectives with the preservation of sites.
- Cultural sensitivity concerns.
- Potential for misinterpretation of religious symbols or practices.
- Time constraints during visits leading to incomplete learning experiences.
- Other (Please specify): _____

Do you think there should be any specific ethical guidelines or considerations when visiting these sites? (Select all that apply)

- Ensuring respect for religious practices and customs during visits.
- Obtaining permission from religious authorities before visits.
- Educating students on appropriate behavior and attire before visits.
- Avoiding taking photos or videos in sensitive areas.
- Providing context about the religious significance of the sites.
- Balancing educational goals with the need for religious privacy.
- Encouraging an open-minded approach to different religious practices.
- Other (Please specify): _____

Appendix 2.

Interview Questions

1. Personal Experience and Perspective:

- Can you share your experiences or thoughts on religious tourism and its role in understanding cultural heritage? Share examples of your visits and how they have contributed to or had an impact on your understanding of Georgian cultural heritage.

2. Educational Value:

- How do you think visiting religious sites could enhance your education in tourism?
- In what ways do you believe these visits could be integrated into the current curriculum to benefit students?

3. National Pride and Heritage:

- Do you feel that visiting these sites would increase your sense of national pride? Could you elaborate on why or why not?
- How important do you think it is for tourism students to have a deep understanding of their own cultural and religious heritage?

4. Global Citizenship:

- How do you think these visits could contribute to your development as a global citizen?
- What role do you think understanding different cultures and religions plays in becoming a global citizen?

5. Challenges and Considerations:

- What challenges do you think might arise in organizing and conducting these site visits?
- Are there any ethical concerns or guidelines that you think should be considered when integrating these visits into the curriculum?

6. Suggestions for Improvement:

- Do you have any suggestions for how the university could better incorporate religious site visits into the tourism program? What other activities or methods do you think could complement these visits in enhancing your education?

THE PSYCHO-SOCIAL SERVICE IN PRE-UNIVERSITY SCHOOLS IN ALBANIA

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ABSTRACT

The process of reforms in the education system in Albania, as part of the changes in the government system that occurred in the early 90s, highlighted the need for the development of institutional capacities that should serve to ensure the social well-being and population mental health. The opening in 1992 at the University of Tirana of the Faculty of Social Sciences, with the branch "Social Work" and the opening in 1996 of the branch "Psychology" are two important moments of this reform process, which created the possibility for the implementation of the psycho-social services in pre-university education schools. The adoption of Law 69/2012 "On the pre-university education system in the Republic of Albania" was the main legislative act on which the development and implementation of the reform for psycho-social services in educational institutions of pre-university education is based. This service is conceived as a specialized Unit with psychologist/social worker, within the organizational structure of pre-university educational institutions. Currently, this service is active in about 1000 schools of pre-university education system. The main objectives of the psycho-social service in Albania are to identify and support the treatment and solution of problems, phenomena and situations that can be encountered in school, which negatively affect the mental and physical health of students. In order to achieve the objectives, the psycho-social service is developed as a process of cooperation with the school's academic staff, leaders and parents, in accordance with the requirements of the "Student at the Center" principle. The cooperation of this service with local educational institutions parts of Ministry of Education at regional level and local self-government bodies for the design and implementation of preventive programs that serve the mental and physical health of students, along with the extension of this service to schools located in peri-urban and rural areas of the country are among the current challenges of this service.

Keywords: Psycho-social service, Pre-university school, Albania

Introduction

Implementimi i shërbimit psiko-social në shkollat e arsimit parauniversitar është një sfidë multidimensionale. Nder kohë, që duke ju referuar problemeve me të cilat përballë procesi i edukimit në këto cikël ky shërbim është i domosdoshëm. Nxënësit në arsimin parauniversitar, në vecanti në ciklin lower and high secondary, janë shumë të ekspozuar ndaj rrezikut për t'u

perballur me situata psiko-emocionale qe mund te shkaktojne pasoja dhe efekte negative me veprim afategjate (Ntinda,et al, 2014).

In Albanian National Education strategy 2021-2026 emphasizes that "Psycho-Social Services in schools should be considered as a key factor in promoting the mental and physical well-being of students as well as for facilitating the learning process. The psychologist and the social worker in the school should be considered as an integral part of the staff in the educational institution. To successfully accomplish their mission of providing services to students based on their emotional, learning, and social needs, these workers must collaborate and interaction with teachers, school administrators, parents, non-profit organizations, and with safety officer".

According to (UNESCO MGIEP, 2020) "Students' social and emotional experiences influence learning processes and in turn affect learning outcomes". Consequently, schools that prioritize students' well-being have a higher chance of improving their academic achievements (UNESCO Office Bangkok, 2017).

UNICEF (2022) to the document "Learning Brief on Mental Health and Psychosocial Support (MHPSS) in Education" emphasizes that: "The overarching vision of the UNICEF Education Strategy, 2019-2030, is improved learning and skills development for boys and girls, from early childhood to adolescence, particularly for the most marginalized and those affected by humanitarian situations".

The overall objective of Psychosocial Service in pre-university schools should be improve learning and the skills development within a safe learning environment that promotes and responds to their mental health and psychosocial wellbeing needs in all contexts (Palaghia, 2023).

The reform in the pre-university education system in Albania after the changes in the government system that occurred in the early 90s, had and has as an essential part of it the adaptation of this system to the demands of the system that operates in the conditions of a democratic and open society. Part of this reform process are also efforts to implement psycho-social services in educational institutions of the pre-university cycle. (Balli 2016).

The object of this paper is the analysis of the psycho-social service in pre-university education schools in Albania. In this paper, are showed the results related to:

(i) the legislative reform,

(ii) the problems and challenges the implementation psychosocial service in pre-university schools, as a service that have its general objective to create in schools an environment friendly related to well-being and psycho-social health of the students.

On the beginnings of the implementation of psycho-social services in pre-university education schools

The first important step, which can also be considered as the beginning of the realization of the state's responsibilities to ensure in pre-university education schools supportive conditions for

the psycho-social health of students, is the opening in 1992, at the University of Tirana of the Faculty of social sciences, with the "Social Work" branch and in 1996 also with the "Psychology" branch. In this way, the process of training qualified specialists for social work and psychologists, who are necessary for the functioning of psycho-social services in schools, began in Albania.

In the academic year 2004-2005, by order of the Ministry of Education and Science, in some schools in the pre-university education system, the experimentation of the psychological service began. In the schools included in this pilot experiment, the task of implementing this service was entrusted to psychologist specialists. The results of this pilot experiment were used for the design and implementation of the project for extending this service to other schools. The Ministry of Education and Science, ordered and supported the implementation of the service, as the task of the psychologist in all schools of basic education and secondary education in the urban area of the country. According to Ago (2013), the psychologist in the school was defined as the person responsible for the identification, defining, finding the roads and building the instruments that will serve for:

- (i) promotion and mental and physical development of students and
- (ii) support for increasing quality in the teaching and learning process.

In this phase of psycho-social service implementation, as a rule, employees should have been psychologist specialists but in their absence, could be a social service specialist, also. Such an approach was conditioned by shortages in the number of psychologist specialists. This solution and the experiences created in the process of its implementation have served as the basis for conceptualizing the model according to which the establishment and operation of the psycho-social service in pre-university education schools in Albania was conceived.

On the psycho-social service in pre-university education schools

The establishment and function of the Psycho-social Service in the pre-university education schools in Albania has started with the Order no. 344, dated 19.08.2013 of the Minister of Education "On the establishment of the Psycho-Social service unit Psycho-Social Service in schools". For the first time, this order began to be implemented in the academic year 2013/14. In this way, according to Agolli & Shehu (2020), in pre-university education schools, the process of creating the necessary structure began, which will serve to create more effective supporting conditions for dealing with and solving problems that affect the secondary education process of students. at school and for coping with difficulties encountered in problems related to discipline, violence, alcohol and drug use at school.

Approval of Law no. 69/2012 "On the pre-university education system in the Republic of Albania" is one of the important results of the reform for the implementation of Psycho-social Services in schools. In Article 20 "Psycho-social service in educational institutions" of this law it is determined that, through psychologists or social workers, psycho-social service in schools must:

(i) to offer care and support for the treatment of problems, phenomena and situations that may be encountered at school, which negatively affect the mental and physical health of students.

(ii) to identify all cases where service intervention is necessary

(iii) to address the problems faced by children with special psycho-social needs.

(iv) to design and engage in the implementation of preventive programs, according to the needs of the school community.

Based on this law, in National Strategy for the development of the Education system in Albania the psycho-social services in schools have been treated as a priority.

The need for harmonization of the legal definitions provided for in the law no. 69/2012 "On the pre-university education system in the Republic of Albania" with the requests addressed in Law no. 18/2017 "On the Rights and Protection of Children", has conditioned efforts to find ways and instruments that make possible cooperation and interaction between psycho-social services and structures whose task is to protect children, guarantee well-being and improving the quality of their lives.

The legislative framework that deals with issues of psycho-social services in pre-university education schools charges the regional directorates of pre-university education to supervise the work of this service and, in cooperation with the directorates of the schools that are under their jurisdiction, to provide the solutions to organizational problems in the field of this service.

In order to build the necessary capacities for the functioning of psycho-social services, the Ministry of Education has approved as part of the Normative Provisions, 2013, a series of rules and requirements that must be fulfilled by pre-university education institutions. Among them are the provisions related to:

(i) the function and composition of the psycho-social service unit,

(ii) the main tasks of the psychologist/social worker,

(iii) appointment, dismissal of the employee

(iv) professional development and privacy protection,

(v) support of the Unit for the performance of tasks

(vi) monitoring and observing the work of the psycho-social service unit

Order no. 150, dated 04.04.2018 "On the establishment of the psycho-social service unit" is an important act for the implementation of psycho-social services in pre-university education schools. In this order determined that: "In institutions of secondary education, one psychologist and one social worker should be provided for 1800-2300 students, while for upper secondary school, like gymnasiums, with over 700 students, should be provided with one psychologist or a social worker." The experience of implementing this order served to identify other more effective solutions. Order no. 313, dated 10.10.2020 "On the organization and function of

psycho-social services in institutions of pre-university education." is the regulatory act that deals, in a more complete way and in accordance with the requirements, with the implementation of psycho-social services in the pre-university education system in Albania. In this act, it is determined that the number of employees in the psycho-social service unit must be:

- one psychologist/social worker for every 500-700 students
- two psychologists/social workers for each school with over 700 students
- one psychologist/social worker for every school that has at least 10 students with disabilities
- a psychologist/social worker will cover some schools in the case where the schools have less than 500 students
- a psychologist for each special education school.

An important part of the reform for the psycho-social service is also the conception and determination of the work principles for the psycho-social service job. According to the National Association of Social Workers, (2012), to guarantee effective psycho-social services within school systems, according to Agolli & Shehu, (2020) it is necessary for the psychologist/social worker to be guided by the principles related to:

- (i) social justice,
- (ii) responsibility in the performance of the task,
- (iii) cooperation with students, parents and teachers,
- (iv) assessment of needs, characteristics and interactions with students, families and school staff,
- (v) continuing professional development and
- (vi) supervision as a need and opportunity to develop the confidence and competence of the psycho-social worker

During the 2014-2023 period, the efforts to implement the psycho-social service in the school had as their main objective the continuous improvement of the legislative and regulatory framework, as well as the establishment of conditions for increasing the organizational and professional capacities of this service. As a result of these efforts, during this period the psycho-social service at the school which has started as a pilot project in some schools in academic year 2014/15, in the academic year 2023-2024 it is active in about 1000 schools in the pre-university education system and with about 754 psychologists/social workers. Referring to the number of students in primary and secondary education schools and the number of psycho-social service workers, it is noted that in the implementation of Order no. 150, dated 04.04.2018, in which it is determined that for every 1800-2300 students there should be an employee for psycho-social services, in the academic year 2018/19 a psychologist/social worker served an average of 1,660

students and in accordance with Order 313, dated October 10, 2020, a psychologist/social worker served an average of 960 students . Currently, the value of this indicator for the academic year 2023/24 has been halved and it is estimated that on average one psycho-social worker serves 461 students. Meanwhile, it is important to emphasize that these statistics serve only to illustrate the trend of the reform.

Regardless of the actual growing trend that characterizes the implementation of psycho-social services in pre-university education schools in Albania, the problems and challenges with this service faces and should solve are numerous and complex.

In order to achieve its objectives, the psycho-social service should be developed as a process of cooperation with the school's academic staff, leaders of school and parents, in accordance with the requirements of the "Student at the Center" principle. Referring to the indicators that reflect the extent of this service in pre-university education schools, it can be identified as one of the main challenges for this service, its establishment in schools located in peri-urban and rural areas of the country.

Conclusion

The psycho-social service in pre-university education schools in Albania is being implemented as part of the transformation process of this system to adapt it to the conditions and requirements that arise with the need for its alignment with the education system in developed democratic countries and EU countries

Law 69/2012 "On the pre-university education system in the Republic of Albania" is the main legislative act that supports the development and implementation of the reform for psycho-social services in educational institutions of pre-university education.

The psycho-social service in Albania is conceived as a specialized Unit with a psychologist/social worker within the organizational structure of pre-university educational institutions.

The main object of the work of the psycho-social service is the identification and support for the treatment and solution of the problems, phenomena and situations that can be encountered in the school, which negatively affect the mental and physical health of the students.

The psycho-social service in Albania, which started to be implemented as a pilot project in the academic year 2014/15 in some schools, is currently developing as a process characterized by a positive growing trend.

The implementation of psycho-social services in pre-university education schools in Albania is a complex process that faces difficulties and challenges related to the lack of experience and the need to increase professional capacities and in infrastructure.

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INVESTIGATING EMPATHETIC TENDENCIES IN PSYCHOLOGY STUDENTS AT THE UNIVERSITY OF SHKODER, ALBANIA.

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ABSTRACT

Empathy refers to the ability to understand and share the feelings of others, particularly in the context of psychology where clients commonly experience vulnerability, anxiety, or discomfort. For psychologists, empathy transcends mere sympathy; it involves forging authentic connections, comprehending clients' emotions, addressing their concerns, and aligning with their wellness objectives. This quantitative study aims to assess the levels of empathy among psychology students and the correlations between different dimensions of empathy and demographic variables such as gender, age, year of study, birth order and providing insights into their empathetic development. To assess empathy level, the Multidimensional Emotional Empathy Scale (MEES) was administered online to 150 students (137 female and 13 male) enrolled in the 2023-2024 academic year, selected through a purposive non-probability sampling. The study revealed varying levels of empathetic tendencies among psychology students. Female students reported a statistically significant higher mean MEES score compared to their male counterparts. Also, first born students demonstrated the highest level of empathy. No significant differences were observed regarding age and year of the study. This study provides valuable insights into the empathetic landscape of psychology students at the University of Shkoder. The findings has made some important contributions of addressing empathy in education and highlight potential pathways for enhancing empathetic skills among future professionals.

Keywords: Empathy, Psychology Students, Demographic Variables, MEES.

INTRODUCTION

The present study delves into the critical role of empathy within the field of psychology, particularly focusing on how demographic variables such as gender, age, level of study, and birth order affect empathy levels among psychology students. Empathy, defined as the capacity to understand and share the feelings of others (Kerasidou et al., 2020), is a fundamental attribute in psychological practice. It not only facilitates compassionate interactions but also enhances therapeutic efficacy by promoting better patient outcomes (Decety & Lamm, 2006). In psychological practice, empathy is considered a vital component of therapeutic effectiveness, contributing to better client outcomes (Rogers, 1957).

The importance of empathy in healthcare settings is well-documented. Studies have shown that higher levels of empathy in healthcare professionals are associated with improved patient satisfaction, adherence to treatment, and clinical outcomes (Hojat et al., 2004; Kim et al., 2004). Furthermore, empathy is linked to a reduction in malpractice claims, highlighting its significance in fostering trust and effective communication between practitioners and patients (Levinson et al., 1997). Educational experiences play a crucial role in the development of empathy, with various studies indicating that factors such as gender, age, and year of study influence empathic tendencies (Colliver et al., 2010; Neumann et al., 2011). For instance, gender differences in empathy have been extensively studied, with women consistently showing higher empathy levels than men (Eisenberg & Lennon, 1983; Smith & Johnson, 2023). This disparity is often attributed to social and cultural norms that encourage women to be more emotionally expressive and attuned to the needs of others (Brody, 1985).

Previous studies have highlighted the influence of educational experiences and situational factors, such as gender and year of study, on the development of empathy (Colliver et al., 2010). However, findings in this area have been mixed, with some studies reporting stable, declining, or even increasing empathy scores among students as they progress through their studies (Ferreira-Valente et al., 2017).

Empathy is a fundamental aspect of psychological practice, enabling professionals to understand and respond to the emotional states of their clients. It involves not only recognizing emotions but also sharing and responding to them appropriately (Davis, 1994). Empathy is particularly crucial in psychology, where clients often experience vulnerability, anxiety, and discomfort. The development of empathetic skills during educational training is essential for future psychologists, making it imperative to explore these tendencies in psychology students.

Despite the significance of empathy in psychological training, there is limited research on the empathetic tendencies of psychology students in Albania. This study aims to fill that gap by assessing the empathy levels of students at the University of Shkoder.

Understanding the empathetic tendencies of psychology students is crucial, as it provides insight into how prepared they are to engage empathetically with clients. This study seeks to investigate these tendencies among psychology students at the University of Shkoder and explore the impact of demographic variables on their empathetic development.

Research Questions:

What are the levels of empathy among psychology students at the University of Shkoder?

How do gender, age, year of study, and birth order correlate with empathy levels among these students?

MATERIALS AND METHOD

Research design

This study utilized a cross-sectional design, which is a commonly used quantitative research method. The cross-sectional approach allows for the analysis of data from a specific point in time, providing insights into the levels of empathy among psychology students at the University of Shkoder.

Participants

The study was conducted among students enrolled in the Bachelor's degree program in Psychology at the University of Shkoder during the academic year 2023-2024. A total of 150 participants were selected for the main study using purposive non-probability sampling. This sampling method was chosen to target a specific group of students who are most relevant to the research questions. Prior to the main study, a pilot study was conducted with 30 subjects using non-probability sampling to test the reliability of the research instruments and procedures. Following the pilot study, the main study commenced with the full sample of 150 participants, comprising 137 females (91%) and 13 males (9%), ranging in age from 18 to over 26 years old.

Procedure

The recruitment process involved creating a list of the official university email addresses of psychology students. These students were then invited via email to participate in the study by completing an online questionnaire hosted on Google Forms. The invitation email included information about the study's objectives and the ethical guidelines governing the research, as well as an informed consent form that participants were required to review and agree to before proceeding with the questionnaire.

Assessment Tools

The assessment tool used in this study was the Multi-Dimensional Emotional Empathy Scale (MDEES) developed by Caruso and Mayer (1998). This scale is designed to measure various dimensions of emotional empathy across six subscales: suffering, positive sharing, responsive crying, emotional attention, feel for others, and emotional contagion. The MDEES consists of 30 items, each scored on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score on the MDEES can range from 30 to 150.

For this study, the reliability of the MDEES was determined using Cronbach's alpha, which yielded a score of $\alpha = .89$, indicating high internal consistency.

In addition to the MDEES, demographic variables such as gender, age, level of study, and birth order were collected and analyzed to assess their relationship with empathy levels.

Data Analysis

Data collected from the online questionnaires were analyzed using SPSS version 23.0 (SPSS Inc., Chicago, IL). The analysis included: Reliability Analysis, Descriptive Statistics, Independent Sample T-Tests and One-Way ANOVA.

RESULTS

The descriptive analysis of the empathy levels among psychology students shows that a significant majority, 61.4% (n = 92), reported high levels of empathy. Meanwhile, 35.3% (n = 53) of students exhibited medium levels of empathy, and only 3.3% (n = 5) demonstrated low empathy levels. This suggests that the student population tends to have a higher prevalence of empathy, which is crucial for their future roles in the psychology field.

Table 1. Prevalence of empathy levels among psychology students

Empathy Level	Frequency (n)	Percentage (%)
Low	5	3.3%
Medium	53	35.3%
High	92	61.4%

Note: The empathy levels were measured using the Multi-Dimensional Emotional Empathy Scale (MDEES).

As can be seen in Table 2, the results provide an overview of the demographic distribution of the study's participants. The majority of the sample were female students (91.3%), with males making up only 8.7%. In terms of age distribution, most participants were aged between 18-19 years (41.3%) and 20-21 years (42.0%), while smaller proportions were aged 22-23 years (4.0%), 24-25 years (4.7%), and over 26 years (8.0%). Regarding the level of study, second-year students were the largest group, representing 50.7% of the sample, followed by first-year students (34.0%) and third-year students (15.3%). Birth order distribution shows that middle-born students were the most prevalent at 47.3%, followed by first-borns (33.3%) and last-borns (19.3%). There were no participants identified as only children in the study.

Table 2. Descriptive statistics of gender, age, level of study, and birth order

Variable	n	%	M	SD	Minimum	Maximum
Gender						
Female	137	91.3%	111.72	12.35	75	140
Male	13	8.7%	96.54	14.21	72	115
Age Group						
18-19 years old	62	41.3%	105.40	15.27	72	135
20-21 years old	63	42.0%	106.10	14.10	74	140
22-23 years old	6	4.0%	102.67	13.75	86	119
24-25 years old	7	4.7%	107.57	14.23	80	122
Over 26 years old	12	8.0%	108.25	15.05	81	125
Level of Study						
First Year	51	34.0%	109.45	14.45	78	140
Second Year	76	50.7%	106.58	13.67	75	135
Third Year	23	15.3%	105.13	13.90	80	130
Birth Order						
First Born	50	33.3%	106.20	14.10	72	135
Middle Born	71	47.3%	112.53	16.32	75	140

Last Born	29	19.3%	103.67	13.25	76	125
Only Child	0	0.0%	—	—	—	—

An independent samples t-test was conducted to examine gender differences in empathy scores. The analysis revealed a significant difference between females ($M = 111.72$, $SD = 12.35$) and males ($M = 96.54$, $SD = 14.21$), $t(148) = 3.074$, $p = .003$. This suggests that females reported higher levels of empathy compared to males.

Table 3. Independent samples t-test results for gender differences in empathy

Gender	n	M	SD	t	df	p
Female	137	111.72	12.35	3.074	148	.003
Male	13	96.54	14.21			

An ANOVA was conducted to investigate differences in empathy levels across age groups. The results indicated no significant differences in empathy levels between the age groups, $F(4, 145) = 1.133$, $p = .343$. This suggests that age does not significantly influence empathy levels in this sample.

Table 4. ANOVA results of empathy levels by age group

Age Group	N	Mean	SD	F	df	p
18-19 years	62	110.23	15.12	1.133	4, 145	.343
20-21 years	63	109.57	16.08			
22-23 years	6	108.67	14.75			
24-25 years	7	109.00	16.22			
Over 26 years	12	112.58	16.47			

Even in this case ANOVA was conducted to examine differences in empathy levels among students in different years of study. The results showed no significant differences in empathy levels between first, second, and third-year students $F(2, 147) = 1.154$, $p = .318$ (Table 5). This suggests that year of study does not significantly impact empathy levels in this sample.

Table 5. ANOVA results of empathy levels by year of study

Year of Study	N	Mean	SD	F	df	p
First Year	51	112.47	15.89	1.154	2, 147	.318
Second Year	76	110.19	16.02			
Third Year	23	109.58	16.11			

According to Table 6, the analysis revealed a significant effect of birth order on empathy levels, $F(2, 147) = 3.328$, $p = .039$. Post hoc comparisons indicated that middle-born subjects ($M = 112.53$, $SD = 16.32$) reported higher levels of empathy compared to first-born ($M = 109.78$, $SD = 16.25$) and last-born individuals ($M = 108.46$, $SD = 15.89$).

Table 6. ANOVA Results of Empathy Levels by Birth Order

Birth Order	N	Mean	SD	F	df	p
First Born	50	109.78	16.25	3.328	2, 147	.039
Middle Born	71	112.53	16.32			

Last Born	29	108.46	15.89			
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DISCUSSION

This study revealed that 61.4% of the psychology students reported high levels of empathy. Likewise, Brown et al. (2020) conducted a meta-analysis across multiple studies and reported that, on average, 63% of participants exhibited high empathy scores.

Gender differences are particularly notable, with female students exhibiting significantly higher empathy levels than their male counterparts, a pattern that aligns with established research on gender and emotional expression (Smith & Johnson, 2023). This difference is often attributed to socialization processes that encourage emotional expressiveness in women (Karniol et al., 2003).

The results of the present study suggests that empathy does not significantly vary with age within the sample. This finding is consistent with some studies that have found stability in empathy levels across different age groups (Hoffman, 2000; Jolliffe & Farrington, 2006). While some other studies suggest that empathy increases with age and experience, due to greater exposure to diverse perspectives and situations (Spreng et al., 2009), others indicate that these factors may not have a significant impact on empathy levels, particularly among young adults in educational settings (Beadle et al., 2012).

Another finding suggests that the progression through academic years does not significantly influence empathy levels in this sample. This finding contrasts with some literature suggesting that academic and social experiences in university might impact empathy development (Ramaekers et al., 2012). However, the current study's lack of significant results may indicate that factors other than year of study, such as the content of courses or personal experiences, might play a more substantial role in shaping empathy.

Middle-born individuals reported significantly higher empathy levels compared to first-born and last-born individuals. This result is consistent with some studies suggesting that middle-born children may develop higher empathetic skills due to their unique family roles, which involve navigating between older and younger siblings (Suloway, 1996). Adlerian theory posits that middle-born children may develop stronger empathic skills due to their role as mediators within the family (Leman, 2009). However, this association is not consistent across different contexts, with some research suggesting that firstborns or youngest children may also exhibit high levels of empathy depending on family dynamics and cultural background (Suloway, 1996; Jefferson et al., 1998).

Despite providing valuable insights into the factors influencing empathy, this study has several limitations that should be considered: *Firstly*, the sample size and composition may limit the generalizability of the findings. *Secondly*, the cross-sectional design provides only a snapshot of empathy levels at a single point in time. This design does not account for changes in empathy over time. Longitudinal studies would be more effective in examining how empathy evolves. *Thirdly*, the use of self-report measures could introduce response biases, such as social

desirability or self-perception inaccuracies. *Fourthly*, the study focused on specific variables (gender, age, year of study, birth order) and did not explore other potential influences, such as cultural background or personality traits. Future research should consider a broader range of factors to provide a more nuanced understanding of empathy.

CONCLUSION

This study provides important insights into the factors affecting empathy levels, highlighting significant gender differences and the influence of birth order. The results indicate that females exhibit higher empathy levels compared to males and that middle-born individuals report higher empathy than their first-born and last-born counterparts. However, no significant differences were found based on age or year of study. These findings contribute to the understanding of empathy and its variability among different demographic and individual factors. Despite the valuable insights gained, the study is limited by its sample size, cross-sectional design, reliance on self-reported measures, and lack of exploration of additional variables. These limitations suggest that the results should be interpreted with caution and that further research is needed to confirm and expand upon these findings.

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ENHANCING RANDOM FOREST PERFORMANCE THROUGH BAYESIAN OPTIMIZATION: A STUDY ON HYPERPARAMETER TUNING

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ABSTRACT

Hyperparameter optimization is essential for improving the performance of machine learning (ML) models. Traditional techniques such as grid search and random search are commonly employed, however they frequently fail to identify the most optimal hyperparameters due to their exhaustive and random characteristics. Powerful alternatives such as Bayesian Optimization (BO) and evolutionary algorithms have developed as advanced methodologies. This study investigates the efficacy of Bayesian Optimization in fine-tuning the hyperparameters of a random forest regression model. BO constructs a probabilistic model of the objective function and utilizes this model to strategically choose the most favorable hyperparameters, balancing exploration and exploitation.

At first, we utilize linear regression (LR), decision tree (DT), and random forest (RF) models on a dataset for predictive modeling. We use grid search to adjust their hyperparameters. Subsequently, these models undergo evaluation utilizing diverse performance criteria to establish a benchmark. Bayesian Optimization is then employed to fine-tune the hyperparameters of the random forest regression model. The procedure entails ongoing testing and assessment to determine the appropriate hyperparameters that produce the most optimal performance.

The results of our study show that Bayesian Optimization greatly improves the performance of the random forest model compared to traditional methods of adjusting hyperparameters. Using Bayesian Optimization in this situation highlights its capacity as a significant instrument in machine learning, providing a systematic and effective technique for fine-tuning hyperparameters. This study adds to the increasing amount of evidence that supports the utilization of advanced optimization approaches to enhance the performance of machine learning models.

Keywords: Hyperparameter tuning, machine learning model, BO, RF.

1. INTRODUCTION

Machine learning (ML) has demonstrated broad applicability across diverse domains, including marketing, finance, healthcare, security, engineering, and education. Notable

examples include its use in credit risk analysis for predicting loan default probabilities using real-world data (Addo et al., 2018), in medical diagnosis for detecting and diagnosing diseases (Singh et al., 2021), and in improving intrusion detection system (IDS) performance (Liu and Lang, 2020). The growing interest in machine learning among researchers stems from its strong predictive capabilities and the availability of extensive high-dimensional datasets, coupled with advancements in high-performance computational infrastructure. In prediction problems, machine learning methods are suggested as effective solutions. These methods are helpful in recognizing and interpreting the relationships within the present data, which makes them suitable for various predictive tasks such as salary prediction, sales forecasting, heart disease prediction, or weather forecasting (Martin et al., 2018; Yao, 2023; Rasheed et al., 2024; Biswas et al., 2018). Choosing the right methods for tuning the hyperparameters of a machine learning model to improve its performance is a significant challenge (Claesen and De Moor, 2015). The choice of hyperparameter optimization technique is influenced by several factors, such as the complexity of the search space, dataset size, available computational resources, and the specific type of machine learning model being applied. Various methods, such as grid search, random search (George and Sumathi, 2020; Bergstra and Bengio, 2012), Bayesian Optimization (Wu et al., 2019), and evolutionary algorithms (Tani et al., 2021), are more suitable depending on these considerations. Bayesian Optimization, in particular, has found applications in hyperparameter tuning, experimental design, and optimization problems across various domains where evaluating the objective function is costly or time-consuming, (Wu et al., 2019; Zhang et al., 2023; Gonzalez et al., 2019). BO is especially advantageous because it builds a probabilistic model of the objective function and uses this model to select the most promising hyperparameters to evaluate next. This method is efficient and can provide better results with fewer evaluations compared to traditional methods like grid search. By applying Bayesian Optimization, we aim to find the optimal hyperparameters for the random forest model, thereby enhancing the predictive performance and reliability of the salary prediction model.

The remainder of the paper is organized as follows: Section 2 outlines the methodology, including the use of Bayesian Optimization (BO) and machine learning (ML) models for salary prediction, along with details about the dataset. Section 3 presents the results and discussion, focusing on key findings from grid search and Bayesian Optimization. Finally, Section 4 provides the conclusion, while Section 5 lists the references.

2. METHODOLOGY

In machine learning, regression analysis is a fundamental component of supervised learning techniques, essential for solving a wide range of predictive modeling tasks where the goal is to predict numeric outcomes based on input data. By analyzing the relationships between predictors and the target variable within a training dataset, regression models learn to generalize and make predictions on new data. Our methodology for salary prediction employs linear regression (LR), decision tree (DT), and random forest (RF) models. After evaluating

model performance through grid search hyperparameter tuning, Bayesian Optimization is applied to further optimize the parameters of the random forest model.

2.1 Bayesian Optimization method

Bayesian Optimization (BO) is a powerful and widely used technique for efficiently solving global optimization problems and tuning hyperparameters in machine learning models (Jones et al., 1998; Snoek et al., 2012). This method leverages a probabilistic model, often a Gaussian Process (GP), to represent the objective function based on observed data. This model enables BO to make informed decisions about where to explore next in the hyperparameter space. The acquisition function plays a crucial role in guiding these decisions. This function guides the selection of hyperparameter configurations to evaluate, striking a balance between exploration (seeking new promising areas) and exploitation (focusing on areas expected to yield high performance). By selecting configurations to evaluate based on a probabilistic model and acquisition function, Bayesian Optimization significantly reduces the number of function evaluations. In contrast, grid search conducts an exhaustive search through a manually specified hyperparameter space, while random search uses the same hyperparameter space but evaluates configurations randomly, (Marco et al., 2022).

Let us consider the problem of maximizing an unknown function f that is expensive to evaluate, which can be formulated as follows:

$$x^* = \underset{x \in \chi}{\operatorname{argmax}} f(x), \quad (1)$$

where, χ denotes the search space of interest, which is often a compact subset of \mathbb{R}^d and x^* denotes the global optimum of f , as referenced in (Zhang et al., 2023; Frazier, 2018).

Gaussian process. The Gaussian process is a commonly adopted non-parametric model known for its strong ability to fit functions, particularly in the field of regression. It is widely used in Bayesian Optimization for efficiently optimizing hyperparameters and exploring complex objective functions. Assume we have $\mathcal{D}_{1:t} = \{x_i, y_i\}_{i=1}^t$ the collection of sampling points, where $p(\mathcal{D}_{1:t}|f)$ is the likelihood distribution of observation set, $p(f)$ is the prior probability distribution of f , and $p(f|\mathcal{D}_{1:t})$ represents the posterior probability distribution of f and is used to update and test the unknown target function. Below is the updated formula in the probabilistic proxy model

$$p(f|\mathcal{D}_{1:t}) = \frac{p(\mathcal{D}_{1:t}|f)p(f)}{p(\mathcal{D}_{1:t})}. \quad (2)$$

The function $f(x)$ follows a Gaussian process, either in the noise-free case or with Gaussian noise, as referenced in (Gonzalvez et al., 2019), characterized by a mean function $m(x)$ and a covariance function $k(x, x')$, (Wu et al., 2019). We denote Gaussian process as

$$f(x) \sim \mathcal{GP}(m(x), k(x, x')). \quad (3)$$

When a set of sample (x_{t+1}, y_{t+1}) is added to the collection $\mathcal{D}_{1:t} = \{x_i, y_i\}_{i=1}^t$ of points, given that $\mathbf{k} = [k(x_{t+1}, x_1) \ k(x_{t+1}, x_2) \ \dots \ k(x_{t+1}, x_t)]$, the updated covariance matrix K is

$$K = \begin{bmatrix} \mathbf{K} & \mathbf{k} \\ \mathbf{k}^T & k(x_{t+1}, x_{t+1}) \end{bmatrix}, \quad (4)$$

where \mathbf{K} denotes the covariance matrix of the previous t samples. With the updated covariance matrix, the posterior probability distribution of the function value at x_{t+1} is computed using the first t samples

$$\begin{cases} p(f_{t+1} | \mathcal{D}_{1:t}, x_{t+1}) \sim \mathcal{N}(\mu, \sigma^2) \\ \mu = \mathbf{k}^T \mathbf{K}^{-1} \mathbf{f}_{1:t} \\ \sigma^2 = k(x_{t+1}, x_{t+1}) - \mathbf{k}^T \mathbf{K}^{-1} \mathbf{k} \end{cases}. \quad (5)$$

Acquisition functions. Acquisition functions are utility functions that guide the search towards the optimum of the objective function by determining where to sample next, which is crucial in Bayesian Optimization. Among the most commonly used acquisition functions are probability of improvement (PI), expected improvement (EI) and upper confidence bound (UCB). They are widely employed due to their effectiveness in balancing exploration and exploitation during the optimization process.

Let f^* denote the optimum obtained so far, and $\Phi(\cdot)$ and $\phi(\cdot)$ denote the cumulative distribution function and probability density function, respectively, of the standard normal random variable. Expected improvement (EI) is one of the most widely used acquisition functions and is calculated as:

$$\text{EI}(\mathbf{x}) = \begin{cases} (\mu(\mathbf{x}) - f^*) \Phi\left(\frac{\mu(\mathbf{x}) - f^*}{\sigma(\mathbf{x})}\right) + \sigma(\mathbf{x}) \phi\left(\frac{\mu(\mathbf{x}) - f^*}{\sigma(\mathbf{x})}\right), & \text{if } \sigma(\mathbf{x}) > 0 \\ 0 & \text{if } \sigma(\mathbf{x}) = 0. \end{cases} \quad (6)$$

Introducing a positive (hyper)parameter ξ reduces the value of the acquisition function near the currently sampled points, thus enhancing exploration. In this case, the EI function can be expressed as:

$$\text{EI}(\mathbf{x}) = \begin{cases} (\mu(\mathbf{x}) - f^* - \xi) \Phi\left(\frac{\mu(\mathbf{x}) - f^* - \xi}{\sigma(\mathbf{x})}\right) + \sigma(\mathbf{x}) \phi\left(\frac{\mu(\mathbf{x}) - f^* - \xi}{\sigma(\mathbf{x})}\right), & \text{if } \sigma(\mathbf{x}) > 0 \\ 0 & \text{if } \sigma(\mathbf{x}) = 0. \end{cases} \quad (7)$$

This approach, utilizing the parameter ξ , is discussed in (Berk et al., 2019).

2.2 Linear regression

Linear regression is a statistical method used to estimate the linear relationship between a dependent variable, often denoted as y and one or more independent variables, denoted as x . It is widely used for understanding relationships and making predictions based on observed data. In machine learning, linear regression is one of the simplest and most commonly used algorithms for supervised learning tasks, where the goal is to predict a continuous numeric

outcome. It serves as a foundational method for predictive modeling (Rong and Bao-Wen, 2018; Plevris et al., 2022).

2.3 Decision trees

A decision tree is a supervised learning algorithm used for both classification and regression tasks. It works by splitting data based on feature values, which makes the model easy to understand and suitable for different types of data. A decision tree determines the result of a function $f(x)$ by repeatedly testing the input x . Each test result guides the next step until $f(x)$ is accurately found, (Blockeel et al., 2023; Zhao and Zhang, 2007).

2.4 Random forest

A random forest (Breiman, 2001), is an ensemble of decision trees, consisting of multiple individual trees. Each tree is trained on a distinct subset of the data and may utilize different subsets of features. These individual decision trees work together to make predictions, and their outputs are combined to form the final prediction of the random forest. This ensemble approach significantly improves the generalization and robustness of random forests compared to relying on a single decision tree (Klusowski, 2018).

2.5 Metrics

The performance of these ML models is evaluated using several metrics. Given n observations, let x_i denote the actual (true) value and y_i denote the predicted value for the i – th observation. Let's consider mean absolute error (MAE), mean squared error (MSE), root mean square error (RMSE), and R-squared, also known as the coefficient of determination (R^2):

$$MAE = \frac{1}{n} \sum_1^n |y_i - x_i|; \quad (8)$$

$$MSE = \frac{1}{n} \sum_1^n (y_i - x_i)^2; \quad (9)$$

$$RMSE = \sqrt{\frac{1}{n} \sum_1^n (y_i - x_i)^2}; \quad (10)$$

$$R^2 = 1 - \frac{\sum_1^n (y_i - x_i)^2}{\sum_1^n (\bar{x} - x_i)^2}, \quad (11)$$

here, \bar{x} is the mean of the actual values. R^2 provides a measure of how well the predicted values approximate the actual values. An R^2 of 1 indicates perfect prediction, while an R^2 of 0 indicates that the model does not explain any of the variability in the response data, see (Chicco et al., 2021; Plevris et al., 2022).

2.6 Dataset overview

In this paper, a dataset of non-academic staff is used to analyze annual salaries. This analysis is based on the Albanian Government Council of Ministers' decision regarding national

minimum salaries (Decision No. 114, dated March 1, 2023), incorporating detailed salary categorizations. Below, in Table 1 the information about the dataset is presented.

Table 1. Information of the dataset.

Age	Gender	Education Level	Job Title	Years of Experience	Salary (ALL)
36	Female	Master of Science	Specialist in the Statistics Department	11.0	88760
40	Female	Master of Science	Head of Legal Services Department	15.0	118500
41	Male	Master of Science	Department Manager	15.0	119128
30	Female	Master of Science	Specialist	5.0	86100
45	Female	High School	Cleaner	7.0	44800

Table 2 shows the statistical information summarizing the numerical features of the salary dataset.

Table 2. Statistical information of numeric features of the dataset.

	Age	Years of Experience	Salary
count	183.000000	182.000000	183.000000
mean	42.442623	13.472527	73308.770492
std	23.079788	7.977649	27330.802434
min	26.000000	0.000000	20751.000000
25%	35.000000	7.000000	48200.000000
50%	40.000000	12.000000	84420.000000
75%	48.000000	20.000000	90110.000000
max	334.000000	30.000000	183260.000000

The prediction of salaries is based on variables such as age, gender, education level, and job title, with model performance evaluated using the metrics discussed earlier.

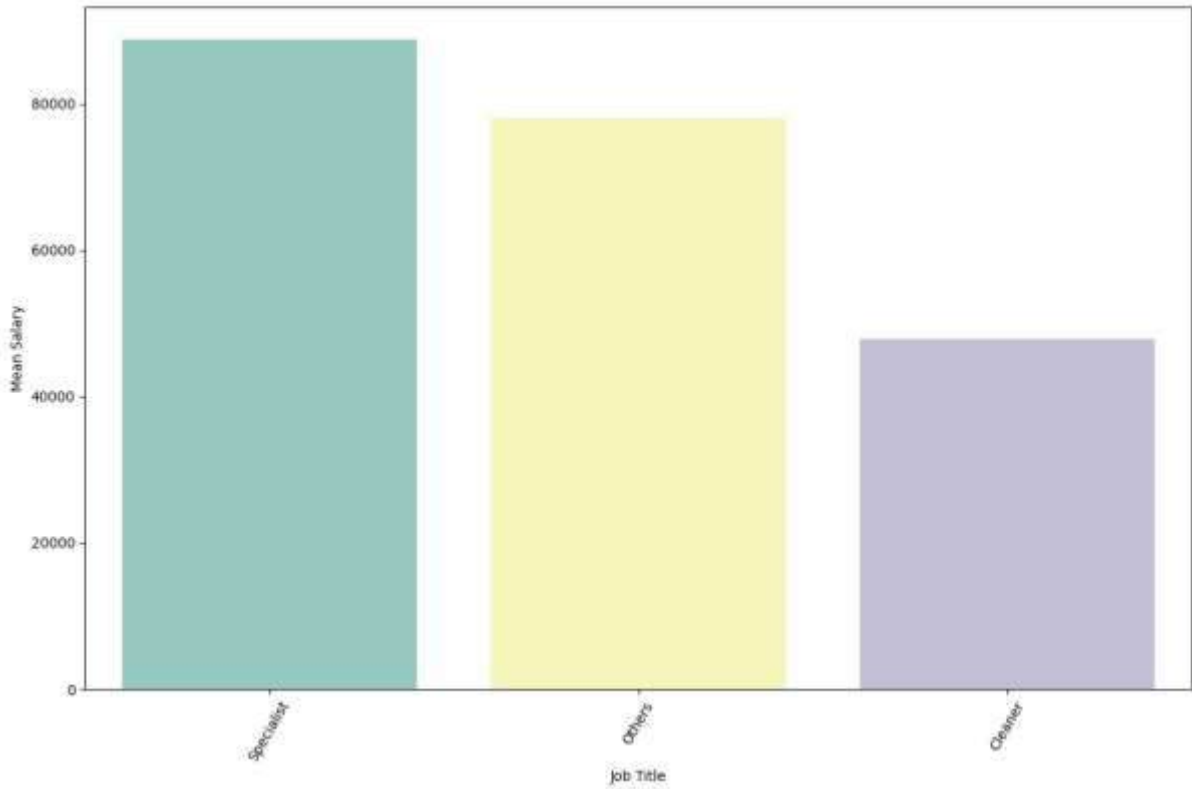


Figure 1. Mean salary distribution.

Based on the mean salary distribution in the dataset, the highest paying job title is specialist, followed by other job titles, with cleaner being the least paying, see Figure 1.

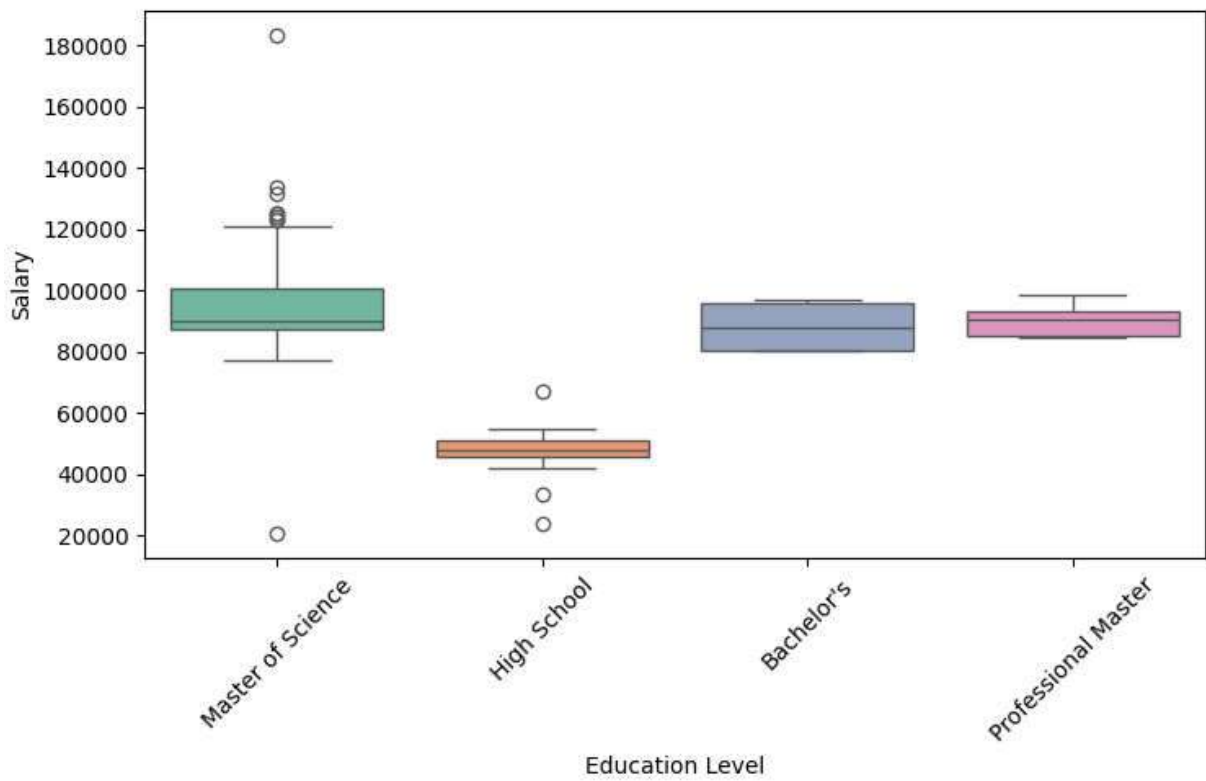
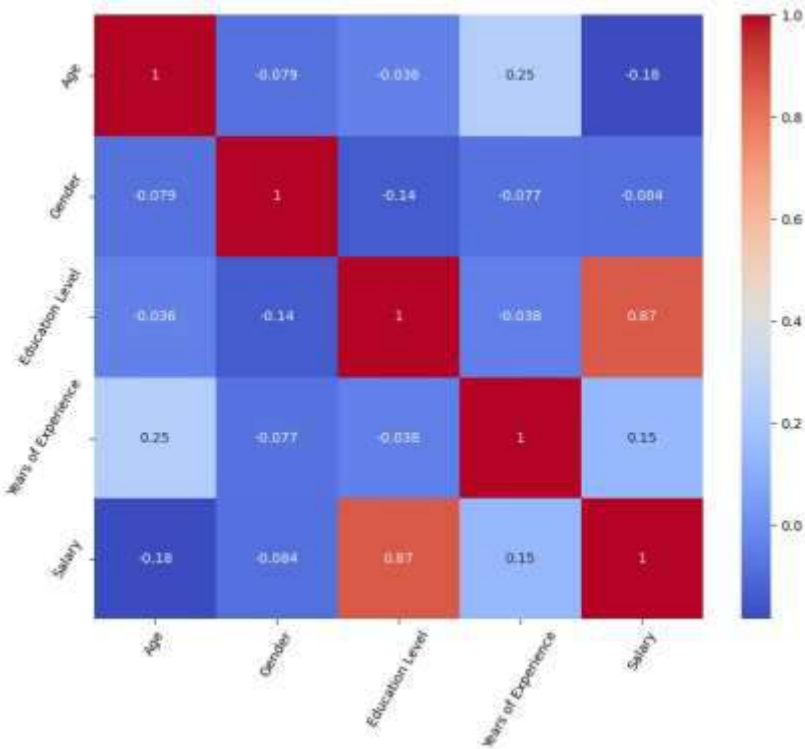


Figure 2. Boxplots of salaries across education levels.

In Figure 2, is illustrated the relationship between education level and salary. This box plot visually summarizes the distribution of data across High School, Bachelor, Professional Master, and Master of Science levels of education, providing insights into key statistical measures.

Table 3, shows the correlation heatmap of 6 variables in the dataset.

Table 3. Correlation Heatmap.



As indicated, the highest correlation is between education level and salary (except for the correlation of each variable with itself, which is 1), while the lowest correlation is between age and salary. Therefore, it should be interpreted with an understanding that education level is just one of many contributing factors to salary variations.

3. RESULTS AND DISCUSSION

The analysis and prediction of salary are implemented using Python and the scikit-learn library (Pedregosa et al., 2018). Initially, we employ grid search to optimize the parameters of the LR, DT, and RF models. Subsequently, Bayesian Optimization is used for hyperparameter tuning of the random forest regression model. The core technique of evaluating the model through cross-validation and calculating the average negative mean squared error (MSE) remains consistent across both approaches. The only difference lies in the optimization method used to determine the best hyperparameters.

3.1 Hyperparameter tuning of ML models using grid search

The class GridSearchCV available in scikit-learn is used to tune the parameters of LR, DT and RF models. Cross-validation is a computationally intensive method that involves using all

available data as both training and testing examples. In this framework, we used 5-fold cross-validation to evaluate the performance of the three machine learning models, as demonstrated in Figure 3, (Bengio and Grandvalet, 2004).

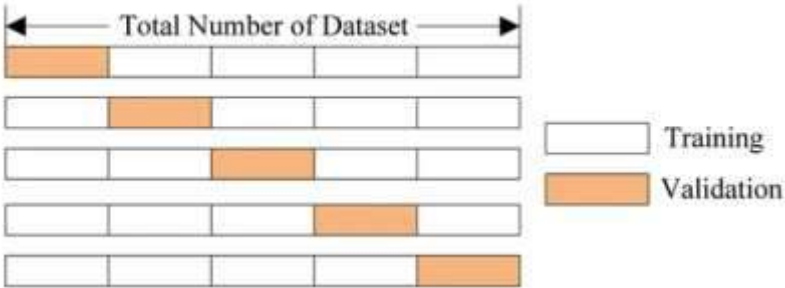


Figure 3. 5-Fold cross-validation technique.

Our dataset is divided into a training set, 70% of data and a test set, 30% of data. From this practice, we get a reliable estimate of how the model will perform in real-world scenarios, meaning we can trust that the model will work well when deployed in practical applications outside of the controlled testing environment.

Table 4 shows the hyperparameter search space using grid search for three ML models discussed above. Linear regression itself is quite straightforward and does not have hyperparameters in the traditional sense that require tuning through techniques like grid search or cross-validation. For linear regression model we utilize the default settings provided by scikit-learn. However, for the other two models, we specifically define the parameters outlined in Table 4. This approach helps in systematically exploring and enhancing the models’ performance.

Table 4. Parameter search space using grid search.

ML model	Parameter values
Linear Regression	Default settings provided by scikit-learn.
Decision Tree	max_depth: [2, 4, 6, 8, 10] random_state: [0, 42] min samples split: [2, 5, 10, 20]
Random Forest	n_estimators: [10, 20, 30, 50, 80] random_state: [0, 42] max_depth: [2, 4, 6, 8, 10, 20] min samples split: [2, 5, 10, 20] min sample leaf: [1, 2, 3, 4]

By running the algorithm, we obtain the results of three regression models. First, we estimate the models by evaluating the metrics R^2 , MSE, MAE and RMSE using grid search. The results are shown in Table 5.

Table 5. Comparison of metrics for ML models with grid search.

Model	R ²	MSE	MAE	RMSE
LR	0.7642	176332679.09	7219.79	13279.03
DT	0.7578	181139336.91	5239.68	13458.8
RF	0.8019	148157847.41	4896.88	12172.01

From the results in Table 5, it is observed that the random forest regressor model achieved the best performance with an R-squared value of approximately 0.8045, and the lowest values for MSE, MAE, and RMSE compared to the other regression models. This indicates that its predictions are closer to the actual values, thus demonstrating higher accuracy and reliability.

Figure 4 shows the performance of the LR, DT, and RF models. The random forest regression model achieved the highest R-squared value, indicating that it outperformed both the linear regression and decision tree models.

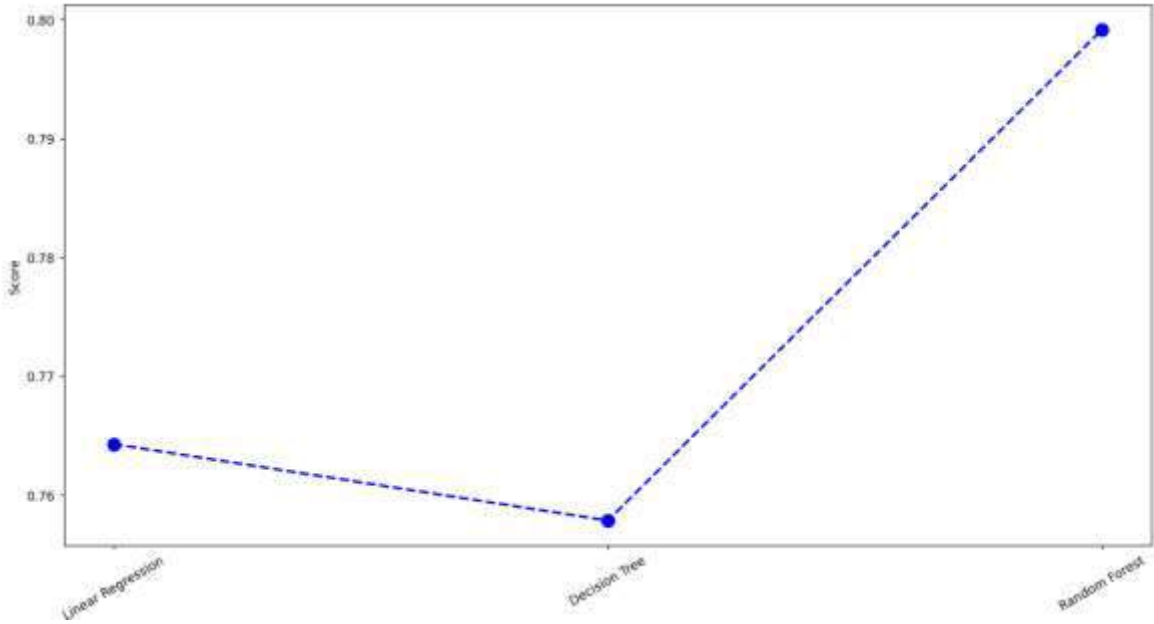


Figure 4. Comparison of ML models.

We obtained the optimal parameters for this model using grid search: n_estimators=20, max_depth=4, min_samples_split=10, min_samples_leaf=1, and random_state=42.

From the actual versus predicted salary plot, Figure 5, we visually compare the actual salary values with those predicted by the RF model. This plot helps us understand the model's performance by showing how close the predicted values are to the actual values. The closer the points are to the diagonal dashed line, the better the model's predictions.

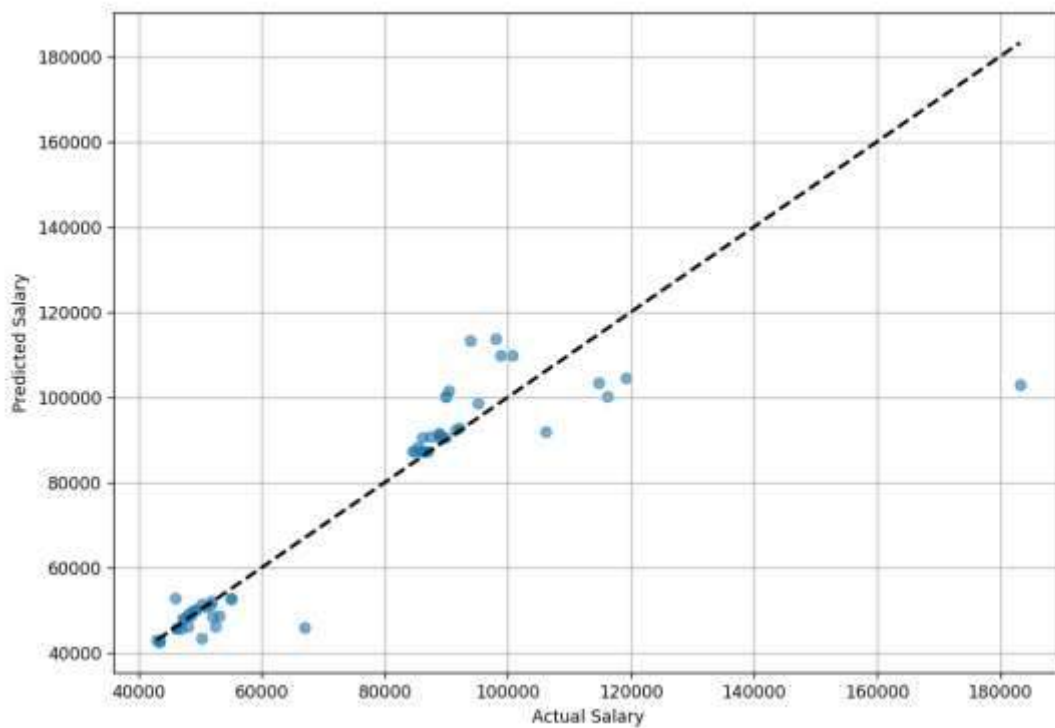


Figure 5. Actual vs predicted salary visualization.

Table 6 shows the actual and predicted salary values, along with the residuals between them, based on the performance of the RF model using grid search.

Table 6. Actual and predicted salary values.

No	Actual value	Predicted value	Residual
19	50152	41449.7	8702.3
42	88760	88760	0
155	98800	102082.5	-3282.5
98	48450	49256.5	-806.5
147	52000	44067.5	7932.5

In Figure 6, we present the importance of the top 10 features in predicting salary within our dataset using the random forest model. The analysis reveals that the most influential factors affecting salary prediction include education level, age, years of experience, and specialist status, among other factors. Notably, gender also plays a significant role in predicting salary, highlighting its impact alongside the other key features

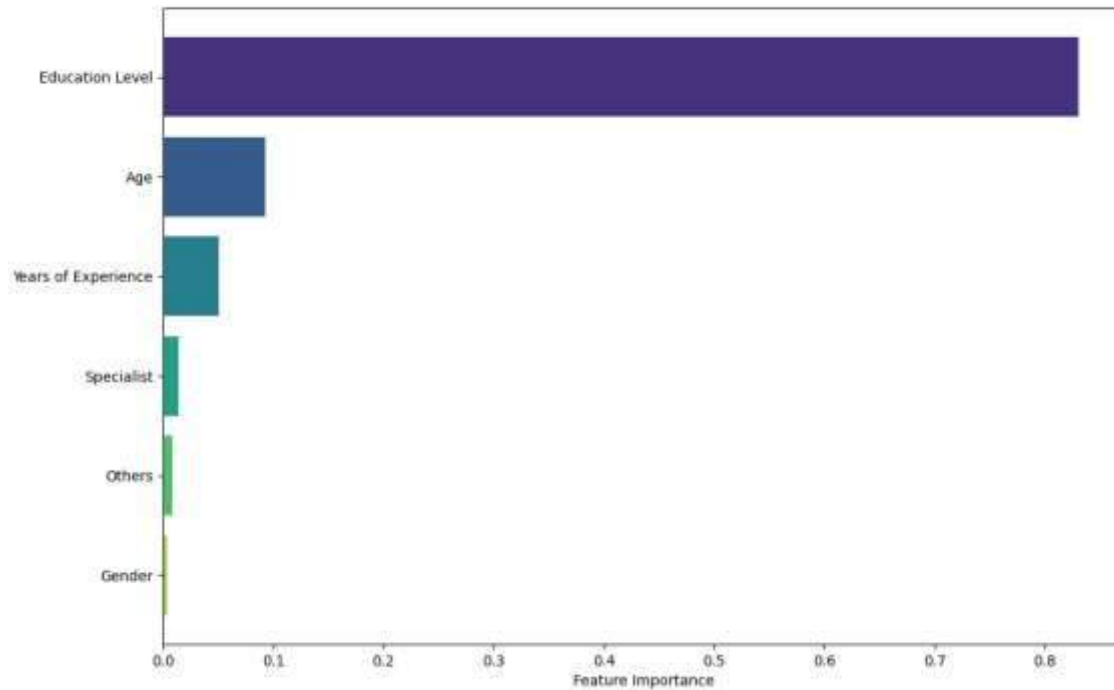


Figure 6. Top 10 features by importance in predicting salary.

3.2 Optimizing RF hyperparameters with Bayesian Optimization

The BayesianOptimization class from the bayes_opt library is used to perform the optimization method. Key hyperparameters for tuning the random forest model using Bayesian Optimization include the number of trees in the forest (`n_estimators`), the maximum depth of the tree (`max_depth`), the minimum number of samples required to split an internal node (`min_samples_split`), and the minimum number of samples required to be at a leaf node (`min_samples_leaf`). Referring to the best performance of the RF model shown in Figure 4, we use the Bayesian Optimization algorithm to fine-tune the parameters of the random forest regression.

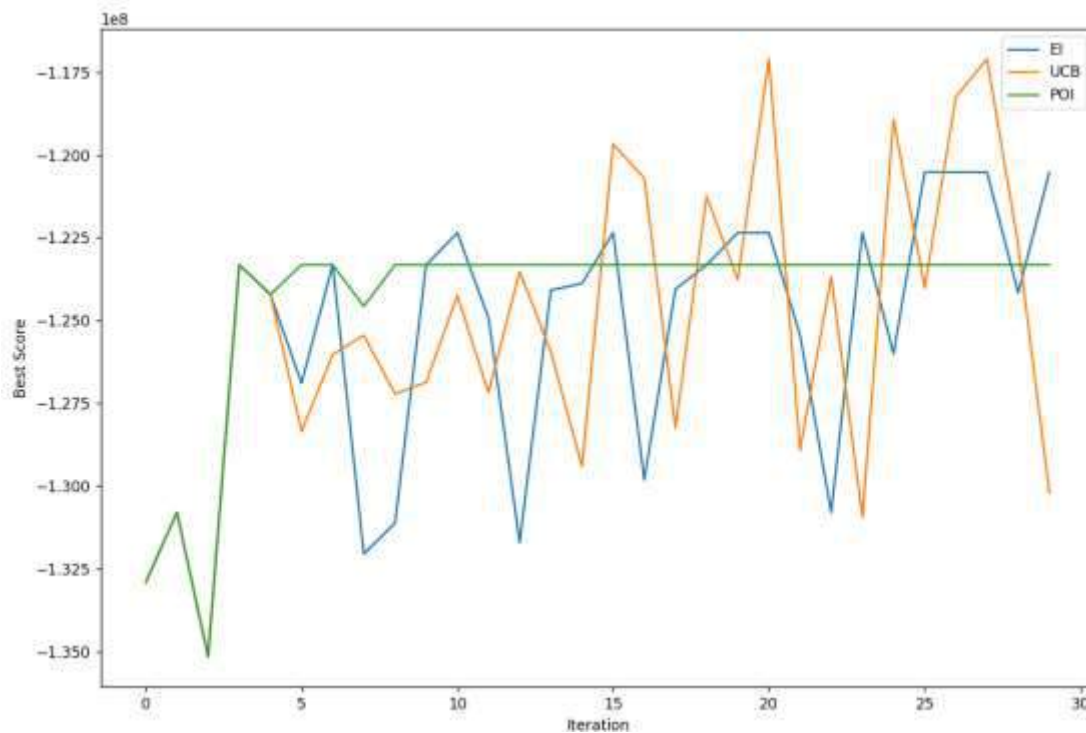


Figure 7. The convergence of BO with different acquisition functions.

We used the expected improvement (EI) acquisition function with $\xi = 0.01$, as it provided more optimal values compared to the upper confidence bound (UCB) and probability of improvement (PI), see Figure 7.

Table 7. Parameter space and results for RF using BO.

No	Parameters Space	R ²	MSE	MAE	RMSE	Best Parameters
1	n_estimators: (20, 100) max_depth: (4, 20) min samples split: (5, 20) min sample leaf: (3, 4)	0.7719	170618747.93	6157.27	13062.11	n_estimators=99 max_depth=5 min_samples_split=1 min_sample_leaf=3
2	n_estimators: (10, 80) max_depth: (2, 10) min samples split: (2, 20) min sample leaf: (2, 4)	0.7916	155826148.02	5120.86	12483.03	n_estimators=27 max_depth=6 min_samples_split=3 min_sample_leaf=2
3	n_estimators: (10, 50) max_depth: (2, 20) min samples split: (2, 20) min sample leaf: (1, 4)	0.8168	137009194.24	4770.59	11705.09	n_estimators=19 max_depth=16 min_samples_split=2 min_sample_leaf=1
4	n_estimators: (10, 20) max_depth: (2, 4) min samples split: (2, 5) min sample leaf: (1, 3)	0.7787	165526702.97	5732.46	12865.71	n_estimators=19 max_depth=4 min_samples_split=5 min_sample_leaf=1

Table 7 shows the number of experiments, the parameter space, evaluation metrics, and the best parameters for each case. For the RF model, we set random_state=42. After several experiments, we chose to run the algorithm 4 times, each with 30 iterations. In case 3, we

obtained the highest R-squared value of 0.8168 and the lowest values for MSE, MAE, and RMSE. The optimal hyperparameters for RF model as identified through BO are: `n_estimators=19`, `max_depth=16`, `min_samples_split=2`, and `min_samples_leaf=1`. The objective function evaluates the performance of different hyperparameter settings by calculating the negative mean squared error (MSE) across cross-validation folds. Minimizing this score improves the model's performance by reducing the prediction error.

Table 8 presents the actual and predicted salary values, along with the residuals, for the random forest model optimized with Bayesian Optimization, specifically for case 3. This case represents the best performance achieved with the given parameter space.

Table 8. Actual and predicted salary values using BO.

No	Actual value	Predicted value	Residual
19	50152	41290.2	8861.8
42	88760	91490.5	-2730.5
155	98800	98952.6	-152.6
98	48450	48763.8	-313.8
147	52000	49740.6	2259.4

From the observations in Table 8, the residuals plot for the random forest model optimized with Bayesian Optimization is presented below.

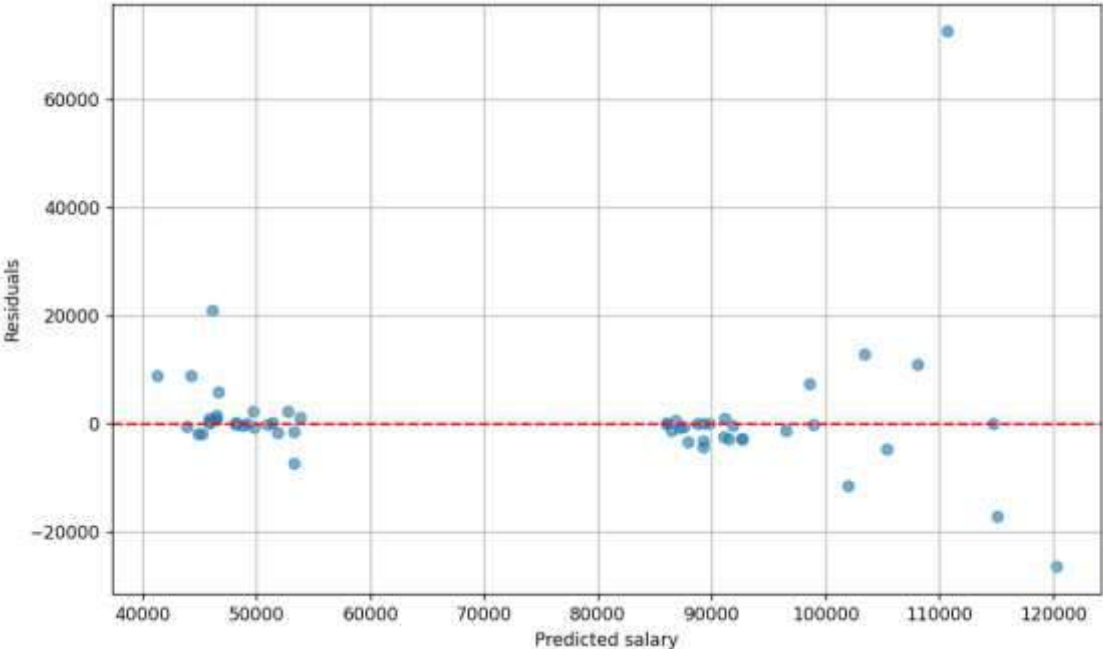


Figure 8. Residual errors plot for RF with BO.

In Figure 8, it is observed that the residuals are above, below, and near the straight line. This indicates that the model's predictions are sometimes accurate, sometimes underestimate, and sometimes overestimate.

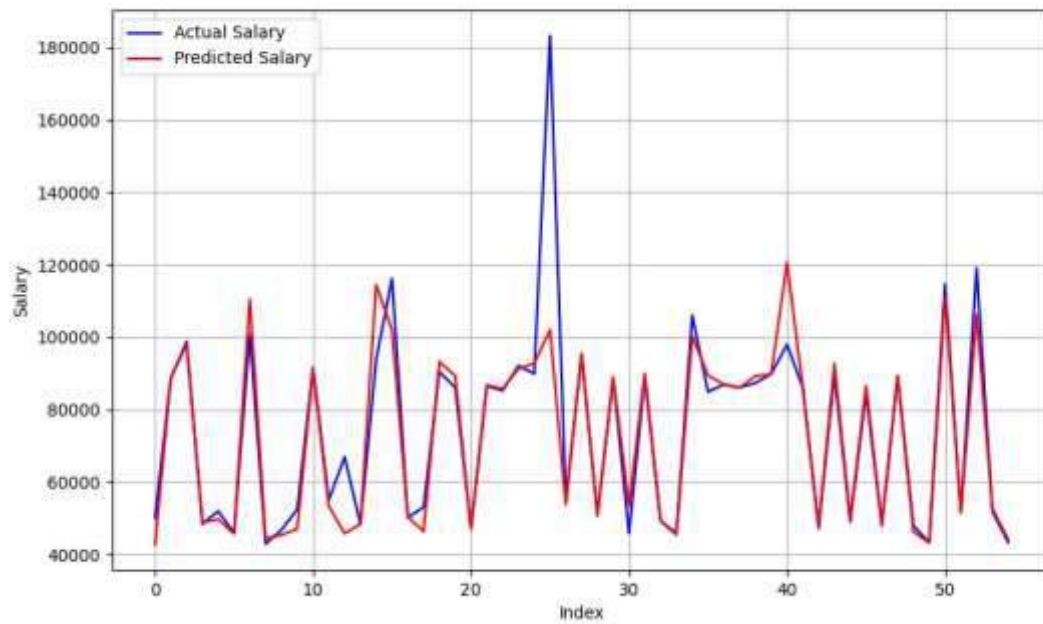


Figure 9. Predicted salary vs actual salary on the test set.

Figure 9 shows the predicted versus actual salary values on the test set for the random forest model tuned with Bayesian Optimization (case 3). The plot indicates that, in some cases, the model tends to overestimate the target values, as demonstrated by the predicted values being higher than the actual values in the visualization.

4. CONCLUSION

The study evaluated the performance of three machine learning models in predicting salary based on a diverse set of features. The findings suggest that the random forest model, when optimally tuned, can serve as a robust tool for salary prediction and potentially other predictive modeling tasks. Bayesian Optimization, in particular, proved to be more efficient in finding optimal hyperparameters compared to grid search. After evaluating the random forest model's performance using Bayesian Optimization, we achieved the highest R-squared value of 0.8168, indicating that the model explains 81.68% of the variance in the target variable. Additionally, the model achieved its lowest values for MSE, MAE, and RMSE, reflecting minimal prediction errors and high model accuracy for the regression task. The results of this study highlight the effectiveness of Bayesian Optimization in tuning hyperparameters of the random forest model, leading to enhanced predictive performance. Using Bayesian Optimization, we can quickly find the best hyperparameters, saving time and improving the model's performance. However, there are instances where Bayesian Optimization may overestimate the target value for certain observations. For future work, we suggest exploring the impact of different acquisition functions in Bayesian Optimization on the performance of various machine learning models, aiming to determine the most effective strategies for different datasets.

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THE WEAKNESSES OF HAJIAN ET AL.'S LIGHTWEIGHT AUTHENTICATION AND KEY AGREEMENT PROTOCOL FOR HETEROGENEOUS IOT

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ABSTRACT

After the development of information technology, the Internet of Things (IoT) has become a new era of communication technology for information exchange. With the increase in the usage of smart devices, IoT services have become more accessible. However, it faces two challenges. The first is the balance of login and authentication communication costs. They must have the lowest load imposed on sensing devices that have restricted resources. The secondary is some security and privacy problems in implementation and design. The two issues are trade-offs of each other: the more security, the more cost. Many researchers have proposed authentication protocols to ensure the security of access at a lightweight cost. In those schemes, we find the Hajian et al.'s authentication and key agreement protocol for IoT scheme. They present the weaknesses of three proposed protocols against compromise and insider attacks and propose a lightweight authentication protocol for IoT environments. However, we found that Hajian et al.'s scheme is vulnerable to similar attacks and lacks some data in validation processes, such as without anonymous property and computing validation data fail. If an attacker gets the secret from the smart card, the message in the insecure channels and the content of IoT device, that can get the new identity of the user. Another, the proposed protocol has some necessary messages not contained in the devices. We can add a simple and experimentally feasible modification to Hajian et al.'s scheme; the modified scheme can protect the new identity against attacks. This proposed modification not only addresses the current vulnerabilities but also paves the way for a more secure and efficient future for the protocol. We will propose this simple modification with better security and efficiency in the future.

Keywords: Internet of Things, Authentication, Smart card, Biometric, Anonymity, Impersonation, Denial of service.

INTRODUCTION

In recent years, the development of technology, the Internet of Thing (IOT) has been widely used in many areas. The wireless nature of the network and the wide variety of sensors offer numerous practical applications to improve health care, for example, the heart rate, blood pressure monitor, and endoscopic capsule. The data is gathered from individuals that the security and privacy concerns are among the major areas. Many researchers consider mutual authentication service is not enough. An adversary can benefit from monitoring the traffic and knowing which sensor is in the communication of patient's data. Therefore, the sensors'

anonymity is an essential service. In 2021, Alzahrani et al. (Alzahrani, Irshad, Albeshri, & Alsubhi, 2021) proposed a WBAN patient healthcare monitoring and authentication protocol that improved from Xu et al.'s scheme (Xu, Xu, Chen, & Yang, 2019) is suitable in WBAN. Singh and Chaurasiya use elliptic curve cryptography, aptly suitable for low-constrained devices, and propose a mutual authentication framework using fog computing in healthcare (Singh & Chaurasiya, 2022). Akleylek and Soysaldi (Akleylek & Soysaldi, 2022) proposed a lattice-based authentication scheme for RFID systems to resist the quantum attacks. Goswami and Choudhury (Goswami & Choudhury, 2022) proposed a scheme for remote registration and group authentication of the IoT devices in 5G cellular network. Safkhani et al. (Safkhani, Rostampour, Bendavid, Sadeghi, & Bagheri, 2022) proposed a secure generalized improved mutual authentication protocol with a new message authentication code function. Wang et al. (Wang et al., 2022) proposed an ultra-lightweight RFID security authentication protocol utilizing a cloud server based on Bit-Crossing XOR rearrangement operations. In 2023, Gaikwad and Ananthakumaran reviewed security and privacy for healthcare applications in wireless body area networks (Gaikwad & Ananthakumaran, 2023). In those schemes, we find we found that Hajian et al.'s scheme (Hajian, Erfani, & Kumari, 2022) is vulnerable such as without anonymous property and computing validation data fail. If an attacker gets the secret from the smart card, the message in the insecure channels and the content of IoT device that can get the new identity of the user. Another, the proposed protocol has some necessary messages not contained in the devices. We can add a simple and experimentally feasible modification to Hajian et al.'s scheme; the modified scheme can protect the new identity against attacks. This proposed modification not only addresses the current vulnerabilities but also paves the way for a more secure and efficient future for the protocol. We will propose this simple modification with better security and efficiency in the future.

REVIEW OF HAJIAN ET AL.'S SCHEME

In the Hajian et al.'s, the user sends a request to the IoT device and after receiving the response that sends with its data to the gateway. The gateway validates the request and returns to both user and IoT device. For example, an wifi access point (AP) as the gateway and a user with a mobile phone and some IoT sensors including light control and heartbeat. The scheme want to minimize the communication and computation overhead of IoT devices and *GWN* provides mutual authentication. The system model is shown in Fig 1.

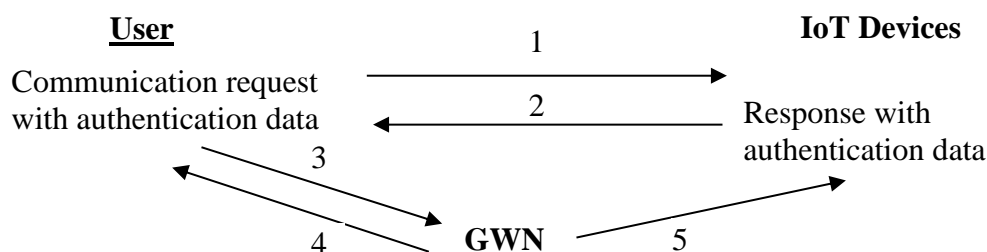


Figure 1. The authentication step diagram of Hajian et al.'s scheme

There are five phases in Hajian et al.'s scheme (Hajian et al., 2022) that includes user registration phase, IoT device registration phase, authentication phase, password and biometric information change phase, and username activation or change phase. The notations used in this paper are summarized in Table 1.

Table 1: The notations used in this paper.

Notations	Description	Notations	Description
U_i	User i	x_i, f_i	Secret credentials of U_i and GWN
TID_i	U_i 's temporal identity	x_j, f_j	Secret credentials of S_j and GWN
MID_i	U_i 's masked identity	K_i, K_j	Random nonces (large prime numbers)
SC_i	U_i 's smart card	$h(\cdot), H(\cdot)$	One-way hash function
ID_i, PW_i, BIO_i	U_i 's identity, password, and biometric	$Gen(\cdot), Rep(\cdot)$	Generator and reproduction function of biometric
S_j	Sensing device j	SK_{ij}	Session Key between U_i and S_j
SID_j	S_j 's identity	ΔT	The max. delay range
GWN, ID_{GWN}	Gateway node and identity	$T_{i=(1,2,...)}$	The timestamp
X_{GWN}	GWN 's private key	θ	Biometric public reproduction parameter
\oplus	Bitwise XOR operator	\parallel	Concatenation
\longrightarrow	Insecure channel	\dashrightarrow	Secure channel
U_a	Adversary		

REGISTRATION PHASE OF USER

In this phase, user U_i is registered to GWN as following steps and shows in Fig. 2.

- U_i chooses an identity ID_i , password PWD_i , input biometric BIO_i , and a random number r_i , then calculates $(\sigma_i, \theta) = Gen(BIO_i)$, $MID_i = h(ID_i \parallel r_i)$, $MP_i = h(PWD_i \parallel r_i \parallel \sigma_i)$, and send a registration request message $\{ MID_i, MP_i \}$ to GWN in a secure channel.
- GWN get the request, chooses a random number f_i , computes $x_i = h(MID_i \parallel X_{GWN})$, $d_i = (x_i \parallel h(X_{GWN} \parallel i)) \oplus h(MP_i \parallel MID_i)$, $e_i = h(h(X_{GWN} \parallel i) \parallel x_i \parallel f_i)$, $TID_i = H(MID_i \parallel x_i \parallel f_i)$, and $v_i = h(x_i \parallel TID_i \parallel h(X_{GWN} \parallel i) \parallel e_i)$, where the $H(\cdot)$ is a 160 bit hash function. Then, GWN store $\langle d_i, e_i, h(\cdot), H(\cdot) \rangle$ in smart card SC_i , send SC_i with f_i and v_i to U_i in a secure channel and store TID_i, f_i and MID_i in the database.
- U_i get SC_i with f_i and v_i , then computes $(x_i \parallel h(X_{GWN} \parallel i)) = d_i \oplus h(MP_i \parallel MID_i)$, $TID_i = H(MID_i \parallel x_i \parallel f_i)$ and $v_i' = h(x_i \parallel TID_i \parallel h(X_{GWN} \parallel i) \parallel e_i)$. If v_i' is equal to v_i , U_i computes $MP_i' = h(ID_i \parallel PWD_i \parallel \sigma_i)$, $d_i' = (x_i \parallel h(X_{GWN} \parallel i)) \oplus h(MP_i' \parallel MID_i)$, and $c_i = r_i \parallel f_i \oplus MP_i'$. Finally, U_i stores $\{ c_i, d_i, e_i, h(\cdot), H(\cdot) \}$ in SC_i .

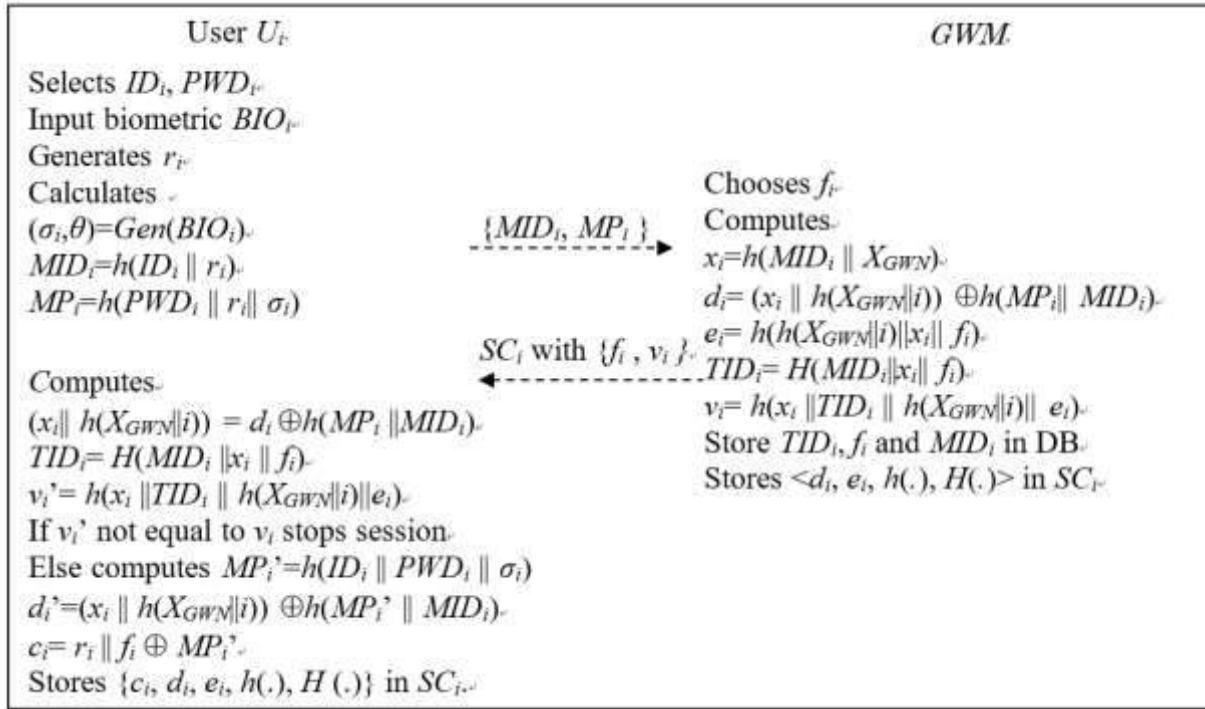


Fig 2. The user's registration phase of Hajian et al.'s scheme

REGISTRATION PHASE OF IOT DEVICES

In this phase, the IoT sensor S_j is registered by GWN on the network as following steps and shows in Fig. 3. Firstly, S_j selects SID_j and send it to GWN . GWN generates a random number f_j , calculates $x_j = h(SID_j || X_{GWN})$, and returns $\{x_j, f_j\}$ to S_j . Then, GWN stores SID_j and f_j in its database. After get the message, S_j stores $\langle SID_j, x_j, f_j \rangle$. The messages are transmitted in a secure channel.

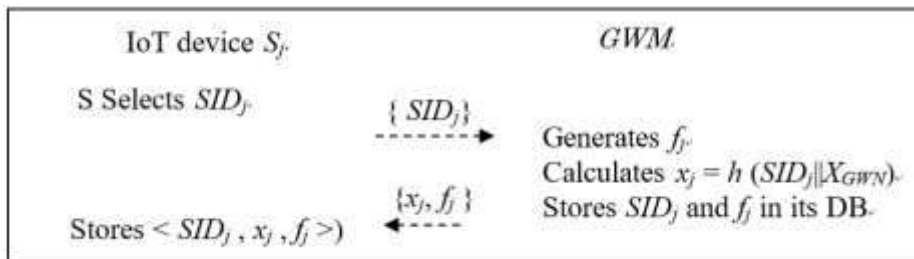


Fig 3. The IoT device's registration phase of Hajian et al.'s scheme

LOGIN AND AUTHENTICATION PHASE

The login and authentication phase is complex with user, IoT device and GWN that user send request to IoT device, device reponses the authentication information to user, user send to GWN with both message. GWN provides mutual authentication of user and device and generates a secure session key between them. The detail steps are show as following in Fig. 4a to Fig.4c.

1. U_i inserts SC_i and inputs ID_i' , PWD_i' , and BIO_i' . SC_i computes $(\sigma_i') = Rep(BIO_i', \theta)$, $MP_i' = h(ID_i' || PWD_i' || \sigma_i')$, $r_i' || f_i' = c_i \oplus MP_i'$, $MID_i' = h(ID_i' || r_i')$, $x_i' || h(X_{GWN} || i) = d_i \oplus h(MP_i' || MID_i')$ and $e_i' = h(h(X_{GWN} || i) || x_i' || f_i')$. If e_i' is not equal to e_i , the process will terminate.

Otherwise, SC_i generates a random nonces K_i and calculates $TID_i = H(MID_i' || x_i' || f_i)$, $TID_i^{new} = H(TID_i || MID_i' || x_i' || T_1)$, $M_1 = (K_i || TID_i^{new}) \oplus h(x_i' || f_i' || T_1)$ and $V_1 = h(M_1 || K_i || TID_i^{new} || SID_j || T_1)$, where T_1 is the currently timestamp. Finally, SC_i send the message $\langle ID_{GWN}, M_1, V_1, T_1 \rangle$ to S_j in an insecure channel.

- S_j get the message and checks $|T_2 - T_1| < \Delta T$ for freshness, where T_2 is the current timestamp. If it is true, S_j selects K_j and calculates $M_2 = h(x_j || f_j || T_1) \oplus K_j$ and $V_2 = h(SID_j || (x_j \oplus f_j) || K_j || T_1)$. Next, S_j transmits the verification message $\langle M_2, V_2 \rangle$ to U_i .

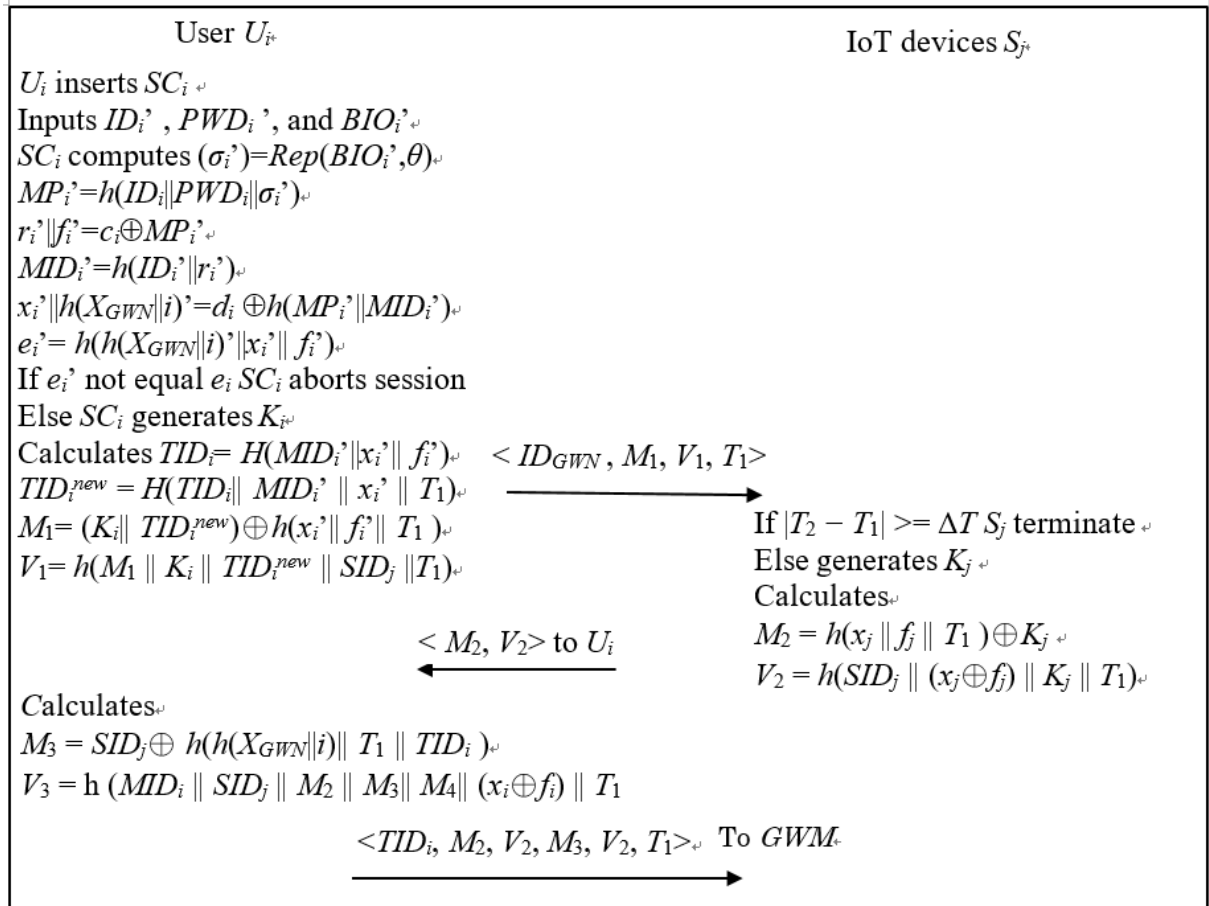


Fig 4a. The login and authentication phase of Hajian et al.'s scheme

- U_i get the message and calculates $M_3 = SID_j \oplus h(h(X_{GWN} || i) || T_1 || TID_i)$ and $V_3 = h(MID_i || SID_j || M_2 || M_3 || M_4 || (x_i \oplus f_i) || T_1)$ and transmits the message $\langle TID_i, M_2, V_2, M_3, V_2, T_1 \rangle$, containing the information required for authentication of user and sensing device, to GWN through an insecure channel.
- GWN receives the message and checks $|T_3 - T_1| < \Delta T$ for the freshness. Then, GWN calculates $SID_j' = M_3 \oplus h(h(X_{GWN} || i) || T_1 || TID_i)$ retrieves and fetches the values of MID_i and f_i by TID_i from its database. Next, it calculates $x_i = h(MID_i || X_{GWN})$, $V_3' = h(MID_i || SID_j || M_2 || M_3 || M_4 || (x_i \oplus f_i) || T_1)$ and checks for $V_3' = V_3$. If it is not met, GWN aborts the session. Otherwise, it authenticates U_i , and the integrity of the received message is confirmed. However, we find that the M_4 have not exist for calculates V_3' and make the scheme fail.

5. GWN fetches the values of x_j and f_i by SID_j' from its database and calculates $K_j = h(x_j || f_j || T_1) \oplus M_2$ and $V_2' = h(SID_j' || (x_j \oplus f_j) || K_j || T_1)$. If $V_2' = V_2$, GWN authenticates S_j . otherwise, it terminates the session.
6. GWN calculates $M_4 = h(x_j || f_j || T_1) \oplus h(T_1 || f_i || x_i)$, $TID_i^{new} = H(TID_i || MID_i || x_i || T_1)$, $V_4 = h(SID_j || TID_i^{new} || M_2 || M_4 || K_j || T_1)$ and $M_5 = h(x_i || f_i || T_1) \oplus h(T_1 || f_j || x_j)$. Finally, it send $\langle M_4, V_4 \rangle$ to U_i and $\langle M_5 \rangle$ to S_j .

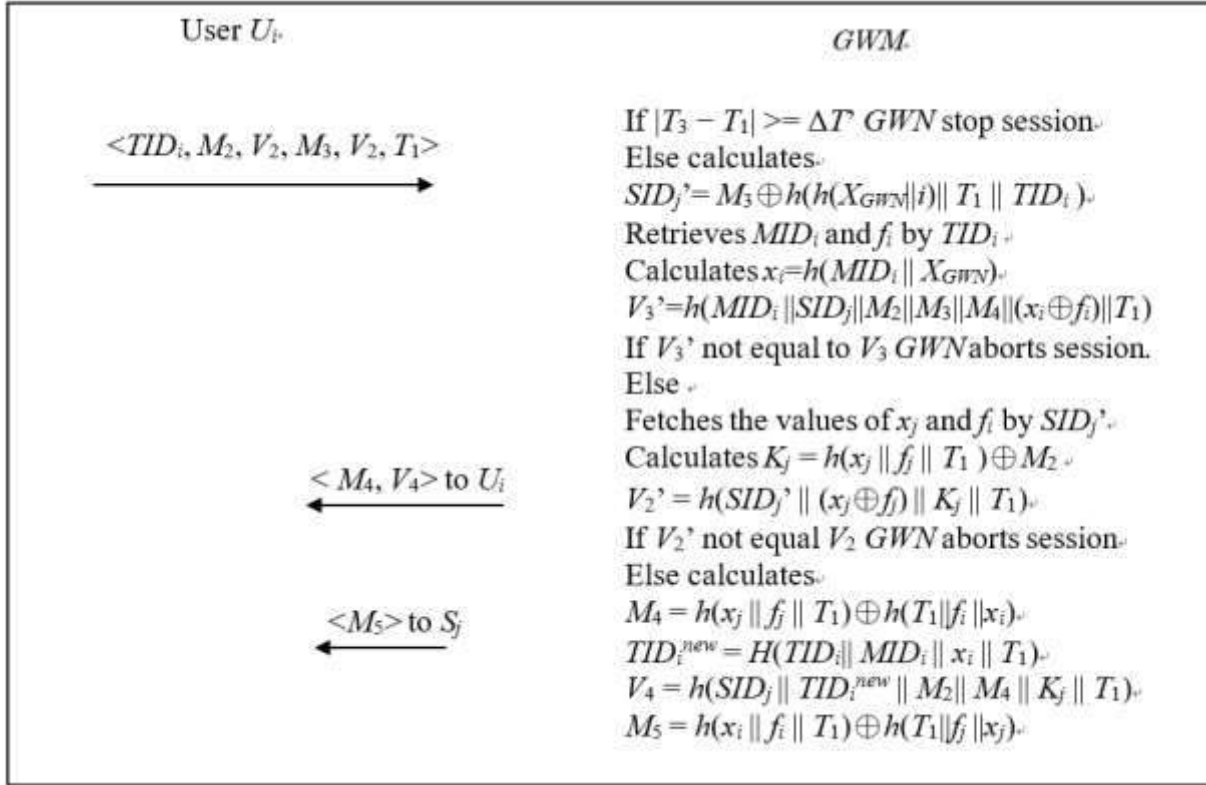


Fig 4b. The login and authentication phase of Hajian et al.'s scheme

7. U_i receives the message and checks the freshness by $|T_3 - T_1| < \Delta T$ to avoid replay attacks. It retrieves $K_j' = M_4 \oplus h(x_j || f_j || T_1) \oplus M_2$ and $V_4' = h(SID_j || TID_i^{new} || M_2 || M_4 || K_j' || T_1)$. if $V_4' = V_4$, U_i ensures that S_j is legal. It calculates $SK_{ij} = h(K_i \oplus K_j' || SID_j || TID_i^{new})$ and replaces TID_i with TID_i^{new} . If the process is not successful, U_i keep TID_i and TID_i^{new} for future re-login attempts..
8. S_j receives the message $\langle M_5 \rangle$, S_j uses M_5 to obtain $(K_i' || TID_i^{new}) = M_5 \oplus h(T_1 || f_j || x_j) \oplus M_1$ and $V_1' = h(M_1 || K_i' || TID_i^{new} || SID_j || T_1)$. If $V_1' = V_1$, S_j calculates the session key $SK_{ij} = h(K_i' \oplus K_j || SID_j || TID_i^{new})$; otherwise, S_j terminates the session.
9. If the S_j or U_i are not verified, GWN transmits a message to both to inform them and avoid clogging attacks.

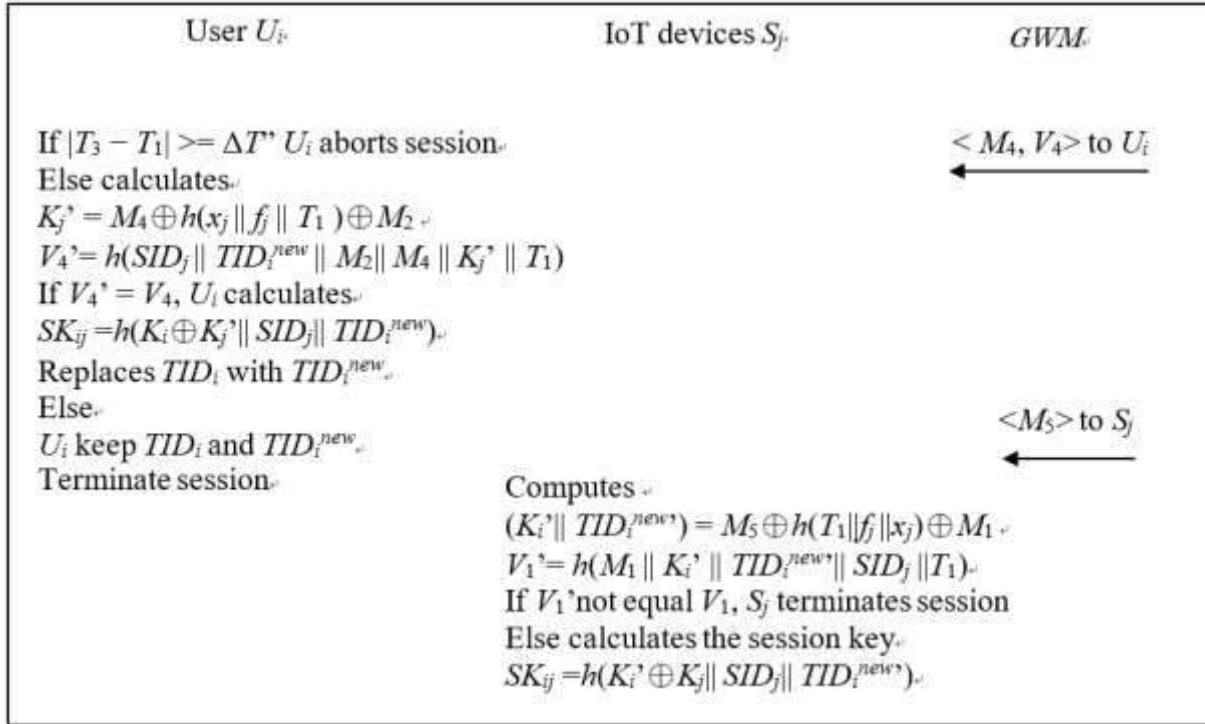


Fig 4c. The login and authentication phase of Hajian et al.'s scheme

PASSWORD AND BIO CHANGE PHASE

In this phase, user U_i want to change its password that not involve the process of gateway. The process as following description and shows in Fig. 5.

U_i inserts SC_i and inputs original ID_i , PWD_i , and BIO_i . SC_i computes $(\sigma_i') = Rep(BIO_i', \theta)$, $MP_i' = h(ID_i \| PWD_i \| \sigma_i')$, $r_i' \| f_i' = c_i \oplus MP_i'$, $MID_i' = h(ID_i' \| r_i')$, $x_i' \| h(X_{GWN} \| i)' = d_i \oplus h(MP_i' \| MID_i')$ and $e_i' = h(h(X_{GWN} \| i)' \| x_i' \| f_i')$. If e_i' is not equal to e_i , the process will terminate. Otherwise, U_i input PWD_i^{new} and BIO_i^{new} . SC_i computes $(\sigma_i^{new}, \theta) = Gen(BIO_i^{new})$, $MP_i^{new} = h(ID_i \| PWD_i^{new} \| \sigma_i^{new})$, $d_i^{new} = (x_i \| h(X_{GWN} \| i)) \oplus h(MP_i^{new} \| MID_i)$ and by replacing d_i with d_i^{new} .

USERNAME ACTIVATION/CHANGE PHASE

In this phase, user U_i want to change its failed login ID_i . U_i send a new ID_i activation request message in a secure channel to GWN that as following steps and shows in Fig. 6.

1. U_i inserts SC_i and inputs original ID_i , PWD_i , and BIO_i . SC_i computes $(\sigma_i') = Rep(BIO_i', \theta)$, $MP_i' = h(ID_i \| PWD_i \| \sigma_i')$, $r_i' \| f_i' = c_i \oplus MP_i'$, $MID_i' = h(ID_i' \| r_i')$, $x_i' \| h(X_{GWN} \| i)' = d_i \oplus h(MP_i' \| MID_i')$ and $e_i' = h(h(X_{GWN} \| i)' \| x_i' \| f_i')$. If e_i' is not equal to e_i , the process will terminate. Otherwise, U_i input ID_i^{new} and r_i^{new} . SC_i calculates $MID_i^{new} = h(ID_i^{new} \| r_i^{new})$, $MP_i^{new} = h(ID_i^{new} \| PWD_i \| \sigma_i')$, $M_1 = MID_i^{new} \oplus h(h(X_{GWN} \| i) \| T_1)$ and $V_1 = h(MID_i' \oplus f_i \| TID_i \| MID_i^{new} \oplus x_i' \| T_1)$, where T_1 is the currently timestamp. Then, SC_i send the message $\langle MID_i', MP_i^{new}, M_1, V_1, T_1 \rangle$ to GWN in an secure channel.

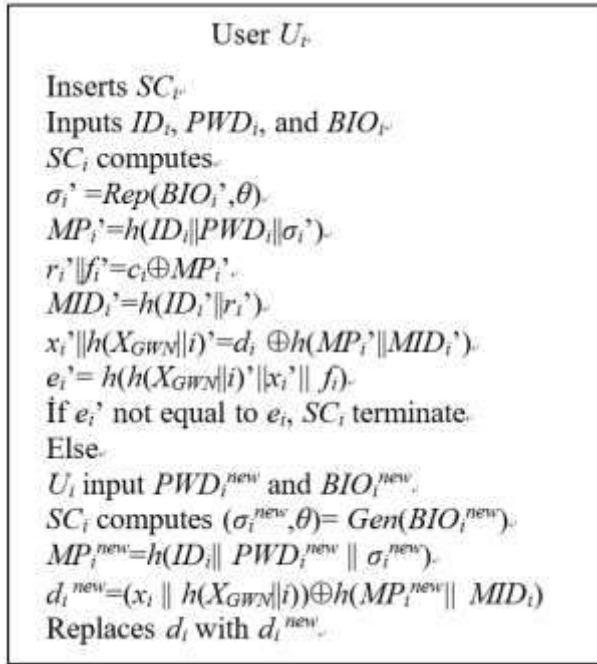


Fig 5. The password and bio change phase of Hajian et al.'s scheme

2. GWN receives the message and checks $|T_2 - T_1| < \Delta T$ for the freshness. Then, GWN calculates $MID_i^{new} = M_1 \oplus h(h(X_{GWN} || i) || T_1)$ and fetches the values of old MID_i and f_i by TID_i from its database. Next, it calculates $x_i = h(MID_i || X_{GWN})$, $V_1' = h(MID_i \oplus f_i || TID_i || MID_i^{new} \oplus x_i || T_1)$ and checks for $V_1' = V_1$. If it is not met, GWN aborts the session. Otherwise, it GWN get the request, chooses a random number f_i^{new} , computes $x_i^{new} = h(MID_i^{new} || X_{GWN})$, $d_i^{new} = (x_i^{new} || h(X_{GWN} || i)) \oplus h(MP_i^{new} || MID_i^{new})$, $e_i^{new} = h(h(X_{GWN} || i) || x_i^{new} || f_i^{new})$, $TID_i^{new} = H(MID_i^{new} || x_i^{new} || f_i^{new})$, and $v_i^{new} = h(x_i^{new} || TID_i^{new} || h(X_{GWN} || i) || e_i^{new})$. Then, GWN replace SC_i content $\langle d_i, e_i \rangle$ with $\langle d_i^{new}, e_i^{new} \rangle$ and send SC_i with f_i^{new} and v_i^{new} to U_i in a secure channel and replace TID_i, f_i and MID_i with TID_i^{new}, f_i^{new} and MID_i^{new} in its database However, we find that the GWN has not the old SC_i to replace.
3. U_i get $\langle d_i^{new}, e_i^{new} \rangle$ with f_i^{new} and v_i^{new} , then computes $(x_i^{new} || h(X_{GWN} || i)) = d_i^{new} \oplus h(MP_i^{new} || MID_i^{new})$, $TID_i^{new} = H(MID_i^{new} || x_i^{new} || f_i^{new})$ and $v_i' = h(x_i^{new} || TID_i^{new} || h(X_{GWN} || i) || e_i^{new})$. If v_i' is equal to v_i , U_i computes $MP_i^{new} = h(ID_i^{new} || PWD_i || \sigma_i)$, and $c_i^{new} = r_i^{new} || f_i^{new} \oplus MP_i^{new}$. Finally, U_i replaces $\{c_i, d_i, e_i\}$ with $\{c_i^{new}, d_i^{new}, e_i^{new}\}$ in SC_i .

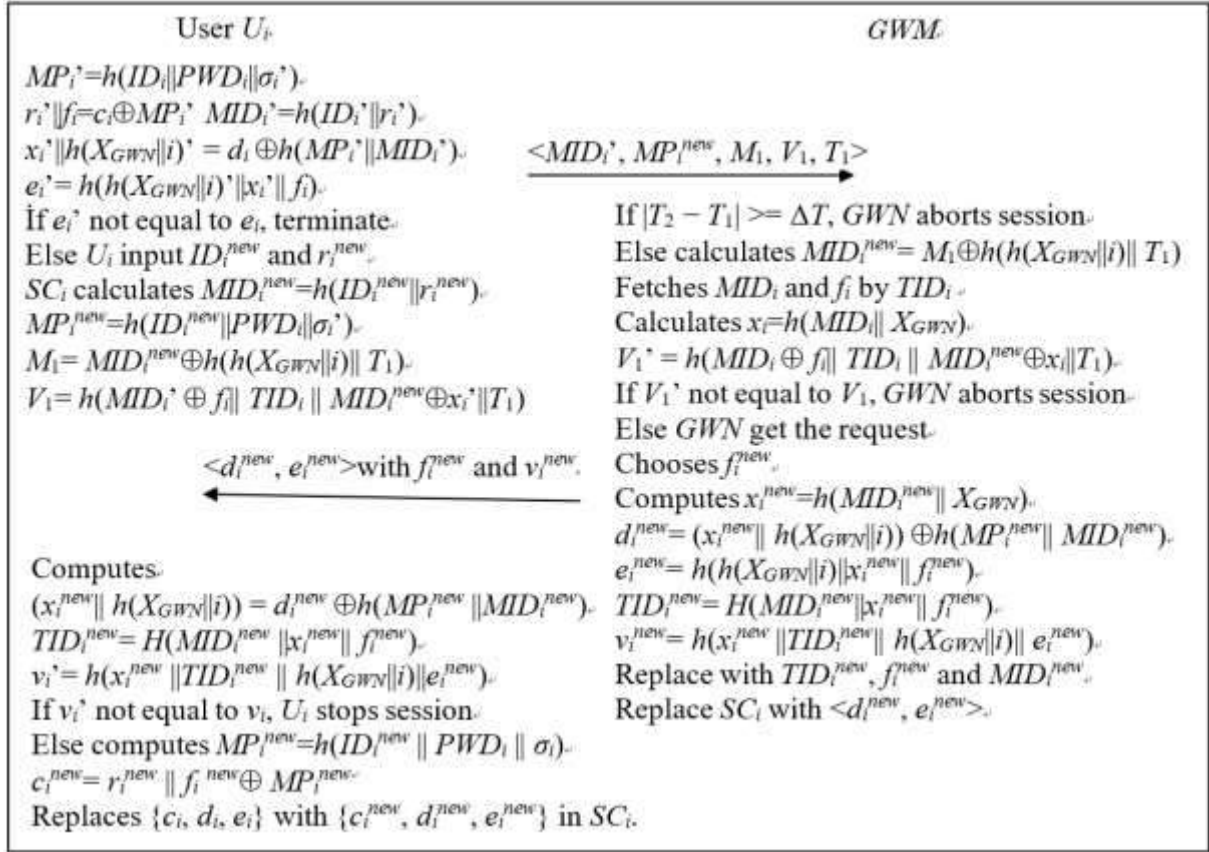


Fig 6. The username activation/change phase of Hajian et al.'s scheme

THE PROBLEMS AND WEAKNESS OF HAJIAN ET AL.'S SCHEME.

This section demonstrates the problems and weakness of Hajian et al.'s scheme. We follow assumptions of their attack model that we analyze the weakness existing in their scheme. (Hajian et al., 2022). Two attack methods can be used in Hajian et al.'s scheme that an attacker is assumed to hold the following capabilities.

1. An attacker could recover the parameters of a sensor by using power-differential analysis.
2. An attacker can intercept and manipulate by altering the contents or replay the parameters on an open channel.

THE WEAKNESS OF ANONYMITY ATTACK.

Hajian et al.'s scheme supposes that the adversary cannot guess the identity that is bound by a one-way hash digest in MID_i and SID_i and sent in V_3 with TID_i and timestamp T_1 , which are change in each session that the identity of users and devices in communication remains unknown. We find that the attacker records the common channel message twice, they can get the old and knew psude identity TID_i and TID_i^{new} that can traces the user and broken the anonymous property.

THE PROBLEM OF MISSING NECESSARY DATA

Hajian et al.'s scheme supposes that user, device and GWN can calculate all data in their scheme. However, we find that some necessary data cannot be generated in last login or stored in smart card or database. Therefore, their scheme has a serious data loss problem. The problem arises in the following steps.

1. In login and authentication phase step 3, U_i does not have the ability to calculate $M_4 = h(x_j || f_j || T_1) \oplus h(T_1 || f_i || x_i)$ and assemble the $V_3 = h(MID_i || SID_j || M_2 || M_3 || M_4 || (x_i \oplus f_i) || T_1)$.
2. The previous M_4 is invalid due to the timestamp T_1 , even if it is saved that it cannot be used to add it to the verification message V_3 .
3. This makes GWN impossible for to use M_4 to verify V_4 in Step 5.
4. In fact, M_4 is generated by GWN in Step 7, but if M_4 is removed from M_3 , it will cause security problems.

CONCLUSION

This paper analyzes the weaknesses of Hajian et al.'s IoT authentication protocol. The wide variety of sensors offers numerous practical applications, but security and privacy concerns are among the major areas of concern. Many researchers consider mutual authentication service is not enough that the anonymity of the communicating is an important. Hajian et al. propose a suitable IoT lightweight authentication protocol. However, we found that Hajian et al.'s scheme is vulnerable to anonymous attack and lacks serious data in the validation phase. Therefore, we find that Hajian et al.'s scheme is unsuitable for IoT applications. We will propose this simple modification of their scheme with better security and efficiency in the future to provide the need for user privacy and security.

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EFFECT OF ^{60}Co GAMMA IRRADIATION ON THE INELASTIC PROPERTIES IN SIGE ALLOYS

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ABSTRACT

Bulk crystal substrates of the Si-Ge system are promising materials for the electronic devices. Si-Ge alloys with a Ge concentration of $10^{19} - 10^{20} \text{ cm}^{-3}$ deserve attention. In them, the main characteristics of the crystal structure and physical properties of Si are practically preserved, while Ge atoms dissolved in the substitution positions in the crystal lattice modify them [1].

The interaction between the parameters of Si-Ge substrates and the epitaxial layers based on them alloys by changing the concentration of germanium leads to the possibility of adjusting the voltages at the phase separation boundary. This is crucial for enhancing the efficiency of semiconductor photodetectors, radiation sensors, solar cells, as well as X-ray and neutron monochromators based on Si-Ge alloys [2].

The aim of the paper is to study the temperature spectrum of the dynamic shear modulus and internal friction of the monocrystalline $\text{Si}+1.5\text{at}\%\text{Ge}:\text{P}(10^{15}\text{cm}^{-3})$ alloy in the initial and gamma-irradiated states. The test crystals were obtained by the Chokhralski method. Metallographic research was carried out on an optical microscope NMM-80RF/TRF. Experimental measurements of the internal friction and shear modulus were performed by the method of determining the frequency of torsional oscillations and damping logarithmic decrement in the ranges of frequency 0.5-5.0 Hz, strain amplitude 10^{-5} - 10^{-3} and temperature range 20-900°C. The electrophysical characteristics of the samples are determined at room temperature using Hall effect measurements.

The contribution of radiation defects to the radiation hardening of the test sample is analyzed. The obtained results can be applied in the process of development and creation of materials and devices with specific physical- mechanical characteristics based on SiGe alloys.

Keywords: SiGe alloys, gamma radiation, relaxation, dislocation structure, shear modulus.

INTRODUCTION

Silicon-Germanium (Si-Ge) alloys have become highly attractive materials for advanced electronic and optoelectronic applications. These alloys, with germanium concentrations ranging from 10^{19} to 10^{20} cm^{-3} , offer a unique combination of properties that make them suitable for a wide range of devices. The introduction of germanium into the silicon lattice preserves the fundamental crystal structure and physical attributes of silicon, while allowing for precise regulation of the material's electronic properties through the controlled substitution of silicon atoms by germanium atoms.

This adjustment is particularly advantageous in the fabrication of high-performance semiconductor devices, including high-speed transistors, heterojunction bipolar transistors (HBTs), and complementary metal-oxide-semiconductor (CMOS) technology. Additionally, Si-Ge alloys enable the optimization of strain in epitaxial layers, which is critical for improving the efficiency and sensitivity of photodetectors, infrared sensors, and solar cells. The ability to adjust strain at the interface between different layers also enhances the performance of X-ray and neutron monochromators, making Si-Ge alloys a versatile and valuable material in the field of modern semiconductor technology.

In the crystalline lattice of Si-Ge alloys, adjacent pairs of atoms of different lengths and bond strengths are formed: Ge-Ge, Ge-Si and Si-Si. They influence the processes of formation of localized stresses and defects in the real structure with different intensity[3]. In particular, it is expected to significantly change the conditions of activation of the motion of defects in the structure. Pairs of Si and Ge components that make up Si-Ge alloys can change the mechanisms of conception and diffusion of technological impurity atoms and complexes and bring about changes in structurally sensitive properties [4].

To date, the microscopic mechanisms of the interaction of point and dislocation origin defects and the influence of motion activation energy on structurally sensitive properties of Si-Ge alloys have been poorly studied. Structure-sensitive mechanical properties of the Si-Ge system alloys formed on the basis of Si are characterized by highly unpredictable regularities with a change in germanium concentration in the case of a small content of dislocations. In Si-Ge alloys, under conditions of increase of Ge (0-5at.%), the characteristics of mechanical properties decrease practically linearly, the mentioned circumstance is related to the 4% higher value of the covalent radius of germanium, which leads to an increase in the lattice parameter and locally interatomic distances. Accordingly, the connection forces and the mechanical characteristics related to them are reduced.

Under the conditions of high density of dislocations (10^5cm^{-2}), dynamic strengthening is expected, as the conditions for blocking of dislocations by germanium and impurity atoms are created. Complex character changes of mechanical properties were experimentally detected in wide ranges of temperature and amplitude deformation of internal friction and shear dynamic modulus of low-frequency torsional oscillations of Si-Ge alloys [5].

The non-monotonic changes in the activation energy of the movement of dislocation origin defects in Si-Ge alloys in the range of germanium concentration 0-5at% are shown. In Si-Ge alloys irradiated with high-energy electrons and alpha particles, the temperature areas of shear modulus drop and rise are revealed, which clearly proves the dynamic mechanical strengthening in the field of localized stresses by the mechanism of the braking of the oscillating segments of dislocations [6]. In the mentioned cases, radiation defects and their complexes, located in the so-called Cottrell's atmosphere and directly in the cores of dislocations.

MATERIALS AND METHOD

The aim of the paper is to study the temperature spectrum of the dynamic shear modulus and internal friction of the monocrystalline Si+1.5at%Ge:P(10^{15}cm^{-3}) alloy in the initial and gamma-irradiated states. The test crystals were obtained by the Chokhralski method. The samples for research were prepared using standard techniques, including cutting and mechanical polishing on a diamond disc. Metallographic research was carried out on an optical microscope NMM-80RF/TRF. Experimental measurements of the internal friction and shear modulus were performed by the method of determining the frequency of torsional oscillations and damping logarithmic decrement in the ranges of frequency 0.5-5.0 Hz, strain amplitude 10^{-5} - 10^{-3} and temperature range 20-900°C. The electrophysical characteristics of the samples are determined at room temperature using Hall effect measurements.

RESULTS AND DISCUSSION

Through microstructural studies, it was determined that the distribution of dislocations on the (111) orientation surface of the initial Si-Ge sample is uniform and is characterized by a density of $5 \cdot 10^4 \text{ cm}^{-2}$. Irradiation with gamma photons practically does not change the density of dislocations. There is a slight difference in the sizes of the dislocation etching pits. In particular, 10-15% of the total number of poisoning figures of different samples are triangle-shaped figures of reduced sizes. The occurrence of the difference of the nature mentioned in the etching fits may be related to the strongly localized deformation areas initiated by the radiation. The magnitudes of the electrical characteristics change noticeably when irradiated with $5 \cdot 10^{16} \text{ cm}^{-2}$ fluence gamma photons (Table 1).

Table1. Physical Characteristics of Si+2%Ge (10^{15} cm^{-3}) Alloys with the [111] Orientation

Sample	Specific electrical resistivity, ohm·cm	Current-carrying concentration, cm^{-3}	Dislocation density, cm^{-2}	Shear modulus, Kg/mm ²
Si+1,5%Ge:P				
Initial State	14,5	$1 \cdot 10^{15}$	$4 \cdot 10^4$	4550
Irradiated by gamma photons	20,7	$7 \cdot 10^{14}$	$5 \cdot 10^4$	4780

It should be noted that the decrease in the concentration of current-carriers is accompanied by a decrease in their mobility. The decrease in the mobility of the current-carriers is due to their scattering on the clusters and complexes of radiation defects, which are formed in the process of irradiation with gamma photons with appropriate concentration. The simultaneous decrease in the concentration and mobility of current-carriers, in turn, leads to an increase in the resistivity of Si-Ge alloys. The thermal stresses developed in the process of crystallization by the Chokhralski method and the deformation field localized near the Ge-Ge clusters produce dislocation stacking faults in the bulk crystal structure of the Si-Ge alloy. It is not possible to register them on a metallographic microscope, but indirectly it is possible to reveal their influence on electrical and mechanical properties. Structure-sensitive internal friction spectra over a wide range of temperature and amplitude deformation provide rich information about highly localized deformation fields and the complex structure and mobility of the dislocation structure. Indeed, the initial state of the tested SiGe alloy is characterized by a very complex shape of the temperature spectra of internal friction and shear modulus (Fig. 1).

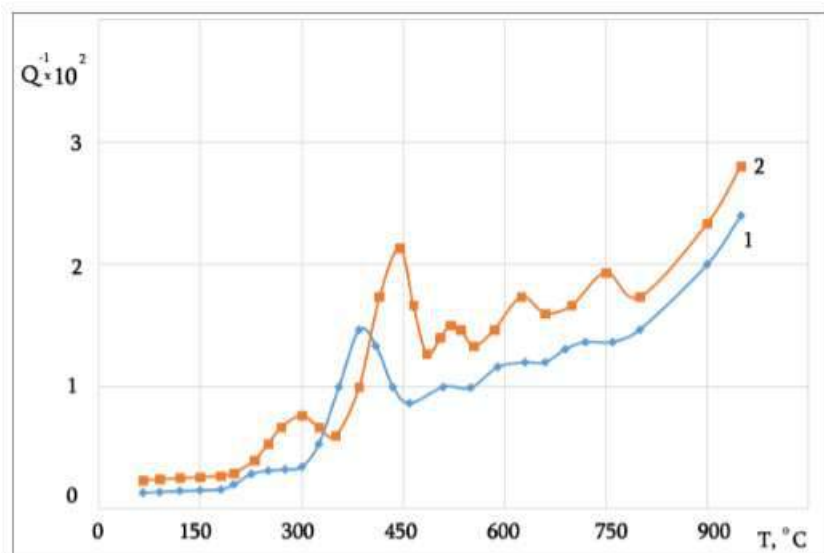


Figure 1. The influence of gamma photon irradiation on the temperature spectrum of internal friction of monocrystalline Si+2%Ge:P (10^{15} cm^{-3}) alloy.

1. Initial, $f_0 = 1.4 \text{ Hz.}$; 2. 5. irradiated with ^{60}Co gamma photons of 10^{16} cm^{-2} fluence,

$$f_0 = 1.5 \text{ Hz.};$$

The temperature spectrum of the internal friction of the test SiGe:P alloy under the conditions of the reverse torsional pendulum frequency of 1.5 Hz and strain amplitude of $2 \cdot 10^{-5}$ is consists of 5 overlapped maxima and an exponentially increasing background. The critical temperatures of maxima are 400, 510, 600-610, 700°C. A sharp increase in the background of internal friction begins in the temperature range of 780-800°C. The temperature of all maxima depends on the frequency of torsional oscillations, which is confirmed by measuring the frequency of different identical samples at room temperature.

The frequency dependence of the maximum critical temperatures is characteristic of internal friction processes of relaxation origin. The activation energy of the individual relaxation maxima was estimated with the critical temperature and frequency based on the known formula:

$$H = K \cdot T_{max} \cdot \ln \frac{kT_{max}}{hf_{max}} \quad [7]$$

where K and h are Boltzmann's and Planck's constants, and Tmax and fmax are maximum temperature and oscillation frequency. Table 2 presents the activation characteristics of relaxation processes.

Table 2. Characteristics of relaxation processes of SiGe:P alloys

Test sample	Temperature of maxima, °C	Activation energy, eV.	Frequency factor, sec ⁻¹	Shear modulus, Kg/mm ²
Si+1,5%Ge:P	400	1,50	2·10 ¹²	4550
	500	1,65	4·10 ¹¹	
	600-610	1,80	3,5·10 ¹²	
	700	2,0-2,10	4·10 ¹¹	
Irradiated by gamma photons	300	1,35	5·10 ¹²	4700
	420	1,55	1·10 ¹²	
	510	1,70	9·10 ¹¹	
	620	1,85	1,2·10 ¹¹	
	715	2,10	2·10 ¹¹	

Registration of the frequency and number of oscillations at different temperatures was performed at a sample heating rate of 2 degrees/min. Thermal burning of the sample took place under such conditions. As a result, the background of internal friction was reduced by 10-15%, and all relaxation maxima showed thermal stability and practically kept the initial values of the critical temperature. The experiment revealed the dependence of all maxima on the amplitude of torsional oscillations. In particular, it was found that by increasing the relative amplitude deformation from 10⁻⁵ to 10⁻³, the intensity of the relaxation maxima increases by 15-20% and approaches saturation. Changes of the mentioned nature are typical for the movement of dislocations surrounded by point defects in the field of periodic mechanical stress.

The reduction of the background caused by the thermal annealing during the first measurement process shows the strengthening of dislocation bonds due to the influence of

point defects moved by diffusion towards their cores. In such conditions, in the course of repeated measurements, the amplitude dependence of the maxima of the relaxing internal friction can be revealed only under conditions of 5-10 times higher strain amplitude. In repeated experiments at room temperature, it was clearly observed an increase in the oscillation frequency and, accordingly, an increase in the shift modulus proportional to the square of the frequency by 8-12%.

Irradiation with gamma photons of fluence $5 \cdot 10^{16} \text{ cm}^{-2}$ sharply increases the intensity of the exponential background of internal friction, slightly raises the temperature of all four relaxation maxima characteristic of the initial state, significantly increases their intensity and leads to the formation of a new, additional maximum near the temperature of 300°C (Fig. 1.2). The additional maximum is characterized by a weak amplitude dependence of the intensity at relatively low values of the strain amplitude (10^{-5} - 10^{-4}), a frequency dependence of the temperature of the maximum, which reveals its relaxing nature. The new maximum is related to radiation defects formed by gamma radiation, namely, such radiation centers that are located in the Cottrell atmosphere surrounding the dislocations and in the immediate vicinity of the nuclei. All of the above causes a weak amplitude dependence of the intensity of the new relaxation maximum. Table 2 presents the characteristic values of activation parameters of relaxation internal friction processes and dynamic shear modulus of the sample irradiated with gamma photons, from which it can be seen that the values of the frequency factor are distributed in the interval 10^{10} - 10^{12} s^{-1} . Such high values are typical for strong localization of the centers involved in relaxation processes.

Point defects of thermal and radiation origin and their clusters are characterized by a certain diffuse activity, which can increase in the process of increasing the temperature. Accordingly, the bond conditions of segments and bends on the dislocations will be changed in the direction of weakening as well as strengthening. Such complex displacements in the defect structure are clearly revealed on the graph of temperature dependences of the shear modulus (Fig. 2). In both the initial and gamma photon-irradiated samples, the shear modulus is characterized by a decrease near the relaxation maxima temperatures. A sharp decrease in the shear modulus is proportional to the intensity of the internal friction maximum. A zigzag change is observed in the intervals between the maxima in the temperature spectrum of the shear modulus. Such changes are possible due to the diffusion of point defects in the direction of dislocations in the process of temperature increase. As a result, their movement is restricted, that is, the so-called Dynamic mechanical reinforcement. An increase in the diffuse activity of point defects of thermal and radiation origin is also possible under the influence of a deformation field concentrated with germanium atoms of a large atomic radius.

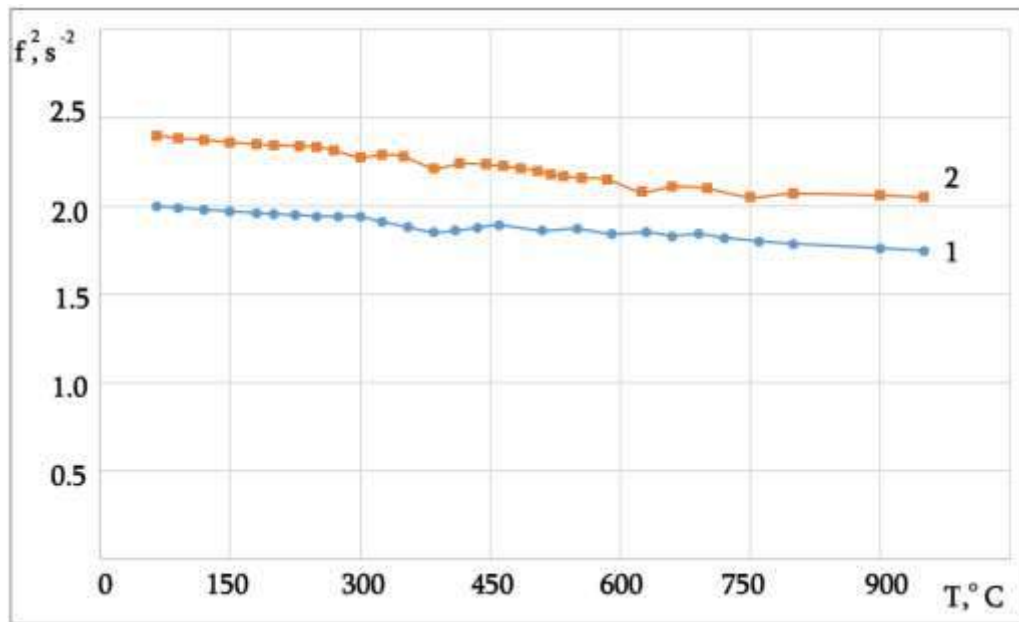


Figure 2. The influence of gamma photon irradiation on the temperature spectrum of shear modulus of monocrystalline Si+2%Ge:P (10^{15} cm^{-3}) alloy.

1. Initial, $f_0 = 1.4 \text{ Hz.}$; 2. 5. irradiated with ^{60}Co gamma photons of 10^{16} cm^{-2} fluence, $f_0 = 1.5 \text{ Hz.}$;

Thus, it has been experimentally established that irradiation with ^{60}Co gamma photons of $5 \cdot 10^{16} \text{ cm}^{-2}$ fluence causes a weak increase in the activation energy of relaxation maxima of dislocation origin characteristic of SiGe alloys, and dynamic mechanical strengthening. In the spectrum of internal friction, a relaxation maximum of radiation origin is detected at a temperature of 300°C . Its intensity is sensitive to strain amplitude. The mentioned circumstance as well as the relatively low values of the activation energy and frequency factor ($\sim 1.35 \text{ eV}$, $5 \cdot 10^{12} \text{ s}^{-1}$) give the basis to consider the VO (vacancy-oxygen) complex of geometric bending of 60-degree edge dislocations and radiation defect as the relaxation center.

CONCLUSION

The obtained experimental results showed that by changing the fluence of radiation irradiation, it is possible to control the processes of radiation hardening of SiGe alloys. This is very important for the creation of semiconductor materials and devices with defined properties based on Si and SiGe alloys.

ACKNOWLEDGEMENT:

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**EXPONENTIAL STABILITY AND NUMERICAL RESULTS OF A
THERMOELASTIC TIMOSHENKO SYSTEM WITH DIFFUSION EFFECT,
MEMORY AND DISTRIBUTED DELAY**

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ABSTRACT

In this paper, we study the following thermoelastic Timoshenko system with diffusion effect, memory and distributed delay terms, when they act on the second equation,

$$\left\{ \begin{array}{l} \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x = 0, \\ \rho_2 \phi_{tt} - b\phi_{xx} + \kappa(\varphi_x + \phi) + \int_0^t \mu(t-s)\phi_{xx}(s)ds + \mu_1 \phi_t \\ \quad + \int_{\tau_1}^{\tau_2} |\mu_2(\tau)|\phi_t(x, t - \tau) - \gamma\theta_x - \beta C_x = 0, \\ \rho_3 \theta_t + \varpi C_t - \kappa\theta_{xx} - \gamma\phi_{tx} = 0, \\ C_t - h(\beta\phi_x + \varrho C - \varpi\theta)_{xx} = 0, \end{array} \right.$$

Firstly, we exploit suitable hypotheses, and we use the Faedo-Galerkin method to show the well-posedness of the system. Then, under the same assumptions, we establish the energy decay, and we construct a Lyapunov functional, which is equivalent to the energy to arrive at the exponential stability result. Next, we introduce a finite element scheme of the problem. Then, we achieve the discrete energy decay. Finally, we give priori error estimates and some numerical simulations to illustrate our solutions.

Keywords: Timoshenko system, diffusion effect, stability, discrete energy, numerical solution.

INTRODUCTION

Timoshenko system is a mathematical model representing shear deformation and rotational bending effects on the beam [10]. It is given as follows

$$\begin{cases} \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x = 0, \\ \rho_2 \phi_{tt} - b\phi_{xx} - \kappa(\varphi_x + \phi) = 0, \end{cases}$$

Where φ is the transverse displacement, ϕ is the angle of rotation and

$$\rho_1 = \rho A, \quad \rho_2 = \rho I, \quad b = EI, \quad \kappa = k_1 GA,$$

Where ρ is the mass per unit length, A is the cross-sectional area, I is the second moment of the cross-sectional area, E is Young's modulus of elasticity, G the modulus of rigidity, and k_1 is the shear modulus.

Many authors were interested in the thermoelastic Timoshenko system ([10, 12]). They have shown the asymptotic stability of solutions of the thermoelastic equations [11]. Furthermore, they included the thermoelasticity effects, memory and delay terms in their systems [2, 10]. In [10], Moumen et al. studied the thermoelastic Timoshenko system with memory and distributed delay terms

$$\begin{cases} \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x + \gamma \theta_x = 0, \\ \rho_2 \phi_{tt} - b\phi_{xx} + \kappa(\varphi_x + \phi) + \int_0^t \mu(t-s)\phi_{xx}(s)ds + \mu_1 \phi_t + \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| \phi_t(x, t-\tau) = 0, \\ \rho_3 \theta_t + \kappa q_x + \gamma \varphi_{tx} = 0, \\ \tau_0 q_t + \delta q + \kappa \theta_x = 0, \end{cases}$$

Under suitable hypotheses, they evinced the exponential stability of the system. In [9], the authors studied the well-posedness and proved the exponential stability of a nonlinear porous-elastic system with infinite memory. For more information about porous elastic systems see [1]. El-Hindi and El-Arwadi [6] studied the thermoviscoelastic Timoshenko system with another physical effect. It is the mass diffusion effect which combines thermal and diffusion effects. They have shown the well-posedness of the following system

$$\begin{cases} \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x + \gamma_1(\varphi_x + \phi)_{xt} = 0, \\ \rho_2 \phi_{tt} - b\phi_{xx} + \kappa(\varphi_x + \phi) + \gamma_2 \phi_{xxt} + \gamma_1(\varphi_x + \phi)_t - \gamma \theta_x - \beta C_x = 0, \\ \rho_3 \theta_t + \varpi C_t - \kappa \theta_{xx} - \gamma \phi_{tx} = 0, \\ C_t - h(\beta \phi_x + \varrho C - \varpi \theta)_{xx} = 0, \end{cases}$$

and studied the theoretical and numerical exponential stability of the system.

For this work, we study a linear thermoelastic Timoshenko system with diffusion effect, memory and distributed delay term

$$\begin{aligned}
& \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x = 0, \\
& \rho_2 \phi_{tt} - b\phi_{xx} + \kappa(\varphi_x + \phi) + \int_0^t \mu(t-s)\phi_{xx}(s)ds + \mu_1 \phi_t \\
& + \int_{\tau_1}^{\tau_2} |\mu_2(\tau)|\phi_t(x, t - \tau) - \gamma\theta_x - \beta C_x = 0, \\
& \rho_3 \theta_t + \varpi C_t - \kappa\theta_{xx} - \gamma\phi_{tx} = 0, \\
& C_t - h(\beta\phi_x + \varrho C - \varpi\theta)_{xx} = 0,
\end{aligned} \tag{1}$$

with initial data and Dirichlet boundary conditions

$$\begin{cases}
\varphi(x, 0) = \varphi_0, \phi(x, 0) = \phi_0, \theta(x, 0) = \theta_0, P(x, 0) = P_0, \\
\varphi_t(x, 0) = \varphi_1, \phi_t(x, 0) = \phi_1, \phi_t(x, -\tau) = f(x, \tau), \\
\varphi(0, t) = \phi(0, t) = \theta(0, t) = P(0, t) = 0, \\
\varphi(1, t) = \phi(1, t) = \theta(1, t) = P(1, t) = 0,
\end{cases} \tag{2}$$

Where $(x, \tau, t) \in (0, 1) \times (\tau_1, \tau_2) \times (0, \infty)$, and θ is the difference temperature, and C denotes the concentration of the diffusive material. The coefficients

$\rho_1, \rho_2, \rho_3, b, \kappa, \beta, \gamma, h, \varrho, \omega, \tau_1, \tau_2, \mu_1$ are positive constants, $\mu: [\tau_1, \tau_2] \rightarrow \mathbb{R}$ is a bounded function and the kernel $\mu \in C^1(\mathbb{R}_+, \mathbb{R}_+)$ satisfying

(A1) $\mu(0) > 0, \alpha - \int_0^\infty \mu(p)dp = l > 0$, where $\alpha = b - \frac{\beta^2}{\varrho}$.

(A2) There exists a decreasing function $V \in C^1(\mathbb{R}_+, \mathbb{R}_+)$ satisfying

$$\mu'(t) \leq -V(t)\mu(t).$$

(A3) The function μ_2 satisfies

$$\int_{\tau_1}^{\tau_2} |\mu_2(p)|dp \leq \mu_1.$$

As in [6], we take C as follows

$$C = \frac{1}{\varrho}(P - \beta\phi_x + \varpi\theta),$$

with

$$\alpha = b - \frac{\beta^2}{\varrho} > 0, \xi_1 = \gamma + \frac{\beta\varpi}{\varrho}, \xi_2 = \frac{\beta}{\varrho}, d = \frac{\varpi}{\varrho}, c = \rho_3 + \frac{\varpi^2}{\varrho}, r = \frac{1}{\varrho}$$

Substituting the above constants in (1), we get

$$\left\{ \begin{array}{l} \rho_1 \phi_{tt} - \kappa(\phi_x + \phi)_x = 0, \\ \rho_2 \phi_{tt} - \alpha \phi_{xx} + \kappa(\phi_x + \phi) + \int_0^t \mu(t-s) \phi_{xx}(s) ds + \mu_1 \phi_t \\ + \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| \phi_t(x, t - \tau) - \xi_1 \theta_x - \xi_2 P_x = 0, \\ c \theta_t + d P_t - \kappa \theta_{xx} - \xi_1 \phi_{tx} = 0, \\ d \theta_t + r P_t - h P_{xx} - \xi_2 \phi_{tx} = 0, \end{array} \right. \quad (3)$$

Assuming that the symmetric matrix $\Gamma = \begin{pmatrix} c & d \\ d & r \end{pmatrix}$ is positive definite, which leads us to conclude that for all θ, P

$$rP^2 + c\theta^2 + 2d\theta P > 0. \quad (4)$$

And let's suppose also that

$$\alpha \rho_1 = \kappa \rho_2. \quad (5)$$

In this research paper, we start by showing the well-posedness of system (3)-(2). Next, we demonstrate the exponential decay by constructing a Lyapunov functional and show that it is equivalent to the energy. Then, we obtain the approached problem of (3)-(2) using a finite element approximation, and showing the discrete energy decay. Finally, we give priori error estimates and numerical simulations.

For the rest of this article, we denote

$$\mu \circ \phi x = \int_0^1 \int_0^t \mu(t-s) (\phi_x(t) - \phi_x(s))^2 ds dx. \quad (6)$$

WELL-POSEDNESS

In this section, we evince the existence and uniqueness of solution of system (3)-(2), using the Faedo-Galerkin method with four priori estimates [7, 8]. For this, we give other variables z and η such that ([9, 10])

$$\begin{aligned} z(x, \varrho, \tau, t) &= \phi_t(x, t - \varrho\tau), \\ \eta(x, t, s) &= \phi_x(x, t) - \phi_x(x, s), \end{aligned}$$

Noticing that z checks

$$\begin{cases} \tau z_t + z_\varrho = 0, \\ z(x, 0, \tau, t) = \phi_t. \end{cases}$$

And η satisfies

$$\eta_t - \phi_{xt} = 0.$$

Thus, system (3) becomes

$$\left\{ \begin{array}{l} \rho_1 \varphi_{tt} - \kappa(\varphi_x + \phi)_x = 0, \\ \rho_2 \phi_{tt} - \alpha \phi_{xx} + \kappa(\varphi_x + \phi) + \int_0^t \mu(t-s) \phi_{xx}(s) ds + \mu_1 \phi_t \\ + \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z(x, \varrho, \tau, t) - \xi_1 \theta_x - \xi_2 P_x = 0, \\ c \theta_t + d P_t - \kappa \theta_{xx} - \xi_1 \phi_{tx} = 0, \\ d \theta_t + r P_t - h P_{xx} - \xi_2 \phi_{tx} = 0, \\ \eta_t - \phi_{xt} = 0, \\ \tau z_t(x, \varrho, \tau, t) + z_\varrho(x, \varrho, \tau, t) = 0, \end{array} \right. \quad (7)$$

With

$$\left\{ \begin{array}{l} \varphi(x, 0) = \varphi_0, \quad \phi(x, 0) = \phi_0, \quad \theta(x, 0) = \theta_0, \quad P(x, 0) = P_0, \\ \varphi_t(x, 0) = \varphi_1, \quad \phi_t(x, 0) = \phi_1, \quad z(x, \varrho, \tau, 0) = f(x, \varrho, \tau), \quad \eta(x, 0, s) = \eta_0, \\ \varphi(0, t) = \phi(0, t) = \theta(0, t) = P(0, t) = 0, \\ \varphi(1, t) = \phi(1, t) = \theta(1, t) = P(1, t) = 0, \end{array} \right. \quad (8)$$

Where $(x, \varrho, \tau, t) \in (0, 1) \times (0, 1) \times (\tau_1, \tau_2) \times (0, \infty)$.

Now, let's define the following Hilbert space

$$H = (H^2(0, 1) \cap H_0^1(0, 1) \times H_0^1(0, 1))^2 \times (H^2(0, 1) \cap H_0^1(0, 1))^2 \times L^2(0, 1) \\ \times L^2((0, 1) \times (0, 1) \times (\tau_1, \tau_2))$$

Theorem 2.1 Suppose that (A1)-(A3) and (4) are satisfied. Let the initial data $(\varphi_0, \varphi_1, \phi_0, \phi_1, \theta_0, P_0, \eta_0, f) \in H$. Then, problem (7)-(8) admits a unique solution $U = (\varphi, \varphi_t, \phi, \phi_t, \theta, P, \eta, z)$ that satisfies

$$\begin{aligned} \varphi, \phi &\in C(\mathbb{R}_+, H^2(0, 1) \cap H_0^1(0, 1)), \quad \varphi_t, \phi_t \in C(\mathbb{R}_+, H_0^1(0, 1)), \\ \theta, P &\in L^\infty(\mathbb{R}_+, H^2(0, 1) \cap H_0^1(0, 1)), \\ \eta &\in C(\mathbb{R}_+, L^2(0, 1)), \quad z \in L^\infty(\mathbb{R}_+, L^2((0, 1) \times (0, 1) \times (\tau_1, \tau_2))), \end{aligned}$$

Furthermore, the solution depends continuously on the initial data.

EXPONENTIAL STABILITY

This section contains several lemmas showing that the system (7)-(8) is exponentially stable.

Lemma 3.1 The energy of the system (7)-(8) is defined as

$$E(t) = \frac{1}{2} \int_0^1 \left[\rho_1 \varphi_t^2 + \rho_2 \phi_t^2 \left(\alpha - \int_0^t \mu(p) dp \right) \phi_x^2 + \kappa(\varphi_x + \phi)^2 + c \theta^2 + r P^2 + 2d \theta P \right] dx \\ + \frac{1}{2} (\mu \circ \phi_x) + \frac{1}{2} \int_0^1 \int_0^1 \int_{\tau_1}^{\tau_2} \tau |\mu_2(\tau)| z^2(x, \varrho, \tau, t) d\tau d\varrho dx, \quad (9)$$

Which satisfies

$$E'(t) \leq -\kappa \int_0^1 \theta_x^2 dx - h \int_0^1 P_x^2 dx + \frac{1}{2} (\mu' \circ \phi_x) - \eta_1 \int_0^1 \phi_t^2 dx, \quad (10)$$

Where $\eta_1 = \mu_1 - \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| d\tau \geq 0$.

Lemma 3.2 The functional

$$G_1(t) = \frac{\rho_1}{\kappa} \int_0^1 \varphi_t \phi_x dx + \frac{\rho_2}{\alpha} \int_0^1 \phi_t (\varphi_x + \phi) dx - \frac{\rho_1}{\alpha \kappa} \int_0^1 \varphi_t \int_0^t \mu(t-s) \phi_x(s) ds dx, \quad (11)$$

Checks for any $\epsilon, \epsilon_5, \epsilon_6 > 0$

$$\begin{aligned} G'_1(t) \leq & -\frac{\kappa}{3\alpha} \int_0^1 (\varphi_x + \phi)^2 dx + \left(\frac{\rho_2}{\alpha} + \frac{\mu_1}{2\alpha\epsilon_1} \right) \int_0^1 \phi_t^2 dx + \frac{\xi_1}{2\alpha\epsilon_2} \int_0^1 \theta_x^2 dx \\ & + \frac{1}{2\alpha\epsilon_4} \int_0^1 \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z^2(x, 1, \tau, t) d\tau dx + \left(\frac{\rho_1\mu(0)\epsilon_5}{2\kappa\alpha} + \frac{\rho_1\epsilon_6}{2\kappa\alpha} \right) \int_0^1 \varphi_t^2 dx \\ & + \frac{\rho_1\mu(0)}{2\kappa\alpha\epsilon_5} \int_0^1 \phi_x^2 dx - \frac{\rho_1\mu(0)}{2\kappa\alpha\epsilon_6} (\mu' \circ \phi_x) + \frac{\xi_2}{2\alpha\epsilon_3} \int_0^1 P_x^2 dx \\ & + \frac{1}{2\epsilon} \left[\left(\phi_x(1, t) - \frac{1}{\alpha} \int_0^t \mu(t-s) \phi_x(1, s) ds \right)^2 \right. \\ & \left. + \left(\phi_x(0, t) - \frac{1}{\alpha} \int_0^t \mu(t-s) \phi_x(0, s) ds \right)^2 \right] + \frac{\epsilon}{2} (\varphi_x^2(0, t) + \varphi_x^2(1, t)). \end{aligned} \quad (12)$$

Lemma 3.2 Let the functional G_2 defined by

$$G_2(t) = -\rho_1 \int_0^1 \varphi_t \varphi dx, \quad (13)$$

Then, for any $c_1 > 0$, we have the following estimate

$$G'_2(t) \leq -\rho_1 \int_0^1 \varphi_t^2 dx - \frac{3\kappa}{2} \int_0^1 (\varphi_x + \varphi)^2 dx + \frac{\kappa c_1}{2} \int_0^1 \phi_x^2 dx. \quad (14)$$

Lemma 3.4 For any $\epsilon_7 > 0$, the functional G_3 defined by

$$G_3(t) = \rho_2 \int_0^1 \phi_t \phi dx + \frac{\mu_1}{2} \int_0^1 \phi_t^2 dx, \quad (15)$$

Satisfies the following estimate

$$\begin{aligned} G'_3(t) \leq & -\frac{l}{2} \int_0^1 \phi_x^2 dx + \frac{\kappa\epsilon_7}{2} \int_0^1 (\varphi_x + \varphi)^2 dx + \rho_2 \int_0^1 \phi_t^2 dx + \frac{\xi_1}{2} \int_0^1 \theta_x^2 dx \\ & + \frac{1}{2} \int_0^1 \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z^2(x, 1, \tau, t) d\tau dx + c_4 (\mu \circ \phi_x) + \frac{\xi_2}{2} \int_0^1 P_x^2 dx. \end{aligned} \quad (16)$$

Lemma 3.5 For any $\epsilon > 0$ defined in (12), the functional

$$\begin{aligned} G_4(t) = & \frac{\rho_1\epsilon}{\kappa} \int_0^1 (1-2x) \varphi_t \varphi_x dx \\ & + \frac{\rho_2}{\alpha\epsilon} \int_0^1 (1-2x) \phi_t \left(\phi_x - \frac{1}{\alpha} \int_0^t \mu(t-s) \phi_x(s) ds \right) dx \end{aligned} \quad (17)$$

Verifies for any $\epsilon, \epsilon_9 > 0$, the estimate

$$\begin{aligned}
G_4'(t) \leq & \left(3\epsilon + \frac{\kappa\epsilon_9}{3\alpha\epsilon}\right) \int_0^1 (\varphi_x + \phi)^2 dx + \nu_1 \int_0^1 \phi_t^2 dx + \frac{\xi_1}{2\alpha\epsilon} \int_0^1 \theta_x^2 dx + \nu_3(\mu \circ \phi_x) \\
& + \frac{1}{2\alpha\epsilon} \int_0^1 \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z^2(x, 1, \tau, t) d\tau dx + \frac{\rho_1\epsilon}{\kappa} \int_0^1 \phi_t^2 dx \\
& + \nu_2 \int_0^1 \phi_x^2 dx - \nu_4(\mu' \circ \phi_x) + \frac{\xi_2}{2\alpha\epsilon} \int_0^1 P_x^2 dx \\
& - \frac{1}{2\epsilon} \left[\left(\phi_x(1, t) - \frac{1}{\alpha} \int_0^t \mu(t-s)\phi_x(1, s) ds \right)^2 \right. \\
& \left. + \left(\phi_x(0, t) - \frac{1}{\alpha} \int_0^t \mu(t-s)\phi_x(0, s) ds \right)^2 \right] - \frac{\epsilon}{2} (\varphi_x^2(0, t) + \varphi_x^2(1, t)).
\end{aligned} \tag{18}$$

Lemma 3.6 The functional

$$G_5(t) = \int_0^1 \int_0^1 \int_{\tau_1}^{\tau_2} \tau e^{-\tau\varrho} |\mu_2(\tau)| z^2(x, \varrho, \tau, t) d\tau d\varrho dx, \tag{19}$$

Satisfies

$$\begin{aligned}
G_5'(t) \leq & -\eta_2 \int_0^1 \int_0^1 \int_{\tau_1}^{\tau_2} \tau e^{-\tau\varrho} |\mu_2(\tau)| z^2(x, \varrho, \tau, t) d\tau d\varrho dx + \mu_1 \int_0^1 \phi_t^2 dx \\
& - \eta_2 \int_0^1 \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z^2(x, 1, \tau, t) d\tau dx.
\end{aligned} \tag{20}$$

Lemma 3.7 Let $N, N_1, N_2, N_3, N_4 > 0$, and L a functional defined as

$$L(t) = NE(t) + N_1(G_1(t) + G_4(t)) + N_2G_2(t) + N_3G_3(t) + N_4G_5(t), \quad \forall t \geq 0$$

Then, there exist $\lambda_1, \lambda_2 > 0$ such that

$$\lambda_1 E(t) \leq L(t) \leq \lambda_2 E(t), \forall t \geq 0.$$

Theorem 3.1 Assume that the assumptions (A1)-(A3) and (5) hold. Then, there exist two constants $\lambda_3, \lambda_4 > 0$ such that (9) satisfies

$$E(t) \leq \lambda_4 e^{-\lambda_3 t}, \forall t \geq 0.$$

NUMERICAL APPROXIMATION

In this section, we introduce a finite element scheme for problem (7), and then we give the expression of the discrete energy and prove the decay of it.

For this work, we partition the interval $[0,1]$ into subintervals $I_j = (x_{j-1}, x_j)$ such that $x_j = jh$, $j = 0, \dots, M$ where $M > 0$, and $h = \frac{1}{M}$ is the space step. Next, for a given final time $T > 0$, let $t_n = n\Delta t$, $n = 0, \dots, N$, where $N > 0$ and $\Delta t = \frac{T}{N}$ is the time step.

Now, we define

$$S_0^h = \left\{ u \in H_0^1(0,1) \cap C([0,1]), u|_{I_j} \text{ is a linear polynomial} \right\}$$

Then, the approximative problem by finite element method of (7) is to find

$\varphi_h^n, \phi_h^n, \theta_h^n, P_h^n, \eta_h^n, z_h^n \in S_0^h, \forall n \geq 1$, such that for all $\bar{\varphi}_h, \bar{\phi}_h, \bar{\theta}_h, \bar{P}_h, \bar{\eta}_h, \bar{z}_h \in S_0^h$

$$\left\{ \begin{array}{l} \frac{\rho_1}{\Delta t} (u_h^n - u_h^{n-1}, \bar{\varphi}_h) + \kappa (\varphi_{hx}^n + \phi_h^n, \bar{\varphi}_{hx}) = 0, \\ \frac{\rho_2}{\Delta t} (v_h^n - v_h^{n-1}, \bar{\phi}_h) + \left(\alpha - \int_0^{t_n} \mu(p) dp \right) (\phi_{hx}^n, \bar{\phi}_{hx}) + \kappa (\varphi_{hx}^n + \phi_h^n, \bar{\phi}_h) + \\ \mu_1 (v_h^n, \bar{\phi}_h) + \xi_1 (\theta_h^n, \bar{\phi}_{hx}) + \xi_2 (P_h^n, \bar{\phi}_{hx}) + \int_0^{t_n} \mu(t_n - s) (\eta_h^n, \bar{\phi}_{hx}) ds \\ + \int_0^1 \bar{\phi}_h \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| z_h^n(1, \tau) d\tau dx = 0, \\ \frac{c}{\Delta t} (\theta_h^n - \theta_h^{n-1}, \bar{\theta}_h) + \frac{c}{\Delta t} (P_h^n - P_h^{n-1}, \bar{P}_h) + \kappa (\theta_{hx}^n, \bar{\theta}_{hx}) - \xi_1 (v_{hx}^n, \bar{\theta}_h) = 0, \\ \frac{d}{\Delta t} (\theta_h^n - \theta_h^{n-1}, \bar{P}_h) + \frac{r}{\Delta t} (P_h^n - P_h^{n-1}, \bar{P}_h) + h (P_{hx}^n, \bar{P}_{hx}) - \xi_2 (v_{hx}^n, \bar{P}_h) = 0, \\ \frac{1}{\Delta t} (\eta_h^n - \eta_h^{n-1}, \bar{\eta}_h) - (v_{hx}^n, \bar{\eta}_h) = 0, \\ \frac{\tau}{\Delta t} (z_h^n - z_h^{n-1}, \bar{z}_h) - (z_{hq}^n, \bar{z}_h) = 0, \end{array} \right. \quad (21)$$

The approximations of $\varphi_0, \varphi_1, \phi_0, \phi_1, \theta_0, P_0, \eta_0, f$ are $\varphi_h^0, u_h^0, \phi_h^0, v_h^0, \eta_h^0, z_h^0$, respectively.

Theorem 4.1 The discrete energy of the system (21) is defined as

$$\begin{aligned} E^n = & \frac{1}{2} \left[\rho_1 \|u_h^n\|^2 + \rho_2 \|v_h^n\|^2 + \left(\alpha - \frac{\Delta p}{3} \left[\mu(0) + \mu(t_n) + 2 \sum_{i=1}^{n-1} \mu(t_i) + 2n \sum_{i=1}^{S-1} \mu(p_{2i}) \right. \right. \right. \\ & \left. \left. \left. + 4n \sum_{i=1}^S \mu(p_{2i-1}) \right) \right] \|\phi_{hx}^n\|^2 + \kappa \|\varphi_{hx}^n + \phi_h^n\|^2 + c \|\theta_h^n\|^2 + r \|P_h^n\|^2 \quad (22) \\ & + 2d (P_h^n, \theta_h^n) + \int_0^{t_n} \mu(t_n - s) \|\eta_h^n\|^2 ds + \int_0^1 \int_{\tau_1}^{\tau_2} \tau |\mu_2(\tau)| \|z_h^n\|^2 d\tau d\varrho. \end{aligned}$$

Which decays to zero, i.e

$$E^n \leq E^{n-1}, \quad n = 1, \dots, N. \quad (23)$$

Theorem 4.2 Suppose that the assumptions (A1) and (A3) are satisfied, and assume that

$$\begin{aligned} U \in & \left(H^4((0, T), H^2(0, 1)) \right)^4 \times H^3((0, T) \times (0, T), H^1(0, 1)) \\ & \times H^3((0, T) \times (0, 1) \times (\tau_1, \tau_2), H^1(0, 1)) \end{aligned}$$

Then, for all $n > 0, M > 0$, we have

$$\begin{aligned}
& \|u_h^n - \varphi_t(t_n)\|^2 + \|v_h^n - \phi_t(t_n)\|^2 + \left\| \phi_{hx}^n - (\phi(t_n))_x \right\|^2 + \|\theta_h^n - \theta(t_n)\|^2 \\
& + \kappa \left\| \varphi_{hx}^n + \phi_h^n - \left((\varphi(t_n))_x + \phi(t_n) \right) \right\|^2 + \int_0^{t_n} \mu(t_n - s) \|\eta_h^n - \eta(t_n)\|^2 ds \\
& + \|P_h^n - P(t_n)\|^2 + \int_0^1 \int_{\tau_1}^{\tau_2} |\mu_2(\tau)| \|z_h^n - z(t_n)\|^2 d\tau d\varrho \leq M(h^2 + \Delta t^2).
\end{aligned} \tag{24}$$

NUMERICAL SIMULATION

For the simulation, we take the $\rho_1 = \rho_2 = 10^{-4}$, $\mu_1 = 10^{-3}$, $\alpha = 1$, $h = 0.2$, $\xi_1 = 0.01931$, $\xi_2 = r = 0.0004635$, $d = 0.00251$, $c = 0.03058$, $\kappa = 1$, $\Delta p = 0.001$, $\Delta \tau = \Delta t = 0.01$, and we choose these initial conditions

$$\varphi_0 = \varphi_1 = \phi_0 = \phi_1 = \theta_0 = P_0 = (1 - x)^2 x.$$

And we choose $\mu_2(\tau) = \tau$, $\forall \tau \in [0.01, 0.02]$ which satisfies (A3).

Finally, we choose $\mu(t) = e^{-t}$, which satisfies (A1) and (A2) with $V(t) = 1$, $\forall t \in (0, +\infty)$.

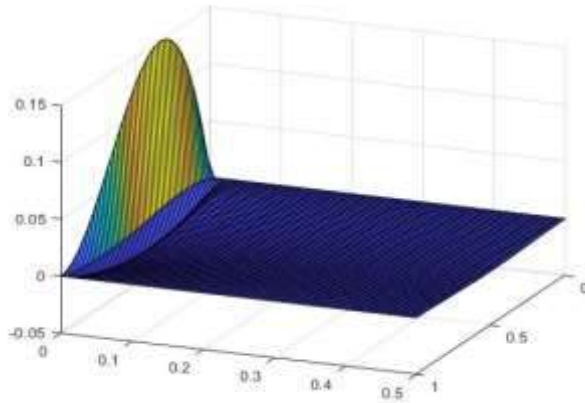


Figure .1: The evolution in time and space of φ .

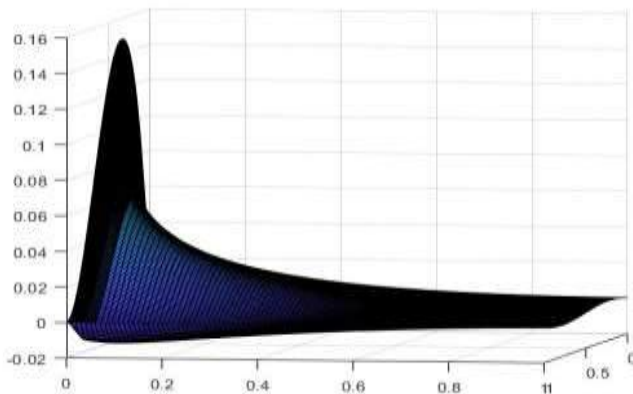


Figure .2: The evolution in time and space of ϕ .

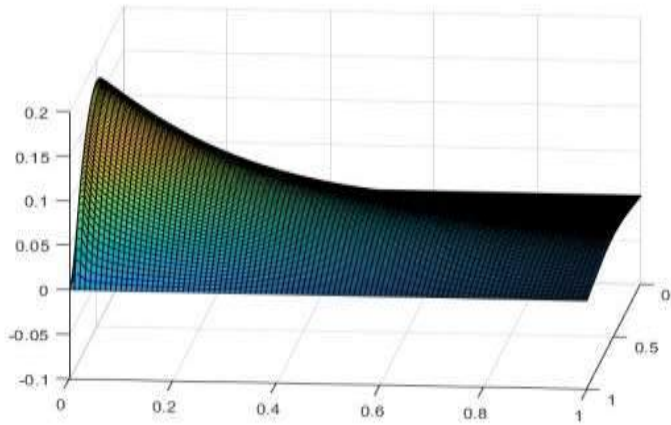


Figure .3: The evolution in time and space of θ .

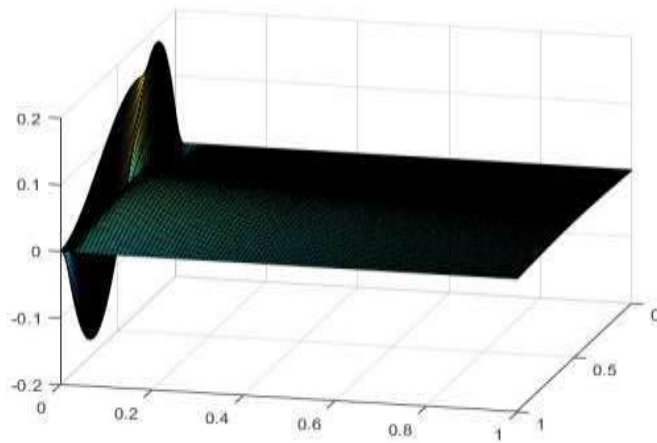


Figure .4: The evolution in time and space of P .

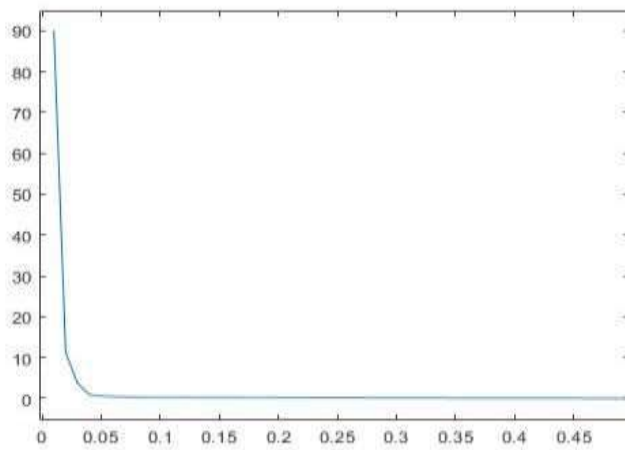


Figure .5: The evolution in time of E^n .

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WATER AWARENESS IN URBANS: WATER MANAGEMENT WITH BLUE-GREEN INFRASTRUCTURE STRATEGIES

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ABSTRACT

Water is one of the basic life cycles of the earth and is an indispensable abiotic landscape value of the ecosystem. Any damage or pollution in the water cycle can cause irreversible damage to this basic life cycle. Especially in the 21st century, approximately 50% of the world population lives in cities, and industrial and technological developments have brought global warming problems. In urbans where the impact of climate change is intensely experienced, the construction of permeable surfaces, settlement pressure on green areas and water basins, and ignoring policies regarding rainwater management have recently led to water-related natural disasters, water scarcity and an increase in urban heat islands in Turkey. One of the natural-based solutions that minimize these basic problems in urbans is blue-green infrastructure (BGI) strategies. BGI strategies, which produce an ecological water management approach, provide water awareness for urban residents, improve the life quality, provide accessibility, increase recreational opportunities, provide ecosystem services and protect the healthy life cycle for organism. This research, based on hydrological networks under structural pressure in urbans, is conducted to raise awareness of water resources in urbans that still preserve their natural landscape values but are under pressure from agriculture, industry and settlement. In this context, it is aimed to develop BGI strategies based on the ecological water management approach and serve holistically from planning to design scale. To reach this aim, it is offered to increase permeable surfaces and green areas in urbans, to ensure the sustainability of the natural rainwater cycle, to ecologically clean urban waters with landscape restoration suggestions, to provide healthy living environments for organism and to provide recreation opportunities. The findings of this research based on the regulations regarding water in Turkey and the European Water Framework Directive, can set an example for raising water management awareness of Turkey, which has 25 river basins, by developing natural-based BGI strategies.

Keywords: Water management, Climate change, Blue-green infrastructure strategies, Awareness.

INTRODUCTION

Global warming and the consequent climate change contribute to water scarcity and shortages, desertification due to drought, degradation of natural landscape structures, and

alterations in the essential life cycle quantities of water, carbon dioxide, oxygen, nitrogen, and phosphorus. These changes negatively impact the landscape's functions related to water, soil, biodiversity, habitat, and erosion. Additionally, cultural landscapes that emerge from evolving cultural activities also exert an influence on natural landscapes. The increase in the global population and the consequent acceleration of urbanization, along with the conversion of permeable surfaces to impermeable ones and improper land-use decisions, exert negative pressures on freshwater resources. On permeable surfaces, approximately 40% of water evaporates, 50% infiltrates the subsurface and groundwater, and only 10% becomes surface runoff. Conversely, in cities dominated by impermeable surfaces, about 30% of water evaporates, 15% infiltrates the subsurface and groundwater, but a significant majority of 55% becomes surface runoff. This condition leads to floods, loss of life and property, and pollution of freshwater and surface water resources in urban areas (Chen and Zhang, 2022; Sharma and Kumar, 2023). In recent years, it has been emphasized that to ensure the sustainability of urban ecosystems, the hydrological network systems that form the structural backbone of the city, along with the open green space networks that are integrated parts of these systems, should be holistically preserved and developed. In this context, effective management of water resources, enhancement of green infrastructure, and preservation of natural habitats are critical to increasing the ecological resilience of cities (Gülçin, 2018; Şen et al., 2019; Demir, 2022).

Increasing urban development leads to the reduction of natural permeable surfaces, resulting in the proliferation of impermeable surfaces that prevent water infiltration into the soil. This phenomenon causes rainwater to accumulate on the surface and flow uncontrollably, compromising the integrity of urban infrastructure and contaminating freshwater resources, particularly drinking water supplies (Demirel and Velibeyoğlu, 2017; Hepcan, 2019; Sharma and Kumar, 2023). Furthermore, due to the effects of global climate change, the frequency of sudden and severe weather events in cities has increased, necessitating the development of new water management systems to enhance urban resilience. These systems are designed either by mimicking natural processes or through engineered methods. The expansion of impermeable surfaces, in particular, disrupts the natural topography of watershed areas, and the encasement of water resources within concrete structures interrupts the natural water cycle, hindering the adequate recharge of groundwater and surface water sources. Simultaneously, the excessive rainfall caused by global warming elevates flood risks, while surface runoff contributes to environmental pollution and degradation of water quality (Hepcan, 2019; Chen and Zhang, 2022). For these reasons, many countries have recently implemented blue-green infrastructure solutions, sponge city models, water-sensitive urban design, and sustainable urban drainage systems within the framework of sustainable urban approaches, particularly in major cities under intense urbanization pressure, and have launched various projects (Özveren and Kaplan, 2017; Hepcan, 2019; Esbah, 2021).

Rapid urbanization has intensified pressures on natural and cultural landscape values, leading to a growing emphasis on sustainable urban development and models in urban settings, as in

other sectors. To alleviate these pressures and create a sustainable urban structure, there is a critical need for the holistic protection and enhancement of cities' hydrological network systems and open green space networks (Özveren and Kaplan, 2017; Gülçin, 2018; Şen et al., 2019). Within this framework, to restore the ecological values of cities whose natural structures have been degraded, the concept of blue-green infrastructure (BGI)—one of the nature-based solutions that integrates water networks and green spaces—has gained prominence. This approach, which spans from planning to design scales, involves green spaces established on hydrological networks that sustain ecological functions, linking water systems with built (grey) infrastructure. The growing interest in this green infrastructure concept highlights its role as a vital component of sustainable urban development.

The blue-green infrastructure (BGI) approach seeks to integrate water-supported green networks by connecting urban rivers and streams with surrounding green spaces and corridors, thereby preserving hydrological processes. This framework emphasizes the restoration of ecological values in cities whose natural structures have been compromised. The green infrastructure concept, operational from planning through design scales, is gaining traction as it facilitates connections between hydrological networks and green spaces that maintain ecological functions, bridging the gap between water systems and grey infrastructure. It is becoming increasingly recognized as an essential element of sustainable urban development (Tian et al., 2018; Chen and Zhang, 2022; Follstad, 2022).

The proliferation of impermeable surfaces, disruption of watershed structures, and the confinement of water resources within concrete barriers in urban areas interrupt the natural water cycle, impeding the recharge of groundwater and surface water sources. Global warming and climate change exacerbate these challenges by causing excessive rainfall and flooding, increasing surface runoff, which leads to the contamination of water resources (Hepcan, 2019; Demir, 2022; Sharma and Kumar, 2023). Moreover, the depletion of water resources contributes to drought and desertification, altering natural landscape structures. In this context, the impacts of cultural landscapes, alongside natural landscapes, must also be considered. The disparities in evaporation, infiltration, and surface runoff rates between permeable and impermeable surfaces exacerbate issues such as flooding and freshwater contamination (Brown and Gillespie, 2021; Follstad, 2022).

In rapidly urbanizing regions, preserving natural and cultural landscape values necessitates a reevaluation of sustainable urban development and urban models. In this context, the concept of green infrastructure becomes prominent. Green infrastructure is an approach that integrates green spaces, which align with hydrological networks and sustain ecological functions, with water systems and grey infrastructure, making it a crucial tool for sustainable urban development. Fundamental principles of green infrastructure techniques include the recycling of rainwater, natural evaporation processes, and the natural infiltration of water into the ground. These techniques involve utilizing natural and nature-based engineering systems to

mitigate surface runoff, store rainwater, and promote its reuse (Tian et al., 2018; Hsu and Tsai, 2023).

BGI elements encompass network systems composed of water features and green network systems. In this scope, urban green infrastructure components include natural elements such as forests, shrublands, grasslands, and wetlands, as well as semi-natural and cultural components like parks, sports fields, schoolyards, and rooftop gardens (Oktay et al., 2016; Özeren and Kaplan, 2017). Additionally, there are studies evaluating the effectiveness of green infrastructure elements in enhancing urban ecosystem services and optimizing water management (Elmqvist et al., 2015; Andersson et al., 2014).

Within the framework of integrated water resources management, measures such as filtering rainwater before it reaches receiving bodies, reducing surface runoff velocity, and distributing water over broader areas are essential for recharging groundwater resources. This approach includes designing floodplains with green corridors like parks, sports fields, and walking and cycling paths, which not only improve urban quality of life but also address recreational needs (Demir and Demirel, 2018; Brown and Gillespie, 2021; Hsu and Tsai, 2023).

In Turkey, ensuring the sustainability of water resources requires integrating water management into the planning process. The Integrated Water Resources Management (IWRM) approach, supported by the European Union Water Framework Directive, facilitates the planning of water resource use in alignment with social, economic, and ecological goals. This approach aims to protect all water ecosystems, especially freshwater ecosystems, and to restore the disrupted natural processes of the water cycle (Saygın and Ulusoy, 2011; Muluk et al., 2013; Demir, 2022). This study aims to raise awareness about water management across Turkey's 25 river basins, develop nature-based ecological strategies, and integrate IWRM strategies from planning through to design. The objective is to expand permeable surfaces and green spaces, ensure the sustainability of natural rainwater cycles, propose landscape restoration solutions, ecologically clean urban water resources, create healthy living environments, and provide recreational opportunities. The results of this research, conducted with consideration of Turkey's water regulations and the European Union Water Framework Directive, may contribute to raising awareness about water management in Turkey's 25 river basins by developing nature-based ecological strategies.

METHOD

Blue-Green Infrastructure Techniques

In large cities under the pressures of climate change and increasing population, blue-green infrastructure (BGI) techniques, sponge city models, water-sensitive urban design, sustainable urban drainage systems, and low-impact development approaches ensure the effective and sustainable use of water resources (Saygın & Ulusoy, 2011; Follstad, 2022). As a nature-based solution, BGI represents a planning and design approach that aims to bridge green spaces, which perform ecosystem functions, with traditional gray infrastructure. This concept

emphasizes green spaces that are based on hydrological networks and support ecological services. By extending beyond traditional gray infrastructure, BGI provides vital ecosystem services to the public (Chen & Zhang, 2022; Sharma & Kumar, 2023). As an extension of the principle of sustainability, the green infrastructure concept emerged in the early 2000s in the United States and has gained significant prominence in urban planning. This approach is recognized as an effective tool in developing urban green frameworks. BGI is a method that supports and manages biodiversity across a broad ecosystem framework in both rural and urban areas, enhancing nature's capacity to provide ecosystem services such as clean air and water. Additionally, it produces design solutions by establishing strategic connections between high-quality natural, semi-natural, and urban areas. These systems maintain clean air and water while protecting natural areas and processes. They also create a holistic network that conserves wildlife and biodiversity and integrates natural areas with other open green spaces. The increasing prevalence of impervious surfaces due to urbanization has heightened the importance of BGI applications. In this context, BGI techniques are generally based on principles such as rainwater harvesting, evaporation and infiltration through vegetation and soil layers, and management of streambeds and floodplains. BGI systems aim to reduce surface runoff, store and reuse rainwater, and offer environmental, social, and economic benefits by mitigating the effects of climate change and supporting biodiversity. Implemented in urban areas, these systems promote economic growth, preserve cultural heritage, enhance biodiversity, facilitate climate change adaptation, improve accessibility, and strengthen social cohesion (Tian et al., 2018; Gómez & Barton, 2021). Consequently, they contribute to the formation of healthy cities and communities.

Nature-based solutions include blue-green infrastructure (BGI), which is a planning and design approach aimed at bridging the gap between green spaces that perform ecosystem functions and traditional built infrastructure (gray infrastructure). This concept particularly emphasizes green areas that are based on hydrological networks and support ecological services. Moving beyond conventional gray infrastructure, blue-green infrastructure provides essential ecosystem services that are accessible to the public (Chen and Zhang, 2022; Sharma and Kumar, 2023). As an extension of the principle of sustainability, the green infrastructure concept emerged in the early 2000s in the United States and has gained significant importance in urban planning. This approach is recognized as an effective tool in the development of urban green networks.

BGI is a method that enhances the capacity of nature to provide ecosystem services such as clean air and water, supporting and managing biodiversity within a broad ecosystem framework, both in rural and urban areas. It also generates design solutions by establishing strategic connections between high-quality natural, semi-natural, and urban areas. These systems not only conserve natural areas and processes but also ensure the preservation of clean air and water. Additionally, BGI creates a holistic network that protects wildlife and biodiversity while integrating natural areas with other open green spaces. The increased prevalence of impervious surfaces due to urbanization has highlighted the importance of BGI

applications. In this context, BGI techniques generally rely on principles such as rainwater harvesting, evapotranspiration and infiltration through vegetation and soil layers, and the management of streambeds and floodplain boundaries. BGI systems aim to reduce surface runoff, store and reuse rainwater. BGI applications offer environmental, social, and economic benefits by mitigating the effects of climate change and supporting biodiversity. These systems implemented in cities promote economic growth, preserve cultural heritage, enhance biodiversity, facilitate climate change adaptation, improve accessibility, and strengthen social cohesion (Tian et al., 2018; Gómez and Barton, 2021). Consequently, they contribute to the development of healthy cities and communities.

Rainwater Mangement

Rainwater Management: Countries are categorized based on the annual per capita availability of freshwater into classifications such as water scarcity, water stress, or water abundance. This classification allows for the development of strategic approaches in areas such as water planning, design, maintenance, project development, operation, and management (İstanbulluoğlu and Kır, 2011; Sarış, 2021; Yılmaz, 2015). Countries with an annual per capita water availability of less than 1,000 m³ are considered water-scarce. When this amount ranges between 1,000-1,700 m³, the country is considered to be experiencing water stress, whereas countries with more than 1,700 m³ per capita are classified as water-rich. For example, the United States, the United Kingdom, Iceland, and Northern European countries are considered water-rich, while Turkey is among those experiencing water stress (Yılmaz, 2015; Chen and Zhang, 2022; Demir, 2022; Follstad, 2022; Sharma and Kumar, 2023). According to estimates by the United Nations Food and Agriculture Organization, the proportion of countries experiencing water stress is expected to increase by 34%, and those facing water scarcity by 15%, by the year 2025, due to increased water consumption and the impacts of climate change (Marco et al., 2017; Sharma and Kumar, 2023). These projections highlight the necessity for developing sustainable water management strategies and nature-based solutions.

In both developed and developing countries, various European nations have developed comprehensive water policies. The primary objective of these policies is the protection and sustainability of water resources. This approach is of critical importance for water sources such as streams, brooks, rivers, and waterways within urban areas (Esbah, 2021). Unsustainable urban, agricultural, and industrial activities in cities are disrupting the natural structure of river corridors and leading to a decline in water quality. In this context, water policies and management are of great significance at both national and international levels for the protection of existing water resources and meeting the increasing demand for water. Various treaties also play a crucial role in the process of establishing international water strategies. One of the key treaties is the Ramsar Convention, which covers wetlands and was signed in Europe in 1971. Turkey ratified this convention on December 28, 1993. The Ramsar Convention represents an international framework aimed at the conservation and sustainable

use of wetlands (Demir, 2022). Furthermore, the first international meeting on water planning and management was the United Nations Conference on the Human Environment held in Stockholm in 1972. This conference resulted in significant decisions regarding the protection of water, soil, air, and natural ecosystems, and highlighted the importance of water. In 1977, the first international water conference, the UN Water Conference, was held. This conference addressed the rights of all people to meet their basic water needs and led to the initiation of the UNESCO World Water Program.

Another significant international initiative regarding water planning and management began with the publication of the "Our Common Future" report by the World Commission on Environment and Development in 1987. This report emphasized that resource management within the context of sustainable development requires international cooperation. Subsequently, the Bucharest Convention, signed in 1992, outlined measures to combat marine pollution for countries bordering the Black Sea, such as Bulgaria, Georgia, Romania, the Russian Federation, Ukraine, and Turkey. In the same year, the United Nations Conference on Environment and Development, also known as the Rio Summit, developed an understanding of the sustainable use of water as a limited resource and recognized its economic value (Demir, 2022; Kassinos and Koutsou, 2022; Hsu and Tsai, 2023). At the Rio Summit, the importance of water resources was highlighted with the slogan "Water for People, Water for Life," emphasizing the need to improve water management, enhance resources, and increase cross-sectoral collaboration.

The 11th Sustainable Development Goal set by the United Nations for 2030 aims to make cities and other human settlements safer, more resilient, inclusive, and sustainable (Esbah, 2021). In this context, the importance of water resources—one of the fundamental human needs and a critical component in the life cycles of ecosystems—is emphasized. This underscores the necessity for sustainable water management approaches that function harmoniously to ensure healthy cities, healthy individuals, and vibrant living environments.

Turkey is integrating regulations mandated by international agreements on water management into its national legislation. Consistent with these international agreements, various ministries and official bodies manage national regulations and legislation related to rivers and water resources. Key institutions involved in water management include the Ministry of Agriculture and Forestry, the Ministry of Environment, Urbanization and Climate Change, the Ministry of Health, and local governments. Each of these bodies provides services through various regulations and directives according to their respective jurisdictions. For instance, the General Directorate of State Hydraulic Works, under the Ministry of Agriculture and Forestry, has prepared regulations and guidelines on flood and sediment control, improvement of surface water quality, and river rehabilitation. Additionally, the Directorate General of Water Management develops regulations aimed at protecting water basins and establishing management plans. The Ministry of Environment, Urbanization and Climate Change has also set forth regulations concerning water pollution control and rainwater harvesting systems

(Demir, 2022). Metropolitan municipalities implement their own regulations concerning the protection of water basins (Table 1).

Table 1. Metropolitan municipalities implement their own regulations concerning the protection of water basins (Demir, 2022).

MINISTRY	DIRECTORATE	REGULATION	PURPOSE OF THE REGULATION
Ministry of Agriculture and Forestry of the Republic of Turkey	General Directorate of State Hydraulic Works	Flood and Sediment Control Regulation	Protection and Use Sustainable Development Water Quality
		Surface Water Quality Regulation	Flood Mitigation Stream Restoration
		River and Stream Bed Improvement	Integrated Approach Catchment Protection
	General Directorate of Water Management	Regulation on the Protection of Water Basins and the Preparation of Management Plans	Ensuring Groundwater and Surface Water Quality
Ministry of Environment, Urbanization, and Climate Change of the Republic of Turkey	No Directorate	Regulation on the Control of Water Pollution	Establishment of Sustainable Rainwater System
		Regulation on Rainwater Collection, Storage, and Discharge Systems	Wastewater Collection Protection of Natural Water Resources
		Regulation on Wastewater Collection and Disposal Systems	Enhancing Water Quality Providing Safe Drinking Water
Ministry of Health of the Republic of Turkey	No Directorate	Regulation on Water for Human Consumption	Enhancing Water Quality Providing Safe Drinking Water
Metropolitan Municipality	General Directorate of Water and Sewerage Administration of the Relevant Province	Regulation on the Protection of Water Basins	Integrated Approach Protection of Watersheds

RESULT and DISCUSSION

The core principles of Blue-Green Infrastructure (BGI) applications emphasize the importance of vegetation and soil surfaces in managing stormwater recycling, supporting natural evaporation, promoting groundwater infiltration, and mitigating the urban heat island effect. This involves controlling surface runoff, storing rainwater, and reusing surface water through both natural methods and engineered solutions that mimic nature. At larger scales, it

is essential to integrate green and water infrastructure in a functional manner. At smaller scales, BGI techniques should be meticulously designed for neighborhoods, streets, gardens, buildings, and amenities.

In urban areas, water corridors formed by rivers and streams, when integrated with surrounding green spaces and greenways, contribute to the development of water-based hydrological permeable areas within the city. This integration supports sustainable urban planning by preserving fundamental water cycles and ensuring accessibility (Gómez and Barton, 2021; Demir, 2022; Hsu and Tsai, 2023). Natural areas and processes should function in harmony with natural ecosystem values, maintaining clean air and water resources, and preserving water cycles and surfaces. Additionally, a comprehensive and sustainable network system must be created, providing environmental, social, and economic benefits while connecting open green spaces and supporting wildlife and biodiversity (Hepcan, 2019; Chen and Zhang, 2022; Follstad, 2022; Sharma and Kumar, 2023).

In contemporary urban settings, water bodies are utilized for various purposes, provided they are free from domestic, agricultural, and industrial wastes. These water bodies serve multiple functions, including agricultural irrigation, fishing, provision of clean water, energy production, and recreation (Andersson et al., 2014; Demir, 2022). In this context, preserving ecological balance during the landscape planning, design, restoration, and management of urban and peri-urban water surfaces is of paramount importance. The use of water resources for diverse purposes, if not controlled properly, can lead to degradation and pollution of water shores and surrounding areas (Hepcan, 2019; Özeren and Kaplan, 2017).

River corridors, which are integral components of natural drainage systems, function as corridors within a landscape framework composed of patches, corridors, and matrices. These river corridors are crucial landscape structures that facilitate connectivity between patches within an ecosystem. In urban areas, river corridors confined between impervious surfaces play critical ecological roles, such as water collection and transfer to the main water body, within the context of climate change (Demir and Demirel, 2018; Hepcan, 2019; Kassinos and Koutsou, 2022). However, factors such as high impervious surface ratios, topographical changes, neglect of natural drainage systems, and the covering of riverbeds with concrete blocks disrupt the natural flow of water, interrupt the water cycle, and hinder the replenishment of groundwater and surface water sources. Additionally, floods resulting from excessive rainfall lead to the mixing of stormwater with sewage systems, causing contamination of rivers and other receiving water bodies (Demir, 2022; Hsu and Tsai, 2023).

The urbanization process disrupts the integrity of natural habitats, and unsustainable land use decisions cause damage to sensitive ecosystems such as water corridors (Demir and Demirel, 2018; Hepcan, 2019; Gómez and Barton, 2021). In this framework, various stormwater management strategies and corresponding laws and regulations have been established to mitigate the negative impacts of urbanization and pressures on water resources, arising from agricultural activities, industrial developments, and climate change. These regulations include

national and international water strategies aimed at protecting existing water resources, rehabilitating degraded water sources, developing solutions to meet increasing water demands with limited resources, and preventing flood and inundation risks. Furthermore, agreements signed within this framework promote international cooperation in water resource protection and contribute to the establishment of common standards for water management.

CONCLUSION and RECOMMENDATIONS

Ensuring the sustainability of water resources in Turkey necessitates meticulous planning of water management processes and their integration into relevant legal frameworks. In this context, the European Landscape Convention, enacted in Turkey in 2003, holds significant importance for water resources. This convention establishes objectives for the planning, protection, management, restoration, and monitoring of landscapes, committing to the integration of outcomes from these processes into local legal regulations. Consequently, Turkey must delineate its existing groundwater and surface water resources, analyze agricultural, industrial, and domestic pressures on these resources, develop ecological solutions, and integrate these recommendations into legal processes. Additionally, the European Union Water Framework Directive, which Turkey has ratified, represents a fundamental legal framework aimed at protecting and improving the quality and quantity of all water resources in Europe. At the national level, regulations on wetland protection, flood and sediment control, rainwater collection, storage and discharge systems, wastewater collection and disposal systems, stream beds, and flood management underscore the significance of water resources on ecosystems. These regulations encompass various practices aimed at enhancing water quality and quantity, preventing surface runoff of rainwater, and restoring disrupted natural water cycles. In this context, it is proposed to develop a participatory and sustainable water management organization that collaborates with relevant ministries and directorates within the framework of river management, by evaluating international and national agreements, regulations, and legislation.

Recently, the increase in construction and population density due to urban and industrial development has highlighted the need for the integrated conservation and enhancement of hydrological network systems and open green spaces in urban areas. The rise in construction leads to the conversion of permeable surfaces to impervious ones and increases surface runoff of rainwater, resulting in direct flow into watercourses without treatment, causing material damage and, particularly, the contamination of drinking water sources. To mitigate the adverse effects of sudden weather events caused by global climate change and to make cities more resilient to these changes, blue-green infrastructure systems that mimic natural processes have been developed with both natural systems and engineering solutions. Despite Turkey having 25 river basins, deficiencies in administrative organization regarding water management and the lack of coordination between existing legislation and national and international agreements complicate effective management. Therefore, it is crucial to establish a permeable urban fabric that supports ecological and nature-based water management.

Infrastructure systems that work in conjunction with permeable surfaces and water bodies enhance the environmental quality of urban areas and water quality, while providing ecosystem services to urban residents. These infrastructure systems must be evaluated in an integrated manner with the city's entire green space network. Strategically planned through an interdisciplinary management organization, these systems offer a green-hydrological approach that supports the effective and sustainable use of water in urban areas. The findings of this research can serve as a model for enhancing awareness of holistic and effective stormwater management and blue-green infrastructure (BGI) in Turkey and other developing countries.

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YAĞMUR SUYU HASADI UYGULAMALARININ GENEL DEĞERLENDİRMESİ

GENERAL EVALUATION OF RAINWATER HARVESTING PRACTICES

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ÖZET

Dünya yüzeyinin dörtte üçü sularla kaplı olmasına rağmen, insan kullanımına uygun tatlı suyun miktarı ve artan nüfusa bağlı olarak kişi başına düşen kullanım suyu oranı giderek azalmaktadır. Yeryüzünde var olan suyun %1'den daha az bir kısmı ekosistem ve insan kullanımına uygun tatlı su kaynaklarından oluşmaktadır. Suya olan talebin ve tüketimin her geçen gün artmasının yanı sıra, yeryüzündeki bütün canlılar için yaşamsal önem taşıyan su, iklim değişikliği, bilinçsiz tüketim, kirlilik ve benzeri nedenlerle döngüsünü normal şartlarda tamamlayamamakta, dolayısıyla su kıtlığı ve sorunlar gündeme gelmektedir.

Su yetersizliği sorununun çözümü konusunda alınacak pek çok tedbirin başında tasarruf ve verimlilik gelmektedir. Bu çalışma kapsamında; suyun etkili ve verimli kullanımı konusunda giderek yaygınlaşan ve nihayetinde kanuni çerçeveye oturtularak toplumsal bir gerçek haline gelen yağmur suyu hasadının ve yöntemlerinin değerlendirilmesi, kullanımındaki pratiklerin irdelenmesi yoluyla elde edilecek sonuçlara dair öneriler sunulması ve toplumda yağmur suyu hasadının verimli bir şekilde yaygınlaştırılması hedeflenmiştir.

Dünyada suyun sektörel bazlı kullanımına bakıldığında; %69 tarım amaçlı, %19 sanayi ve %12 evsel tüketim oranları görülecektir. Bu verilerden yola çıkarak, yağmur suyu hasadı yöntemiyle tasarruf edilen suyun alternatif kullanım şekillerinin verimliliğinin izlenmesi, kullanım performansının izlenmesi ve karşılaşılabilen uygulama sorunlarının analizi amacıyla, örnek olarak seçilen ve Kastamonu Merkez ilçede yaşayan bir ailenin yağmursuyu depolama sistemi ile biriktirdiği suyun; bahçe sulaması, büyükbaş, küçükbaş ve kümes hayvanlarının su ihtiyacı, araba yıkaması için kullanımı incelenmiştir. Bu amaçla konutun 300 m²'lik çatı alanından bulunduğu ilin aylık yağış verileri kullanılarak toplanılacak yağmur suyu miktarı yıllık olarak 104,78 m³ olarak hesaplanmıştır. Toplanan yağmur suyunun; ailenin evsel tüketimi dışındaki ihtiyacının %99,44'ünü karşılayacağı tespit edilmiştir. İlave olarak, yağmur suyu toplama sisteminin maliyeti 10.100 TL ve yıllık 1568 TL şebeke suyundan tasarruf sağlanabileceği hesaplanmıştır. Bunlardan yola çıkılarak sistem maliyeti ile ve yıllık tasarruf edilen su faturasının karşılaştırılması neticesinde uygulanan sistemin amortisman süresi 6,4 yıl olarak bulunmuştur.

Son yıllarda özellikle de teknolojinin ilerlemesine bağlı olarak yağmur suyu hasat yöntemleri çoğu ülkede yaygınlaşmış ve ülkemizde de Planlı Alanlar İmar Yönetmeliği'nde 2021 yılında yapılan değişiklikle 2.000 m²'den büyük parsellerde yapılacak yapıların mekanik tesisat projelerinin; çatı yüzeyinden toplanacak yağmur sularının gerekmesi halinde filtre edilerek bir tankta toplanması ve bina tuvalet sifonlarında kullanılması amacıyla yağmur suyu toplama sistemi içermesi zorunlu hale getirilmiştir.

Sonuç olarak su sıkıntısının çekildiği ve su temininin büyük maliyetlere yol açtığı günümüzde, yağmur suyu hasadı gibi hem ucuz hem de pratik sistemler yaygınlaştırılmalıdır. Bu sistemlerin yaygınlaştırılması ile ekolojik dengenin korunacağı, sürdürülebilir kalkınmanın sağlanacağı ve su kaynaklarının daha verimli kullanılacağı düşünülmektedir. Evsel kullanım dışı amaca yönelik oluşturulan yağmur suyu depolama sistemlerinde mevcut malzemeler kullanılarak maliyet düşürülebilir. Böylece sistemin geri ödeme süresi azaltılabilir. Yine yerüstü depolar seçilerek işçilik maliyeti en aza indirgenip, yağmur suyu deposunu zeminden yükseğe konumlandırarak pompa ve elektrik ihtiyacı olmaksızın depoda biriken suyun cazibeli bir şekilde akması sağlanabilir.

Ayrıca gerekli su yönetimi politikaları geliştirilerek iklim değişikliğine bağlı kuraklık sorunlarına karşı su kaynaklarının kullanımları planlanmalı ve yağmur suyu yönetimleri geliştirilmelidir. Özellikle karasal ikliminin etkisinde olan yerler için yağmur suyu hasadına gereken önem verilmelidir.

Anahtar Kelimeler: İklim Değişikliği, Yağmur Suyu Hasadı, Su Verimliliği

ABSTRACT

Although three-quarters of the world's surface is covered with water, the amount of fresh water suitable for human use and the rate of water used per person are gradually decreasing due to the increasing population. Less than 1% of the water on earth consists of ecosystems and fresh water resources suitable for human use. In addition to the increasing demand and consumption of water, water, which is vital for all living things on earth, cannot complete its cycle under normal conditions due to climate change, unconscious consumption, pollution and similar reasons, thus water scarcity and problems come to the fore.

Saving and efficiency come first among many measures to be taken to solve the problem of water insufficiency. Within the scope of this study; It is aimed to evaluate rainwater harvesting and its methods, which are becoming increasingly widespread in the effective and efficient use of water and eventually become a social reality by being placed in a legal framework, to present suggestions on the results to be obtained by examining the practices in its use and to spread rainwater harvesting efficiently in society.

When we look at the sectoral use of water in the world; 69% agricultural, 19% industrial and 12% domestic consumption rates will be seen. Based on these data, in order to monitor the efficiency of alternative ways of using the water saved by the rainwater harvesting method, to

monitor the usage performance and to analyze the application problems that may be encountered, the water collected by a rainwater storage system of a family selected as an example and living in the central district of Kastamonu; Its use for garden irrigation, water needs of cattle, sheep and poultry, and car washing were examined. For this purpose, the amount of rainwater to be collected from the 300 m² roof area of the house was calculated as 104.78 m³ annually using the monthly rainfall data of the province where it is located. It was determined that the collected rainwater would meet 99.44% of the family's needs other than domestic consumption. In addition, it was calculated that the cost of the rainwater collection system was 10,100 TL and that 1568 TL could be saved annually from mains water. Based on these, the amortization period of the implemented system was found to be 6.4 years as a result of comparing the system cost and the annual saved water bill. In recent years, especially due to the advancement of technology, rainwater harvesting methods have become widespread in many countries, and in our country, with the amendment made in the Planned Areas Zoning Regulation in 2021, it has been made mandatory for the mechanical installation projects of buildings to be built on parcels larger than 2,000 m² to include a rainwater collection system in order to filter the rainwater collected from the roof surface and collect it in a tank if necessary and use it in building toilet flushes.

As a result, in today's world where there is a water shortage and water supply causes great costs, both cheap and practical systems such as rainwater harvesting should be popularized. It is thought that with the popularization of these systems, the ecological balance will be preserved, sustainable development will be ensured and water resources will be used more efficiently. In rainwater storage systems created for purposes other than domestic use, the cost can be reduced by using existing materials. Thus, the payback period of the system can be reduced. Again, by choosing above-ground tanks, labor costs can be minimized, and by positioning the rainwater tank above the ground, the water accumulated in the tank can be ensured to flow attractively without the need for pumps and electricity.

In addition, necessary water management policies should be developed to plan the use of water resources against drought problems caused by climate change and rainwater management should be improved. Rainwater harvesting should be given due importance, especially for places affected by continental climate.

Keywords: Climate change, Rainwater Harvesting, Water Efficiency

GİRİŞ

Su, canlıların yaşamlarını sürdürebilmeleri için en önemli ihtiyaçların başında gelmektedir. Dünyada bulunan 1 milyar 400 milyon km³ suyun % 97,5'i deniz ve okyanuslarda tuzlu su, % 2,5'lik kısmı ise tatlı sudur. Ancak tatlı suların dünya üzerinde % 69,5'i kutup buzullarında ve toprak tabakasında, yaklaşık % 30,1'i yeraltı suyunda ve yalnızca % 0,4'ü atmosfer suları ve

yüzey su kaynağı olarak yer almaktadır. Yani kullanılabilir tatlı su miktarı dünya su varlığının % 1'inden daha az bir kısmına karşı gelmektedir.

Dünya Ekonomik Forumu için 2024 yılında hazırlanan Risk Raporu'na göre doğal kaynaklardaki azalma, dünyadaki en önemli dört risk arasında yer almaktadır. Halen dünya nüfusunun yüzde 40'ı (3,2 milyar kişi) su sıkıntısı çeken yerlerde yaşarken, diğer yandan 2,2 milyar kişi ise altyapı yetersizliği ve ekonomik nedenlerle sağlıklı suya ulaşmamaktadır [1]. Önümüzdeki 40 yıl içerisinde dünya nüfusunun % 40 artacağı beklenmektedir [2]. Nüfusun artmasıyla birlikte suya olan talepte artacaktır. Son yüzyıl içinde dünya nüfusu üç kat artarken, su kaynaklarına olan talep yedi kat artmıştır [1]. Dolayısı ile suya olan talep nüfus artışına oranla çok daha fazladır. Tatlı su kaynaklarının yaklaşık %70'i tarımda kullanılmaktadır. Artan nüfusun yanı sıra gelir ve tüketim düzeyinin yükselmesi ve gıda ürünlerine yönelik taleplerin artması da su kaynakları üzerinde ilave baskı yaratmaktadır. İçme ve kullanma amaçlı tüketilen suyun yüzde yetmiş (70%)'ini tuvaletler, bahçe sulama, araç ve çamaşır yıkama gibi işlemler oluşturmaktadır.

Kuru iklim, Kuraklık (Kuru dönemlerin sıklığı ve uzunluğu), Çölleşme (Erozyon, ormansızlaşma, aşırı otlama), Su stresi (Yüksek nüfus ve yoğun sanayi nedeniyle aşırı talep), Çevre tahribatı (Su havzalarının amaç dışı kullanımı, su kaynaklarının kirletilmesi ve küresel iklim değişimi) su kıtlığına neden olan önemli faktörlerdendir [3,4]. Günümüzde artan nüfusa paralel olarak tatlı su kaynaklarının hızlı biçimde tüketilmesi ve kirletilmesinin bir sonucu olarak alternatif bir kaynak olan yağmur suyunun sulamada kullanılması gündeme gelmiştir. Yağmur suyunun toplanarak bahçe sulamada kullanılması hem su tasarrufu, hem de su kaynaklarının korunması ve sürdürülebilirliği açısından büyük önem arz etmektedir.

Ülkemizde kişi başına düşen su miktarı 1.500 m³/yıldır. Gelecek 20 yıl içinde nüfusumuzun 87 milyona çıkacağı düşünüldüğünde kişi başı su miktarının 1.042 m³ / yıl'a düşeceği ve su fakiri ülkeler arasına katılacağımız öngörülmektedir. Yağmur sularının yalnızca %30'unun yer altı sularına katıldığı ve geri kalan % 70 yağmur suyundan faydalanılmadığı düşünüldüğünde ve suyun canlılar için önemi göz önünde bulundurulduğunda, yağmur sularının değerlendirilmesinin öneminin çok büyük olduğu çarpıcı bir gerçektir. Yağmur suyunun toplanıp depolanması ve farklı amaçlarla kullanılması hem çevre ve su kaynaklarının korunması bakımından hem de ekonomik kazanım açısından etkili bir yöntemdir. Yağmur suları başta bina çatıları olmak üzere, yollar, kaldırımlar ve otopark gibi açık alanlardan borularla toplanarak filtrelendikten sonra depoya alınır. Depolanan bu su bahçe sulama, araç yıkama, WC rezervuarı, temizlik işleri vb. ihtiyaçlar için kullanılabilir [5].

Yağmur suyunun toplanarak değerlendirilmesi ile ilgili yapılan literatür bir takım çalışmalar yapılmıştır. Bu çalışmalarda özellikle kurak bölgeler için yağışlı dönemlerdeki yağmur sularının potansiyelinin belirlenerek depolanması ve kullanma suyu ve bahçe sulama ihtiyacının karşılanması amacıyla kullanılabilirliği araştırılmıştır [6-9].

Bu çalışmada Sakarya Üniversitesi kampüsü içerisinde yer alan yeşil alanların sulanmasında bina çatılarından toplanacak yağmur sularının kullanım potansiyelinin araştırılması

amaçlanmıştır. Bu amaçla kampüs alanı büyüklüğü ve binaların farklı noktalarda olması nedeni ile kampüs alanı 8 ayrı bölgeye ayrılmıştır. Her bir bölgede yer alan binaların çatı alanları hesaplanmış ve devlet meteoroloji işleri Sakarya Bölge Müdürlüğünden alınan aylık yağış verileri kullanılarak her bir binadan toplanacak yağmur suyu miktarları hesaplanmıştır. Ayrıca her bir bölgedeki yeşil alanların miktarı ve yağmur suyu ihtiyacı hesaplanarak, toplanacak yağmur suyunun bu ihtiyacın ne kadarını karşılayacağı tespit edilmiştir.

GREEN BUILDING AND CERTIFICATION SYSTEMS

YEŐİL BİNA VE SERTİFİKASYON SİSTEMLERİ

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ABSTRACT

Since the existence of human beings, their needs have changed day by day according to the conditions they have been in. Depending on the extremely active and intense pace of life of today's people, solutions that make life easier are used. Mostly these solutions are realized by using the energy available in our world. The possibilities offered by technology affect design decisions and at the same time give direction. Today, sustainable architecture has become an integral part of the building sector as a result of the environmental damage caused by the building sector and the rapid depletion of natural resources. In line with the technological developments in construction and building systems and sustainable architecture strategies, sustainable design decisions of buildings have started to have an impact on facade technologies and building designs. As unhealthy construction and urbanization increase, the need for sustainable architecture has also grown. Today, energy waste, which affects environmental problems in the first degree, is caused by energy losses in all stages of building production from the feasibility-design stage to the construction site stage and in all stages of the life cycle processes, as well as inefficient and inappropriate usage habits in buildings (such as the consumption of fossil fuels, the main cause of CO² emission). Many sustainable building assessment systems such as BREEAM, LEED, Green Star and CASBEE have been established in order to prevent this unhealthy construction and to increase the number of sustainable buildings or green buildings and to be suitable for the environment in which they are located. These evaluation systems try to minimize the damage to the environment by protecting human comfort and health. For this reason, in this study, the concept of sustainability, the concept of green building and certification systems are explained through examples and suggestions are presented.

Keywords: Sustainability, Green Building, Certification systems

ÖZET

İnsanoğlunun varoluşundan bu yana içinde bulunduğu koşullara göre gereksinimleri de günden güne farklılık göstermiştir. Günümüz insanının yaşamındaki aşırı hareketli ve yoğun temposuna bağlı olarak, hayatı kolaylaştıran çözümlere gidilmektedir. Çoğunlukla başvurulan bu çözümler dünyamızda var olan enerjiyi kullanarak gerçekleşmektedir. Teknolojinin sunduğu olanaklar

tasarım kararlarını etkilemekte, aynı zamanda da yön vermektedir. Günümüzde yapı sektörünün çevreye verdiği zararlar ve doğal kaynakların hızla tükenmesi sonucunda, sürdürülebilir mimarlık yapı sektörünün ayrılmaz bir parçası olmuştur. Yapım ve yapı sistemlerindeki teknolojik gelişmelerle birlikte sürdürülebilir mimarlık stratejileri doğrultusunda, yapıların sürdürülebilir tasarım kararları cephe teknolojilerinde ve yapı tasarımlarında da etkisini göstermeye başlamıştır. Sağlıksız yapılaşma ve kentleşme arttıkça sürdürülebilir mimarlığa duyulan ihtiyaç da büyümüştür. Günümüzde çevre sorunlarını birinci dereceden etkileyen enerji israfı, binalarda verimsiz ve uygunsuz (CO² yayılımının başlıca sebebi fosil yakıtların tüketimi gibi) kullanım alışkanlıklarının yanında, yapı üretiminin fizibilite-tasarım aşamasından şantiye aşamasına kadar tüm aşamalarında ve hayat döngüsü süreçlerinde yaşanan enerji kayıplarından kaynaklanmaktadır. Bu sağlıksız yapılaşmayı engellemek ve sürdürülebilir binaların ya da yeşil bina olarak da tanımladığımız bu yapıların artması ve buldukları çevreye uygun olmaları açısından BREEAM, LEED, Green Star ve CASBEE gibi birçok sürdürülebilir bina değerlendirme sistemleri oluşturulmuştur. Bu değerlendirme sistemleri insan konforunu ve sağlığını koruyarak, çevreye verilen zararları en az düzeye indirmeye çalışmaktadır. Bu nedenle çalışmada, sürdürülebilirlik kavramı, yeşil bina kavramı ve sertifikasyon sistemleri hakkında bilgiler verilmiş örnekler üzerinden açıklanmış öneriler sunulmuştur.

Anahtar Kelimeler: Sürdürülebilirlik, Yeşil bina, Sertifikasyon sistemleri

INTRODUCTION

The concept of "sustainability" entered the awareness of architects towards the end of the 20th century and became an important issue in the discipline of architecture (Williamson et al., 2003). "Sustainability", which was first brought to the agenda with the Brundtland report at the conference held in Stockholm in 1987, is simply the ability of something to continue its own existence (Meadowcroft, 1997). O'Riordan (1998) states that renewable resources should be used sparingly and repeatedly (O'Riordan, 1998). Daily and Ehrlich (1996) characterize it as a process that refers to the preservation of the assets needed by social, economic and ecological systems, or at least the preservation of them at the level needed (Daily & Ehrlich, 1996).

Sustainable architecture is all of the activities of creating buildings that prioritize the use of renewable energy resources, are environmentally sensitive, use energy, water, materials and space effectively, and protect the health and comfort of people, taking into account future generations in the conditions in which they exist and in every period of their existence (Sev, 2009). High performance, green and sustainable construction are now frequently encountered expressions in the architectural literature. However, the definition of sustainable construction creates a more comprehensive framework of ecological, social and economic issues. In 1994, CIB (Conseil International du Batiment), an international construction research organization, defined the purpose of sustainable construction as "the creation and management of healthy environments based on the efficient use of resources and ecological design" (Kibert, 2005).

The goal of sustainable design and construction is to provide solutions that guarantee the survival of the global ecosystem consisting of humans, living organisms and inorganic elements. There are three basic principles of sustainable design and construction (Sev, 2009):

- Resource Management; it is based on the principle of recycling and reuse of natural resources that constitute the inputs in the structure.
- Life Cycle Design; envisages the development of a methodology for analyzing the environmental impacts of all processes related to a building from design to demolition.
- Design for People; focuses on creating interaction between humans and the natural environment.

In 1987, in the "Brundtland Report" published by the United Nations under the title "Our Common Future", the concept of "sustainable development" was defined as meeting the needs of the present without jeopardizing the ability of future generations to meet their own needs (The Brundtland Commission, 1987). Sustainable development, which is not limited to a specific discipline or field, covers a wide range from food to construction sector and concerns every living thing and every field (Karbuz, 2002).

RESEARCH AND FINDINGS

With the reflection of the concept of sustainability in the field of construction, the concept of sustainable construction came to the agenda, and with the specialization of the concept of sustainable construction with livable buildings, the concept of "green building" emerged (Haselbach, 2010).

Research on green buildings has shown that if buildings are designed and operated in this way, they are 24% to 50% lower in energy use than the average building designed and operated with traditional methods (Ding, 2008);

- Between 24% and 50% reduction in energy use,
- Between 33% and 39% in CO² emissions,
- Between 30% and 50% in water consumption,
- By 70% in the amount of solid waste,
- It shows that maintenance costs can be reduced by 13%.

A green building is a building that does not pollute the environment during its construction, operation and demolition and makes optimal use of water, energy, waste and material resources (Table 1).

Table 1. Green building main criteria and sub-headings (BRE Ltd, 2004)

Görünüm	Consumptions	Environmental Impacts	Large-scale Impacts
<ul style="list-style-type: none"> • Positioning • Design • Construction • Operations • Maintenance and Repair • Renovation • Construction-Dismantling 	<ul style="list-style-type: none"> • Energy • Water • Material • Underground Resources 	<ul style="list-style-type: none"> • Wastes • Air Pollution • • Water Pollution • Indoor Pollution • Heat Island Effect • Rainwater Runoff Noise 	<ul style="list-style-type: none"> • Damages to Human Health • Degradation of Nature • Depleted Energy Resources

After the green building concept became widespread in the 1990s, environmental assessment and certification systems were established by introducing certain standards to measure and classify the energy efficiency of buildings. Green building certification systems are a tool to realize environmental issues. It is to guide the design team and building owners by creating standards to be taken as reference. It is to create strategies for building environmentally friendly buildings. It is to ensure that different disciplines make efforts to implement these strategies (Cole, 2003).

It is an undeniable fact that the construction sector has a significant impact on creating employment and contributing to the economy among all sectors (Kang et al., 2016). There are many building assessment methods worldwide, focused on different areas of sustainable development and developed for different types of projects. Some of these tools include life cycle assessment, life cycle cost analysis, energy systems design, performance assessment, productivity analysis, indoor air quality assessments, operation and maintenance optimization (Fowler & Rauch, 2006).

Green building assessment systems and certification programs have an important role in objectively demonstrating the environmental impacts of buildings. These systems draw the attention of the participants in the construction sector to environmental problems and provide significant benefits to prevent environmental damage to the sector. Since life cycle analyses are tools that mostly address the design phase, criteria-based certification systems come to the forefront because they are comprehensive, easy to apply, objective and easy to understand (Sev & Canbay, 2009). Green building certification programs are systems that evaluate and measure the environmental performance of a building according to a set of criteria. The whole set of criteria required for a building to be considered a sustainable building constitutes the main skeleton of the certification systems. These criteria have varying points and weights depending

on the type of the project, the country and geographical conditions. As a result of the evaluation, a total score is obtained according to the score obtained from each criterion and the score obtained shows the environmental performance level of the building. According to Cole, certification systems consist of three main components (Cole, 2003):

- Structure: A set of environmental performance criteria that are clearly defined and organized in a logical manner,
- Scoring: Points or credits earned for a criterion if the performances in the criteria are met,
- Conclusion: A tool to demonstrate the total environmental performance of the building. Today, the most valid approach to describing and categorizing sustainable buildings is the use of environmental assessment and certification systems.

In addition to the added value that an internationally recognized certificate can add to a new real estate project, these certification systems also provide guidance to project developers on how to achieve their sustainability goals. The objectives and characteristics of certification systems are given below. Objectives of certification systems (Erdede & Bektaş, 2014):

- Defining green building by establishing general and valid measurement standards,
- Developing a holistic building design method,
- Recognizing environmental leadership in the construction sector,
- Promoting green competition,
- To transform the building market by raising consumer awareness of the benefits of green building.

Founded in 1999 at its first meeting in California, USA, with the participation of Australia, Canada, Japan, Spain, Russia, the United Arab Emirates, the United Kingdom and the United States, the World Green Building Council (WGBC) has four internationally accepted methods. The first of these, BREEAM, which was introduced in the UK in 1990, is the most widely used international method today. Introduced in 1998 in the United States, LEED ranks second in international use. CASBEE, introduced in 2004 in Japan and Green Star, introduced in 2002 in Australia, are methods that have spread only in their respective regions and continents. Apart from these, the other 20 methods mentioned in Table 2 are used as national and local methods that have been prepared according to the conditions of the country and region in which they are located and have not expanded their usage area with different versions (Portalatin et al., 2010).

Table 2. Assessment and certification systems in the world

COUNTRIES	MEASUREMENT AND EVALUATION SYSTEMS
USA	LEED
ENGLAND	BREEAM
JAPAN	CASBEE
SOUTH KOREA	YEŞİL BİNA SİSTEMİ
BRAZIL	AQUA/LEED BRAZIL
CANADA	LEED CANADA/GREEN GLOBES
FİNLAND	PROMISE
FRANCE	HQE
GERMANY	DGNB
HONG KONG	HHBEAM
INDIA	GRIHA/LEED INDIA
ISRAEL	Sİ-5281
ITALY	ITACA
MEXICO	LEED MEXICO
NEW ZEALAND	GREEN STAR NEW ZEALAND
NETHERLAND	BREEAM NETHERLAND
PORTUGAL	LİDER A
SINGAPORE	CONQUAS
SOUTH AFRICA	GREEN STAR SA
SPAIN	VERDE
SWEDEN	Environmental Status

NORWAY	EcoProfile
INTERNAIONAL	SBTool
AUSTRALIA	GREENSTAR

BREEAM (ENGLAND)

It was established in 1990 as a tool to measure the sustainability of new non-residential buildings in the UK and is awarded by the BRE-Global Institute of the British Research Establishment BRE (Erten, 2009). BREEAM is the oldest certification system (Prior et al., 2001). The aim of this system is to increase the value of buildings by measuring and reducing the environmental impact of users (Gu et al., 2006). BREEAM can be used to assess the environmental performance of all types of buildings (new and existing) and standard versions have been prepared for common building types. BREEAM certification categories (BREEAM Healthcare, BREEAM Industrial, BREEAM Multi-residential, BREEAM Offices, BREEAM Retail, BREEAM Education, BREEAM Ecohomes, BREEAM In-Use, BREEAM Global, (BREEAM Bespoke) (Topçu 2010).

The BREEAM assessment system uses recognized performance measures that adjust a building's characteristics, design and building features. The measures used are represented in a broad category of criteria from energy to ecology. BREEAM assesses the environmental performance of buildings according to criteria defined under various performance categories and the project scores points for each criterion it meets. BREEAM performance categories are grouped into nine categories: management, health and satisfaction, energy, transportation, water, materials, waste, pollution and land use and ecology. In the BREEAM assessment system, energy and health and satisfaction categories are the categories with the highest weight (Saunders, 2008; Sev & Canbay, 2009). Scores are applied to the weights given for each category. When the scores are added to each other, an environmental score is formed and the BREEAM certification rating of the building is selected (Table 3).

Table 3. BREEAM

	Year	Country	Criteria	Certificate Levels
BREEAM	1990	England	<ul style="list-style-type: none"> • Management • Energy • Water • Transportation • Health and Comfort • Waste • Materials 	<ul style="list-style-type: none"> • Unclassified (<30) • Pass (≥30) • Good (≥45) • Very good (≥55) • Excellent (≥70) • Exceptional (≥85)

			<ul style="list-style-type: none"> • Land use and Ecology • Pollution • Innovation 	
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Designed by Pascall+ Watson Architects in Aberystwyth, UK, the building includes laboratories, a seminar center, café and social spaces. The building is designed with short depths to maximize the use of sunlight and provide appropriate shading and natural ventilation. A ground source heat pump provides heat for the building with low carbon emissions. Rainwater collection tanks provide all the water used in the toilets. The green roof allows a variety of plants to grow. Low energy design with a BREEAM Excellent rating, sedum roof, ground source heat pumps and 90% passive ventilation (URL-1; URL-2), (Figure 1).



Figure 1. BREEAM Certified Newcastle-under-Lyme College (URL-2)

LEED (USA)

LEED was developed by the US Green Building Council (USGBC), founded in 1998. It is a non-profit, national and international certification system with more than 1800 members. The LEED certification system is regularly renewed and requirements are strengthened (USGBC, 2009). LEED aims to maximize the use of natural resources, support regenerative and restorative strategies, minimize impacts that harm the environment and living health, and improve the quality of indoor space for building users. At the same time, the goal of the LEED program is to draw the attention of all individuals and organizations that have a stake in the building sector to the environmental impacts of buildings during the life cycle process and to develop their products in line with reducing these impacts. In the LEED system, the entire certification and documentation system is based on certification and a completely transparent technical evaluation process is carried out (Sev & Canbay, 2009). In the LEED evaluation system, the sustainability of buildings is evaluated in nine categories. These categories are; integrated process management, location and transportation, sustainable spaces, water efficiency, materials and resources, energy and atmosphere, indoor environmental quality, innovation in design and regional priority. The point weights of the categories may vary

according to building types. The energy and atmosphere category is the most important category in the LEED certification system (Arslan, 2015). LEED is the most widely used green building scoring system in the world (Zimmerman & Kibert, 2007). LEED was initially developed as a system that only issued certificates to new buildings as a result of evaluations made by experts in line with the applications made, but later diversified in different areas such as renovation of existing buildings, interior architecture, commercial buildings, and created certificates consisting of different criteria for each area. Today, LEED certification standards (LEED-NC, LEED-EB, LEED-CI, LEED-CS, LEED-H, LEED-ND) have been developed for 6 different types of projects (Topçu, 2010).

Unlike BREEAM, there is no obligation to work with an expert in the LEED certification system. In order for the building to be evaluated, the prerequisites defined for each performance category must be fulfilled. In two stages, design and construction, after the necessary documents regarding the criteria met by the building are uploaded to the system on the internet, these documents are examined by USGBC and the issues to be clarified or requests for additional documents are sent. With the completion of these studies and submission to USGBC, a point is earned for each criterion. The sum of these points determines the certification level of the building (Turner & Frankel, 2008). In order for the building evaluated in the LEED system to be certified, it must collect at least 40 percent of the points. Accordingly, the buildings evaluated are graded as follows (Table 4).

Tablo 4. LEED

	Year	Country	Criteria	Certificate Levels
LEED	1998	USA	<ul style="list-style-type: none"> • Integrated process management • Location and transportation • Sustainable areas • • Water efficiency • Materials and resources • Energy and atmosphere • Indoor environmental quality • Innovation in design • Regional priority 	<ul style="list-style-type: none"> • Cannot be certified (<40) • Certified (40-49) • Silver (50-59) • Gold (60-79) • Platinum (+80)

Completed in 2014 in Ankara, Prokon-Ekon Group of Companies New Headquarters Building is an example of a LEED Platinum certified building. For the purpose of LEED Platinum certification candidacy; High-performance building façade, high-efficiency water-source VRF system, use of fire storage as thermal storage for VRF, high indoor air quality, automation/energy metering monitoring system, gray water system, rainwater collection/utilization system, 500 kW solar PV electrical system, solar hot water collectors, solar air collectors, solar light chimneys, trigeneration system (Çakmanus, 2021; URL-3), (Figure 2)..



Figure 2. LEED Platinum Certified Prokon-Ekon Group of Companies New Headquarters Building (URL-3)

CASBEE (JAPAN)

Casbee is a comprehensive assessment system for the environmental efficiency of buildings. Casbee is a method of environmental labeling of buildings introduced by the Japanese Sustainable Building Consortium in 2004 (Endo et al., 2005). Casbee has created four assessment tools related to the life cycle of buildings. "Casbee Family" is the common name of these four tools and has been extended for specific purposes. The assessment tools that make up the Casbee Family (Casbee, 2007);

- Casbee for Pre-Design,
- Casbee for New Buildings,
- Casbee for the renovation,
- Each tool, including CASBEE for Existing Buildings, is designed to meet a different purpose and a wide range of users' requests. CASBEE has additional versions (CASBEE for Detached Houses, CASBEE for Temporary Construction, Local Government Versions, CASBEE for Heat Island Effect, CASBEE for Urban Development, CASBEE for Market Promotion, CASBEE for Real Estate, CASBEE for Cities).

The CASBEE assessment process is quite different from the other systems and is based on two principles. The first is the environmental quality and performance of the building (Q) and the other is the environmental loads of the building (L). The "Q/L" value expresses the environmental effectiveness (BEE) of the building. "Q" is the sum of the building's scores in the categories of indoor environment, service quality and outdoor environment on the site. The

"L" value refers to the score in the categories of energy; resources and materials; and environment outside the site. The Q and L values are calculated automatically by entering the required performance values into excel spreadsheets provided from CASBEE's website. The environmental efficiency value is then expressed graphically and the sustainability level of the building is determined. As a result of the evaluation, the building is given certificates as C, B-, B+, A and S. C represents the lowest environmental efficiency level and S represents the highest sustainability level (Sev & Canbay, 2009; Erten, 2009), (Table 5).

Tablo 5. CASBEE

	Year	Country	Criteria	Certificate Levels
CASBEE	2001	Japan	<ul style="list-style-type: none"> • Indoor Environment • Service Quality • Outdoor Environment on the Plot • Energy • Resources and Materials • Environment Outside the Land 	<ul style="list-style-type: none"> • S • A • B+ • B- • C

The Nissan Headquarters building in Yokohama, Japan, received Casbee certification level S in 2008. The use of natural light in the building is maximized by lenses that follow the sun. Air conditioning energy saving is also controlled by the choice of window blinds. Energy (CO²) reduction has been achieved for lighting and air conditioning. It has been certified thanks to criteria such as waste water recycling, rainwater collection and drainage, the use of green roofs to reduce the urban heat island effect, and the use of recycled materials (İsmail & Mihlayanlar, 2013; URL-4), (Figure 3).



Figure 3. Casbee Certified Nissan Headquarters Building (URL-4)

GREEN STAR (AUSTRALIA)

Greenstar is an assessment system for the environmental design and construction of buildings developed by the Green Building Council of Australia (GBCA) in 2003. Greenstar measures the environmental potential of a building's design, construction and management processes under ideal conditions. The Green Star certification system was created to create a common language for the environmental assessment of buildings and to raise public awareness to pioneer sustainable design. There are nine different performance categories to assess the sustainability of buildings: water, materials, transportation, pollution, energy, innovation, management, indoor air quality and space use. In the performance categories of the Green Star system, as in BREEAM and LEED, criteria related to the provision of energy, materials and indoor air quality come to the fore. The points collected for these categories are multiplied by weighting coefficients, taking into account the conditions of the region where the building to be evaluated is located, and innovation points are added to create a total score at the end of the evaluation (Saunders, 2008; Arslan, 2015). The points earned in the Green Star certification system are evaluated in the range of 1 to 6 stars as shown in Table 6.

Tablo 6. Green Star

	Year	Country	Criteria	Certificate Levels
Green Star	2003	Avustralya	<ul style="list-style-type: none">• Water• Material• Transportation• Pollution• Energy• Innovation• Management• In door air quality• Space utilization	<ul style="list-style-type: none">• 1 Star (10-19)• 2 Star (20-29)• 3 Star (30-44)• 4 Star (45-59 points)• 5 Star (60-74 points)• 6 Star (75-100 points)

The Green Star system has 'rating tools' developed to evaluate buildings with different functions. Rating tools are grouped under titles such as Multi Unit Residential v1 (multi-use buildings), Healthcare v1 (healthcare buildings), Retail Centre v1 (retail center), Education v1 (education buildings), Office v3 (offices), Office interior v1.1 (office interiors), Industrial v1 (industrial buildings) (URL-5).

Lyell McEwin Hospital, the inpatient building of SA Health, was built in 1959 in Australia and renovated in the new C section. High levels of natural daylight and external fresh air ventilation, solar panels to provide on-site renewable heating energy generation and rainwater storage tanks to collect water from roofs were designed. The hospital has been certified from the design stage and has earned the right to become a 6-star hospital. It meets all the criteria presented in the certification program at the design stage, even after the construction of the building, and is

among the certified hospitals by increasing its score from 70 points to 77 points. All HVAC chillers will have zero or no Ozone Depletion Potential (ODP). Projected greenhouse gas emissions will be reduced to 25% below the Benchmark Building. The proposed maximum building electricity demand will be 30% less than the Standard Practice Building. The building will reduce occupant exposure to carbon dioxide (CO²) and airborne chemicals (VOCs). The building will be designed to keep interior noise levels at an appropriate level. 95% of interior painted surfaces, adhesives, adhesives, insulation materials and ceiling covering materials will be selected from materials with low volatile organic compounds. The building will preserve or enhance the ecological value of the land on which it is located. Of the 90% of all steel used in the project, 50% will have recycled content or be reused after consumption. Potable water consumption for irrigation will be reduced by 90% or "xeriscape" landscaping arrangements will be made that do not require irrigation (Tavşan & Yolcu, 2023), (Figure 4).



Figure 4. Green Star Certified SA Water Administration Building (URL-6)

CONCLUSION

The concept of sustainability has contributed greatly to the first steps of many developments and innovations in architectural construction. In architectural construction, the effective use of energy resources has brought along an understanding that is more sensitive to the environment and respectful to the ecological balance. Sustainability, defined as the ability to be continuous, has emerged as green buildings that aim to be environmentally friendly and energy efficient in architecture. Today, the development of construction and building technologies has accelerated with the innovations obtained every passing day. As technological developments affect all life, they also positively affect the studies in the field of architectural design. The impact of developing construction and building technologies on architectural design decisions cannot be ignored. The possibilities offered by technology affect design decisions and at the same time give direction. In line with the technological developments in construction and building systems and sustainable architecture strategies, sustainable design decisions of buildings have started to show their impact on facade technologies and building designs. Today, energy wastage, which

has a primary impact on environmental problems, is caused by inefficient and inappropriate usage habits in buildings (such as the consumption of fossil fuels, the main cause of CO² emission), as well as energy losses in all stages of building production from the feasibility-design stage to the construction site stage and in the life cycle processes. Factors such as orientation of the building according to atmospheric conditions such as sun, prevailing wind etc. during the design phase, ecological features taken into consideration during the project design phase, full-empty volumes to be applied on the facades, the design of the borders where independent sections are separated from each other and common use spaces, the qualifications of the materials and workmanship used, acting according to sustainable energy understanding in the design of installation and heat-water insulation systems, transportation features are important steps in creating green buildings today.

The main cause of environmental problems in the world is the use of solid fuels. Alternative energy systems, which emerged with the abandonment of the use of solid fuels, have become compulsory with the control of states over time. When you look at environmental problems such as climate change, development of new technologies that will enable cleaner burning of fossil fuels, water quality problems, water scarcity, destruction of ecosystems by uncontrolled development, increase in toxic substances and chemicals, air pollution, disposal of solid and toxic wastes, ozone depletion and deforestation, it is not difficult to understand how much duty the building sector has. Green building should be placed at the top of the corporate environmental strategy. The tax reductions and incentives provided by states that understand the importance of the issue also provide the greatest support to the solution of the problems. Green building energy certification systems, which were created to control the energy consumption of buildings, encourage alternative energy systems while also ensuring the control of buildings. In order to keep the future of the world's ecology safe, it is necessary to control the existing buildings as well as the new buildings to be built. Each standard building produced with renewable energy systems prevents extra energy consumption. Sustainable building certification systems are rating systems created by architects, engineers and individuals and organizations in the building sector in general to define a sustainable building. These rating systems determine how sustainable a building is. The rating systems consist of a set of criteria that a building (new building, existing building, renovation project, etc.) must fulfill and have in order to be considered sustainable. Each criterion has a score that varies according to the typology of the building or its place in the life cycle. The assessment consists of examining the building against each criterion and scoring it accordingly. However, since each country has its own evaluation system and adapts these systems to its own climate and conditions, the applicability of these systems in other countries becomes difficult. Making an assessment based on criteria and scoring method usually ensures transparency and easy implementation of the system. However, in some certification systems, each criterion is given equal points, which makes it unrealistic to assess in countries with different conditions. For example, for some countries, saving of clean water resources is at the forefront, while for other countries, issues such as energy conservation, land use, public transportation are at the forefront. While LEED,

BREEAM and Green Star support public transportation, CASBEE in Japan does not address public transportation and the use of fuel-efficient vehicles. This is because public transportation is already the most common mode of transportation in Japan. International certification systems should be locally adapted to local differences in Turkey in terms of climatic conditions, economic and cultural values, the structure of the construction sector, differences in materials and techniques, and differences in political approaches.

From the point of view of the compatibility of certification systems with Turkey, systems that can adapt to the appropriate variability should be identified in order to evaluate a country with different regional characteristics such as Turkey without being bound to a specific framework, and such systems that calculate the efficiency of the building according to the rate of utilization of the surrounding opportunities should be included in the list of systems that can be taken as an example for Turkey. In the process of adaptation or adaptation, it is thought that the creation of a sub-database for Turkey in which these scores can be made, just like in other countries, can play a major role in the development and emergence of the evaluation system. For Turkey, which is in a much more fortunate position in terms of sunshine duration and natural resources, creating such a system and supporting it with incentives by the state is of great importance in terms of national energy efficiency and resource savings. For this reason, a general evaluation system that can be used in all countries of the world instead of various systems will enable all architects and engineers to meet at a common point. If national and regional priorities can be brought to the forefront with the application of weighting coefficients in evaluation systems, this application will be of great benefit in addressing priority problems.

In order to ensure the widespread adoption of building certification practices, various government supports such as VAT exemption on high-cost but environmentally friendly products used in buildings within the scope of sustainability should be provided. In order for the widespread green building evaluation systems used worldwide to be easily implemented in our country, it is necessary to support studies on practices, standard values, etc., to provide seminars for educational purposes, and to promote these practices by encouraging green buildings.

As a result, despite the additional costs incurred in the implementation of sustainable green buildings, it is understood that green buildings are at an acceptable level in terms of comfort, healthy living space and livable environment.

SOURCE

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TRANSFORMING FOOD WASTE INTO VALUE: THE ROLE OF FUNCTIONAL FOODS AND PROBIOTICS

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ABSTRACT

The growing concern over food waste has led to major environmental, economic, and social challenges worldwide. Approximately one-third of all food produced, totaling 1.3 billion tons annually, is lost or wasted. Addressing this issue is crucial for conserving natural resources, reducing greenhouse gas emissions, and reaping significant economic benefits. Functional foods, known for their health-promoting properties, have become popular due to their benefits beyond basic nutrition. These foods are essential for preventing and managing various health conditions. Probiotic integration improves food items made from food waste while also contributing to the overall objective of improving public health. Probiotics are live bacteria that are good for human health. They are a valuable addition to functional food made from wastes due to their numerous health benefits.

This review investigates the potential of repurposing food waste to produce various functional foods. It explores the technological processes and nutritional advantages of these innovative products. Transforming food waste into high-value products can reduce environmental impacts and promote sustainable development. By incorporating various health-enhancing ingredients into these functional foods, they not only improve health outcomes but also support more sustainable food systems. The review also addresses the challenges associated with these conversion processes, such as ensuring food safety and maintaining nutritional quality. Overcoming these challenges requires innovative technologies and collaborations across different food sectors. The aim of this review is to offer a comprehensive overview of the opportunities and challenges in creating functional foods from food waste, emphasizing their role in advancing sustainability and innovation in the food industry.

Keywords: Food Waste, Functional Foods, Probiotics, Sustainability

INTRODUCTION

Food waste is any substance that is formed during the processing, consumption, transportation and production of food products and is not consumed and is generally discarded (Parfitt et al., 2022). Food waste represents a significant global issue with far-reaching implications for food security, environmental sustainability, and economic efficiency. It was estimated by Food and Agriculture Organization of the United Nations (FAO) that annually 1.3 billion tonnes of wasted food is generated globally. Recent reports by the FAO and United Nations Environment Programme (UNEP) indicate that approximately 931 million tonnes of food waste were generated worldwide in 2019, with household waste accounting for the majority (UNEP, 2021). This substantial amount of waste contributes to environmental degradation through greenhouse gas emissions, pollution, and resource inefficiency, adversely affecting natural ecosystems and biodiversity (FAO, 2023). It can also lead to the loss of potential substances such as bioactive compounds, pigments, vitamins, polysaccharides, *etc.* in food waste that could be transformed into added value (Kumar et al., 2020; Fernández-Rodríguez et al., 2021).

Addressing food waste is crucial for achieving Sustainable Development Goal 12.3, which aims to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains by 2030 (FAO, 2023). In this context, thermal, physical treatments and biological activities are used to evaluate food waste in the food industry. among these methods, the development of functional foods providing an important transformation into added value is in a significant position (Hashem, 2020; Zeng & Jiang, 2022). Functional foods made from food wastes include whey (Zhang et al., 2020a), pomegranate seeds (Bertuzzi et al., 2020), fruit and vegetable pomaces and peels (Gouw et al., 2017; Berizi et al., 2020; Martínez-Hernández et al., 2020; Liu et al., 2021; Sahar et al., 2021; Nguyen et al., 2022), and malt residues (Michaud et al., 2022) are so common in the industry. Particularly functional foods produced from whey, fruit and vegetable pomaces (Genevois et al., 2019) that have been supplemented with probiotics are notable among these examples. Probiotics, as defined by the International Scientific Association for Probiotics and Prebiotics, are live microorganisms that confer health benefits to the host when administered in adequate amounts (Hill et al., 2014). When the benefits provided by the probiotics themselves are combined with the rich content of the waste, the functional qualities are enriched and enhanced. Therefore, their contribution to human health is increased.

Integrating probiotics into food products derived from food waste not only adds value but also promotes sustainable food production and consumption patterns. This dual approach of waste reduction and health enhancement exemplifies a strategic response to some of the pressing challenges outlined by global food waste statistics and sustainability goals (Martínez-Monteagudo & Saldaña, 2021; Hancz, 2022).

FOOD WASTE

Food wastes produced at different points along the food supply chain are rich in bioactive components and high nutritional content, including proteins, carbohydrates, lipids, vitamins, and minerals (Gustavsson et al., 2011; FAO, 2021). The utilization of this content into value-added products (Fig.1) supports sustainable development goals and offer new economic opportunities (Gómez-García et al., 2021; Zheng and Jiang, 2022). It is projected that this utilization will grow its market share worldwide. The bioeconomy, which employed 18.6 million people in 2014 and generated 2.2 trillion euros in revenue in Europe, is predicted to expand quickly (Ronzon et al., 2017). According to recent reports from the chemical industry, about 15% of the global chemical business is expected to be bio-based by 2025 (Alexandri and Venus, 2017) and to generate 102.76 billion US dollars in 2022 (Zion Market Research, 2017). It is essential for governments, industries, and individuals to collaborate and raise awareness about the importance of reducing and recycling food waste (Tsang et al., 2019).

While a disposal challenge, by-products of plant food processing are valuable for their technological and nutritional properties (Garcia-Garcia et al., 2019). The resulting waste is land-filled, composted, burned, or utilized as animal feed (Socas-Rodríguez et al., 2021). These disposal techniques raise major environmental concerns because of things like landfill leachate, toxic and greenhouse gas emissions, and microbiological growth brought on by the high moisture content (Sharma et al., 2020). However, food waste's chemical makeup, which mostly consists of carbohydrate polymers like glucose, proteins, lipids, cellulose, as well as additional microelements, gives it a lot of potential (Lo Turco et al., 2020). Natural food and beverage manufacturers can utilize bioactive compounds derived from plant waste and/or by-products as functional additives (Özdemir et al., 2021). Figure 1 provides a detailed view of the types of food waste sources, waste contents, assessment techniques, and uses of processed goods (Ben-Othman et al., 2020).

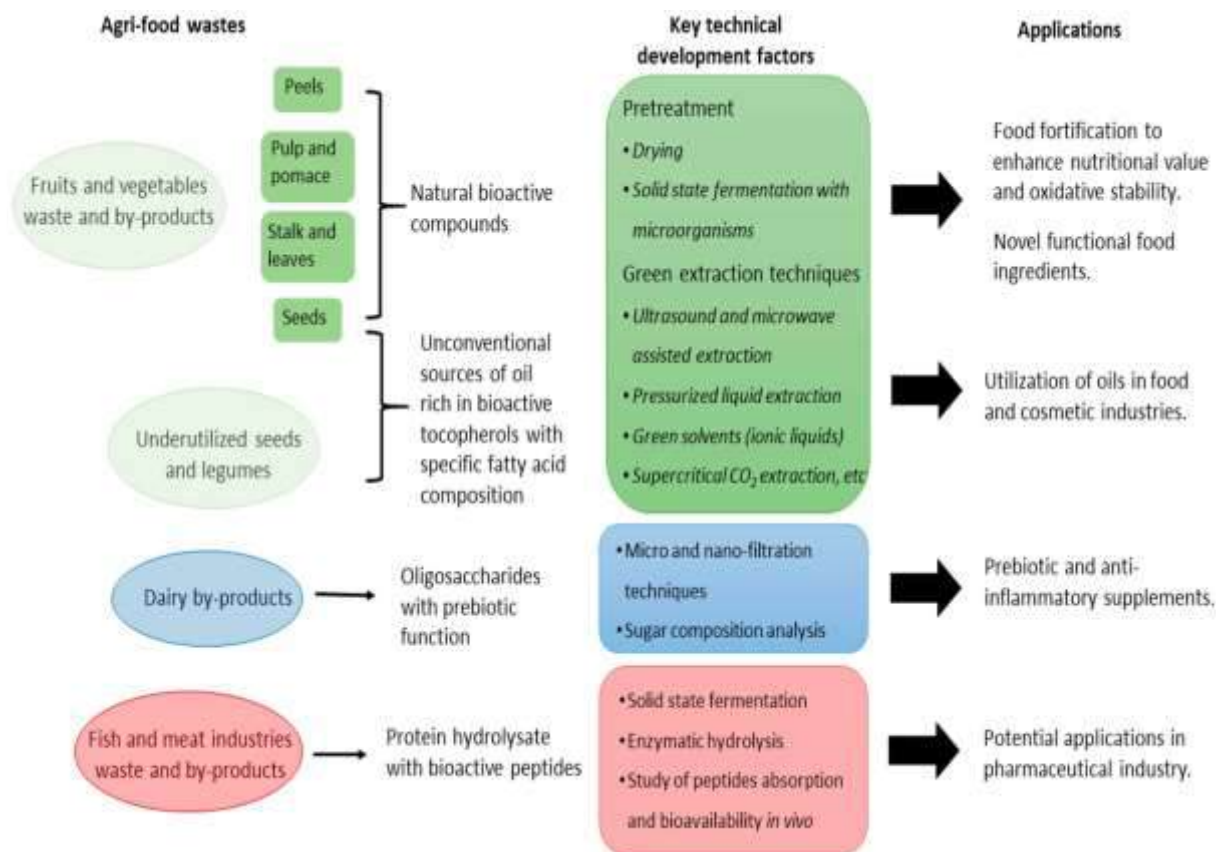


Fig.1. Schematic representation of the high added-value compounds from agri-food wastes and by-products (Ben-Othman et al., 2020).

FOOD WASTE PROCESSING TECHNOLOGIES

There are a variety of technologies to produce valuable products from the wastes. These technologies include thermal and physical treatments as well as biological activities. Biochemical processes such fermentation, enzymatic hydrolysis, extraction, and bioconversion may realize this transformation into useful biochemicals, enzymes, probiotics, and bioplastics (Martínez-Monteaquedo & Saldaña, 2021). Biochemical processes play an important role in the utilization of food waste. Through the fermentation process, food waste can be converted into energy and useful biochemicals by microorganisms (Zhang et al., 2018). Enzymatic hydrolysis allows the breakdown of large molecules in food waste into smaller and valuable components with the help of enzymes (Li et al., 2020). Extraction allows the extraction of biologically active components from waste to obtain bioactive substances (Smith & Clark, 2019). Biotransformation, on the other hand, converts food waste into valuable products such as biofuels with the help of microorganisms (Patel et al., 2021).

Food waste can be physically processed by pressing, grinding, and drying. Food waste is processed using these methods so that it can be used for fertilizer, animal feed, or energy generation, among other things. Thermal procedures, such pyrolysis and gasification, use high temperatures to turn food waste into energy (Tsang et al., 2019). Processing food waste makes it possible to create new goods as well. Fruit and vegetable waste, for instance, can be utilized

to create novel food items full of beneficial components including dietary fiber and antioxidants (Yılmaz et al., 2021).

FUNCTIONAL FOOD PRODUCTS

The European Commission launched the Functional Food Science in Europe (FuFoSE) program in the late of 1990s, sparking interest in functional foods on the continent. According to the Commission, "a food product can only be considered functional if it has beneficial effects on one or more functions of the human organism, thus improving general and physical conditions or reducing the risk of disease, in addition to its basic nutritional impact" (Ozen et al., 2012; Pravst, 2012). Scientific research now recognizes the nuanced effects of biologically active food components on physical and mental well-being, rather than only seeing food as a source of energy and nutrition. As a result, the phrase "functional food" was coined (Martirosyan & Singh, 2015). In this sense, obtaining functional products have been the subject of many studies in recent years. The fortification of bakery products by functional ingredients from by-products of pomegranate has been recently explored (Melini et al., 2020). The primary byproduct of the pomegranate juice business is pomegranate seeds. They have high-quality proteins, dietary fiber, and oil that are rich in conjugated fatty acids (Telekar et al., 2018). Munekata et al. (2021) provided a comprehensive review on utilizing pomace from food processing to produce high-value products through fermentation. The study focuses on obtaining carotenoids, fatty acids, linolenic acid, and polyphenols from grape, apple, and olive pomace. Whey can be utilized in protein powders and functional yogurts due to its high protein and mineral content (Zhang et al., 2020b). Because yogurt waste has probiotic qualities, it can be used in products that promote health (Kumar et al., 2021). Fruit and vegetable pulps can be utilized to make nutritious snacks and nutritional supplements since they are high in fiber, vitamins, and antioxidants (Liu et al., 2021; Nguyen et al., 2022). Products containing omega-3 fatty acids and antioxidants can benefit from the use of pomegranate seeds (Bertuzzi et al., 2020). Bread and energy bars can benefit from the usage of malt residues due to their high protein and fiber content (Michaud et al., 2022).

These studies also demonstrate the significance of functional foods that contain probiotics. Food waste is an excellent substrate for the growth of probiotics, which improve gut health by boosting immune response and digestion while also helping with waste management. These uses demonstrate the mutual advantages of enhancing health outcomes and lessening environmental effect. Additionally, by increasing nutrient absorption and decreasing waste, using food waste to produce probiotic-enriched functional meals improves sustainable food systems (Martínez-Monteagudo & Saldaña, 2021; Hancz, 2022). Furthermore, dietary fiber is often referred to as prebiotics since it has the ability to specifically increase the growth or activity of probiotics in the colon. Accordingly, studies have been conducted to see if those prebiotics can be added to everyday meals like cheese and bread (He et al., 2021).

CONCLUSION

Functional foods have become an important part of our lives in recent years. Today's consumers are increasing the demand for probiotic food products, prioritizing foods that function as preventive medicine, contain fewer chemicals and are healthier. Probiotic-added products that can be obtained from food waste enable the development of new and innovative food solutions. These probiotic-rich products provide significant benefits to the digestive and immune system along with waste management, promoting a sustainable production and consumption model from food waste. In this context, the value of transforming food waste into functional foods is demonstrated both from a health and industrial perspective.

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BENEFITS AND CHALLENGES OF TECHNOLOGY FOR OCCUPATIONAL HEALTH AND SAFETY ON CONSTRUCTION SITES

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ABSTRACT

Today, with the rapid development of technology, there are great advantages to our daily lives. However, the traditional construction sector struggles to adopt these technologies, even though they are needed to produce structures more quickly, at higher quality, and at a lower cost. This study aims to explore the benefits and challenges of using construction technologies in terms of occupational health and safety at construction sites. For this purpose, literature studies were reviewed, and the benefits and challenges of construction technologies in terms of occupational health and safety on construction sites were identified. According to the findings, the integration of technology into occupational health and safety on construction sites offers numerous benefits and challenges. One of the key advantages is the improvement of safety performance by leveraging digital technologies and artificial intelligence for training, prediction, real-time monitoring, communication, and proactive safety measures. These applications can substantially decrease accident rates and enhance overall safety management practices. Utilizing technologies like computer vision-based image/video processing and vision intelligence technology integrated with BIM-cloud models allows for automatic identification and recognition of unsafe conditions, providing stakeholders with real-time updates and visual representation of risk levels. This significantly bolsters on-site safety and decision-making processes. In addition, the adoption of smart wearables, IoT and cloud-based solutions has become more widespread, helping to reduce labor shortages and financial burdens while promoting a safer working environment. However, challenges associated with these technologies include the complexity of developing and operating detection algorithms tailored to specific workplaces and times, as well as the need to effectively organize and present safety information to stakeholders. Furthermore, the implementation of these technologies requires significant investments and training programs to ensure their effective use on-site, which can be a barrier for small and medium-sized construction stakeholders. Despite these challenges, the potential benefits of using safety technologies, such as improved safety performance and healthier working environments, emphasize the importance of striving for more widespread adoption and integration of these tools in the construction industry.

Keywords: Occupational health and safety, Construction management, Construction technology

INTRODUCTION

The construction sector contributes significantly to economic growth by creating employment opportunities for both skilled and unskilled workers. Occupational safety and health (OSH) has been a major concern in recent years in the construction industry, which often involves numerous activities required to demolish, renovate, maintain or construct infrastructure or building projects (Zhou et al. 2015). The construction industry poses numerous risks, hazards, and accidents due to the dynamic nature of work on construction sites and poor management. It remains one of the most hazardous industries because of the inherent risks associated with heavy machinery, working at heights, and exposure to toxic chemicals and harsh weather conditions (Manikandan, 2023). The construction industry is notorious for its high incidence of occupational accidents and fatalities worldwide. According to a comparative study of fatality rates in the construction sector in various countries, South Korea, China and Mexico have the highest fatality rates. Using national data, South Korea has a fatality rate of 1.54 fatalities per full-time equivalent worker, significantly higher than other countries such as Japan (0.84), Mexico (0.83), China (0.70), the United Kingdom (0.15) and Singapore (0.13) (Yukyung et al. 2022). There has also been a noticeable shift in the number of fatal construction-related accidents in Turkey between 2012 and 2019, highlighting that changes in safety measures, regulations or other influencing factors were instrumental during this period. The construction industry's hazardous working conditions exacerbate these high fatality rates and underscore the need for robust safety measures and strict enforcement of occupational safety laws (Olcay et al. 2021). The industry's challenges are compounded by the lack of proper safety protocols, such as inadequate risk management, poor communication and heat-related conditions, which lead to accidents and occupational diseases. Despite legal and moral obligations to ensure worker safety, many construction sites lack comprehensive safety and health policies, adequate training and personal protective equipment. To address these issues, Industry 4.0 technologies offer promising solutions. The number of studies in the literature on this topic has been quite high in recent years. In order to evaluate this research and inspire future research, many review articles have been conducted.

Antwi-Afari et al. (2019) examine the current trends, different types and research topics related to the applications of detection and warning-based technology for improving occupational health and safety (OHS) in the construction industry through the analysis of articles published between 1996 and 2017. A standard three-step screening and data extraction method was used to identify 87 relevant articles for analysis. The paper aims to discuss annual publication trends, relative contributions of individual journals, different applications of detection and warning-based technology, relevant research topics, research gaps, and future research directions in the field of OHS in the construction industry.

Rahman et al. (2023) aims to investigate the adoption of three categories of emerging technologies, namely wearable sensors, augmented reality (XR) and exoskeletons, and robotics to reduce occupational non-fatal injuries in the construction industry. It used bibliometric and

scientometric analyses to quantitatively examine the relationship in the literature. The study identifies current research trends in the application of new technologies to occupational safety and health in the construction industry while suggesting future research directions in this dynamic field.

Sanni-Anibire et al. (2020), in their study, aim to develop a risk assessment approach to improve the safety performance of construction projects. Moreover, for this purpose, they determined risk scores and weights for various construction accidents and their potential causes through pairwise comparisons and ranking weighting questionnaires. In addition, the study aims to provide recommendations on occupational health and safety on construction sites and provide valuable information to the construction industry.

In their research, Zhang et al. (2020) aim to review previous attempts in the field of vision-based occupational health and safety monitoring of construction site workers using bibliometric and content-based analysis methods to present the current research status in the field of occupational health and safety in the construction industry. Furthermore, the research aims to clarify the application capability of computer vision in monitoring construction site workers' occupational health and safety through a comprehensive review addressing gaps and limitations in existing research to guide valuable future research directions. To this end, the study focuses on overcoming technical limitations in computer vision technology for worker health and safety monitoring on construction sites and proposes solutions to improve the accuracy and reliability of visual information obtained in dynamic and complex construction environments.

Nnaji and Karakhan (2020), in their study, aimed to describe the available technologies for OHS management, identify the benefits and limitations of these technologies and identify barriers to the adoption of technologies for OHS management and propose solutions to overcome such barriers. Furthermore, Trask and Linderoth (2023) aimed to summarize the state of the evidence for digital health and safety technologies in the construction industry and develop recommendations for practitioners and researchers. Fagnoli and Lombardi (2020) aimed to provide a comprehensive synthesis of research to improve worker safety through the use of Building Information Modeling (BIM) tools in construction activities.

When the literature studies are evaluated, it is seen that construction technologies have benefits and challenges in terms of occupational health and safety on construction sites. With the rapid development of technologies in recent years, there is a need to determine the benefits and challenges of these technologies on occupational health and safety. This study aims to determine the benefits and challenges of construction technologies on occupational health and safety by analyzing the articles obtained within the scope of the literature review.

MATERIALS AND METHOD

For the purpose of this study, a search was made for review articles from the literature. “Occupational Health And Safety” and ‘Construction technology’ were entered in the subject section of the Web of Science database. “Civil Engineering” and ‘Construction and Building

Technology’ were entered in the Web of Science Categories section. “Review” was selected as the document type. According to the results obtained, a total of 11 articles were selected. The information on the selected articles is shown in Table 1. By analyzing these articles, for the purpose of this study, the benefits and challenges of construction technologies in terms of occupational health and safety at construction sites will be determined.

Table 1. Articles selected for this paper

N	Authors	Article Title	Source Title	Year	Citation
1	Fargnoli and Lombardi	Building Information Modelling (BIM) to Enhance Occupational Safety in Construction Activities: Research Trends Emerging from One Decade of Studies	BUILDINGS	2020	54
2	Trask and Linderoth	Digital technologies in construction: A systematic mapping review of evidence for improved occupational health and safety	JOURNAL OF BUILDING ENGINEERING	2023	3
3	Rahman et al.	Review of Emerging Technologies for Reducing Ergonomic Hazards in Construction Workplaces	BUILDINGS	2023	0
4	Khan et al.	Risk factors and emerging technologies for preventing falls from heights at construction sites	AUTOMATION IN CONSTRUCTION	2023	10
5	Sidani et al.	Catalysing Construction Safety: A Comparative Analysis of Technological Advancements across High-Risk Industries	BUILDINGS	2023	0
6	Saedi et al.	Applications of electroencephalography in construction	AUTOMATION IN CONSTRUCTION	2022	23
7	Antwi-Afari et al.	Sensing and warning-based technology applications to improve occupational health and safety in the construction industry A literature review	ENGINEERING CONSTRUCTION AND ARCHITECTURAL MANAGEMENT	2019	38
8	Nwaogu et al.	Review of global mental health research in the construction industry A science mapping approach	ENGINEERING CONSTRUCTION AND ARCHITECTURAL MANAGEMENT	2020	35
9	Zhang et al.	A critical review of vision-based occupational health and safety monitoring of construction site workers	SAFETY SCIENCE	2020	78
10	Sanni-Anibire et al.	A risk assessment approach for enhancing construction safety performance	SAFETY SCIENCE	2020	93
11	Nnaji and Karakhan	Technologies for safety and health management in construction: Current use, implementation benefits and limitations, and adoption barriers	JOURNAL OF BUILDING ENGINEERING	2020	117

S AND DISCUSSION

When the review articles identified within the scope of this study are examined, it is seen that construction technologies have many benefits in terms of occupational health and safety at construction sites. In order for these benefits to be effective in the construction sector, construction technologies need to be adopted. This adaptation of the construction sector, which has a conservative system, seems to be very difficult. For this reason, it is important that the benefits obtained by adopting technologies are effective in terms of cost, time and quality for the construction sector to adopt technology. Foremost among these is the reduction of occupational accidents in terms of occupational health and safety, which the construction industry often suffers from.

When the identified review articles are analyzed, the benefits of construction technologies in terms of occupational health and safety are as follows.

- Detection and alert-based technologies help identify potential hazards on construction sites, such as unsafe equipment or hazardous areas, which can prevent accidents before they happen.
- Real-time monitoring technologies allow continuous monitoring of the work environment and worker behavior, providing real-time data that can be used to address unsafe conditions or actions quickly.
- Using technologies such as the Internet of Things (IoT) and direct measurement sensors, construction sites can implement more effective safety measures, such as automatic alerts for hazardous areas that help reduce the risk of injury.
- Automated systems reduce reliance on human judgment for safety monitoring, which can be prone to errors, thereby improving the overall safety of the construction site.
- Data collected from these technologies can be analyzed to make informed decisions about safety protocols and improvements, leading to a more proactive approach to occupational health and safety.
- Technologies that provide early warnings about potential hazards can help workers evacuate from dangerous areas in a timely manner, thus preventing accidents and saving lives.
- Effective safety measures can prevent accidents and reduce downtime, leading to significant cost savings for construction companies, as they spend less on medical expenses, legal fees and compensation claims.
- Wearable sensors can monitor workers' health and safety in real-time, alerting them to potential hazards and providing immediate feedback on unsafe conditions, reducing the risk of on-site injuries.
- XR technologies, including virtual reality (VR), augmented reality (AR) and mixed reality (MR), allow workers to train in realistic, simulated environments without exposure to real hazards, thereby improving their preparation and reducing the likelihood of accidents.
- Wearable motion capture systems equipped with inertial measurement units (IMUs) can monitor and analyze workers' postures and movements, identify unsafe work postures and facilitate ergonomic risk assessments to prevent injuries.
- Physiological wearable sensors such as heart rate monitors and skin temperature sensors continuously monitor workers' activities and provide real-time feedback, effectively identifying high-risk activities and reducing occupational injuries.
- By creating a safer working environment through the use of advanced technologies, employees experience reduced mental stress and musculoskeletal pain, leading to increased confidence and job satisfaction.

- Robotic and exoskeletons assist with strenuous tasks, reduce reliance on manual material handling and minimize the risk of injury associated with heavy lifting and repetitive movements.
- Effective OHS management programs are essential to reduce fatalities and injuries on construction sites. These programs help to identify and mitigate risks systematically, thus ensuring a safer working environment for construction workers.
- The application of BIM-based tools for quantitative risk analysis supports better safety management by providing a more objective assessment of risks. This can lead to more informed decision-making and improved safety protocols.
- Computer vision technology allows continuous monitoring of construction sites, which helps to identify and eliminate potential hazards in a timely manner, thus reducing the risk of accidents and injuries among workers. Compared to traditional methods such as manual monitoring or sensor-based systems, computer vision is more cost-effective and suitable for large-scale construction sites as it does not require the installation of physical sensors on each asset.
- Using advanced image databases and algorithms, computer vision can improve the accuracy of detecting unsafe behaviors and conditions, such as misuse of equipment or unsafe postures, which helps prevent accidents and occupational diseases.
- Computer vision can monitor the proximity between workers and equipment, ensuring that safe distances are maintained to prevent collisions and other accidents, which is crucial for crowded construction sites.
- Automation of safety monitoring reduces the need for manual labor in monitoring tasks, allowing human resources to be allocated to more critical areas, thus improving overall efficiency and safety.
- The ability to predict dynamic interactions between workers and their environment allows for timely interventions, preventing accidents before they occur and ensuring a safer working environment.

By integrating these technologies, the construction industry can significantly improve occupational health and safety and create a safer and more efficient working environment for everyone involved. Computer vision technology takes advantage of these benefits to significantly improve the occupational health and safety of construction workers, leading to safer and more efficient construction sites.

The challenges of construction technologies in terms of occupational health and safety are as follows.

- One of the key challenges in using sensing and alerting-based technologies is interference caused by motion artifacts, which are unwanted movements that can corrupt the data collected by sensors and lead to inaccurate measurements and potentially false alarms

- Depending on the type of technology used, the data collected may need to be processed in multiple stages, which can delay the time needed to alert workers about dangerous areas or unsafe behavior and reduce the effectiveness of safety measures.
- Combining different detection and alert-based technologies can be complex and challenging. It requires seamless integration to ensure that all systems work together effectively to provide comprehensive safety monitoring.
- Advanced detection and warning-based technologies can be expensive to implement, which can be a barrier for small construction companies that do not have the financial resources to invest in these systems.
- Workers and management need to be adequately trained to use these technologies effectively, which can be time-consuming and require additional resources. There may also be resistance to adopting new technologies due to a lack of familiarity or trust.
- These technologies require regular maintenance to ensure they are working correctly. Any malfunction or failure in the system can jeopardize the safety of employees and make reliability a critical concern.
- Construction sites often have harsh and variable environmental conditions, such as extreme temperatures, dust and humidity, which can affect the performance and durability of detection and warning-based technologies.
- Ensuring that technologies comply with various occupational health and safety regulations can be challenging, as these regulations can vary by region and change over time, requiring constant updates and adjustments to systems.
- Wearable sensors, while useful for monitoring security, can cause discomfort due to the need to be firmly attached to the body and can interfere with ongoing tasks, making it difficult for workers to perform their duties efficiently.
- Wearable sensors' continuous collection of activity-related data raises significant privacy concerns among employees, requiring the development of secure and encrypted data processing methods to protect their personal information.
- Extended reality (XR) technologies, including VR and AR, face limitations, including physical constraints on users, difficulties in achieving accurate simulations, and the need for significant training and familiarization, which can hinder their effective application in safety training.
- Adoption of advanced technologies such as exoskeletons and robotics involves high costs and technical barriers, including ongoing maintenance, complex programming requirements, and limited adaptability and flexibility that can be prohibitive for many construction companies.
- The integration of robotics in construction requires careful consideration of safety concerns, as human-robot collaboration can pose risks if not managed properly, requiring the development of specific safety standards and protocols to ensure worker safety.

- There is often resistance among workers to the adoption of new technologies due to uncertainty, varying safety standards and concerns over return on investment that may hinder the widespread implementation of wearable sensors, XR and robotics in construction workplaces.
- The transition to Industry 4.0 and the integration of advanced technologies in construction requires a highly skilled and educated workforce that can operate and maintain these technologies, and this poses a challenge in attracting and retaining such a workforce, especially in economies with aging populations or rising labor costs.
- One of the main challenges is the lack of specialized image databases for the construction domain, which makes it difficult to accurately train and test computer vision models for occupational health and safety monitoring.
- Construction sites are dynamic and complex, involving multiple workers, various types of equipment, and changing environments. They present significant challenges for computer vision technology in monitoring and ensuring worker safety accurately.
- Computer vision systems face a variety of technical limitations, such as poor lighting conditions, obstruction (where objects block the view), limited visual range and challenges with camera placement, all of which can affect the accuracy and reliability of the monitoring system.
- Computer vision systems find it challenging to understand the overall scene on a construction site, including spatial relationships and logical connections. This can hinder accurate assessments of occupational health and safety risks.
- Accurately measuring the distance and proximity between workers and equipment is especially challenging in real-time, which is crucial to prevent accidents but is not yet fully mature in current research.
- While computer vision is cost-effective compared to some other methods, the initial installation and maintenance of these systems can still be expensive, especially for large-scale construction sites.
- There is a need for thorough validation and evaluation of the methods used in computer vision systems to ensure that they are effective and reliable in real-world construction environments.
- The degree of automation and timeliness of analysis and feedback provided by computer vision systems is not yet fully supported by practical applications on construction sites, which may limit their effectiveness in preventing accidents.
- Monitoring interactions between workers and their environment, including predicting dynamic interactions, is complex and requires sophisticated algorithms that are still being developed and tested.
- Training and calibrating computer vision models to accurately detect and interpret safety risks in construction environments is challenging due to the variability and complexity of these sites.

By understanding and addressing these challenges, the construction industry can better utilize detection and warning-based technologies to improve occupational health and safety, creating a safer working environment for all.

CONCLUSION

In recent years, the integration of developing technologies into the construction sector, especially in the field of occupational health and safety, has brought many benefits and challenges. The literature research conducted within the scope of this study has determined the benefits and challenges of technologies within the scope of occupational health and safety on construction sites.

The literature on falls from height identifies unique risk factors and hazards for each type of fall. Emerging technologies have been tested to address these hazards, but more research is needed to fill existing gaps and improve fall-from-height safety in the construction industry. Technologies such as VR and Building Information Modeling (BIM) have shown potential to improve worker safety by increasing hazard awareness, alerting workers to workplace hazards, and eliminating hazards during the design phase. Despite these benefits, significant barriers, such as extensive upfront investment, the need for extensive training and concerns about the availability of technical support, hinder the widespread adoption of these technologies in construction safety management. Proactive safety measures, including hazard identification and risk assessment, are crucial to prevent work injuries and accidents. These measures can be more effective in combination with technologies to ensure construction safety. In this context, collaboration between academic institutions, industry stakeholders and financial support is vital for the development and implementation of advanced safety measures. This collaboration improves the overall quality and effectiveness of safety research and practice. Future research should focus on addressing identified gaps in fall-from-height safety, exploring the applications of BIM-based tools for safety education and training, and overcoming barriers to technology adoption in OHS management. By addressing these points, the construction industry can significantly improve occupational health and safety standards and lead to safer and more productive working environments.

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THYMUS SPP. USAGE AGAINST DISEASES IN FIELD CROP PLANTS

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ABSTRACT

Plants are in constant interaction with a wide variety of microorganisms. Some of the microorganisms are pathogens which can settle in the internal tissues or on surface of the above or belowground plant parts. Detecting, preventing and eliminating of the spread of the diseases caused by these microorganisms, which can be caused by bacteria, phytoplasmas, fungi, viruses, and viroids are very important for plant quality and productivity. Considering that the production cannot be met with the rapidly increasing population, it is necessary to improve the current production and develop as effective solutions as possible. Especially when grains, legumes and root crops, which have a great place in human nutrition, and industrially valuable fiber, oil and feed plants, are evaluated, the protection and combat against the diseases that may cause yield and quality losses become more important. Considering the ecological and environmental damage caused by chemical pesticides in the combating diseases in the plants, there is an interest in researching nature-friendly and safer alternatives. Searching for the studies conducted on the crop protection in recent years, one of the most common is the use of essential oils and extracts obtained from plants. In this review, the studies and results obtained with essential oils and extracts obtained from species belonging to the *Thymus* genus, which are known to be effective against some diseases seen in crop plants due to the precursor compounds they contain, are examined.

Keywords: Plant Diseases, *Thymus*, Essential Oils, Plant Extract, Crop Protection, Antifungal, Antibacterial, Antiviral

INTRODUCTION

Diseases seen in cultivated plants negatively affect production and lead to economic losses. The most effective and easiest way against these diseases, which can be caused by bacterial, fungal or viral pathogens, is the use of pesticides. However, pesticides cause harmful effects on the crops, the environment, and even the health of farmers and consumers. In addition, pesticides used continuously and for a long-time lead to rise out of resistant pathogen species over time.

In this case, the synthetic pesticides used will both cause environmental pollution to continue to increase and bring food safety problems (Burketova et al., 2015).

With the developing understanding of modern environmentalism in recent years, studies on nature-friendly and safer alternatives have increased and sustainable agricultural practices have come to the fore. Instead of conventional agriculture with high inputs, good agricultural practices in which inputs are controlled have become more important (Eryılmaz et al., 2019). In this regard, it is necessary to reduce the use of chemical pesticides and put alternative options on the agenda in order to prevent environmental problems in the world and to develop sustainable agricultural systems. Two of the most important alternatives that can be applied are plant extracts and plant essential oils. These substances, also defined as herbal pesticides, are biologically effective, have broad-spectrum, economical and safe. Essential oils obtained from plants are strong-smelling and oily mixtures that are liquid at room temperature but can sometimes freeze (Çalikoğlu et al., 2006). It is known that the substances obtained from essential oils are used as pharmaceutical raw materials and in the perfume industry, as well as being effective in the protection and combating against diseases, pests and weeds in crop growing and storage.

Thyme (*Thymus* spp.) is one of the plants frequently used in the combating against plant diseases, thanks to its active ingredient carvacrol/thymol. Thyme grows naturally in the meadows and pasture areas and provides significant benefits to the nutrition and health of animals, is a valuable essential oil and spice plant in the Lamiaceae family. There are many varieties defined as thyme and used as herbal pesticides (Balabanlı et al., 2019). In this study, the effects of essential oils and extracts obtained from the *Thymus* spp. on some plant diseases seen in cultivated cereals, legumes, fiber, oil, and forage plants were discussed and the results obtained from the research conducted on this subject were compiled.

***Thymus* spp. Usage Against Cereal Diseases**

Wheat is the most important plant worldwide and the plant can be attacked by several pathogenic fungi including *Fusarium* spp. In a study conducted to determine the antifungal effect of thyme (*Thymus vulgaris*) essential oil (TEO) against *Fusarium pseudograminearum* and *F. culmorum* diseases in wheat, it was determined by the researchers that the contact and volatile phase effects of different concentrations of thyme essential oil prevented the growth of both fungi. Additionally, spore germination and production were found to be strongly inhibited by thyme essential oil. As a result of the study, they also determined that thyme essential oil showed a high seed protection ability against fungal infection without a negative effect on seed germination. In the *in vivo* experiment carried out under greenhouse conditions using susceptible wheat plants treated with thyme essential oil, it was determined by the researchers that it provided significant plant protection against the pathogens. As a result of the study, the researchers revealed that thyme essential oil had a high effect in reducing both the disease incidence and disease severity index in wheat plants inoculated with *Fusarium* species, and therefore, they stated that thyme essential oil and its components can be used as

environmentally friendly biofungicides in the protection of wheat plants against the relevant *Fusarium* species (Faghieh-Imani et al., 2020).

The use of plant derived essential oil has an importance in ecological combat in crop protection. In several studies more than one plant essential oils or extracts were used to reach a result. For example in a study using two standard fungal isolates (*Fusarium graminearum* CCM F-683 and *Fusarium graminearum* CCM 8244), the antifungal effects of six different essential oils (*Thymus vulgaris*, *Syzygium aromaticum*, *Origanum vulgare*, *Hyssopus officinalis*, *Ocimum basilicum*, and *Myristica fragrans*) including thyme were determined. EOs were diluted in sterile dimethyl sulfoxide (DMSO) to obtain concentrations of 100 µg/mL and 500 µg/mL. Before the liquid medium was poured into the petri dishes, 100 µg/mL and 1% (10 mg/mL) DMSO of each tested essential oil was added to the PDA medium. Then, the radial growth inhibition of the essential oils of the mycelium of the relevant fungal isolates was analyzed. As a result of the study, it was determined that all the used plant essential oils including thyme had antifungal activity against both strains of *Fusarium graminearum* at different concentrations. This study also emphasized that it is necessary to study whether the essential oils in the seeds used suppress germination (Harčárová et al., 2021).

In a study conducted to determine the antifungal, antimycotoxigenic and phytotoxic potential of three essential oils (EO) of *Origanum vulgare*, *Thymus vulgaris*, and *Coriandrum sativum* on wheat storage, the effect of two concentrations (0.4% and 0.2%) of essential oils in vapor state was investigated. As a result of the study, it was proven that *Origanum vulgare* EO and *Thymus vulgaris* EO inhibited *Alternaria*, *Fusarium* and *Drechslera*, while *Saccharomyces* and *Cladosporium* were found as tolerant to these essential oils. Regarding the phytotoxic effect of steam application of essential oils on seed germination, it was concluded that *Thymus vulgaris* EO and *Origanum vulgare* EO had an inhibitory effect, especially at 0.4%, and the maximum inhibition percentage was obtained after 21 days of steam exposure and was more effective at 0.2% (Bota et al., 2022). This study is important in emphasizing the need for further deepening studies on essential oils.

In another study conducted with corn and wheat, which are among the most important plants in the world, oils of thyme (*Thymus vulgaris* L.), sage (*Salvia officinalis* L.), cypress (*Cupressus sempervirens* L.), and cumin (*Cuminum cyminum* L.) obtained from a commercial source were used. The experiment was conducted under *in vitro* conditions in Petri dishes with a diameter of 90 mm into which potato dextrose agar (PDA) medium was poured. After the medium hardened, discs with a diameter of 5 mm coated with mycelium of the analyzed fungal species were placed in the central part and essential oils to be tested (in two doses: 1 mL and 2 mL) were added to 200 mL PDA medium. In the experiment, isolates of *Fusarium* fungi obtained from a winter wheat (*Triticum aestivum*) and a corn (*Zea mays*) varieties were used. The experiment was performed in two series with 5 repetitions each, and the average mycelium growth in millimeters was calculated after 3 weeks. The strongest inhibition of mycelium development was observed in sage essential oil, oregano EO and cumin EO, which were used

in higher doses. In the case of *F. graminearum*, no differences were found between doses of sage EO. In all cases, cypress essential oil had the lowest level of effect on mycelium development of the pathogens tested. In the study, in which the shoot, the length of the seedling roots and the germination capacity of the seeds were also examined, as a result, they observed that oregano essential oil has the best effect on reducing seedling infection, but at the same time negatively affects the development of seedlings compared to the control. Researchers have also stated that essential oils including thyme are a promising alternative to synthetic fungicides, but different types need to be tested for both efficacy and product safety (Danielewicz et al., 2024).

Protecting seeds, fruits and vegetables against abiotic and biotic problems by coating them with biofilms is an increasing practice. In a study examining the application of biofilm containing *Thymus serpyllum* essential oil for rice storage preservation, disinfected rice grains were immersed in the resulting fungal conidial suspension and then sprayed with different doses (300 and 600 µg/mL) of EO prepared in Tween 20 onto boxes. After than the wetted seeds completely were dried and fine coating formed. As a result, it was concluded that fungal growth of the studied pathogens, *Bipolaris spicifera*, and *Curvularia hawaiiensis*, decreased and *T. serpyllum* biofilm was found as effective in rice storage (Roselló et al., 2024).

***Thymus* spp. Usage Against Legume Diseases**

In a study about essential oils treatments with organic seed to control ascochyta blight on peas (*Pisum sativum*), laboratory tests and field trials at two sites (Lodi and Rome, Italy) were conducted with three different essential oils, thyme (*Thymus vulgaris*), tea tree (*Melaleuca alternifolia*), and clove (*Syzygium aromaticum*), over two consecutive seasons. The essential oils were applied to artificially infected seeds with *Didymella pinodella*, *D. pinodes*, and *D. pisi* strains by dipping or spraying. In the research, essential oil phytotoxicity and their fungicide activity were examined. While no effect was observed on seed germination in the first season, the effect was observed in the second season on the parameter. The researchers reported that the laboratory results showed that the oils used showed good activity in reducing fungal infection in the pea seeds, without significant differences. They stated that dipping method showed more consistent effectiveness than spraying over two seasons, and that spraying gave better results in field trials for established plants compared to dipping (Riccioni et al., 2019).

The chemical composition and antifungal activity of five different aromatic plants (*Thymus vulgaris*, *Origanum compactum*, *Eucalyptus camaldulensis*, *Mentha pulegium*, and *Myrtus communis*) were investigated against *Ascochyta rabiei*, which is one of the biggest biotic stresses that reduce the potential yield of chickpeas worldwide. As a result, the best effect in inhibiting the radial growth of *A. rabiei* was obtained with *Thymus vulgaris* essential oil. In addition, in the phytotoxicity test of the essential oils used in the study on chickpea germination, it was determined by the researchers that thyme oils did not have a phytotoxic effect at low concentration (Ennouri et al., 2020).

A comprehensive study was conducted to determine the effects of thirty eight oils and their volatiles on mycelial growth and spore germination of important phytopathogenic fungi and

oomycetes. For this purpose, strains belonging to ten different fungal disease species (*Aphanomyces euteiches*, *Botrytis cinerea*, *Colletotrichum lentis*, *Didymella pisi*, *Didymella rabiei*, *Didymella lentis*, *Fusarium avenaceum*, *Stemphylium beticola*, *Sclerotinia sclerotiorum*, and *Pythium sylvaticum*) which are common in legumes were used. Among the oils the used, the researchers concluded that thyme oil reduced the mycelial growth of all applied pathogenic species by 100%, in addition to the data, thyme oil completely inhibited the conidial germination (germination 0%) of *F. avenaceum* and *D. pisi* (Parikh et al., 2021).

The antifungal activity of essential oils of thyme and lemongrass aromatic plants against three *Sclerotinia sclerotiorum* strains causing white rot in beans was examined. In the study, *Thymus vulgaris* and *Cymbopogon citratus* were applied to the nutrient medium at three different concentrations (0.75 ml/ml, 1.5 ml/ml and 3 ml/ml). Pure strains were isolated from infected bean leaves showing symptoms of the disease. Pure strains were planted in petri dishes containing essential oils in the nutrient medium, and the sensitivity of the fungi was evaluated by measuring the radial growth of the mycelium every 24 hours. The experiment lasted 8 days and was repeated 3 times. As a result, essential oil of *Thymus vulgaris* showed highly antifungal property, with an inhibition percentage of the order of 100% in most cases. Researchers stated that the essential oils used in the experiment have antifungal properties that can be used to control white rot in beans. In addition, whether the pathogen is sensitive or resistant should also be taken into account when selecting the essential oils and their doses (Mboussi et al., 2023).

***Thymus* spp. Usage Against Fiber Plants Diseases**

Cotton seeds of the "Carmen" variety were used in a study in which the effect of 6 different essential oils (*Thymus serpyllum*, *Lavandula stoechas*, *Ocimum basilicum*, *Origanum onites*, *Rosmarinus officinalis*, and *Salvia sclarea*) on three different pathogens (*Fusarium solani*, *Macrophomina phaseolina*, and *Rhizoctonia solani*) was examined in controlling cotton damping-off and seedling root rot. For the identification and selection of the most virulent pathogen isolates, surfacely sterilized cotton seeds were placed in pure pathogenic colonies developed in PDA media in petri dishes, and germination and the first stages of development were observed. In order to determine the sensitivity of the isolated pathogens to essential oils, essential oils were used in 5 different doses (500, 1000, 1500, 2000, 2500 ppm) have been added to the PDA medium. In addition, a phytotoxicity test was performed with seeds in order to determine the phytotoxic effects of essential oils in effective doses. The essential oils that did not show phytotoxicity to seeds in effective doses were applied to the seeds with a coating and then germination test was performed. The data obtained from the study showed that all essential oils except *L. stoechas* inhibited the mycelial growth of *F. solani*, *M. phaseolina* and *R. solani* between 10% and 100%. Additionally, researchers reported that the most effective essential oils were *O. onites* and *T. serpyllum* with doses of 2000 and 2500 ppm (Celen and Gokcol, 2019).

In a study that conducted to isolate and identify the cotton bacterial blight pathogen *Xanthomonas citri* subsp. *malvacearum* and to determine the antibacterial activity of different plant essential oils, the antibacterial effect of essential oils obtained from eleven different plants

(*Thymus serpyllum*, *Origanum syriacum*, *Thymus syriacus*, *Origanum onites*, *Cistus ladan*, *Salvia aramiensis*, *Laurus nobilis*, *Hypericum perforatum*, *Rosmarinus officinalis*, *Origanum majorana* and *Thymbra spicata*) against the disease was investigated *in vitro*. The plant essential oils used in the study, which were applied by disc diffusion method, showed antibacterial activity against the bacterial agent by creating a blocking zone with a diameter of 6.33-43.33 mm in the medium. The most effective essential oils were determined as *T. serpyllum* and *T. spicata* (43.33 mm), *O. syriacum* (43.00 mm), *T. syriacus* (38.33 mm) and *O. onites* (37.3 mm), respectively. As a result, the researchers found that the *Thymus* sp., *Thymbra* sp. and *Origanum* sp. have the potential to be applied as an alternative control method to chemical control against the seed-borne plant pathogenic bacterial pathogen (Soylu et al., 2024).

A study was conducted to investigate the effectiveness of essential oils from twenty two different plants in controlling powdery mildew disease (*Oidium lini*) in flax plant (*Linum usitatissimum*). In an outdoor pot experiment, the essential oils were applied as foliar spray in three years experiments. 20 seeds were planted in 25 cm pots with autoclaved soil and the disease was allowed to develop naturally. Suspensions of essential oils were prepared according to the protocol taken into consideration by the researchers and applied at planned intervals. The first application of essential oil to pots coincided with the first signs of the disease. In the study, disease incidence was calculated as the percentage of infected plants (plants/pot), and disease severity was calculated as a percentage (random 10 plant samples/pot). As a result, it was observed that the severity of the disease decreased in the following years compared to the first year. Antifungal effects have been observed in all used essential oils including *Thymus* species containing significant amounts of phenolic monoterpenes. The researchers stated that especially onion, cumin, celery and black cumin oils significantly reduced the incidence and severity of the disease in each year of the study and that they did not have negative effects on seed and straw production and were commercially promising (Mansour et al., 2022).

***Thymus* spp. Usage Against Oil Plant Diseases**

Arachis hypogaea (peanut) is an oil crop and a leguminous plant, has some diseases. The results obtained in a study comparing the recommended fungicide (Rizolex-T) and four different plant oils (thyme, cumin, garlic and cardamom) against damping off and root rot in peanuts were evaluated. Vegetable oils used in five different concentrations (0.25%, 0.50%, 1%, 2% and 4%) were tested on *Fusarium solani*, *Macrophomina phaseolina*, *Rhizoctonia solani*, and *Sclerotium rolfsii* disease agents. It has been determined that garlic oil has the strongest and most comprehensive preventive effect on the all fungi, and the second most effective oil is thyme oil. It was noted that there was a decrease in the linear growth of fungi as the dose of oil used increased from 0.25% to 4%. In addition, when the effectiveness of fungicides in reducing pre-emergence and emergence of peanuts was compared, it was seen that the results obtained from the commercial fungicide used in the study and the thyme oil used at a dose of 4% were close to each other. As a result of greenhouse and field studies conducted for two consecutive seasons,

researchers determined that the application of essential oils significantly reduced peanut damping off and root rot (Mahmoud et al., 2013).

A study was conducted to determine the effect of *Thymus vulgaris* essential oil on soybean seeds infected with *Pseudomonas savastanoi* pv. *glycinea* B076 and *Pseudomonas syringae* M7-C1 under greenhouse conditions. In the first step the nonphytotoxic concentration of the essential oil in seeds was determined, then in the second the antimicrobial activity at this concentration in soybean seeds infected with both strains was analyzed. For this, seed germination, plant growth, disease incidence, disease severity, and the effect of EO on the soil microbiome were taken into account. The non-phytotoxic concentration of thyme essential oil was determined as 1,76 mg/ml. While germination rate of the essential oil-treated seeds was 73%, these rates were only 55% and 49% at the infected seeds. When treated with *Thymus vulgaris* EO, the number of bacteria in the seeds decreased significantly. The growth parameters of the plants were similar in all treatments, while the soil microbiome was not affected by EO. The incidence and severity of the disease were determined to be significantly lower in plants consisting of seeds treated with thyme EO (Sotelo et al., 2021).

In a study analyzing the effects of hydrolyzed collagen and thyme oil on the germination and emergence of *Brassica napus* seeds, stock solution and a 50% stock solution of collagen were prepared and thyme oil was added to it at different rates (0, 0.1, 0.25 and 0.5) then their effects on the germination and emergence of the seeds of rapeseed plants were tested. It was also aimed to determine the effectiveness of collagen (in both doses) combined with thyme oil against *Alternaria brassicae*. The pathogen tested in the study was isolated directly from plant material and grown in PDA culture medium. First of all, the seeds were placed between layers of blotting paper moistened with sterile distilled water and then incubated at 22-25°C for 4-8-12 days. Then, collagen applications combined with different doses of thyme oil were applied and the results were evaluated. The data obtained showed that the use of collagen with thyme oil (0.1 ml) was an effective and recommended option in the combating against the *Alternaria brassicae* pathogen (Săndulescu et al., 2024).

***Thymus* spp. Usage Against Forage Plant Diseases**

The forage plant is one of the important crop groups, eaten by livestock. The plants utilized by ready feed after storage, or by grazing. Various crop diseases can be seen in these plants both in pastures and feed stores.

The antibacterial vapor phase activity of allspice (*Pimenta dioica*), thyme (*Thymus vulgaris*) and rosemary (*Rosmarinus officinalis*) essential oils (EO) on two foodborne pathogens (*Listeria monocytogenes*, and *Salmonella typhimurium*) on alfalfa seeds were studied to evaluate the antibacterial vapor phase efficiency and their effect on the sensory characteristics of the sprouts. The minimum inhibitory concentration of the EOs in the vapor phase was determined to prevent the growth of the foodborne pathogens in culture media and alfalfa seeds. It was observed that the vapor phase of the EOs used did not affect the germination of alfalfa seeds. As a result of

the study, it was determined that the thyme EO was the most effective of the EOs tested in culture media and alfalfa seeds against both bacteria (Lorenzo-Leal et al., 2019).

In a study investigating the usability of *Origanum vulgare* and *Thymus vulgaris* extracts to improve silage hygienic quality and reduce mycotoxin concentrations, perennial ryegrass (*Phleum pratense*, *Lolium perenne*, *Festuca pratensis*), blue alfalfa (*Medicago sativa* L.), and red clover (*Trifolium pratense*) were collected from different farms in Lithuania for silage production under laboratory conditions. As a result of the study conducted by preparing aqueous and ethanol extracts from *O. vulgare* L. and *T. vulgaris* L. plant materials under laboratory conditions, when silage samples were evaluated together with and without the herbal plant extracts and commercial inoculants, it was observed that aqueous and ethanol extracts of both plant species reduced mycotoxins in perennial rye grass, red clover and blue alfalfa silage samples. Researchers stated that further studies are needed to examine carvacrol and thymol, the main active ingredients of *O. vulgare* and *T. vulgaris*, and their mechanisms of action in silage samples. They emphasized that applications of *O. vulgare* and *T. vulgaris* aqueous and ethanol extracts could be very useful in silage production especially to improve silage hygienic quality and reduce mycotoxin concentrations (Vaičiulienė et al., 2020).

Similarly, another study was conducted to determine the usefulness of *Thymus vulgaris* L. and *Origanum vulgare* L. extracts in reducing the amount of mycotoxins and the usage of hygienic preservatives in *Zea mays* L. silage. Under laboratory conditions, corn silage samples were fermented with the extracts of *O. vulgare* and *T. vulgaris*, their mixture (MIX) and two commercial inoculants. After 90 days of fermentation, the silos were opened and silage samples were taken for evaluation of mycotoxin concentrations and hygienic quality analysis. When looking at the effect of plant extracts on the microbiological population of corn silage after 90 days of fermentation, the lowest total aerobic bacteria and yeast counts were obtained in the samples treated with MIX extract. The lowest mold count was obtained using *T. vulgaris* extract. It was observed that there were significant decreases in some toxin concentrations considered in the study after thyme extract application. Based on the results obtained, it was concluded that the best results in terms of fermentation parameters and microbiological status were determined by the MIX extract. As a result of the study, researchers revealed that ethanol extracts of *T. vulgaris* and *O. vulgare* can be very useful in corn silage production applications to reduce biogenic amines and mycotoxin concentrations and improve the overall hygienic quality of corn silage (Vaičiulienė et al., 2022).

In vitro antifungal application of essential oils of *Thymus vulgaris*, *Eucalyptus globulus*, *Laurus nobilis*, *Myrtus communis* and *Salvia officinalis* were investigated against *Alternaria alternata*, which causes seed rot in *Onobrychis viciifolia* forage plants. For this purpose, doses of 1 µl/petri, 10 µl/petri, and 50 µl/petri were applied *in vitro*. Essential oils were dropped onto sterile culture antibiogram disc papers with automatic micro pipettes. Petri dishes covered with parafilm were incubated at 22±2 °C for 8 days. After the incubation period, measurements were made and the inhibition of mycelial development was determined as percentages. At the end of

this research, it was determined that thyme, eucalyptus, bay myrtle and sage had antifungal effects of 100%, 94.21%, 84.92%, 80.64% and 43.46%, respectively against *A. alternata* at doses of 50 µl/petri. While no difference was observed in terms of mycelium development between the doses of 1 µl and 10 µl/petri, the application of 50 µl/petri was more effective. As a result, it was stated that thyme oil had the highest success in preventing the mycelial development of seed-borne *A. alternata*, and this success may be due to the antifungal effective components it contains, such as thymol and carvacrol (Kırca, 2022).

CONCLUSION

Essential oils and plant extracts have been used in various areas for many years in our country as well as all over the world. With the development of technology, awareness of the harms caused by synthetic drugs, pesticides and additives to human, animal and plant health has increased. The necessity of control and combating the plant diseases with nature-friendly practices in agriculture has been demonstrated. In this regard, the use of essential oils-extracts, which is one of the alternative methods to be applied instead of conventional chemical pesticides is important. According to the literatures, it is reported that the plant *Thymus vulgaris* L. essential oils-extracts have antibacterial, antifungal and antiviral effects, and therefore the use of these compounds instead of chemical pesticides can be a nature-friendly, cheap and convenient.

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ANALYSIS OF CRITICAL POINT SYMMETRY X(5) MODEL WITH YUKAWA POTENTIAL

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ABSTRACT

The points where the nuclear structure changes suddenly and very quickly and the system passes from one phase to another correspond to the breaking of dynamic symmetries called limit structures in the nuclear structure. In this context, the nuclei corresponding to the shape phase transition point are described with the concept of critical point symmetry. Critical point symmetries are constructed using the infinite square well potential in the beta part of the Bohr Hamiltonian, which depends on the β and γ variables describing the collective motion of the deformed nuclei. In this study, the analytical solution of the X(5) model located at the shape phase transition point from spherical structure to axially deformed rotor structure is created using the Yukawa potential. The conformable fractional Nikiforov-Uvarov approach is used to derive closed analytical formulas for energy spectra and wave functions. The wave functions for the β -part of the Bohr Hamiltonian are expressed in terms of Jacobian polynomials. The wave functions obtained for the γ -part of the Bohr Hamiltonian are expressed according to Laguerre polynomials. Normalized and calculated energy values are examined considering the available experimental data of isotopes located in the axially symmetric nuclei region. It is investigated whether several nuclei in the rare earth region and N=90 isotopes such as Nd, Sm, and Dy have properties close to the predictions of the X(5) critical point symmetry.

Keywords: Bohr Hamiltonian, X(5) Model, Conformable Fractional Nikiforov-Uvarov Method, Yukawa Potential.

INTRODUCTION

The experimental observables such as; the neutron separation energies, the $R_{4/2}$ energy ratio between the first 4^+ and the first 2^+ , and the discontinuities or flatnesses seen in the structural changes according to the change in the number of nucleons reveal that atomic nuclei have certain limit structures and that phase-shape transitions occur between these limit structures. These limit structures are treated using two phenomenological models, the semimicroscopic interacting boson model (IBM) (Arima and Iachello, 1975) and the macroscopic geometric collective model (Bohr, 1952; Bohr and Mottelson, 1953).

The geometric collective model used to describe the collective motion of atomic nuclei, commonly known as the Bohr-Mottelson model (Bohr, 1952; Bohr and Mottelson, 1953). In this model, where the nucleus is considered as a vibrating liquid drop, the foundational modes

of nuclear excitation are described by collective motions such as surface oscillations and elastic vibrations. The Interacting Boson Model (IBM) was suggested by Iachello and Arima (Arima and Iachello, 1975) to give a description the collective excitations of intermediate and heavy mass even-even nuclei. According to IBM's basic assumption, each nucleon pair is taken as two kinds of bosons: s , with total angular momentum $L = 0$, and d , with total angular momentum $L = 2$. The collective states of medium and heavy nuclei are constructed according to the N_B boson number, which is obtained as half of the valence proton and neutron numbers completed to the nearest closed shells, regardless of whether they are particles or holes. In the IBM model, whose theoretical background is based on group algebra, three dynamical symmetries, U(5), SO(6) and SU(3), are first defined under the group U(6). In the geometric collective model, these phases correspond to spherical (Arima and Iachello, 1976), γ -unstable (Willets and Jean, 1956) and deformed cores (Elliott, 1958), respectively. For very large N_B boson numbers, some studies relating the dynamical symmetries of the IBM model to the classical equilibrium shapes of the atomic nucleus (Dieperink, et al., 1980; Feng, et al., 1981) have shown that there is a first order phase- shape transition point among U(5) and SU(3) and a second order phase- shape transition point among U(5) and O(6). Among these limit structures, the nuclear structure corresponding to the phase- shape point is handled by the Notion of critical point symmetries. Critical point symmetries are dynamical symmetries that, depending on the functional form of the Bohr Hamiltonian, may occur at the critical point of a phase transition, but not everywhere (Fortunato, 2021). Hence, the second-order critical point symmetry between U(5) and O(6) corresponding to the phase-shape transition point from the spherical vibrator to the γ -unstable structure is named E(5) (Iachello, 2000). In the Bohr-Mottelson Hamiltonian, the critical point of the first-order quantum phase transition from the spherical vibrator, U(5), to the axially deformed rotor, SU(3), is named X(5) (Iachello, 2001). The critical point symmetry of E(5) is the γ -dependent solution of the Bohr Hamiltonian and the solution is constructed only for the potential according as the parameter β . In the case of critical point symmetry X(5) the potential in the Bohr Hamiltonian is a square well in β , but has a minimum in γ near $\gamma = 0^\circ$ for an prolate ellipsoid or around 60° for an oblate ellipsoid.

The exact solution for the critical point symmetry of X(5) is established by taking the reduced potential expression $u(\beta, \gamma) = u(\beta) + u(\gamma) / \beta^2$ in the Bohr Hamiltonian. This solution is labelled ES-X(5) (Bonatsos, et al., 2007a) in the sense of exactly separable. Some nuclei in the rare earth zone have been suggested to have spectroscopic properties close to predictions of the X(5) critical point symmetry. Some of these nuclei are N=90 isotons such as Nd, Gd and Dy (Casten, 2006) and Sm (Casten and Zamfir, 2001). Some other nuclei proposed for X(5) critical point symmetry are the isotopes Mo¹⁰⁴ (Bizzeti and Bizzeti-Sona, 2001).

In this study, ES-X(5) critical point symmetry is derived with the Yukawa potential (Yukawa, 1934; Imbo, et al., 1984) used to describe strong interactions between nucleons. This new model built with Yukawa potential is delineated ES-X(5)-Y. The energy eigenvalues and the wave eigenfunctions required to examine the nuclear structure are calculated by the conformable

fractional Nikiforov and Uvarov (CFNU) method. (Karayer, et al., 2016). The conformal fractional Nikiforov–Uvarov method (CFNU) was developed to figure out any second-order differential equation with at most four singular points created by varying the boundary conditions of the Nikiforov-Uvarav (NU) method (Nikiforov and Uvarov, 1988). Examination of the eigenfunctions and eigenvalues of the Bohr Hamiltonian acquired for the ES-X(5)-Y model was used to examine phase-shape transitions in the shapes of deformed nuclei.

MATERIALS AND METHODS

Exact solution of the Bohr Hamiltonian

The motion of deformed atomic nuclei were introduced by Bohr (Bohr, 1952) and a quantum mechanical expression for the Bohr Hamiltonian is given by

$$H = -\frac{\hbar^2}{2B} \left[\frac{1}{\beta^4} \frac{\partial}{\partial \beta} \beta^4 \frac{\partial}{\partial \beta} + \frac{1}{\beta^2} \frac{1}{\sin 3\gamma} \frac{\partial}{\partial \gamma} \sin 3\gamma \frac{\partial}{\partial \gamma} - \frac{1}{4\beta^2} \sum_k^3 \frac{L_k^2}{\sin^2 \left(\gamma - \frac{2\pi}{3} k \right)} \right] + V(\beta, \gamma) \quad (1)$$

with a constant mass parameter B . In Equation (10), the parameters β and γ denote the usual collective coordinates, which are a measure of the deviation from spherical and axial symmetry, respectively, and L_k ($k = 1, 2, 3$) denotes the components of angular momentum. In the X(5) critical point symmetry, the potential is considered to have a deep minimum at $\gamma = 0^\circ$ and the last term in the Bohr Hamiltonian is taken as around $\gamma = 0^\circ$ (Iachello, 2001).

$$\sum_k \frac{L_k^2}{\sin^2 \left(\gamma - \frac{2\pi}{3} k \right)} \cong \frac{4}{3} (L_1^2 + L_2^2 + L_3^2) + L_3^2 \left(\frac{1}{\sin^2 \gamma} - \frac{4}{3} \right) \quad (2)$$

In the Schrodinger equation corresponding to the Bohr Hamiltonian, the total wave function is taken as $\Psi(\beta, \gamma, \theta_i) = \varphi_K^L(\beta, \gamma) D_{M,K}^L(\theta_i)$. Here $D_{M,K}^L(\theta_i)$ ($\theta_i = 1, 2, 3$) are the Wigner function of Euler angles and the symbols M and K represent the eigenvalues projections of the angular momentum operator L on the z -axis with the laboratory constant and the z' -axis with the body constant, respectively (Bohr, 1952). The expressions of reduced energy; $\varepsilon = 2BE / \hbar^2$ and reduced potential; $u = 2BV / \hbar^2$ are used for the analytical solution. The potential expression for the exact solution is taken as follows (Wilets and Jean, 1956; Fortunato, 2004)

$$u(\beta, \gamma) = u(\beta) + \frac{u(\gamma)}{\beta^2} \quad (3)$$

From here, the Schrodinger equation for the wave function $\varphi_K^L(\beta, \gamma) = f_L(\beta) \eta_K(\gamma)$ splits approximately into two parts, radial and angular, as follows (Bonatsos, et al., 2007a)

$$\left[-\frac{1}{\beta^4} \frac{\partial}{\partial \beta} \beta^4 \frac{\partial}{\partial \beta} + \frac{L(L+1)}{3\beta^2} + u(\beta) + \frac{\Omega}{\beta^2} \right] f_L(\beta) = \varepsilon f_L(\beta) \quad (4)$$

$$\left[-\frac{1}{\sin 3\gamma} \frac{\partial}{\partial \gamma} \sin 3\gamma \frac{\partial}{\partial \gamma} + \frac{K^2}{4} \left(\frac{1}{\sin^2 \gamma} - \frac{4}{3} \right) + u(\gamma) \right] \eta_K(\gamma) = \Omega \eta_K(\gamma) \quad (5)$$

Solution of the β -part of the Bohr Hamiltonian for Yukawa potential

The basic form of this potential is given by (Yukawa, 1935; Imbo, et al., 1984) :

$$u(r) = -\frac{A}{r} e^{-\delta r}$$

The δ parameter is the screening parameter, A is the strengths of the Yukawa potential. By substituting the potential form in Equation (4), The Equation (4) is rewritten as follows.

$$\frac{\partial^2 \xi_L(\beta)}{\partial \beta^2} + \frac{4}{\beta} \frac{\partial \xi_L(\beta)}{\partial \beta} + \left(\varepsilon - \frac{L(L+1)}{3\beta^2} + \frac{A}{\beta} e^{-\delta \beta} - \frac{\Omega}{\beta^2} \right) \xi_L(\beta) = 0 \quad (6)$$

Here, the wave function according as the β parameter is taken as $f_L \rightarrow \xi_L$ for the Yukawa potential. Here this approximation has been used (Arda and Sever, 2012)

$$\frac{1}{\beta^2} \approx \frac{\delta^2}{(1 - e^{-\delta \beta})^2}$$

The Equation (6) is obtained in following form.

$$\frac{\partial^2 \xi_L(\beta)}{\partial \beta^2} + \frac{4\delta}{(1 - e^{-\delta \beta})} \frac{\partial \xi_L(\beta)}{\partial \beta} + \left(\varepsilon - \frac{L(L+1)}{3} \frac{\delta^2}{(1 - e^{-\delta \beta})^2} + \frac{A\delta}{(1 - e^{-\delta \beta})} e^{-\delta \beta} - \frac{\Omega \delta^2}{(1 - e^{-\delta \beta})^2} \right) \xi_L(\beta) = 0 \quad (7)$$

To apply the CFNU method, it is taken a new variable $z = 1 - e^{-\delta \beta}$ and Equation (7) is get as follows

$$\frac{d^2 \xi_L(z)}{dz^2} + \frac{4-z}{z(1-z)} \frac{d \xi_L(z)}{dz} + \frac{1}{z^2(1-z)^2} [-a^2 z^2 - b^2 z - c^2] \xi_L(z) = 0 \quad (8)$$

The expressions in Equation (8) are taken.

$$-a^2 = \frac{\varepsilon}{\delta^2} - \frac{A}{\delta}, \quad -b^2 = \frac{A}{\delta}, \quad -c^2 = -\frac{L(L+1)}{3} - \Omega \quad (9)$$

The basic equation of the CFNU method is expressed as follows.

$$D^\alpha D^\alpha \psi(z) + \frac{\tilde{\tau}(z)}{\sigma(z)} D^\alpha \psi(z) + \frac{\tilde{\sigma}(z)}{\sigma^2(z)} \psi(z) = 0 \quad (10)$$

where D^α is a conformal fractional derivative operator and $0 < \alpha \leq 1$. The $\tilde{\tau}(z)$ is a function of at most α -th order, i.e. this parameter can also be equal to a constant, $\sigma(z)$ and $\tilde{\sigma}(z)$ are functions of at most 2α -th order, and the degrees of these parameters can also be equal to 0 or α . For $\alpha = 1$, the CFNU method becomes the standard NU method. Here, taking the form $\psi(z) = \varphi(z)y_{n,\alpha}(z)$, Equation (10) is reduced to the following equation.

$$\sigma(z) D^\alpha D^\alpha y_{n,\alpha}(z) + \tau(z) D^\alpha y_{n,\alpha}(z) + \lambda y_{n,\alpha}(z) = 0 \quad (11)$$

where $\varphi(z)$ and $\tau(z)$ satisfy the following conditions

$$\frac{D^\alpha \varphi(z)}{\varphi(z)} = \frac{\pi(z)}{\sigma(z)} \quad (12)$$

$$\begin{aligned} \tau(z) &= \tilde{\tau}(z) \\ &+ 2\pi(z) \end{aligned} \quad (13)$$

To obtain a physically acceptable solution, the derivative of the function $\tau(z)$ must be negative. Here, a general equation for $\pi(z)$ is defined as follows.

$$\pi(z) = \frac{D^\alpha \sigma(z) - \tilde{\tau}(z)}{2} \pm \sqrt{\left(\frac{D^\alpha \sigma(z) - \tilde{\tau}(z)}{2}\right)^2 - \tilde{\sigma}(z) + k\sigma(z)} \quad (14)$$

where λ is expressed as

$$\begin{aligned} \lambda & \\ &= k \\ &+ D^\alpha \pi(z) \end{aligned} \quad (15)$$

The newly defined parameter $\pi(z)$ must be at most an α -th order function. Since $\pi(z)$ is at most an α -th order polynomial here, the expression within the square root must be the square of a polynomial, and to find the value of k , the expression under the square root of must be the square of a function with a maximum degree of α . (Karayer, et al., 2016). From here, the solutions of the $y_{n,\alpha}(z)$ polynomial, which is a hypergeometric type of polynomial, are found by the Rodrigues relation.

$$\begin{aligned} y_{n,\alpha}(z) & \\ &= \frac{B_n}{\rho(z)} (D^\alpha)^n [\sigma^n(z)\rho(z)] \end{aligned} \quad (16)$$

In Equation (16), B_n represents the normalization coefficient and $\rho(z)$ represents the weight function satisfying the following condition.

$$\begin{aligned} D^\alpha [\sigma(z)\rho(z)] & \\ &= \tau(z)\rho(z) \end{aligned} \quad (17)$$

Finally, the parameter λ_n corresponding to the specific solution of eigenvalue equation is given as follows.

$$\begin{aligned} \lambda = \lambda_n &= -nD^\alpha \tau(z) - \frac{n(n-1)}{2} D^\alpha D^\alpha \sigma(z) \quad n \\ &= 0, 1, 2, \dots \end{aligned} \quad (18)$$

By comparing Equation (8) with Equation (10), the relevant polynomials are determined as follows.

$$\begin{aligned}\tilde{\tau}(z) &= 4 - z, \quad \sigma(z) = z(1 - z), \quad \tilde{\sigma}(z) \\ &= -a^2 z^2 - b^2 z - c^2\end{aligned}\quad (19)$$

By substituting these polynomials in Equation (14), the $\pi(z)$ polynomials are obtained as follow

$$\pi(z) = -\frac{(3+z)}{2} \pm \sqrt{z^2 \left(\frac{1}{4} + a^2 - k \right) + z \left(\frac{3}{2} + b^2 + k \right) + \frac{9}{4} + c^2} \quad (20)$$

The constant k is determined by the condition that the discriminant of the quadratic equation under the square root is zero and the discriminant gives a new quadratic equation which can be unraveled for the constant k . The roots of k are taken as follows

$$\begin{aligned}k_{\pm} &= -(6 + b^2 + 2c^2) \\ &\pm \sqrt{(4 + a^2 + b^2 + c^2)(9 + 4c^2)}\end{aligned}\quad (21)$$

When the k value are substituted into Equation (20), one obtains four possible $\pi(z)$ equations for potential.

$$\pi(z) = -\frac{(3+z)}{2} \pm \begin{cases} \left(\sqrt{9/4 + c^2} - \sqrt{(4 + a^2 + b^2 + c^2)} \right) z - \sqrt{9/4 + c^2}, \text{ for } k_+ \\ \left(\sqrt{9/4 + c^2} + \sqrt{(4 + a^2 + b^2 + c^2)} \right) z - \sqrt{9/4 + c^2}, \text{ for } k_- \end{cases}$$

To calculate $\tau(z)$ and the polynomial λ , we chose the negative polynomial $\pi(z)$ obtained for k_- because $\tau(z)$ given in the equations above has a negative derivative for this value of $\pi(z)$.

$$\tau(z) = 1 - 2z - \left[\left(\sqrt{9 + 4c^2} + 2\sqrt{(4 + a^2 + b^2 + c^2)} \right) z - \sqrt{9 + 4c^2} \right]$$

$$\begin{aligned}\lambda &= -(6 + b^2 + 2c^2) - \sqrt{(4 + a^2 + b^2 + c^2)(9 + 4c^2)} - 1/2 \sqrt{9 + 4c^2} \\ &\quad - \sqrt{(4 + a^2 + b^2 + c^2)} - 1/2\end{aligned}$$

$$\lambda_n = n \left(2\sqrt{(4 + a^2 + b^2 + c^2)} + \sqrt{9 + 4c^2} + 2 \right) + n(n - 1)$$

Considering the values of the parameters given in Equation (9) and using $\lambda = \lambda_n$, the energy eigenvalues for the Yukawa potential are obtained as follows.

$$\begin{aligned} \varepsilon_{n,L} = & 4\delta^2 + \delta^2 \frac{L(L+1)}{3} + \delta^2 \Omega \\ & - \delta^2 \left[\left(n + \frac{1}{2} \right) \right. \\ & \left. - \frac{n(n+1) - \left(6 - A/\delta + \frac{2L(L+1)}{3} + 2\Omega \right)}{(2n+1) + \sqrt{9 + 4\Omega + \frac{4L(L+1)}{3}}} \right]^2 \end{aligned} \quad (22)$$

To find the wave function of the β part of the Bohr Hamiltonian, we first calculated the weight function from Equation (17) as follows.

$$\rho(z) = (1 - z)^{2a_1} z^{2b_1}$$

$$\text{where } a_1 = \sqrt{(4 + a^2 + b^2 + c^2)}, \quad b_1 = \sqrt{9/4 + c^2}$$

Adding $\rho(z)$ to the Equation (16) allows us to find the function $y_n(z)$ in the following form.

$$y_n(z) = B_n (1 - z)^{-2a_1} z^{-2b_1} \frac{d^n}{dz^n} \left[(1 - z)^{n+2a_1} z^{n+2b_1} \right] \quad (23)$$

The polynomials $y_n(z)$ with $B_n = (-1)^n / 2^n n!$ correspond the orthogonal polynomials associated with Jacobi polynomials and the Jacobi polynomials are denoted by $P_n^{(\omega, q)}(x)$. The orthogonal polynomials with the weight function $(b - x)^\omega (x - a)^q$ on the finite interval $[a, b]$ are expressed as (Szegő, 1939).

$$\text{const. } P_n^{(\omega, q)} \left(2 \frac{x - a}{b - a} - 1 \right)$$

and usually, the case $a = 0, b = 1$ is used (Szego, 1939). Hence, the polynomial $y_n(z)$ can be written according to the Jacobi polynomials as follows:

$$y_n(z) \sim P_n^{(2a_1, 2b_1)}(2z - 1)$$

Considering Equation (12), the other part of the wave function is obtained as follows,

$$\varphi(z) = (1 - z)^{2+a_1} z^{-3/2+b_1}$$

Thus, the radial component of the wave function is found as $f(z) \rightarrow \xi_L(z) = \varphi(z)y_n(z)$

$$\xi_L(z) = C_n(1 - z)^{2+a_1} z^{-3/2+b_1} P_n^{(2a_1, 2b_1)}(2z - 1)$$

The parameter C_n is the normalization constant and is calculated by taking the condition $\int_0^\infty \beta^4 f^2(\beta) d\beta = 1$. From here, the Jacobi polynomials seeming in the wave functions of the ground-state band ($n = 0$), the β_1 band ($n = 1$), and the β_2 band ($n = 2$), which required for the calculation of the normalization constant C_n , are obtained using the following equation (Szego, 1939)

$$P_n^{(\omega, q)}(x) = \frac{1}{2^n} \sum_{m=0}^n \binom{n+\omega}{m} \binom{n+q}{n-m} (x-1)^{n-m} (x+1)^m$$

$$P_0^{(\omega, q)}(x) = 1$$

$$P_1^{(\omega, q)}(x) = \frac{1}{2} [(\omega + q + 2)x + (\omega - q)]$$

$$P_2^{(\omega, q)}(x) = \frac{1}{4} [4(\omega + 1)(\omega + 2) + 4(\omega + q + 3)(\omega + 2)(x - 1) + (\omega + q + 3)(\omega + q + 4)(x - 1)^2]$$

Solution of the γ -part of the Bohr Hamiltonian for Yukawa potential

To determine the Ω value in the energy equation, the solution of the angular part of the Bohr Hamiltonian must be taken. The approximate solution of the X(5) model constructed by Iachello (Iachello, 2001), the potential depending on the parameter γ is simply defined by $\propto \gamma^2$ for very small gamma values. In general, the potential energy for the Bohr Hamiltonian is periodic in γ and symmetric to $\gamma = n\pi / 3$ values with a period of $2\pi/3$ (Fortunato, 2005; Caprio, 2005). Under the conditions of Bohr symmetry (Greiner and Maruhn, 1996), the potential γ is bounded such that $u(\gamma) \propto (1 - \cos 3\gamma)$ is a polynomial. For very small values of γ , for a trigonometric expansion ($\sin \gamma \approx \gamma$, $\cos \gamma \cong 1$) valid for small oscillations around the origin, the system is delineated by a harmonic-oscillator potential (Fortunato, 2005). In this context, the potential γ is taken as the harmonic oscillator potential in the range $0 < \gamma < \pi/3$ as $u(\gamma) \cong \gamma^2$ (Caprio, 2005). From here, the gamma part of Bohr Hamiltonian which is given with Equation 2.14 is written as follows for $\gamma \approx 0$ için $\sin 3\gamma \approx \gamma$ and $u(\gamma) = (3c)^2\gamma^2$ potential form.

$$\left[-\frac{1}{\gamma} \frac{\partial}{\partial \gamma} \gamma \frac{\partial}{\partial \gamma} + \frac{K^2}{4\gamma^2} + (3c)^2\gamma^2 \right] \eta_K(\gamma) = \varepsilon_\gamma \eta_K(\gamma) \quad (24)$$

where $\varepsilon_\gamma = \Omega + \frac{K^2}{3}$. Using the coordinate transformation $\gamma^2 = s$, we rearranged Equation (24) as follows.

$$\frac{d^2 \eta_K(s)}{ds^2} + \frac{2}{2s} \frac{d\eta_K(s)}{ds} + \frac{1}{4s^2} \left[\varepsilon_\gamma s - \frac{K^2}{4} - (3c)^2 s^2 \right] \eta_K(s) = 0 \quad (25)$$

Using mentioned CFNU method, the parameters required for the calculations are determined as follows.

$$\tilde{\tau}(s) = 2 \quad , \quad \sigma(s) = 2s \quad , \quad \tilde{\sigma}(s) = -9c^2 s^2 + \varepsilon_\gamma s - \frac{K^2}{4} \quad , \quad (26)$$

$$\pi(s) = \pm \sqrt{9c^2 s^2 + s(2k - \varepsilon_\gamma) + \frac{K^2}{4}} \quad , \quad (27)$$

In Equation (27), k values obtained by setting the discriminant of the quadratic equation under the square root equal to zero are taken as follows.

$$\begin{aligned}
 k_{\pm} &= \frac{\varepsilon_{\gamma}}{2} \\
 &\pm \frac{3cK}{2}
 \end{aligned} \tag{28}$$

Taking a negative k value, we get the relevant parameters as follows

$$\pi(s) = -\left(3cs - \frac{K}{2}\right) \quad \tau(s) = 2 - 6cs + K$$

$$\lambda = \frac{\varepsilon_{\gamma}}{2} - \frac{3cK}{2} - 3c \quad \lambda_n = 6cn$$

By using $\lambda = \lambda_n$, the ε_{γ} eigenvalues are obtained and here the Ω value is determined as follows:

$$\begin{aligned}
 \varepsilon_{\gamma} &= 6c \left(2n + 1 \right. \\
 &\left. + \frac{K}{2} \right)
 \end{aligned} \tag{29}$$

$$\begin{aligned}
 \Omega &= 3C(n_{\gamma} + 1) - \frac{K^2}{3} \quad , n_{\gamma} \\
 &= 0, 1, 2, \dots \dots
 \end{aligned} \tag{30}$$

In Equation (30), the quantum number is $n = (n_{\gamma} - |K/2|)/2$. The necessary parameters to find the wave function dependent on the γ parameter is obtained as follows.

$$\begin{aligned}
 \varphi(s) &= s^{|K|/4} e^{-3cs/2}
 \end{aligned} \tag{31}$$

$$\begin{aligned}
& y_n(s) \\
& = B_n 2^n e^{3cs} s^{-|K|/2} \frac{d^n}{ds^n} [e^{-3cs} s^{n+|K|/2}]
\end{aligned} \tag{32}$$

The wave function $y_n(s)$ given in Equation (32) corresponds to Laguerre polynomials (Szegő, 1939) and hence, $u(s) = \varphi(s)y_n(s)$, the γ -wave function for $s \rightarrow \gamma$ is gained as follows.

$$\begin{aligned}
& \eta_K(\gamma) \\
& = N_{n_\gamma, K} \gamma^{|K|/2} e^{-3c\gamma/2} L_{n_\gamma, K}^{|K|/2}(\gamma^2)
\end{aligned} \tag{33}$$

NUMERIC RESULTS AND DISCUSSION

For the X(5) model, the ground-state band, β -band and the γ -band values are labeled (n, n_γ) according to the quantum numbers n and n_γ . The allowable angular momentum values for the X(5) model are: $K = 0, L = 0, 2, 4, \dots$ for $K \neq 0, L = K, K + 1, K + 2, \dots$. The energy ratios $R_{n,L}$, which use investigating the nuclear structure, are expressed as following form.

$$R_{n,L}^{(n_\gamma)} = \frac{E_{n,L} - E_{0,0}}{E_{0,2} - E_{0,0}} \tag{34}$$

The ground state band level, $n = 0, n_\gamma = 0, K = 0$, β -band, $n = 1, n_\gamma = 2, K = 0$, γ 1-band energy levels with $n = 0, n_\gamma = 1, K = 2$ is characterized.

Energy levels are represented by L_{n,n_γ} . The parameter c taken in Equation 2.43 depends on the parameter $a \equiv 2AB\beta_W^2/\hbar^2$, which is a measure of the γ -hardness of the Bohr Hamiltonian, obtained by numerical calculations (Caprio, 2005) and expressed as $c = \sqrt{a}/3$. The parameter a is the strength, or in other words the amplitude, of the harmonic oscillator potential. In Equation, the parameter C is connected to parameter a via $C = 2\sqrt{a}/3$. (Bonatsos, et al., 2007b). The $R_{0,4}^0$ values for the scanning parameter $\delta = 0$ are undefined and numerical calculations must be done for $\delta \neq 0$. In this case, the nuclear structure was examined for non-zero values of A . It was determined that the $R_{0,4}^0$ ratios changed very little with the change of the scanning parameter. It is predicted that the scanning parameter $\delta = 1$ should be taken for the changing values of A and a . In order to study the nuclear structure between spherical and rotational nuclei, appropriate parameters are tried to be determined by taking into account the experimental data of certain isotope chains.

CONCLUSION

In this study, the analytical solution of the Bohr Hamiltonian, which is in a five-dimensional space with two collective variables (β, γ) and three Euler angles, used to describe the deformed

nuclei zone, is derived for $\gamma \approx 0$ by selecting the Yukawa potential in the β - part. The constructed new model is labelled ES-X(5)-Y. Analytical solutions for both the β - part and the γ - part are calculated using an analytic method which has been recently developed conformable fractional NU method. The wave functions are acquired for the β - part are expressed in terms of Jacobi polynomials while the wave functions get for the γ - part are expressed in terms of Laguerre polynomials. In this study, it was tried to describe how and to what extent the analytical solution obtained for the phase-shape point between the spherical and deformed structure using the Yukawa potential. For this purpose, the appropriate ranges of the parameters depending on the potential and the structure itself will be tried to be determined by taking into account the experimental values.

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INTERMITTENT FASTING: PHYSIOLOGICAL REFLECTIONS OF METABOLIC, HORMONAL, AND NEUROLOGICAL CHANGES

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ABSTRACT

Intermittent fasting is a dietary regimen that involves alternating periods of eating and fasting. The primary goal of this diet is to improve the body's energy management, promote weight loss, and enhance overall health. It has been shown that intermittent fasting practices provide significant benefits in various areas, such as cardiovascular health, brain health, body composition, immune system responses, and anti-aging effects. However, there are also some side effects and contraindications. This study examines the benefits, potential risks, and safe practice recommendations of intermittent fasting.

Keywords: Intermittent fasting, Cardiovascular health, Brain health, Immune system, Anti-aging effects

INTRODUCTION

Intermittent fasting has gained popularity in recent years and is supported by scientific research. The need to address health issues and chronic diseases brought on by modern lifestyles has led individuals to seek alternative and effective methods. Intermittent fasting offers flexibility with its different application forms and has been adopted by a broad audience. This study discusses the effects of intermittent fasting on health, its potential risks, and safe application strategies. The aim is to comprehensively evaluate the scientific basis of intermittent fasting, its potential benefits for overall health and quality of life, and its possible drawbacks.

INTERMITTENT FASTING

Intermittent fasting (IF) is a dietary regimen that involves alternating periods of eating and fasting. This diet includes eating windows and fasting periods. The main objective of intermittent fasting is to improve the body's energy management and metabolism, promote weight loss, and enhance overall health. The popularity of intermittent fasting has increased to combat health issues related to modern lifestyles and eating habits. The prevalence of chronic conditions such as obesity, diabetes, and cardiovascular diseases has driven individuals to seek alternative and effective methods. A study by Harvard Health Publishing indicated significant improvements in insulin sensitivity and fat loss among individuals practicing intermittent fasting (Harvard Health Publishing, 2018).

Intermittent fasting provides flexibility through different application forms, making it widely adopted. It offers significant advantages, especially regarding weight loss and metabolic health. A review published in the *New England Journal of Medicine* showed that intermittent fasting supports not only weight loss but also cellular repair processes and reduces inflammation (Longo & Mattson, 2019).

TYPES OF INTERMITTENT FASTING

16/8 Method

The 16/8 method is one of the most common forms of intermittent fasting, involving a 16-hour fasting period and an 8-hour eating window. This method is typically implemented by skipping breakfast and eating from noon to evening. It has been shown to increase the body's fat-burning capacity and speed up metabolism. Harvard Health Publishing states that this method yields positive results in weight control and metabolic health (Harvard Health Publishing, 2018).

The 16/8 method is popular due to its ease of integration into a busy daily schedule and its sustainability over the long term. This method helps individuals with regular work schedules, such as office workers, organize and plan their eating patterns better. A study by Hutchison et al. (2020) found that the 16/8 method improves appetite control and reduces late-night eating habits (Hutchison et al., 2020).

5:2 Diet

The 5:2 diet involves normal eating for five days of the week and consuming very low calories (approximately 500-600 calories) on the other two days. This diet can have positive effects on both metabolic improvement and weight loss. According to a paper by Varady et al. (2017), the 5:2 diet positively impacts blood sugar control and insulin levels (Varady et al., 2017).

The 5:2 diet is advantageous because of its flexibility, allowing individuals to adapt it to their social lives and personal preferences. Implementing calorie restrictions on certain days of the week can increase adherence to the diet and lead to long-term success. A systematic review by Harvie & Howell (2014) indicated that the 5:2 diet positively affects cardiovascular risk factors and improves overall health (Harvie & Howell, 2014).

Alternate Day Fasting

Alternate day fasting involves eating normally one day and significantly restricting calorie intake the next. This method typically includes fasting three or four days a week and eating normally on the other days. Studies have shown that this model improves metabolic health and accelerates weight loss. A study by Halberg et al. (2005) reported that alternate day fasting positively impacts weight loss and insulin sensitivity (Halberg et al., 2005).

Alternate day fasting can be more challenging than other intermittent fasting methods but may have more pronounced health effects. This method can increase the body's metabolic flexibility and support cellular repair processes. Research by Klempel et al. (2012) showed that alternate

day fasting reduces chronic disease risk factors and improves overall health (Klempel et al., 2012).

Spontaneous Fasting

Spontaneous fasting involves skipping meals when not hungry without following a specific program. This method is more flexible and allows individuals to act according to their hunger and satiety signals. Spontaneous fasting can easily fit into daily life and reduce diet pressure. A study by Harvard Medical School showed that spontaneous fasting can aid in weight loss by naturally reducing calorie intake (Harvard Medical School, 2018).

Spontaneous fasting can also help individuals become more conscious of their eating habits. The flexibility of eating windows makes it easier to adapt to social and work life. A review published in *Current Obesity Reports* noted that spontaneous fasting positively impacts weight management and metabolic health (Stote et al., 2015).

METABOLIC CHANGES

Intermittent fasting significantly impacts glucose and insulin levels. During fasting periods, the body starts using stored fats as an energy source instead of glucose, leading to a decrease in glucose levels. Simultaneously, insulin levels drop because the body shifts from energy storage mode to energy consumption mode. A study by Anton et al. (2015) showed that individuals practicing intermittent fasting had increased insulin sensitivity and more stabilized blood sugar levels (Anton et al., 2015).

During fasting, the body enters a state called ketosis once carbohydrate stores are depleted. In this process, the body breaks down fats to produce molecules called ketones, which serve as an alternative fuel source for the brain and other organs. Ketosis contributes to the reduction of body fat and the improvement of metabolic health. A study by Volek and Phinney (2016) examined the effects of ketogenic diets and intermittent fasting on ketosis, highlighting their positive impacts on weight loss and metabolic diseases (Volek & Phinney, 2016).

Intermittent fasting also has noticeable effects on metabolic rate and energy expenditure. During fasting periods, the metabolic rate can temporarily increase, leading to higher energy expenditure. This accelerates the body's processes of using energy stores and burning fat. Research by Hatori et al. (2014) concluded that intermittent fasting practices increase metabolic rate and improve energy balance (Hatori et al., 2014).

HORMONAL CHANGES

Insulin and glucagon are two critical hormones that regulate the body's energy storage and utilization. Intermittent fasting positively affects the balance of these hormones. During fasting periods, insulin levels decrease while glucagon levels increase. This change triggers glycogenolysis and lipolysis processes, enabling the body to use its energy stores. A detailed review by Mattson and Wan (2017) examined the positive effects of intermittent fasting on insulin and glucagon balance (Mattson & Wan, 2017).

Intermittent fasting can also increase the secretion of growth hormone. Growth hormone is essential for maintaining muscle mass, fat metabolism, and overall body composition. Fasting periods significantly boost growth hormone levels, which supports fat burning and muscle development. A study by Hartman et al. (2019) explored the effects of intermittent fasting on growth hormone secretion and its metabolic benefits (Hartman et al., 2019).

Intermittent fasting can also affect the levels of stress hormones like cortisol. Cortisol levels may increase during fasting periods, activating the body's mechanisms to cope with stress. However, long-term and regular intermittent fasting practices have been shown to balance cortisol levels and reduce chronic stress responses. A study by Moro et al. (2018) investigated the effects of intermittent fasting on cortisol and other stress hormones (Moro et al., 2018).

DIGESTIVE SYSTEM AND MICROBIOME

Intermittent fasting can lead to significant changes in gut health and the gut microbiota. Fasting can increase the diversity of gut microflora and promote the growth of beneficial bacteria, improving gut health and supporting digestive system functions. Research by Thaiss et al. (2019) examined the positive effects of intermittent fasting on the composition of the gut microbiome (Thaiss et al., 2019).

Intermittent fasting also affects the secretion and activity of digestive enzymes. During fasting periods, the production of digestive enzymes decreases, while their secretion increases during eating windows. This optimizes the digestive process and allows for more efficient nutrient absorption. An article by Zhao et al. (2020) detailed the effects of intermittent fasting on digestive enzyme secretion and its contributions to digestive health (Zhao et al., 2020).

CARDIOVASCULAR HEALTH

Intermittent fasting can have positive effects on blood pressure and cholesterol levels. During fasting periods, the body's metabolic processes change, contributing to lower blood pressure and improved cholesterol levels. A study by Anton et al. (2018) reported decreases in total cholesterol and LDL cholesterol levels, along with increases in HDL cholesterol levels, in individuals practicing intermittent fasting. Additionally, it was noted to help regulate blood pressure (Anton et al., 2018).

Intermittent fasting also creates various positive effects on heart health. By reducing inflammation and improving metabolic parameters, intermittent fasting supports heart health. A study by Ahmet et al. (2011) showed significant improvements in cardiovascular risk factors among individuals practicing intermittent fasting, suggesting that it may be an effective method for reducing the risk of heart attacks and strokes (Ahmet et al., 2011).

BRAIN HEALTH AND NEUROLOGICAL EFFECTS

Intermittent fasting can also have positive effects on brain functions and cognitive health. Increased production of neurotransmitters and synaptic plasticity during fasting periods

supports brain health. A study by Mattson et al. (2015) indicated that intermittent fasting improves brain functions and helps prevent age-related cognitive decline (Mattson et al., 2015).

Intermittent fasting plays a significant role in regulating neurotransmitters and synaptic plasticity. Increased levels of brain-derived neurotrophic factor (BDNF) during fasting support synaptic plasticity and neurogenesis. Research by Longo and Mattson (2014) demonstrated that intermittent fasting positively affects neurotransmitter balance and enhances synaptic plasticity (Longo & Mattson, 2014).

BODY COMPOSITION AND WEIGHT MANAGEMENT

Intermittent fasting can promote fat loss while helping to preserve muscle mass. This eating pattern enables the body to use fat stores as an energy source. A study by Tinsley and La Bounty (2015) demonstrated that individuals practicing intermittent fasting experienced increased fat loss and maintained muscle mass (Tinsley & La Bounty, 2015). This finding indicates that intermittent fasting is an effective method for weight management and body composition.

Intermittent fasting can also positively impact exercise performance and outcomes. Exercising during fasting periods can enhance fat burning and preserve muscle mass. Research by Moro et al. (2016) observed greater fat loss and muscle retention in individuals who combined intermittent fasting with regular exercise (Moro et al., 2016). This supports the benefits of integrating intermittent fasting with exercise.

IMMUNE SYSTEM AND INFLAMMATION

Intermittent fasting can modulate immune system responses and strengthen the body's immune response. During fasting periods, inflammatory responses decrease, and the renewal of immune cells is promoted. A study by Mueller et al. (2018) observed improvements in the number and function of immune cells in individuals practicing intermittent fasting (Mueller et al., 2018). Additionally, this study showed that intermittent fasting enhances the renewal capacity of T cells, bolstering the immune system's resistance to infections and diseases.

Intermittent fasting can also regulate immune responses in autoimmune diseases and balance hyperactive immune responses. This process can reduce inflammation associated with autoimmune diseases and alleviate disease symptoms. Intermittent fasting reprograms the immune system, promoting the clearance of harmful cells and preserving healthy immune cells. A study by Longo and Mattson (2014) reported that intermittent fasting modulates immune responses in autoimmune diseases (Longo & Mattson, 2014).

Intermittent fasting can reduce inflammation in the body by lowering levels of inflammatory markers. Decreases in levels of C-reactive protein (CRP) and interleukin-6 (IL-6) have been observed during fasting periods. A study by Varady et al. (2015) reported significant reductions in inflammatory markers in individuals practicing intermittent fasting (Varady et al., 2015). These reductions play a crucial role in lowering the risk of diseases caused by chronic inflammation.

Additionally, intermittent fasting can help control inflammation by increasing the production of anti-inflammatory cytokines. During fasting periods, the production of molecules that regulate inflammatory responses increases, positively impacting the body's overall inflammatory status. A study by de Cabo and Mattson (2019) examined the beneficial effects of intermittent fasting on inflammatory processes and its role in preventing chronic diseases like cardiovascular diseases (de Cabo & Mattson, 2019).

INTERMITTENT FASTING AND AGING

Anti-aging Effects: Intermittent fasting can have anti-aging effects and extend lifespan. During fasting periods, cellular repair processes and autophagy are promoted, contributing to reduced signs of aging. A study by Fontana and Partridge (2015) demonstrated that intermittent fasting slows down aging processes and extends lifespan (Fontana & Partridge, 2015). This process helps maintain cellular functions more efficiently by clearing damaged proteins and organelles accumulated in cells.

Intermittent fasting can also affect the aging process by reducing levels of insulin-like growth factor 1 (IGF-1). IGF-1 plays a role in cellular growth and proliferation processes, and high levels are associated with aging. Intermittent fasting lowers IGF-1 levels, exerting anti-aging effects. A study by Ristow and Schmeisser (2011) reported that intermittent fasting reduces IGF-1 levels, helping to reduce oxidative stress and inflammation (Ristow & Schmeisser, 2011). These mechanisms help explain the biological processes underlying the anti-aging effects of intermittent fasting.

Cellular Repair and Autophagy: Intermittent fasting supports cellular repair and autophagy processes. Autophagy is a process that allows cells to renew themselves by eliminating damaged or unnecessary components. Intermittent fasting promotes this process, ensuring that cells function healthily. A study by Madeo et al. (2015) demonstrated that intermittent fasting enhances autophagy processes and supports cellular repair (Madeo et al., 2015). This contributes to improved cellular health and reduced signs of aging.

Intermittent fasting can also support DNA repair mechanisms and mitochondrial functions. During fasting periods, the body increases mitochondrial efficiency to optimize energy production processes, improving cellular energy metabolism. Research by Levine et al. (2017) showed that intermittent fasting enhances mitochondrial biogenesis and the activity of DNA repair enzymes, slowing down cellular aging processes (Levine et al., 2017). These mechanisms emphasize the critical role of intermittent fasting in not only delaying aging but also maintaining cellular health.

RISKS AND SIDE EFFECTS OF INTERMITTENT FASTING PRACTICES

Although intermittent fasting practices are generally considered safe, there are some potential side effects and contraindications. During fasting periods, side effects such as headaches, fatigue, dizziness, nausea, and difficulty concentrating may occur. These symptoms are typically more pronounced during the first few days or weeks as the body adapts to the new

eating pattern. Prolonged fasting can lead to eating disorders or worsen existing eating disorders in some individuals. A study by Johnstone et al. (2015) reported negative side effects related to hunger in some individuals practicing intermittent fasting (Johnstone et al., 2015).

Contraindications include pregnancy, breastfeeding, chronic illnesses like diabetes, and a history of eating disorders. In insulin-dependent conditions like type 1 diabetes, fasting can adversely affect blood sugar control and increase the risk of hypoglycemia. Therefore, individuals with chronic illnesses or specific health conditions should consult a healthcare professional before starting intermittent fasting. Patterson et al. (2015) emphasized that intermittent fasting practices should be carefully evaluated in certain patient groups (Patterson et al., 2015).

To safely sustain intermittent fasting practices, some essential points should be considered. Firstly, drinking enough water during fasting periods is crucial to maintain hydration and prevent side effects like headaches. Additionally, supplements such as salt and potassium can be used to maintain mineral and electrolyte balance during fasting periods. Individuals practicing intermittent fasting should consume balanced and nutritious meals to prevent vitamin and mineral deficiencies. A study by Varady (2011) demonstrated that supporting intermittent fasting with nutritious meals enhances its positive health effects (Varady, 2011).

During fasting, excessive exercise should be avoided, and exercise plans should be adjusted according to the individual's energy levels. Furthermore, individuals practicing intermittent fasting should pay attention to their sleep patterns and get enough sleep, as sleep deprivation combined with fasting can increase stress levels. For long-term success and safe intermittent fasting, individuals should listen to their body signals and adjust their eating patterns as needed. A review by Harvie and Howell (2014) detailed safe practice strategies for intermittent fasting (Harvie & Howell, 2014).

CONCLUSION AND RECOMMENDATIONS

Intermittent fasting shows promising results in terms of weight loss, metabolic health, and overall health improvements. Different intermittent fasting methods can adapt to individuals' lifestyles and be sustainable and effective in the long term. However, intermittent fasting practices need to be personalized according to individual differences and health conditions. Individuals practicing intermittent fasting should evaluate whether this eating pattern suits them and consult healthcare professionals to manage potential side effects. When appropriately implemented, intermittent fasting can offer many health benefits and improve quality of life. Longo and Mattson (2014) highlighted the broad-ranging effects and potential benefits of intermittent fasting on health (Longo & Mattson, 2014).

More research is needed to better understand the long-term effects of intermittent fasting and its outcomes in different populations. Particularly, more clinical studies are required on the safety and efficacy of intermittent fasting practices in individuals with chronic diseases. Additionally, topics such as hormonal changes related to intermittent fasting, its effects on the

gut microbiome, and its long-term effects on neurological health should be thoroughly investigated. Future research should focus on comparative analyses of various intermittent fasting methods to determine the most effective and sustainable approaches. Mattson et al. (2018) emphasized the need to expand future research areas related to intermittent fasting (Mattson et al., 2018).

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HOMEOSTATIC IMBALANCE IN CANCER

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ABSTRACT

Cancer is a group of diseases characterized by the uncontrolled growth and division of cells. This study addresses the disruption of homeostatic balance in cancer, cellular and molecular mechanisms, tumor development, metastasis, and resistance to treatment. The disruption of homeostatic mechanisms triggers various biological processes that lead to tumor growth and metastasis. These processes include the breakdown of cell cycle regulatory proteins, angiogenesis, epithelial-mesenchymal transition (EMT), and immune escape mechanisms. Immunotherapies in cancer treatment have ushered in a new era by aiming to enhance the immune system's ability to recognize and destroy cancer cells. Among these immunotherapies are PD-1 and PD-L1 inhibitors, CAR-T cell therapies, and cancer vaccines. These treatment strategies have made significant progress in the fight against cancer and have improved patients' quality of life.

Keywords: Cancer, Homeostasis, Metastasis, Immunotherapy, Treatment Resistance

INTRODUCTION

Cancer is a serious health problem affecting millions of people worldwide and can result in death. One of the fundamental characteristics of cancer is the uncontrolled growth and proliferation of cells. This uncontrolled growth is triggered by genetic mutations and epigenetic changes in the cells' genome (Hanahan & Weinberg, 2011). As a result of these changes, cancer cells produce abnormal proteins and disrupt normal cellular functions. This leads to tumor formation and the development of advanced-stage cancer, such as metastasis.

Homeostasis is the process by which cells and organisms maintain their internal balance to sustain healthy functioning (Cannon, 1929). However, during cancer development, the homeostatic balance is severely disrupted. This disruption affects fundamental processes such as cellular growth and death mechanisms, energy production, nutrient intake, and waste product elimination. The disruption of homeostatic mechanisms initiates various biological processes that support the uncontrolled growth and spread of tumor cells.

In this study, the consequences of homeostatic imbalance in cancer will be examined in detail, focusing on its effects on tumor development, metastasis, and treatment resistance. Additionally, the role of immunotherapies in cancer treatment and their interactions with the immune system will be discussed. Innovative treatment methods such as PD-1 and PD-L1 inhibitors, CAR-T cell therapies, and cancer vaccines will also be evaluated within this scope.

CANCER AND HOMEOSTASIS

Cancer is a group of diseases characterized by the uncontrolled growth and division of cells. While normal cell growth and death are tightly regulated, cancer cells bypass these regulations and gain the capacity for unlimited proliferation. This uncontrolled growth is triggered by genetic mutations and epigenetic changes in the cells' genome. As a result of these changes, cancer cells produce abnormal proteins that disrupt the functions of normal cells, leading to tumor formation (Hanahan & Weinberg, 2011).

Homeostasis is the process by which an organism maintains its internal balance. Cells in the body function within a specific balance and order. This balance is achieved through processes such as energy production, nutrient intake, waste elimination, and cellular signaling. Maintaining homeostasis is essential for the healthy and efficient functioning of cells. Despite changes in internal and external environments, homeostatic balance keeps the organism stable (Cannon, 1929).

The impact of cancer on homeostatic balance leads to the disruption of cellular functions. Unlike normal cells, cancer cells become resistant to environmental stresses, further disrupting homeostatic balance. For instance, cancer cells utilize alternative metabolic pathways like glycolysis to continue energy production even in low oxygen conditions (hypoxia) (Warburg, 1956). These metabolic adaptations support the survival and proliferation of cancer cells while contributing to the formation of an acidic environment in the tumor microenvironment. This acidic environment hinders the functions of immune cells and creates a favorable condition for tumor invasion and metastasis (Gillies et al., 2008).

THE ROLE OF HOMEOSTASIS IN HEALTHY CELLULAR FUNCTIONS

Homeostasis is crucial for cells to operate under optimal conditions. Factors such as the composition of intracellular and extracellular fluids, pH balance, temperature, and ion concentrations are regulated by homeostatic mechanisms. Disruption of these mechanisms can impair cellular functions and lead to diseases. For example, changes in intracellular pH (acidosis or alkalosis) can disrupt the functions of enzymes and other proteins (Alberts et al., 2002).

Cancer represents a condition where homeostatic balance is severely disrupted. Unlike normal cells, cancer cells use alternative metabolic pathways like glycolysis to meet their energy needs, leading to the formation of an acidic microenvironment. Additionally, cancer cells develop various mechanisms to evade the immune system, further disrupting homeostatic balance. This

enhances the survival, growth, and spread of tumor cells while adversely affecting the functions of normal cells (Warburg, 1956).

HOMEOSTATIC IMBALANCE IN CANCER

In cancer, the disruption of cellular homeostasis results from the loss or abnormal functioning of numerous biological mechanisms. Cell cycle regulatory proteins, growth factors, and apoptosis mechanisms often function abnormally in cancer cells. This leads to uncontrolled cell proliferation and immortality (Hanahan & Weinberg, 2011). Furthermore, cancer cells form new blood vessels through a process called angiogenesis, facilitating the supply of oxygen and nutrients necessary for tumor growth and metastasis (Folkman, 2002).

Homeostatic disruption in cancer is also observed in cellular energy production processes. While normal cells produce energy through oxidative phosphorylation, cancer cells prefer glycolysis, a process known as the Warburg effect (Warburg, 1956). This metabolic change allows cancer cells to meet the demands of rapid growth and division. Additionally, cancer cells strengthen their antioxidant defense mechanisms to survive despite the increase in reactive oxygen species (ROS) (Schumacker, 2006).

Cellular Environment and Microenvironment: Interaction of Cancer Cells with Their Environment

The microenvironment of cancer cells provides a supportive environment for the growth and spread of tumor cells. This microenvironment consists of stromal cells, connective tissue, blood vessels, and immune cells. Cancer cells interact with these cells in the microenvironment to strengthen their own growth and survival signals (Whiteside, 2008). For example, cancer cells develop immune escape mechanisms by suppressing the function of immune cells, making it difficult for the immune system to recognize and destroy tumor cells (Joyce & Pollard, 2009).

Additionally, the tumor microenvironment plays a crucial role in the resistance of cancer cells. Microenvironmental stress factors, such as hypoxia (low oxygen levels), cause cancer cells to become more aggressive and invasive (Semenza, 2003). Hypoxia-inducible factors (HIFs) regulate processes such as angiogenesis and glycolysis, supporting tumor growth and metastasis. Therefore, targeting the tumor microenvironment allows for the development of new strategies in cancer treatment (Gilkes et al., 2014).

MECHANISMS OF HOMEOSTATIC IMBALANCE

Genetic mutations play a critical role in cancer development. The activation of oncogenes and inactivation of tumor suppressor genes lead to the disruption of cellular control mechanisms. For instance, mutations in the TP53 tumor suppressor gene hinder the regulation of the cell cycle and the induction of apoptosis in response to DNA damage (Vogelstein et al., 2000). In addition to genetic mutations, epigenetic changes also play a significant role in cancer development. Epigenetic mechanisms, such as DNA methylation and histone modifications, alter gene expression and affect the behavior of cancer cells (Jones & Baylin, 2007).

In cancer cells, cellular signaling pathways are often abnormally activated. For example, the PI3K/AKT/mTOR pathway plays an important role in cell growth and proliferation, and its continuous activation leads to the uncontrolled growth of cancer cells (Vivanco & Sawyers, 2002). Similarly, the MAPK/ERK pathway regulates cell growth and differentiation, and its overactivation contributes to excessive proliferation and metastasis of cancer cells (Dhillon et al., 2007).

Cancer cells have complex interactions with the immune system. Normally, the immune system can recognize and destroy abnormal cells; however, cancer cells develop various immune escape mechanisms to evade this defense system. The interaction between programmed cell death ligand 1 (PD-L1) and programmed cell death protein 1 (PD-1) is a crucial pathway that suppresses the function of immune cells. Cancer cells increase PD-L1 expression to inhibit the activity of immune cells (Pardoll, 2012). Therefore, immunotherapy is used to strengthen the immune system and create a more effective response against cancer cells.

CONSEQUENCES OF HOMEOSTATIC IMBALANCE

Tumor Development and Growth:

The disruption of homeostatic balance has a direct impact on tumor development and growth. Growth and proliferation mechanisms in normal cells are tightly regulated through various checkpoints and signaling pathways. However, in cancer cells, these mechanisms are disrupted, leading to uncontrolled growth. For instance, the inactivation of tumor suppressor genes like p53 results in uncontrolled cell cycle progression and inhibition of apoptosis (Levine, 1997). This leads to rapid proliferation of tumor cells and tumor growth (Hanahan & Weinberg, 2011).

Additionally, cancer cells promote proliferation by using abnormal signaling pathways resulting from homeostatic imbalance. For example, the Wnt/beta-catenin signaling pathway is activated in many types of cancer and affects processes of cellular proliferation and differentiation (Polakis, 2000). The abnormal activation of this signaling pathway also contributes to the maintenance of cancer stem cells and increases tumor heterogeneity, leading to issues like treatment resistance and disease recurrence (Clevers, 2006).

Mechanisms of Cancer Spread

Metastasis is the process by which cancer cells separate from the primary tumor and spread to other parts of the body. This process is associated with severe disruption of cellular homeostasis. Cancer cells break down the extracellular matrix and basement membrane, enter the blood or lymphatic vessels, and spread to distant organs (Fidler, 2003). This spread is supported by molecular changes that enhance the motility and invasion capabilities of cancer cells. For instance, the epithelial-mesenchymal transition (EMT) process contributes to the invasive and metastatic properties of cancer cells (Thiery, 2002).

A critical component of the metastatic process is the ability of cancer cells to survive and proliferate in new micrometastatic niches. This requires cancer cells to develop various adaptive strategies to suppress local immune responses and adapt to the new environment (Valastyan &

Weinberg, 2011). For example, the TGF- β signaling pathway helps metastatic cells escape the immune system using immunosuppressive mechanisms, facilitating the growth of metastatic tumors (Massagué, 2008).

TREATMENT RESISTANCE

Cancer cells are known for their ability to develop resistance to treatment. These resistance mechanisms are related to the reorganization of cellular homeostasis. For example, treatment methods such as chemotherapy or radiotherapy induce cell death by causing DNA damage. However, cancer cells can repair this damage and survive, developing resistance to treatment (Holohan et al., 2013). Additionally, cancer cells can develop mechanisms that prevent drugs from entering the cell or neutralize the drugs, leading to treatment failures and disease recurrence (Longley & Johnston, 2005).

Treatment resistance is further complicated by the heterogeneous nature and genetic plasticity of cancer cells. Targeted therapies may be effective initially, but over time, cancer cells can develop resistance to these therapies by bypassing the targeted signaling pathways or activating alternative pathways (Garraway & Jänne, 2012). For example, resistance to EGFR inhibitors can occur when cancer cells use alternative pathways like MET amplification or KRAS mutations (Engelman et al., 2007).

TREATMENT STRATEGIES

Restoring homeostatic balance is a crucial goal in cancer treatment. To achieve this, therapies have been developed to return cancer cells to normal cellular functions. For example, targeted therapies halt the growth and proliferation of cancer cells by aiming at specific molecular targets (Sawyers, 2004). Additionally, epigenetic therapies have the potential to restore homeostatic balance by regulating abnormal gene expression in cancer cells (Jones & Baylin, 2007).

Targeted therapies represent a revolutionary approach in cancer treatment. These therapies utilize specific molecular inhibitors to target the growth and survival mechanisms of cancer cells. For instance, trastuzumab targets the HER2 receptor in HER2-positive breast cancers, inhibiting the growth of cancer cells (Slamon et al., 2001). Similarly, imatinib targets the BCR-ABL fusion protein in chronic myeloid leukemia (CML), blocking cellular signaling and stopping the proliferation of cancer cells (Druker et al., 2001).

Immunotherapies aim to enhance the immune system's ability to recognize and destroy cancer cells. This treatment strategy targets the mechanisms by which cancer cells evade the immune system. For example, PD-1 and PD-L1 inhibitors block the signals that prevent immune cells from attacking cancer cells, thereby strengthening the immune response (Topalian et al., 2012). Immunotherapies have shown promising results, particularly in patients with advanced-stage cancer, and have ushered in a new era in cancer treatment (Sharma & Allison, 2015).

Another important component of immunotherapies is CAR-T cell therapy. Chimeric Antigen Receptor T (CAR-T) cells are created by genetically modifying a patient's own T cells to better recognize and destroy cancer cells. This treatment method has been particularly effective in

hematological cancers (e.g., acute lymphoblastic leukemia and lymphomas) and has shown high response rates even in patients resistant to conventional treatments (Maude et al., 2014). CAR-T cell therapy has revolutionized cancer treatment by reprogramming patients' immune systems to fight cancer more effectively.

Additionally, other strategies used in immunotherapies include immune checkpoint inhibitors, cytokine therapies, and cancer vaccines. Immune checkpoint inhibitors enhance T cell activation, creating a stronger immune response against tumor cells (Postow et al., 2015). Cytokine therapies involve the use of natural proteins that strengthen the immune system and target cancer cells. Cancer vaccines introduce cancer-specific antigens to train the immune system to recognize and mount a protective response against these cells (Mellman et al., 2011). These approaches are significant within the broad spectrum of immunotherapies, offering more personalized and effective solutions in cancer treatment.

CONCLUSION

Despite significant advances in cancer treatment, ongoing research efforts are needed due to the complex nature and heterogeneity of the disease. Future research areas include a better understanding of the genetic and epigenetic foundations of cancer. Gene editing technologies such as CRISPR/Cas9 enable targeting specific genetic changes in cancer cells (Doudna & Charpentier, 2014). Additionally, studying the metabolic pathways of cancer cells can lead to a better understanding of the Warburg effect and the energy production mechanisms of cancer cells. This knowledge could pave the way for new treatment strategies that starve cancer cells metabolically (Vander Heiden et al., 2009).

In-depth research into the role of the immune system in combating cancer can enhance the effectiveness of immunotherapies. Particularly, understanding the functions of immune cells in the tumor microenvironment can open new avenues for targeting immune escape mechanisms. Combined treatment approaches, such as the use of immunotherapies alongside traditional chemotherapy or radiotherapy, can increase treatment efficacy and prevent resistance development (Chen & Mellman, 2017).

In clinical applications, clinical trials play a critical role in evaluating the safety and efficacy of new treatment approaches. Immunotherapies have achieved significant success in clinical trials and have been adopted as standard treatments for some cancer types. For instance, anti-PD-1 and anti-PD-L1 therapies have shown long-term responses in advanced melanoma and lung cancer (Ribas & Wolchok, 2018). However, new strategies are needed for patients who do not respond to immunotherapies.

While CAR-T cell therapies have shown great success in hematological cancers, their effectiveness in solid tumors remains limited. Therefore, new targets and combination therapies are being explored to enhance the efficacy of CAR-T cells (June et al., 2018). Additionally, personalized medicine approaches allow the development of treatment plans based on patients' genetic profiles, leading to more targeted and effective strategies in cancer treatment.

In the future, multidisciplinary research and clinical trials will remain essential for achieving better outcomes in cancer treatment. The discovery of new biomarkers will allow prediction of

treatment responses and optimization of treatment plans. Furthermore, the development of minimally invasive treatment methods and therapies that reduce side effects will enhance patients' quality of life.

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LAWNAV: YAPAY ZEKA DESTEKLİ HUKUK DANIŞMANI YÖNLENDİRME UYGULAMASI

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ÖZET

Günümüzde internet uygulamaları hemen hemen hayatın her alanında günlük yaşantımızı kolaylaştırmaktadır. Herhangi bir konuda bilgi almak istediğimizde basit bir internet araması ile istediğimiz bilgiye kolayca ulaşabiliriz ancak özel bir durum için bir öneri almak istediğimizde bu arama çok basit olmayabilir. Örneğin; yaşadığımız bir hukuksal bir sorunu hangi alanda hizmet veren hukuk danışmanı görüşmemiz gerektiğini bulmaya çalışıyorsak internet ortamındaki bilgiler ile net bir karşılığını bulmamız mümkün olmayabilir. Bu tip durumlarda genellikle forum siteleri, facebook grupları gibi konu hakkında bilgisi olan uzmanların yorumlarıyla örnek olaya özgü cevabı bulabiliriz. Ancak günümüzde yapay zeka yardımıyla bu durumlar için herhangi bir uzman desteği olmadan istenilen cevaba ulaşılabilir. Bu çalışmada hukuk bürosuna danışacak kişilerin hangi alanda hizmet hukuk bürosuna gitmeleri gerektiğini bilgisini veren yapay zeka destekli bir uygulama geliştirilmiştir. Web tabanlı olarak geliştirilen bu uygulamada, ara yüze girilen örnek olay metnindeki kelimelerin köklerinin hesaplanarak yapılan veri ön işlemleri sonrasında, girilen metindeki kelimelerin frekansına bakılarak, en temel doğal dil işleme yöntemlerinden biri olan Bag of Words yöntemi ile sınıflandırma yapılmıştır. Uygulama çıktı olarak örnek olay metnini giren kullanıcının hangi alandaki hukuk bürosuna gitmesi gerektiğinin bilgisini vermektedir. Çalışma ile hem hukuk bürosu arayan kullanıcılar hem de hukuk büroları için alan dışı gelen kişilerle zaman kaybı yaşanmasının önüne geçilmiştir.

Anahtar Kelimeler: Doğal Dil İşleme, Bag of Words Model, Hukuk bürosu.

ABSTRACT

Nowadays, internet applications facilitate our daily lives in almost every aspect. When we want to obtain information on any subject, we can easily access the desired information with a simple internet search. However, getting a recommendation for a specific situation may not be as straightforward. For example, if we are trying to find out which field of legal consultant we need to consult for a legal issue we are experiencing, it may not be possible to find a clear answer with the information available on the internet. In such cases, we usually find answers specific to the example situation through the comments of experts on forums, Facebook groups, and similar platforms. However, today, with the help of artificial intelligence, it is possible to reach the desired answer for these situations without any expert support. In this study, an artificial intelligence-supported application has been developed to provide information on which field of legal service individuals should consult. In this web-based application, after performing data preprocessing by calculating the roots of the words in the example text entered into the interface, classification is done using the Bags of Words method, one of the most basic natural language processing methods, by looking at the frequency of the words in the entered text. The application provides information on which field of legal service the user should consult based on the example text entered. With this study, both users seeking legal services and law firms are prevented from wasting time with individuals coming for out-of-field issues.

Keywords: Natural Language Processing, Bag of Words, Law Firm.

GİRİŞ

Günümüzde internet teknolojilerinin ilerlemesiyle birlikte birçok bilgiye ve hizmete web sayfaları üzerinden ya da mobil uygulamalar üzerinden çok hızlı erişilebilmektedir. Hemen hemen her alandaki üretilmiş bilgiler, tecrübeler, deneyimler internet üzerinden paylaşılmaktadır. Ancak aranan bilgi özellikle sabit bir cevabı olmayan ve duruma özgü bir inceleme neticesinde üretilmesi ya da cevaplanması gereken bir bilgi ise basit bir internet aramasıyla bu bilgiye ulaşılamamaktadır. Bu tip durumlarda özel durumu dinleyip anlayıp bu duruma özgü cevap verecek bir bireye ihtiyaç duyulmaktadır. Özellikle derinlemesine bir bilgi birikimine ihtiyaç duyulan hukuki alanlarda cevap bulmak istenildiğinde, cevap duruma göre özelleşebildiğinden basit bir şekilde cevaba ulaşmak mümkün değildir. Bu tip durumlar için soru cevap şeklinde paylaşımların yapılabildiği ve cevapları karşı taraftaki uzmanların verdiği platformlar geliştirilmiştir.

Hukuk Evi platformu internet üzerinden erişimi olan bir web uygulamasıdır. Bu uygulamada daha önce sorulan sorular ve cevapları yer almaktadır. Sisteme eklenen sorulara arka tarafta uzmanlar cevap vermektedir(Hukukevi Soru & Cevap, t.y.). Hukuk Evi platformunun haricinde Hukuki Net isimli farklı bir web uygulaması bulunmaktadır. Hukuki.net platformu ise forum benzeri bir altyapıya sahiptir. Bilgi edinmek isteyenlerin soru sorduğu karşılığında sadece uzmanların değil tüm üyelerin cevap verebildiği genel bir bilgi paylaşımının olduğu bir

platformdur(HUKUKI.NET Hukuk Sitesi, t.y.). Hukuki Net ve hukuk Evi benzeri platformların hepsinde karşıda bir uzman veya konu hakkında bilgisi olan birinin olmasına ihtiyaç duymaktadır.

Günümüzde yapay zekanın günlük hayattaki uygulamalarda kullanılmasının yaygınlaşmasıyla birlikte bilgili kişilere ya da uzmanlara olan bağımlılığı azalmaktadır(Uslu vd., 2023). Hukuk ile ilgili platformlardaki uzman görüşü ihtiyacını azaltmak için yapay zeka destekli geliştirilen uygulamalar bulunmaktadır.

AI Lawyer, isimli uygulama hukuki konularda bir hukuk bürosu gibi hizmet veren bir uygulamadır. Kapsamlı olarak geliştirilen bu uygulama sadece hukuk danışmanına ihtiyaç duyan bireyleri değil hukukçularında araştırma yapmalarına ya da dava dosyalarını özetlemeye yönelik özellikler sunmaktadır(AI Lawyer, t.y.). Ancak bu ve benzeri uygulamaların kullanımı hukuk alanında bilgisi olmayan kişiler için çok kolay değil değildir.

Günlük hayatta kullanılan bu uygulamaların bulunmasına rağmen “Hukuki Bilgiye Dijital Erişim” adlı çalışmada, Türkiye’de hukuk alanında teknoloji kullanımının yetersizliğinde bahsetmiştir. Türkiye’de de geleneksel ve gelişen hukuki hizmet modelleri incelenerek yeni nesil hukuk hizmetinin daha etkin bir şekilde karşılanması için çalışılması gerekliliğini vurgulamıştır(Abanoz1, 2020)

Bu çalışmada hukuk bürolarına erişimi hızlandıracak ve basit tasarımı ile kullanım kolaylığını sağlayacak yenilikçi yapay zeka teknolojilerini kullanan bir uygulama geliştirilmiştir. Geliştirilen uygulama doğal dil işleme modellerinden Bag of Words yöntemini kullanarak kullanıcı tarafından girilen metnin hangi alandaki bir hukukçuya danışılarak çözülmesi gerektiğini tahmin edip kullanıcıyı ilgili alanda çalışan bir hukuk bürosuna yönlendirmektedir. Yapılan çalışma hem kullanıcılara kolaylık sağlarken hukuk bürolarındaki farklı alan için gelen ilgili bürolara yönlendirilmesi yoğunluğunu azaltması hedeflenmiştir.

YÖNTEM

Bu çalışma Google Colab kullanılarak Python programlama dili ile doğal dil işleme yöntemleri kullanılarak gerçekleştirilmiştir.

Python

Python, nesne yönelimli, yorumlamalı, modüler ve etkileşimli yüksek seviyeli bir programlama dilidir. Python, yapay zeka ve makine öğrenimi için literatürde sıklıkla kullanılmaktadır. Özellikle en yaygın kullanılan yapay zeka kütüphanelerinin başında gelen Keras, Pytorch, Tensorflow gibi kütüphaneler Python programlama dili üzerinde geliştirilmiştir. Literatürde yapılan çalışmalar incelendiğinde yapay zeka çalışmalarında Python yaygın şekilde kullanılmıştır. Ayrıca yapay zeka ve veri madenciliği gibi alanlarda bir çok paylaşım ve yarışmaların düzenlendiği Kaggle üzerinde de çalışmaların büyük bir çoğunluğu python dili ile yazılmıştır. Bu sebeple çalışmada pyhon dili kullanılmıştır.

Doğal Dil İşleme

Doğal dil işleme (NLP) metinler üzerinde işlem yapan yapay zekanın bir alt dalı olarak tanımlanmaktadır. NLP'nin amacı insan dilinin makineler tarafından anlaşılması ve işlenebilir hale gelmesidir(Li vd., 2015). Konuşulan dillerinin her birinin kendine özgü kuralları bir birinden farklı yapısı olduğundan dil işleme probleminin karmaşıklığını ve esnekliğini çözmek için farklı farklı modeller geliştirilmiştir. Dil bilgisi kurallarını, anlamını, bağlamını sözcüklerin birbirleriyle olan ilişkileri gibi birçok farklı alt özelliklere sahip bu dillerin bilgisayar tarafından anlaşılabilmesi için ön işleme adımları sıklıkla kullanılmaktadır. Bu ön işleme adımları dilin yapısına göre değişiklik göstermektedir. Yaygın olarak StopWord, LowerCasing, Tokenization ve Stemming ön işleme teknikleri kullanılmaktadır(Jakhotiya vd., 2022).

StopWord; bir dilde bulunan etkisiz kelimelerin metinden çıkartılarak yapılan doğal dil işleme hesaplarına dahil edilmemesi işlemine stopword denilmektedir(Sarica & Luo, 2021). İngilizce için “the”, “and”, “is” gibi kelimeler bulunurken Türkçede ise “için”, ”hem”, ”bile” gibi kelimeler bu kapsamda değerlendirilmektedir. Bu işlem ile NLP'deki hesaplama hızı arttırılmaktadır. LowerCasing ise kelimelerde bulunan büyük harflerin hepsinin küçük harflere indirgenmesi ve aralarda bulunan noktalama işaretlerinin kaldırılması işlemidir(Etchevoyhen & Ugarte, 2020). Tokenization, bir metnin kelimelere ayrılma işlemine tokenization denilmektedir. Bu işlem ile metin kelime kelime ayrılarak işlenmeye hazır hale getirilmektedir(Mohan vd., 2016). Stemming işlemi ise tokenizationdan sonra kelime köklerinin belirlenmesi için kullanılır. İyelik eki gibi ekler alan kelimelerin aynı kelimeyi ifade ettiklerini ve aynı kelime olarak değerlendirilmesini sağlamak için kullanılır(Anjali & Jivani, t.y.). Böylelikle kelime ayıklama sonrasında daha tutarlı bir kelime işlemi yapılabilmektedir.

Bags of words

Doğal dil işleme tekniklerinden basit ve temel olanı olarak nitelendirilmektedir. Bu teknikle kelimelerin metin içindeki frekansları değerlendirilerek bir sınıflama yapılmaktadır(Zhang vd., 2010). İstatistik temellere dayanana bu yöntem en popüler NLP yaklaşımlarından birdir(Tsai vd., 2012). Çıkartılan frekansa göre kullanılan modele göre en çok geçen kelimeler modelde belirlenen sınıfla ilişkilendirilir. Bu yöntemde uygulama modelde belirlenen kelimelerin hangi sınıfa ait olduğuna göre şekillenmektedir. Çalışma kapsamında kullanılan model Şekil1'de sunulmuştur.

```

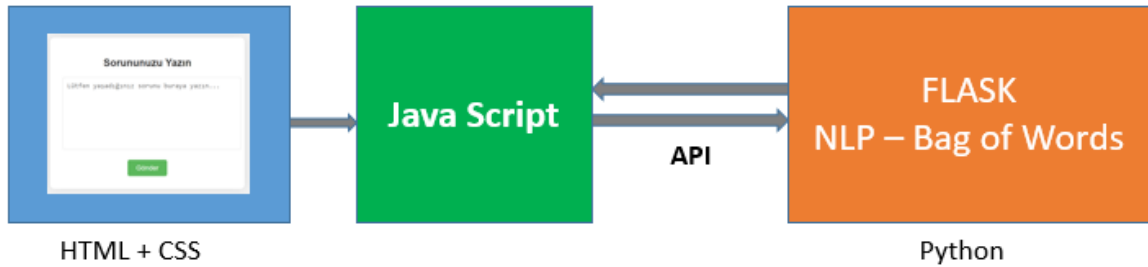
hukukBolumleri = pd.DataFrame({
    "aile": ["eş", "boşanma", "nikah", "nafaka", "vesayet"],
    "borç": ["alacak", "verecek", "borç", "ödeme", "sözleşme"],
    "mülk": ["tapu", "edinme", "satınalma", "emlak", "gayrimenkul"],
    "ceza": ["saldırı", "ceza", "suç", "adli", "dava"],
    "iş": ["işveren", "çalışma", "kovulma", "sözleşme", "işyeri"],
    "fikri_mülkiyet": ["eser", "izinsiz", "mülkiyet", "patent", "telif"],
    "taşınmaz": ["taşınmaz", "satış", "noter", "devir", "kira"],
    "idare": ["idari", "mahkeme", "kamu", "devlet", "zarar"],
    "rekabet": ["rekabet", "piyasa", "tekeli", "düzenleme", "engel"],
    "çevre": ["çevre", "doğal", "koruma", "atık", "kirlilik"],
    "vergi": ["vergi", "vergilendirme", "iade", "mükellef", "denetim"],
    "tüketici": ["tüketici", "ürün", "garanti", "şikayet", "mahkeme"],
    "miras": ["miras", "mirasçı", "hukuk", "vasiyet", "intikal"],
    "internet_ve_teknoloji": ["internet", "siber", "veri", "dijital", "gizlilik"],
    "deniz": ["deniz", "liman", "kaza", "elkoyma", "seyir"],
    "sigorta": ["sigorta", "poliçe", "tazminat", "hayat", "sağlık"],
    "spor": ["spor", "müsabaka", "doping", "yaralanma", "kulüp"]
})

```

Şekil 1. Bag of Words modeli

LAWNAV: YAPAY ZEKA DESTEKLİ HUKUK DANIŞMANI YÖNLENDİRME UYGULAMASI

Lawnav hukuk bürosuna danışmak isteyen bireylerin hangi alanda hizmet hukuk bürosuna gitmeleri gerektiğini bilgisini veren yapay zeka destekli geliştirilmiş bir uygulamadır. Yapılan çalışmada bir internet ortamında çalışan web uygulaması geliştirilmiştir. Html, Css ve Javascript'ten oluşan uygulama backend tarafından Flask altyapısı ile haberleşerek Python dili ile yazılan yapay zeka modeliyle çalışmaktadır. Uygulamanın mimarisi Şekil2' de sunulmuştur.



Şekil 2. Uygulama mimarisi

Uygulama ara yüzü mümkün olduğunca sade bir şekilde tutuklara kullanıcı dostu tasarlanmasına özen gösterilmiştir. Bootstrap Css kütüphanesi kullanılarak geliştirilen ekranda kullanıcının hukukçuya danışmak istediği sorununun yazabileceği bir metin kutusu bulunmaktadır. Metin girişi yapıldıktan sonra altta bulunan gönder butonuna basıldığında uygulama girilen metni API ile yapay zeka destekli çalışan backend'e gönderir. Backend'te çalışan yapay zeka stopWord, lower cating, Tokenization, ve Stemming metin ön işlemleri yaptıktan sonra elde edilen veriyi Bag of Word modeline gönderir. Bags of words'te gelen

verideki kelimelerin frekansı çıkartılarak hangi sınıfa dahil olduğu tahmini yapılır. Uygulamanın işlem adımları Şekil 3, Şekil 4 ve Şekil 5'te üç aşamada verilmiştir.

Uygulama Ara yüzü

Dijital Hukuk Danışmanınız:

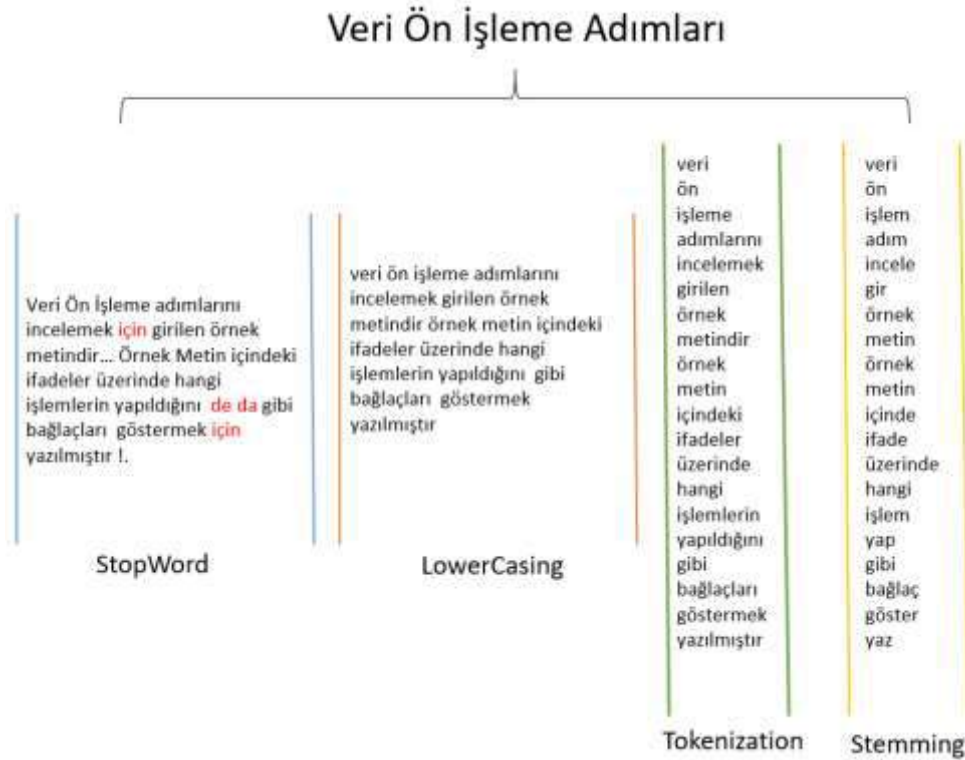
LAWNAV

Sorununuzu Yazın:

Veri Ön İşleme adımlarını incelemek için girilen örnek metindir... Örnek Metin içindeki ifadeler üzerinde hangi işlemlerin yapıldığını de da gibi bağlaçları göstermek için yazılmıştır !.

Gönder

Şekil 3. Uygulama veri giriş ekranı



Şekil 4. Veri ön işleme aşamaları

Doğal Dil İşleme



Şekil 5. Bag of Words sınıflama aşaması

Gerçekleştirilen uygulama sadece amaca yönelik basit bir tasarım tercih edilmiştir. Böylelikle teknoloji kullanımı düşük olan bireylerin dahi uygulamadan faydalanabilmeleri kolaylaştırılmıştır. Uygulamanın soru sorma ara yüzü Şekil 4’te soru sonrasında dönen cevap ise Şekil5’de verilmiştir.

Dijital Hukuk Danışmanınız:
LAWNAV
Sorunuzu Yazın:

Gönder

Şekil 6. Soru sorma ara yüzü

Bunları deneyebilirsiniz
Durumunuz Aile Hukuku kapsamında ele alınır. Eğer yerel bölgenizde Aile Mahkemesi varsa oraya, yoksa Asliye Hukuk Mahkemelerine başvurmanız gerekmektedir. Aile Hukuku, evlilik, boşanma, çocukların velayeti, mal paylaşımı gibi konuları kapsar.
[Tekrar soru sor](#)

Şekil 7. Cevap ekranı örnek görüntüsü

SONUÇ

Bu çalışmada hukuk bürosuna danışacak bireylerin, yaşadıklarının sorun ile ilgili hangi alanda hizmet veren bir hukuk danışmanına gitmeleri gerektiğini yönlendirmesini yapabilen yapay zeka destekli bir web uygulaması geliştirilmiştir.

Yapay zeka yöntemlerinden Doğal dil işleme tekniklerini kullanılarak geliştirilen uygulamada StopWord, LowerCating, Tokenization ve Stemming ön işleme adımları uygulanmıştır. Stopword ile dikkate alınmaması gereken kelimeler çıkartılmıştır. LowerCasting ile kelimeler noktalama işaretlerinden arındırılıp belirli bir kalıba sokulmuştur. Tokenization ile kelimelerine ayrılan metin Stemming ile köklerine ayrılmıştır. Tüm bu ön işlemler sonrasında Bag of Words tekniği kullanılarak metin içerisindeki kelimelerin frekansları belirlenmiştir. Frekansları çıkartılan kelimeler ile modeldeki sınıflar karşılaştırılarak sınıflama yapılmıştır.

Geliştirilen uygulama web tabanlı olup sade bir tasarıma sahiptir. Kullanıcı tarafından metin kutucuğuna girilen metin doğal dil işleme yöntemlerinden geçirilerek sınıflandırılmaktadır. Sınıflama neticesinde kullanıcının hangi alanda hizmet veren bir hukuk bürosuna gitmesi gerektiği kullanıcıya sunulmaktadır.

Bu çalışma neticesinde kullanıcıların doğrudan bir Google araması ile ulaşamadıkları bir bilgiye yapay zeka desteği ile ulaşım sağlanmıştır. Bu bilgi genellikle bir web platformu üzerinden yine uzman kişilerin görüşleri alınarak ya da rastgele bir hukuk bürosuna giderek elde edilebilmektedir. Çalışma sayesinde hukuk bürolarına gelen yanlış başvurular önlenmiştir.

Çalışma yönlendirmeyi sağladıktan sonra kullanıcıların çevrelerindeki o alanda hizmet veren hukuk bürolarını bulmak için tekrar Google'a başvurmaları gerekmektedir. Bu durum kullanıcıyı ikinci bir araç kullanmaya itmektedir.

Gelecekte yapılacak çalışmalarda kullanıcının çevresindeki ilgili hukuk bürolarını listeleyen adres ve telefon bilgilerini getiren bir iyileştirme yapılması çalışmanın işlevselliğini arttıracaktır.

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EHLİYET SINAVINA YARDIMCI SÜRÜCÜ SİMÜLATÖRÜ

DRIVER SIMULATOR TO ASSIST WITH DRIVER'S LICENSE EXAM

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ÖZET

Bu çalışmada ehliyet alım sürecindeki maliyetleri minimize etmek ve bireylerin araç kullanırken yapması gereken temel kuralları alışkanlık haline getirmeyi hedefleyen bir sürücü ehliyet simülatorü geliştirilmiştir. Günümüzde araç kullanımının yaygınlaşmasıyla birlikte sürücü ehliyeti hemen hemen herkesin ihtiyacı haline gelmiştir. Sürücü ehliyeti alınırken araç kullanımı için yapılan pratikler ve sınava hazırlanması sırasında araç kullanımında oluşan araç, yakıt ve araç bakım giderleri düşünüldüğünde oldukça maliyetli bir süreçtir. Bu maliyetlerin azaltılması ve sürücülerin daha çok pratik yapabilmesi amacıyla Unreal Engine oyun geliştirme ortamı üzerinde geliştirilen bu simülator sürücü eğitimi, eğitim modu, manuel vites sınavı ve otomatik vites sınavı olmak üzere üç farklı modda kullanılabilir. Geliştirilen uygulama eğitim modunda çalıştırıldığında emniyet kemeri, sinyal, trafik ışıkları gibi durumlarda sesli ve yazılı şekilde uyarılar yapılarak bireyin kuralları öğrenmesi ve alışkanlık haline getirmesi hedeflenmektedir. Sınav modlarında ise herhangi bir uyarı yapılmayarak kullanıcının hatasız kullanması beklenmektedir. Sınav modlarında herhangi bir hata durumunda sınavdan geçemediniz uyarısı verilerek baştan sınav başlama ekranına dönülmektedir. Simülator üzerinde yapılacak tekrarlar ile herhangi bir araç veya yakıt maliyeti olmadan bireyin temel alışkanlıkları sağlanabilmektedir. Çalışma kapsamında geliştirilen simülator bilgisayar ortamında masaüstü uygulaması şeklinde çalışmaktadır. Simülator klavye ile kullanılabileceği gibi direksiyon, vites ve pedalların olduğu donanımlarla kullanılabilmektedir. Gelecekte yapılacak çalışmalarda bir araba prototipi geliştirilerek simülatorün fiziksel olarak desteklenmesi çok daha başarılı bir sonuç elde edilmesini sağlayabilir.

Anahtar kelimeler: Simülator, Sürücü Ehliyeti, Unreal Engine.

ABSTRACT

In this study, a driver's license simulator was developed to minimize the costs associated with obtaining a driver's license and to help individuals form habits of following the basic rules while driving. With the increasing prevalence of vehicle usage today, having a driver's license has become almost a necessity for everyone. The process of obtaining a driver's license is quite costly when considering the vehicle, fuel, and maintenance expenses incurred during driving practice and exam preparation. To reduce these costs and allow drivers to practice more, this simulator, developed on the Unreal Engine game development platform, can be used in three different modes: driver training, training mode, manual transmission exam, and automatic transmission exam. When the developed application is run in training mode, individuals are provided with audio and written alerts in situations such as wearing seat belts, signaling, and traffic lights to help them learn and internalize the rules. In exam modes, no alerts are given, and the user is expected to drive without errors. In the event of any mistakes in exam modes, a warning is given indicating that the exam was not passed, and the user is returned to the exam start screen. Through repeated use of the simulator, individuals can develop basic driving habits without incurring any vehicle or fuel costs. The simulator developed in this study operates as a desktop application in a computer environment. It can be used with a keyboard as well as with hardware that includes a steering wheel, gear shift, and pedals. In future studies, developing a car prototype to physically support the simulator could yield even more successful results.

Keywords: Simulator, Driver Licence, Unreal Engine.

GİRİŞ

Günümüzde gelişen teknoloji ile birlikte eğitim(Kaplanoglu & Topdal, 2011), hemşirelik (Sezer & Orgun, 2017), denizcilik (Bolat et al., 2021), savunma sanayii (Bakırtaş, 2022), sanal laboratuvarlar(Özdener & ERDOĞAN, 2014) ve çeşitli makinelerin kullanımı gibi alanlarda simülasyon uygulamaları yaygın olarak kullanılmaktadır. Simülasyonlar bir olay veya makinenin gerçeğine uygun şekilde sanal olarak modellenip kullanıcılar tarafından deneyimlenebilmesini hedefleyen sistemlerdir. Simülasyonlar bir sistemi deneyimlerken edinim maliyetleri, kullanımı sırasında ortaya çıkan maliyetler ve kullanım sırasındaki oluşabilecek risklerin minimum seviyeye getirilebilmesi amacıyla geliştirilirler(Makalesi et al., 2023).

B. Sætren ve arkadaşları sürücü ehliyet eğitiminde kullanılan simülasyonun eğitim sürecine olan etkisini incelemişlerdir. Yaşanabilecek kazaların önüne geçmek sadece kurallara uygun sürüşleri değil, kaza yaşanabilecek riskli durumları da simülasyonun içerisine dahil ederek sürücülerin kaza anında nasıl davranmaları gerektiğinin eğitimini vermişlerdir. Ayrıca çalışmalarında karlı, yağmurlu güneşli hava seçenekleriyle simülasyonu zenginleştirmişlerdir. Çalışma sonucunda sürücülerin bu eğitimden hem pozitif etkilendiğini hem de çevre dostu bir yaklaşım olduğunu ifade etmişlerdir(Sætren et al., 2018).

Amerika Birleşik Devletlerinin Kaliforniya eyaletinde yapılan bir çalışmada trafik kazası yapan sürücülerin yaş grupları incelendiğinde genel nüfusa oranla çoğunluk genç ve acemi sürücülerin olduğu tespit edilmiştir. Genel nüfusa oranla %77'lik kazaya karışma oranına sahip geç nüfus yapılan simülatör çalışmaları sonrasında %34'e düşerek önemli bir iyileşme olduğu tespit edilmiştir. Uygulama yapılırken ayrıca üç farklı simülatör kullanılmış ve bunların arasındaki farklarda incelenmiştir. İnceleme sonucunda gerçek araba kabinine benzer yapılan simülatör daha başarılı olduğu görülmüştür(Allen et al., 2007).

Taheri ve arkadaşları yaptıkları çalışmalarında sanal gerçeklik ortamında sürücü simülatörü geliştirmişlerdir. Simülatörü Unity oyun geliştirme motoru ortamında oluşturmuşlardır. Simülatör ile hız limitlerine bağlı kalan sürücüler ile limitleri aşan sürücülerin karakteristik özelliklerini ve duyu durumlarını çıkarmayı hedeflemişlerdir. Yapılan çalışma sonucunda hız limitleri aşıldığında yorgunluk ve kontrol edememe seviyelerinin arttığı görülmüştür(Taheri et al., 2017).

Literatürde araba sürücüleri için geliştirilen simülatörlerin farklı amaçlar için kullanılabilecekleri görülmüştür, günümüzde akaryakıt fiyatları, araba edinim maliyetleri ve buna bağlı olarak arıza veya kaza durumlarında tamir masraflarının oldukça yüksek olması, ehliyet eğitimi veren kurs işletmelerinin uygulamalı eğitim vermelerinin kısıtlamaktadır.

Bu çalışmada ehliyet eğitimi veren kurs işletmelerinin bu maliyetlerini düşürmek ve kursiyerleri ehliyet sınavındaki temel becerilere alıştırmak için bir ehliyet sınav ve eğitim simülasyonu geliştirilmiştir. Geliştirilen simülatör ile hem yakıt ve arıza maliyetlerinin düşürülmesi, hem de kursiyerlerin temel alışkanlıkları edinip gerçek uygulama sırasındaki hazır bulunurluklarını yükseltmek hedeflenmiştir. Temel ehliyet kurallarını uygulama ve hatırlatma üzerine geliştirilen bu simülasyon ile vitesli ve otomatik ehliyet sınavları simülasyonu ile kursiyerlerin kendilerini test etmelerine imkan sağlamaktadır. Simülatör Epic Games tarafından geliştirilen Unreal Engine oyun motoru ortamında oluşturulmuştur. Bilgisayar üzerinde herhangi bir ek donanım veya yazılıma ihtiyaç duymadan basit bir şekilde çalıştırılabilmektedir.

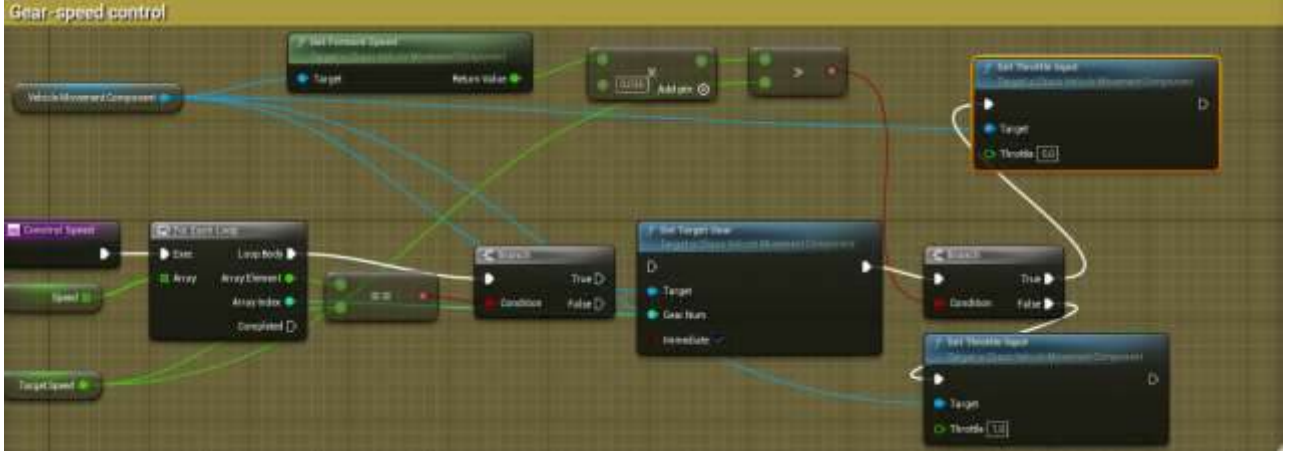
MATERYAL VE METOT

Çalışmada gerçekleştirilen uygulama Unreal Engine ortamında hazırlanmıştır. Unreal Engine ortamına destekleyici olarak Photoshop CS6, Quixel Bridge ve Blender'dan faydalanılmıştır. Menü tasarımları Photoshop CS6 ile geliştirilirken uygulama içerisindeki 3d modeller için Quixel Bridge ve Blender kullanılmıştır.

Unreal Engine

Unreal Engine, Epic Games tarafından geliştirilen bir oyun motoru ve yazılım geliştirme ortamıdır. İlk olarak 1998 yılında Unreal oyunu için tasarlanan bu motor, sadece oyun yapımı için değil film yapımı, simülasyonlar, görselleştirme projeleri ve eğitim programları gibi çeşitli alanlarda kullanılmaktadır(Kumar, 2020). Unreal Engine, farklı ekran özellikleri için kolay bir şekilde uygulama geliştirmemizi ve geliştirilen uygulamaların PC, konsol, mobil cihazlar gibi farklı platformlar için geliştirilebilmesine olanak sağlamaktadır. Unreal Engine kullanımını

arttıran özelliklerinden biri Blueprint teknolojisidir. Blueprint teknolojisi ile kod sayısını azaltarak diyagramlar üzerinden senaryoyu gerçekleştirerek mümkün olduğunca az kodlama yapıp istenilen çalışmayı gerçekleştirme imkanı sunmayı hedeflemektedir. Çalışma kapsamında kullanılan Blueprint diyagramı aşağıdaki Şekil 1’de sunulmuştur.



Şekil 1. Blueprint diyagram

Blender

Blender, ücretsiz ve açık kaynaklı bir 3D modelleme ve animasyon yazılımıdır. Geniş kullanıcı kitlesi tarafından tercih edilen bu yazılım, modelleme, animasyon, rendering ve video düzenleme gibi birçok özelliğin kullanılmasını sağlar. Blender'ın temel özellikleri, 3D modelleme ve sculpting araçları, animasyon ve rigging özellikleri, güçlü rendering motorları, UV mapping ve texturing araçları, video düzenleme yetenekleri ve açık kaynak olmasıdır. Bu özellikler ile basit projelerde kullanılacağı gibi karmaşık projelerde de tercih edilmektedir. Blender açık kaynaklı olduğu için 3D modelleme üzerine çalışılan projelerde çok yaygın şekilde tercih edilmektedir(Hosen et al., 2019). Simülator için Blender’da düzenlenen araç aşağıdaki Şekil 2’de sunulmuştur.



Şekil 2. Simülator için hazırlanan araç görseli

Photosop CS6

Adobe Photoshop CS6, 2012 yılında piyasaya sürülen bir grafik düzenleme yazılımıdır. Fotoğraf düzenleme, grafik tasarım ve 3D çalışmaları gibi geniş bir yelpazede profesyonel kullanıcıların ihtiyaçlarını karşılamak üzere tasarlanmıştır. İçerisindeki filtre efekt gibi hazır bileşenler ile hızlı şekilde tasarımlar gerçekleştirilmesi mümkündür. Çalışmada simülasyon başlangıç ekranı ve alt menülerin bulunduğu sabit ekranların tasarımları Photoshop ortamı üzerinde düzenlenmiştir. Çalışma kapsamında uygulamanın çok detaylı özelliklerine ihtiyaç duyulmadığı için son sürümleri kullanılmamıştır.

Quixel Bridge

Quixel Bridge, Quixel'in Megascans kütüphanesini kullanan bir masaüstü uygulamasıdır. 3D model geliştirme sürecine yönelik tasarlanmıştır. Quixel Bridge ile dünya nesnelere yüksek çözünürlüklü 3D taramalarını içeren Megascans kütüphanesindeki içeriği ulaşıp düzenlenmesi kolaylaşmaktadır. Quixel Bridge ile edinilen 3D veya 2D nesnelere blender programına kolay bir şekilde entegre edilip üzerinde oynamalar yapılabilmektedir(Tan, 2024). Çalışma kapsamında kullanılan 3D nesnelere buradan indirilip blender ile uygulamaya hazır hale getirilmiştir.

EHLİYET SINAVINA YARDIMCI SÜRÜCÜ SİMÜLATÖRÜ

Ehliyet simülasyonu herhangi bir kurulumla ihtiyaç olmadan taşınabilir bir uygulama olarak geliştirilmiştir. Uygulama çalıştırıldığında ana menünün bulunduğu ekran açılmaktadır. Bu ekranda başlama, ayarlar ve çıkış seçenekleri bulunmaktadır. Ana menünün bulunduğu ekran görüntüsü aşağıdaki Şekil 3'te görülmektedir.



Şekil 3. Ana menü ekran görüntüsü

Ana menü üzerinden erişilebilen ayarlar menüsünde son kullanıcı kendi isteğine ve çalıştıracağı bilgisayar özelliklerine göre pencere boyunu, çözünürlüğünü ve görüntü kalitesini değiştirebilmektedir. Ayarlar menüsünün olduğu ara yüz aşağıdaki Şekil 4'te sunulmuştur.



Şekil 4. Ayarlar ara yüzü

Ana menüden başlangıç butonuna basıldığında simülasyonun hangi amaçla kullanılacağına seçildiği ekrana geçilmektedir. Bu ekranda simülasyon ehliyet alacak kursiyere destek olmak için, eğitim, manuel sınav ya da otomatik sınav seçeneklerinin bulunduğu üç farklı senaryoyu sunmaktadır. Seçim ekranı Şekil 5’te görülmektedir.



Şekil 5. Simülasyon senaryo seçenek ekranı

Simülasyonda Unreal Engine içerisinde bulunan hazır kaynaklar kullanılarak bir harita oluşturulmuştur. Bu harita üzerinde seçilen senaryoya uygun şekilde araç kullanılarak eğitim ve sınav gerçekleştirilebilmektedir. Eğitim senaryosunda harita üzerinde belirlenen noktalarda sesli uyarılar verilerek kullanıcının eğitimi desteklenmektedir. Oluşturulan şehir haritası aşağıdaki Şekil 6’da sunulmuştur.



Şekil 6. Simülasyon haritası

Simülâtör içerisinde Unreal engine tarafından hazır sunulan bir araba asseti kullanılmıştır. Kullanılan arabaya sinyal kontrolleri, vites kontrolleri ve kemer kontrolleri eklenmiştir. Kullanılan arabanın içten görünümü aşağıdaki Şekil 7’de verilmiştir.



Şekil 7. Simülasyon aracının içten ve dıştan görünümü

Araç kullanımı için klavye üzerinde bulunan WASD tuşları yönlendirme ve hareket ettirme işlemlerini sağlayacak şekilde belirlenmiştir. Fren yapmak için Space tuşu belirlenmiştir. Sinyalleri yakıp söndürürken sol sinyal için Ğ tuşu sağ sinyal için Ü tuşu atanmıştır. Farları yakmak için ise F tuşu belirlenmiştir. Aracın motorunu çalıştırma ve durdurma için E tuşu, ehliyet kemeri için H tuşu belirlenmiştir. Bu yönlendirme tuşlarının yardımıyla simülasyonda araç hareket ettirilip seçenekler menüsünde seçilen senaryoya uygun şekilde istenilen şekilde eğitim ve sınav için kullanılabilir. Simülasyonun kullanımındaki farklı ekran görüntüleri Şekil 8, Şekil 9 ve Şekil 10’da sunulmuştur.



Şekil 8. Simülör kullanım örnek görüntüsü



Şekil 9. Sınavdan kalma uyarı ekranı



Şekil 10. Simülör park etme görüntüsü

SONUÇ

Bu çalışmada ehliyet sınavına yönelik, ehliyet almak isteyen bireylere yardımcı olacak ve sınav başarımlarını arttırmayı hedefleyen sanal bir ehliyet sınav simülörü geliştirilmiştir. Kullanıcıların geliştirilen simülör ile temel bilgileri tekrar ederek gerçek hayatta uygulamaya geçmeden önce bilişsel olarak alışkanlıkların edinilmesi ve bunun yanı sıra maliyetlerin minimize edilmesi hedeflenmiştir.

Unreal Engine oyun geliştirme ortamında gerçekleştirilen bu çalışmada kullanılan araç trafik ışıkları, yollar, binalar gibi 3D modeller ücretsiz olarak paylaşılan Quixel Bridge platformu üzerinden indirilmiştir. Kullanılan bu nesnelere ihtiyaca göre blender üzerinde düzenlemeler gerçekleştirilerek uygulama içerisine eklenmiştir. Simülörün başlangıç ekranı ve içerisinde seçeneklerin sunulduğu alt menüler Photoshop CS6 programı üzerinde gerçekleştirilmiştir. Simülör masaüstü uygulaması olarak kullanılabilir. Simülörün başlangıç ekranı ve içerisinde seçeneklerin sunulduğu alt menüler Photoshop CS6 programı üzerinde gerçekleştirilmiştir.

Simülörde manuel sınav, otomatik sınav, eğitim çalışması olarak üç farklı sürüş seçeneği bulunmaktadır. Manuel sınav modu, vites geçişlerini kullanıcıların kontrol ettiği bir ve sınav kurallarının işletildiği bir sürüş seçeneğidir. Otomatik sınav modu ise manuel sınav modu ile aynı özelliklere sahip sadece vites geçişleri simülör tarafından gerçekleştirilmektedir. Eğitim çalışmasında ise kullanıcıya yapması gereken davranışları sesli ve yazılı uyarılar şeklinde

vererek kullanıcının farkındalığını yükselterek kullanıcının sürüş ve sınava hazırlanmasında yardımcı olmaktadır.

Ehliyet eğitiminin teorik kısmı çok maliyetli olmasa da pratik kısmında hem araç, bakım, yakıt gibi maliyetler çok yüksektir hem de yeni öğrenen bireylerin yapabilecekleri muhtemel hatalardan kaynaklı kaza riskleri oldukça yüksektir. Çalışmada geliştirilen simülatör ile pratik uygulamalara geçmeden önce sanal ortamda tekrar yapılarak emniyet kemeri takma, sinyal verme gibi temel kuralların alışkanlık edinilmesi sağlanmaktadır. Ayrıca günümüzde araç edinim maliyetleri, araç bakımları ve yakıt maliyetinin oldukça yüksek olduğundan yapılacak ön eğitim ile buradaki pratik öğrenim sürecini hızlandıracağından yakıt ve aracın diğer bakım masraflarında önemli bir azalma sağlanmış olacaktır. Çalışma maliyetleri düşürmek, riskleri azaltmak ve eğitim sürecini desteklemek için oldukça önemli bir rol oynamaktadır.

Gelecek çalışmalarda simülatörün kullanıcılar üzerindeki etkini arttırmak için fiziksel bir prototip geliştirilebilir. Literatürdeki çalışmalarda da simülatörün fiziksel olarak gerçek ortama benzer bir şekilde oluşturulmasının simülatördeki eğitime daha çok fayda ettiği görülmüştür.

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CNN-BASED FEATURE EXTRACTION AND MACHINE LEARNING CLASSIFICATION APPROACH FOR DIAGNOSIS OF PARKINSON'S DISEASE

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ABSTRACT

Parkinson's is defined as a progressive neurodegenerative disease affecting the central nervous system. Early diagnosis of the disease is crucial to improve patients' quality of life and slow the progression of the disease. However, the early stages of Parkinson's disease present with vague symptoms and are very difficult to diagnose. In recent years, the use of computer-aided systems in the field of health has become increasingly widespread. In the health sector, these systems have gained great importance for the diagnosis and treatment process of the disease, especially in diseases where early diagnosis is vital. Traditional deep learning (DL) models and Convolutional Neural Network (CNN) based approaches, which are frequently used in this context, may have difficulty in capturing some complex patterns and fine details when used as a classifier in image classification and feature extraction. The aim of this study is to help early diagnosis of Parkinson's disease by classifying the feature extractions obtained from CNN models by machine learning models. In this study, features extracted from VGG19, VGG13, Resnet50, ResNet34 architectures were classified by Gradient Boosting Machine (GBM), eXtreme Gradient Boosting (XGBoost), Logistic Regression (LR), Support Vector Machine (SVM), Random Forest (RF) machine learning models. As a result of these classification models, the highest Accuracy rate was obtained with ResNet50+XGBoost models with 94.33%

Keywords: Parkinson Disease, Feature Extraction, Classification, Machine Learning, Convolutional Neural Networks

INTRODUCTION

Parkinson's disease, also known as 'tremor paralysis', is a neurodegenerative disease that affects the central nervous system and progresses continuously. It was first described by James

Parkinson in 1817 (Khan et al., 2019). This disease, which usually occurs in individuals aged 60 years and older, affects millions of people worldwide. The most common and prominent symptoms of Parkinson's disease include involuntary tremors, muscle stiffness, slowing of movements, balance and coordination problems (Willis et al., 2022). These symptoms cause a decrease in dopamine levels in the brain and lead to impairments in motor functions. Parkinson's disease is considered as a global health problem with its social and economic dimensions by seriously negatively affecting the quality of life of patients (Garg et al., 2023). With the progression of the disease, individuals have difficulty in maintaining their daily lives and meeting their basic needs, which creates a significant burden for relatives and carers (Choi & Cho, 2022).

Currently, Parkinson's disease cannot be completely cured or eliminated with current treatment methods and technologies. Prospects for slowing the course of the disease and improving patients' quality of life are based on the correct diagnosis of the disease at an early stage, managing symptoms and developing appropriate treatment strategies. This can reduce long-term health consequences related to disease progression. However, as Parkinson's disease shows non-specific symptoms in its early stages, these symptoms can be confused with other neurological diseases. This increases the importance and difficulty of early diagnosis. Currently, clinical methods, neurological tests and medical imaging techniques are used for early diagnosis of Parkinson's disease. Although these methods are necessary to identify the disease, early and vague symptoms can be confused with other neurological problems, making diagnosis difficult.

However, traditional methods are not always able to detect biomarkers of Parkinson's, especially in the early stages of the disease. In this respect, technology, especially advanced technologies such as deep learning (DL) and image processing, are of great importance. Artificial Intelligence (AI), Machine Learning (ML) and DL have become popular in health sciences in recent years. The use of these technologies in healthcare is largely successful (Obayya et al., 2023.). The ability to recognise patterns and features in big data and images gives these technologies great advantages. Technologies in this field have also been applied to the early diagnosis of Parkinson's disease. In addition, there are examples in the literature for the classification of Parkinson's patients based on images obtained without any additional processing, such as brain MRI images and hand drawings of Parkinson's patients. The application of deep learning and image processing technologies in the health field can be seen as a revolutionary development in the early diagnosis of Parkinson's disease and it is of great importance to continue research in this field (Shaban et al., 2023.). Deep learning and image processing, as specialised sub-branches of artificial intelligence, have been frequently used in the field of health and especially in the early diagnosis of neurological diseases. However, studies in this field generally focus on traditional DL models and CNN-based approaches and evaluate the results obtained.

The main objective of this study is to investigate the potential of integrating CNN models with ML algorithms as an alternative to traditional deep learning models and existing medical

diagnosis methods in the early diagnosis of Parkinson's disease. Considering the difficulties encountered in the detection of distinctive biological signs in the early stages of Parkinson's disease, this research aims to contribute to the development of more accurate and reliable diagnostic methods. By overcoming the limitations of traditional methods, the study aims to provide new approaches that will enable more effective diagnosis in the early stages of the disease. At the same time, this study aims to provide new perspectives on the innovative solutions that the integration of deep learning and machine learning methods can create in medical diagnostics.

MATERIALS AND METHODS

Dataset

In this study, in order to perform a comparative analysis of Parkinson's disease with deep learning techniques, a unique dataset created by 'K Scott Matter' and containing drawings of Parkinson's patients was used (Kumar & Bansal, 2023; Parkinson's Disease Augmented Data of Handdrawings, n.d.). In the dataset, 'Spiral' and 'Waves' type drawings were drawn and classified by healthy individuals and Parkinson's disease patients. The 204 images in the original dataset were expanded to 3264 images using data augmentation techniques. This augmentation was performed by rotating the images by 90°, 180°, and 270°, vertically flipping them, and colouring them.

These dataset manipulations aim to allow deep learning models to learn handwriting differences between healthy individuals and Parkinson's patients more effectively. The study aims to develop a system for the automatic detection of Parkinson's disease based on simplified clinical tests of hand drawings. The dataset was selected for this purpose and no additional intervention was made other than resizing. The content of the dataset is shown in Figure 1.

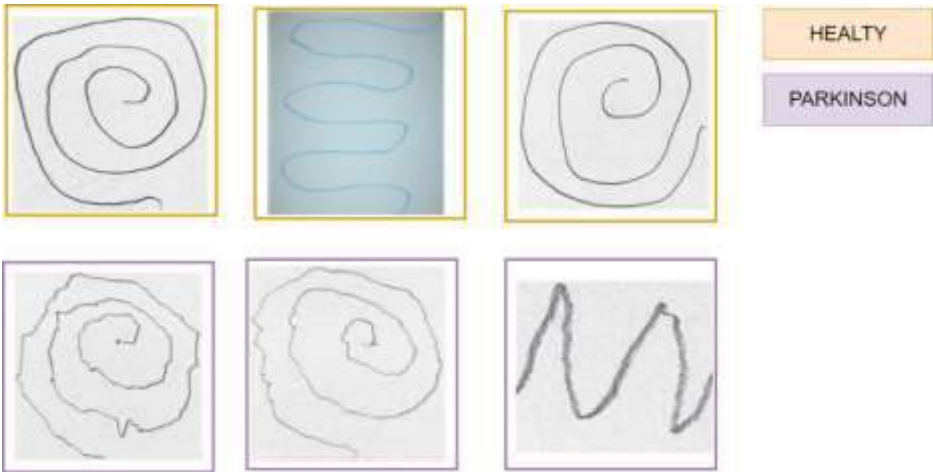


Figure 1. image of dataset content

In this study, considering the methods used in the diagnosis of Parkinson's disease and the difficulties encountered, it is aimed to facilitate early diagnosis by classifying hand drawings, one of these methods, with deep learning techniques. In line with this goal, CNN architectures were used in the feature extraction process and model training was performed with machine learning techniques. A comparative analysis study was carried out by training CNN models with machine learning models by extracting features under similar and optimum hyperparameters. In the study, especially CNN-based Vgg19, Vgg13, ResNet50 and ResNet34 models were used to extract features from hand drawings and to diagnose the presence of Parkinson's disease.

In this study, a comparative analysis was carried out considering the potential of both methods to support the early diagnosis of Parkinson's disease through tests that are more easily accessible than other clinical tests such as hand drawings. As a result of these comparisons, the advantages and limitations of the models for disease diagnosis were identified and it was aimed to determine the most appropriate model combination that could make the classification with the highest accuracy in the early stage of Parkinson's disease. The work flow is as given in Figure 2.

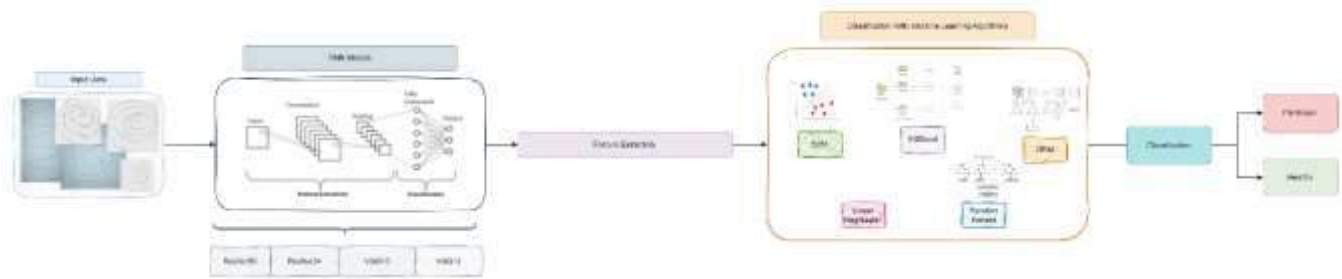


Figure 2. Work flow diagram

ResNet-50

In 2015, Kaiming He et al. developed a neural network called ResNet, now known as Networks. This neural network has come to the forefront by winning first place in many competitions such as ILSVRC and COCO2015 (He et al., 2016). Since the emergence of deep learning architectures, it was thought that the success of the network was related to its depth (Masilamani & Valli, 2021). However, studies have shown that success can reach a certain point as the number of layers increases. After this point, the trained model experienced adaptation problems such as overlearning by memorising the data it sees (Junaidi et al., 2021). To solve these problems, ResNet architecture is now a method developed to provide shortcut connections that form a block structure. ResNet-50 and ResNet-34 architectures have also provided a new solution to this problem by aiming to provide new solutions to the overfitting and underfitting problems faced by models with many layers.

ResNet-50 and ResNet-34 architectures from ResNet family are also analysed among the models trained in this study. These models use a block structure called residual block as a

solution to the problems of overfitting, which is defined as the memorisation of the data during the training phase, and underfitting, which is defined as not understanding the relationship between patterns. Thanks to this method, it is aimed to realise an effective model training process and to avoid problems such as overfitting and underfitting in the training phase, although both models have complex structures. Thanks to this structure, complex and deep structures are avoided and a more efficient working time is achieved.

ResNet-50 and ResNet-34 architectures used in this study are among the ResNet architecture family architectures that stand out with their accuracy and success rates. As shown in Figure 3, the layer structure and details of ResNet models are designed to have a complex and effective structure by using different block structures that can achieve effective results in deep learning-based image processing tasks.

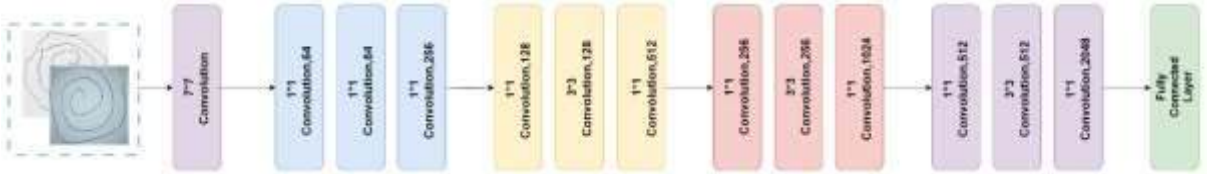


Figure 3. Resnet architecture content

VGG

The VGG series is a family of CNN architectures that stands out with its high performance in tasks such as image classification. Although the models in this CNN architecture family have similar structures, they are distinguished from each other by the different number of convolution layers and are named according to the number of these layers (Simonyan & Zisserman, 2015). The VGG-19 and VGG-13 models in this series are models with 19 and 13 convolution layers, respectively. Although VGG architectures have different depths, they have similar layers. At this point, they perform in different effects by performing different feature extractions on images with different depths. VGG -19 and VGG-13 architectures have a basic structure consisting of a series of pooling, convolutional and fully connected layers. Although they have different number of layers, these models have a similar structure and have a high performance by recognising patterns and features in images. Both models are characterised by their efficiency in feature extraction as shown in Figure 4, which is particularly advantageous for large and diverse datasets.

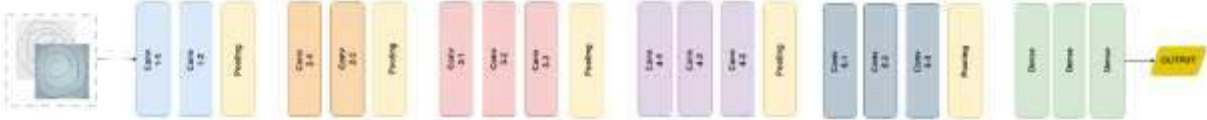


Figure 4. VGG architecture content

The VGG models introduced in ‘Very Deep Convolutional Networks for Large-Scale Image Recognition’ were developed by K. Simonyan and A. Zisserman of Oxford University. ImageNet image dataset consists of a large number of images and classes. VGG models were tested on this dataset and achieved high accuracy rates and high performance. In particular, VGG-19 has a deeper structure compared to other architectures and can perform high performance in more detailed and fine features. In addition, considering the VGG-13 architecture, it is seen that although it has fewer layers, it can produce more efficient results in terms of speed and computation compared to other models. Both models are considered to be classical approaches in the fields of deep learning and image processing and form the basis of many modern CNN architectures.

RESULTS AND DISCUSSION

In this paper, it is aimed to use various machine learning and deep learning models together to measure the classification success of Parkinson's disease on handwritten spiral and wave images. In the study, feature extraction was performed for each data using CNN models. The extracted features were trained with machine learning models to perform classification and a comparative analysis was performed using various performance evaluation metrics. The combination of modern deep learning models, which have rapidly increased in popularity in recent years, with machine learning algorithms in this study has enabled more powerful and effective results to be obtained.

Machine learning models such as Gradient Boosting Machine (GBM), eXtreme Gradient Boosting (XGBoost), Logistic Regression (LR), Support Vector Machines (SVM) and Random Forest (RF) were used in the study. Accuracy rates were tested and analysed using features obtained from various CNN architectures (VGG19, VGG13, ResNet50, ResNet34). Table 1 presents the accuracy results of the study by combining these CNN architectures with machine learning models.

Table 1. Accuracy results of CNN architectures

Model	Large-32	Large-16	Base-32	Base-16
RF	92,8	96,63	93,26	94,95
SVM	97,4	98,16	95,25	95,71
LR	96,48	96,48	95,56	93,87
XGBoost	96,48	97,86	96,78	96,17
GBM	91,73	94,18	92,19	91,58

When CNN architectures are considered, ResNet50 architecture achieved the most successful accuracy rate of 94.33% with the XGBoost classifier. When the performance evaluation metrics obtained with this model are analysed; Accuracy value: 0.9433, Precision: 0.9588, Recall: 0.9178, F1-Score: 0.9378. Performance Evaluation metric results of CNN architectures are as given in Table 2.

Table 2. CNN architectures performance evaluation metrics

Model/PDM	Accuracy	Precision	Recall	F1-Score
RF+VGG19	0.8836	0.8986	0.8454	0.8712
RF+VGG13	0.8974	0.9187	0.8553	0.8859
RF+ResNet50	0.9296	0.9607	0.8849	0.9212
RF+ResNet34	0.9066	0.9263	0.8684	0.8964
SVM+VGG19	0.8989	0.8914	0.8914	0.8914
SVM +VGG13	0.9204	0.9145	0.9145	0.9145
SVM +ResNet50	0.9158	0.9164	0.9013	0.9088
SVM +ResNet34	0.9158	0.8978	0.9243	0.9109
LR+VGG19	0.8928	0.9062	0.8586	0.8818
LR+VGG13	0.9158	0.9164	0.9013	0.9088
LR+ResNet50	0.9188	0.9254	0.8980	0.9115
LR+ResNet34	0.9188	0.9254	0.8980	0.9115
XGBoost+VGG19	0.9020	0.9054	0.8816	0.8933
XGBoost +VGG13	0.9219	0.9148	0.9178	0.9163
XGBoost +ResNet50	0.9433	0.9588	0.9178	0.9378
XGBoost +ResNet34	0.8933	0.9037	0.9471	0.9249
GBM+VGG19	0.8800	0.8981	0.9327	0.9151
GBM +VGG13	0.8967	0.9194	0.9327	0.9260

GBM +ResNet50	0.9096	0.9097	0.8947	0.9022
GBM +ResNet34	0.8989	0.8914	0.8914	0.8914

CONCLUSION

This study explored the integration of Convolutional Neural Networks (CNNs) with machine learning classifiers to enhance the early diagnosis of Parkinson's disease using hand-drawn spiral and wave images. By leveraging feature extraction from CNN architectures such as ResNet50, ResNet34, VGG19, and VGG13, and classifying these features using models like XGBoost, SVM, and Random Forest, we achieved promising results. Notably, the ResNet50 model combined with the XGBoost classifier provided the highest accuracy of 94.33%, demonstrating the potential of this hybrid approach in distinguishing between healthy individuals and Parkinson's patients.

In summary, this research contributes to the development of more accurate diagnostic tools by combining advanced deep learning techniques with established machine learning models, paving the way for better patient outcomes through earlier and more reliable detection of Parkinson's disease. Further research is encouraged to refine these methods and explore their applicability in clinical settings.

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PERFORMANCE EVALUATION IN ALZHEIMER'S DIAGNOSIS: COMPARISON OF MODELS

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ABSTRACT

Alzheimer's disease is a neurodegenerative disorder that leads to memory loss and impaired cognitive function. Early diagnosis is critical to slow the disease's progression and improve patients' quality of life. In this study, the data used to diagnose Alzheimer's disease are divided into two parts: normal and synthesized. In this study, normal data consisting of 4 classes were trained separately, and synthesized data consisting of 4 classes were trained separately. In the studies, feature extraction was performed using ResNet18, ResNet34, ResNet50, and ResNet101 models and then classified with Gradient Boosting Machine, Extreme Gradient Boost, Random Forest, and Logistic Regression algorithms. In normal images, Extreme Gradient Boost achieved the highest accuracy rate of 73.81% with ResNet101. In synthesized data, Extreme Gradient Boost again achieved 71.44% accuracy with ResNet101. Logistic Regression generally achieved high accuracy rates but was not as consistent as Extreme Gradient Boost. This study compares the effectiveness of different deep learning and machine learning algorithms in Alzheimer's diagnosis and highlights the strong performance of Extreme Gradient Boost.

Keywords: Alzheimer's disease, feature extraction, classification, machine learning, deep learning

INTRODUCTION

Alzheimer's disease is a neurodegenerative disorder that affects millions of people worldwide and leads to progressive cognitive impairment. Early detection and accurate diagnosis are critical to slow the progression of the disease and improve patients' quality of life. Today,

advanced technologies such as deep learning and machine learning are emerging as promising tools in diagnosing Alzheimer's disease.

Alzheimer's disease, the most common type of dementia, is characterized by the death of brain cells and loss of neural connections and progresses over time (Doering, S., et al., 2024). Alzheimer's disease has devastating effects on memory, thinking and behavior. The disease usually affects people aged 65 years and older, but it can start earlier. Symptoms of the disease usually start with mild memory loss and mild difficulties in daily activities. They worsen over time. Memory loss usually starts with forgetting events from the recent past. Later, there is a decline in mental skills. Decision-making, problem-solving, and the ability to perform complex tasks are impaired. The perception of time and space becomes complex. Another symptom of the disease is the patient's difficulty finding words and communication. All these conditions lead to depression, anxiety, aggressive behavior, and social withdrawal.

The exact cause of Alzheimer's disease is not known. Experts believe that beta-amyloid plaques and tau protein tangles play important roles in the development of the disease (Doering, S., et al., 2024). Beta-amyloid plaques are protein particles that accumulate between brain cells and disrupt cell communication. Tau protein tangles, on the other hand, are abnormal protein formations that disrupt the structure of microtubules inside the cell, causing cells to lose their function.

Many reasons increase the risk of developing the disease. The most important of these is the age factor. The disease is more common in individuals aged 65 and over. Genetic factors also play an important role in the disease (Wanionok, N. E., Morel, G. R., & Fernández, J. M., 2024). If there is a family history of Alzheimer's disease, the risk becomes even higher. On a gender basis, the incidence of the disease is higher in women. Another risk factor is that the risk may increase in individuals who have had serious head trauma in the past. Factors such as high blood pressure, diabetes, obesity, smoking, and lack of physical activity may also increase the risk.

Diagnosis is usually based on clinical assessment, neurological tests, brain imaging, and biomarker analysis. However, machine learning and deep learning algorithms are becoming increasingly important in diagnostic processes besides traditional methods. These methods can diagnose with high accuracy rates by learning from large data sets. Although there is no definitive cure for Alzheimer's disease, several treatment options are available to alleviate symptoms and slow the progression of the disease (Ansari, M. M., Sahu, S. K., Singh, T. G., Singh, S., & Kaur, P., 2024). Some medications help alleviate the symptoms of the disease, while occupational therapy and support groups are available. Machine learning and deep learning methods offer innovative approaches to treatment processes by creating personalized treatment plans and predicting the effectiveness of medications.

In 2024, Qian et al. proposed a multi-task residual network (MMANet) for Alzheimer's disease classification and brain age prediction (Qian, C., & Wang, Y., 2024). The model was trained on data from normal controls (NC) and tested on data from different disease groups. As a result of the study, a 96.02% success rate was obtained with the proposed method in three-class

classification. In another study conducted in the same year, Hatami et al. investigated the potential of deep learning and reinforcement learning in classifying Alzheimer's disease (Hatami, M., Yaghmaee, F., & Ebrahimpour, R., 2024). CNNs, RNNs, and SAE deep learning algorithms were used for feature selection. At the same time, reinforcement learning was used to ensure that the model interacts with the environment to give better results by using reward-punishment mechanisms. In their study, they increased the accuracy rate to 90.2% using the proposed methods. Also, in 2024, Yang et al. proposed a graph convolution network GCN for classifying Alzheimer's disease using brain region samples (Yang, Z., Liu, W., Gan, H., Huang, Z., Zhou, R., & Shi, M., 2024). The proposed method used Region-to-Sample GCN, Adaptive Local Node Feature (ANNA), and Multimodal Data Fusion. The study improved classification performance by combining multimodal data sources such as DWI and amyloid-PET. As a result of these approaches, an accuracy increase of 3% was achieved in the study.

Machine learning and deep learning technologies play a critical role in diagnosing and treating Alzheimer's disease. These technologies will make it possible to develop more effective and reliable tools for early diagnosis and accurate treatment of Alzheimer's disease. Since Alzheimer's disease is a complex condition that profoundly affects the lives of individuals and their families, early diagnosis and appropriate care will significantly improve the quality of life of patients.

MATERIALS AND METHOD

Dataset

The study's dataset consists of two sets of brain scan images for Alzheimer's disease taken from open source (Alzheimer's Synthesized dataset., 2024). Normal and Synthesized. The normal dataset contains 2000 images representing each stage of Alzheimer's disease, while the synthesized dataset consists of corresponding images enhanced using an innovative pseudo-RGB transform technique. There are 16000 images in both groups (8000 normal and 8000 synthesized data). This dataset provides an important resource to better understand and analyze the progression of Alzheimer's disease.

The synthesized images are not just a simple augmentation process. They were created with a novel pseudo-RGB transform that combines three advanced image processing techniques: CLAHE (Contrast Limited Adaptive Histogram Equalization), Unsharp Masking, and Subtle Sharpening. Each color channel in the synthesized images represents a different enhancement, providing a versatile view of the original scan. This makes the fine details of brain structures more visible and provides clues to the progression of Alzheimer's disease.

This dataset has great potential to train more accurate deep learning models for diagnosing Alzheimer's disease, compare traditional and improved image analysis techniques, discover important features in Alzheimer's diagnosis, and develop new visualization tools for healthcare professionals. All images are anonymized, and users are encouraged to contribute to real-world applications by using this dataset responsibly. The datasets in both groups used in the study are

divided into 4 classes. Figure 1 shows the data for the 4 classes in the normal group, while Figure 2 shows the data for the 4 classes in the synthesized group.

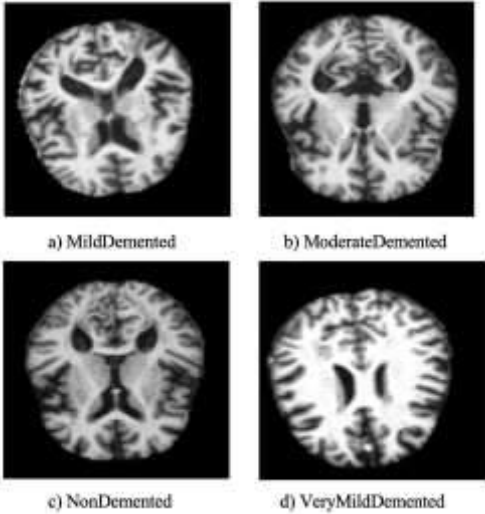


Figure 1. Data samples in the normal group

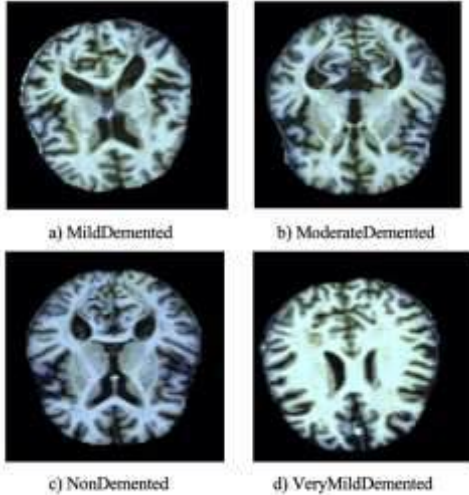


Figure 2. Data samples in the Synthesized group

Algorithms Used for Feature Extraction

In this study, feature extraction was performed on a dataset used to diagnose Alzheimer's disease. The feature extraction process was performed by using deep learning models to extract meaningful and classifiable information from brain scan images. In particular, ResNet18, ResNet34, ResNet50, and ResNet101 models were used to extract features from both normal and synthesized (pseudo-RGB) images. By learning the complex patterns and structures within the images, these models extracted important features to help identify different stages of Alzheimer's disease.

ResNet models can effectively learn fine details and high-level image features thanks to their layered structure. In particular, they provide a better understanding of different brain structures

and abnormalities in normal and pseudo-RGB images. The ResNet models used in this study extract critical features that can be used in the diagnosis of Alzheimer's disease by analyzing the contrast, sharpness, and other image processing techniques-enhanced details in brain scans. These features are then incorporated into the classification process with machine learning algorithms.

The first model used in the study is ResNet18. ResNet18, which is part of the ResNet (Residual Network) family, is one of the widely used and successful CNN models among deep learning models. It is used to solve the vanishing gradient problem encountered during the training of deep networks. As the name suggests, it consists of 18 layers and these layers contain residual connections (Xue, G., Li, S., Hou, P., Gao, S., & Tan, R., 2023). The model, which consists of convolution layers, applies batch normalization and ReLU activation functions after each layer. For classification, the fully connected layer is used.

Another model used is the ResNet34 model, which is also part of the ResNet family. This model solves the vanishing gradient problem just like ResNet18. As the name suggests, it consists of 34 layers (Zhuang, Q., Gan, S., & Zhang, L., 2022). It is similar to the ResNet18 model in terms of structure. The difference between the two models is that the ResNet18 model has fewer layers and can train faster. ResNet34 can learn deeper and more complex patterns. However, this model requires more computational power.

In the rest of the study, two other members of the ResNet family, ResNet50 and ResNet101, are used. The ResNet50 model consists of three 3x3 convolution layers followed by a 1x1 convolution layer (Srilakshmi, K., & Venkata Lakshmi, D., 2024). The layers have complex residual blocks. This structure means more parameters and a deeper network. ResNet50 is often used in large-scale image recognition tasks and deep learning applications. ResNet101 is a deeper version of ResNet50. It consists of 101 layers in total. Due to its depth, it can learn finer details and complex patterns, making it very powerful in a wide range of computer vision tasks (Nawaz, S. A., Li, J., Shoukat, M. U., Bhatti, U. A., & Raza, M. A., 2023). The difference between the two models is that ResNet101 requires more computational power and memory. ResNet50 offers faster training, while ResNet101 outperforms complex tasks.

Algorithms Used for Classification

Deep learning and machine learning models play an important role in the diagnosis of Alzheimer's disease. In this study, the performance of various models used for classification is evaluated. The main objective of the study is to correctly identify the different stages of the disease by extracting meaningful features from the data sets. In this study, Gradient Boosting Machine (GBM) (Yang, P. B., Chan, Y. J., Yazdi, S. K., & Lim, J. W., 2024; Friedman, J. H., 2001), Extreme Gradient Boosting (XGBoost) (Bansal, N., Singh, D., & Kumar, M., 2023; Meng, Q., et. al, 2016), Random Forest (RF) (Breiman, L., 2001; Yadav, S., Padalia, H., Sinha, S. K., Srinet, R., & Chauhan, P., 2021) and Logistic Regression algorithms were used for classification using extracted features. Each of these models aims to achieve high accuracy rates

in the diagnosis of Alzheimer's disease by contributing to the classification process with different approaches and techniques.

The Gradient Boosting Machine (GBM) algorithm was first used in the classification study. GBM is a powerful machine learning model built by sequentially training a set of weak learners (usually decision trees) and refining their results. Each decision tree can have a certain depth, which is usually set as one of the hyperparameters of the model. The GBM algorithm uses different regularization techniques to avoid overfitting. Some of these techniques include the learning rate and the number of weak learners. A low learning rate implies a slower learning process, but one that usually leads to better generalization. This structure makes GBM a powerful tool that is widely used for complex data sets and classification problems.

Extreme Gradient Boosting (XGBoost), a more optimized and high-performance version of the GBM algorithm, is the other classification algorithm used in the study. XGBoost offers several improvements such as memory efficiency, parallel computing capabilities, and regularization techniques. Like GBM, decision trees are often used as weak learners. These decision trees can have a certain depth and can be set as one of the hyperparameters of the model. XGBoost uses various regularization techniques such as learning rate and weak learners to prevent overfitting. Furthermore, L1 (lasso) and L2 (ridge) regularization techniques control the complexity of the model and reduce overfitting. This structure makes XGBoost a powerful and flexible machine-learning tool.

Another algorithm used in the study is Random Forest (RF). RF is an ensemble learning method consisting of multiple decision trees built using a random subset of the dataset and randomly selected features. Instead of using all features in the dataset, the decision trees select a random subset of features at each node. With each subset and randomly selected features, the decision trees are trained independently. The RF model is also capable of evaluating the importance of features. The contribution of each feature to the performance of the model is determined by analyzing the split points in the trees. This information provides valuable insights in identifying the most important features in the dataset especially in the engineering process.

The last machine learning algorithm used is Logistic Regression. This architecture, which is widely used in classification problems, uses the logit function to model the relationship between independent variables and the dependent variable. Logistic Regression works like a linear regression model but uses the sigmoid (logistic) function to constrain the output value. Equation 1 is the equation of the model.

$$\text{logit}(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (1)$$

p is the probability of an event. β_0 is the constant term and $\beta_1 + \beta_2 + \dots + \beta_n$ are the coefficients of the independent variables.

Logistic Regression is a simple, fast, and efficient model for binary classification problems. It makes probability estimates by transforming the linear combination of independent variables

with a sigmoid function. The training of the model is performed by optimizing the parameters by minimizing the log-loss loss function. Logistic Regression is widely used in machine learning and statistical analysis because it provides clear and interpretable results.

EXPERIMENTAL RESULTS

In this study, the performance of different deep learning and machine learning models used in the diagnosis of Alzheimer's disease was evaluated. After feature extraction with ResNet models, classification was performed with GBM, XGBoost, RF, and Logistic Regression algorithms.

Table 1. Results of the study with data belonging to the normal group

	ResNet18	ResNet34	ResNet50	ResNet101
XGBOOST	72.38%	73.81%	72.75%	71.44%
RF	66.75%	68.44%	60%	67.62%
GBM	65.81%	66.50%	65.88%	66.44%
LogisticR	70.81%	70.50%	70.75%	72.62%

As seen in Table 1, accuracy rates are given as a result of the study with the data belonging to the normal group. The XGBoost algorithm achieved the highest accuracy rate among all ResNet models. Especially with ResNet34, the most successful result was achieved with an accuracy rate of 73.81%. When we look at the other classification algorithms, RF algorithm achieved 68.44% accuracy rate with ResNet34 and provided very good results in all models except ResNet50. The GBM algorithm showed the highest accuracy rate with 66.50% in the ResNet34 model. Logistic Regression, on the other hand, generally provided accuracy rates close to the other algorithms. It achieved the highest accuracy rate with 72.62% in the ResNet101 model.

Table 2. The most successful results of XGBoost

ResNet34	
Accuracy	73.81
Precision	73.33
Recall	73.81
F1-Score	73.50

The most successful results for the normal group were obtained with XGBoost and ResNet34. The results show high performance with 73.81% accuracy rate, 73.33% precision, 73.81% recall and 73.50% f1-score. This shows that the model is successful in terms of both accurate classification and balanced performance.

Table 3. Results of the study with the data of the synthesized group

	ResNet18	ResNet34	ResNet50	ResNet101
XGBOOST	67.06%	66%	65.75%	71.44%
RF	67.06%	66%	65.75%	65.44%
GBM	65.44%	66.50%	65.75%	66.75%
LogisticR	68.44%	70.19%	69.56%	70.75%

The other part of the study was performed on synthesized data. Table 2 shows the results of the study using synthesized images. The XGBoost algorithm showed the highest performance with ResNet101, achieving a rate of 71.44%. This shows that XGBoost has a strong classification ability on synthesized images and the ability of the ResNet101 model to extract deep and complex features combined with this algorithm provides high accuracy. The RF algorithm achieves an accuracy of 67.06% with ResNet18 and ResNet34 models, while with ResNet101 the performance drops slightly to 65.44%. The GBM algorithm showed the highest accuracy rate of 66.75% with the ResNet101 model. Logistic Regression performed particularly well with ResNet34 and ResNet101, achieving 70.19% and 70.75% accuracy respectively. These results show that the Logistic Regression algorithm works effectively with synthesized images and fits well with various ResNet models.

Table 4. The most successful results of XGBoost

ResNet101	
Accuracy	71.44
Precision	70.88
Recall	71.44
F1-Score	71.11

The XGBoost algorithm showed high performance with the ResNet101 model, achieving 71.44% accuracy, 70.88% precision, 71.44% recall, and 71.11% f1-score. These results reveal that the model has a balanced and effective classification capability.

XGBoost algorithm showed the most successful performance with high accuracy rates in both image types. Especially the combination of XGBoost and ResNet34 achieved the highest accuracy rate in normal images. In general, the results obtained using normal images achieved higher accuracy rates compared to the results obtained from synthesized images. This shows that normal images are more effective in Alzheimer's diagnosis.

CONCLUSION

In this study, we compared the performance of deep learning and machine learning models on normal and synthesized brain scan images used in the diagnosis of Alzheimer's disease. The results show that the XGBoost algorithm performs the best on both types of images with high accuracy rates. In general, the results obtained with normal images had higher accuracy rates compared to synthesized images. These findings suggest that normal brain scan images are a more reliable source for early detection of Alzheimer's disease. The study provides important insights into how different deep learning and machine learning models can be used in Alzheimer's diagnosis and sheds light on future research.

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CHILDREN'S UNDERSTANDING OF ANIMAL STORIES BASED ON READER RESPONSE THEORY

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ABSTRACT

Literary works can contribute to the development of language competences and language performance of preschool children, and can also significantly influence their emotional and cognitive development. Animals often appear in literary works in the context of established symbols and metaphors, as well as similes, which convey important lessons about distinguishing good from evil, friendship, love and honesty. The research that was carried out for the purposes of this paper was carried out in a preschool institution in Serbia, in Belgrade. Relying on the theory of reader response, it was investigated how children understand stories in which the main characters are animals, what characteristics of animals they recognize, how they describe individual characters and what lessons they understand based on the text read to them. The purpose of the research is to gain insight into the ways in which children's literature helps preschool children understand and talk about emotions. The sample consists of 19 children aged 3, 4 and 5 years. Based on the conducted research, it can be concluded that children often "fill in the blanks" of a literary text based on their previous experience. Also, children recognize well the basic division into "good and evil" heroes in a literary text, and they can also recognize concern and fear. In addition, children recognize in the text what they have personally experienced. At the same time, literary works can help them to understand some emotions that they don't often feel, and they can certainly encourage them to think about various situations and emotions. It is important for both educators and parents to understand the role of literature in the proper development of children, and to use it to help their children learn about themselves and the world around them in a fun way.

Keywords: Language Competences Of Preschool Children, Animal Stories, Reader Response Theory.

Introduction

Children's literature plays an important role in the process of their upbringing. Literary works can contribute to the development of language competences and language performance in children, and can significantly affect their motivational and cognitive development. With these benefits in mind, it turns out to be especially important to research children's literature from an academic point of view.

Reader response theory

Among the various theoretical frameworks, reader response theory has a special importance in the context of this paper. This theory assumes that the interpretation of a literary work is not only a product of the text itself, but is fundamentally shaped by the unique perspective of the individual reader, that is, his personal experiences and emotional responses (Fowler, 2009: 127).

Reader response theory encourages consideration of the role of a child's cognitive and emotional development in shaping their interpretation of animal characters.

As the child matures, his interpretation can become - and should become - more complex, because children mature over time, and begin to recognize the deeper themes of friendship, loyalty and honesty, which are woven into animal stories. By using reader response theory to analyze children's literature that contains animal characters, critics and educators can gain insight into how young readers actively participate in the meaning-making process and how animals as characters evolve alongside children's developmental stages as readers. Some authors believe that the development and popularity of this theory over time speaks of the connection between literature studies and pedagogy (Harkin, 2005: 412).

When it comes to children's literature with animals as characters, reader response theory emphasizes the importance of young readers' personal connections with these characters. This theory emphasizes the dynamic and interactive nature of reading experiences in terms of children's literature, and it emphasizes that the meaning children derive when they encounter a literary work is a product of both the literary text and the child's imagination. In this regard, it can be said that children often empathize with animal protagonists, and project their own emotions onto these heroes (Milenkovic, Drazic & Ristic, 2023: 155).

Encouraging children to communicate through literary texts

Spoken language is the basis for reading and writing (Zhang, 2013: 834). In preschool age, children learn sound patterns, word meanings and sentence structure, as well as how to participate in conversation. These capabilities are crucial for future development. Children who develop strong language skills in the early years show far greater success than their peers when it comes to reading later in childhood. Preschool children learn about 7 new words each day (Bloom & Markson, 1998: 68).

Talking to children after reading a literary work helps them develop their speaking and later reading skills. In addition, conversations on topics related to literary works encourage children to pay attention to details, to notice things around them. Reading stories about topics and contexts close to children can encourage them to talk about things from their own experiences. For example, reading a story set on a farm can encourage children who grow up in the countryside to share their experiences with farm animals, which they regularly see and know. In these cases, children hear words that are familiar to them, close to them. However, the teacher's role involves helping children to use the language to describe abstractly, something that will happen in the future and the like. This often means that children are

encouraged to "enter" the story, to become its protagonists and to develop through that experience (Erickson, 2018: 7).

The teacher tries to help children learn the meaning of new words, as well as their usage. Children who acquire speech quickly and easily are more and more ready to learn to read. Children who hear complex and varied conversations involving familiar topics and who have meaningful opportunities to use and experiment with words and conversations will enter school prepared to move through the later stages of literacy development. In addition to supporting language and literacy development, talking with children can positively affect other areas of child development, such as social relationships, social understanding, knowledge of emotions, and emotional well-being (Test, Cunningham, & Lee, 2010: 14).

In preschool institutions, educators use literary works as a tool for developing communication and critical thinking skills in children. Through interactive reading sessions, educators engage children by reading stories aloud and pausing to ask open-ended questions that encourage discussion and encourage children to share their opinions. These questions, such as "What do you think will happen next?" or "Why do you think the character did that?" stimulate critical thinking and invite children to talk about their thinking (Roche, 2014: 30).

Also, after reading a story, teachers often encourage children to retell the story in their own words, which not only improves understanding, but also provides opportunities for children to articulate their interpretations and attitudes. Role-playing and dramatization activities additionally help children immerse themselves in the story and allow them to express themselves through creative play and act out scenes from the story (Roche, 2014: 142).

In addition to these activities, educators can include art projects inspired by the reading, such as drawing or painting, where children can visually represent their understanding and opinions about the story (Roche, 2014: 117, 120). Group discussions serve as another way for children to express themselves, so they can share their favorite parts of the story or suggest alternative solutions to dilemmas in the story. These discussions encourage collaboration, active listening and respect for different perspectives (Roche, 2014: 161).

When supporting children to share their opinions, educators use a variety of strategies to create an environment where everyone's opinions are valued and respected. Active listening is key, as teachers listen carefully to children's responses, validating their thinking and encouraging further participation. Through encouragement, teachers help the child develop confidence and motivation to express themselves, while respect for diversity of opinion fosters empathy and understanding among peers (Whorrall & Cabell, 2016: 336-339).

In addition to the above, educators foster children's communication skills by articulating their thoughts respectfully, serving as role models for children. They also provide individualized support, recognizing that children may have different levels of confidence in expressing their opinions, and offer guidance, ask follow-up questions or provide extra time as needed. By

using literary works and connecting them to classroom activities, teachers empower children to become confident in communication and respect others' perspectives (Roche, 2014: 114).

Research

The research is being conducted in order to give suggestions for concrete solutions for organizing discovery-research activities in a preschool institution on the topic of understanding literary texts for children. The goal of the research is to understand what qualities of heroes children recognize and how they interpret different animals in stories. The focus is on talking about experiences, as well as understanding the emotions that appear in the text.

Relying on the theory of reader response, it was investigated how children understand stories in which the main characters are animals, what characteristics of animals they recognize, how they describe individual characters and what lessons they understand based on the text read to them. The purpose of the research is to gain insight into the ways in which children's literature helps preschool children understand and talk about emotions.

The sample

The sample consists of children aged 3, 4 and 5 years of preschool institution where the research is conducted. More precisely, the sample consisted of a girl aged 3 years and 7 months, a boy aged 3 years and 5 months, a girl aged 4 years and 5 months, two boys aged 4 years and 3 months, a boy aged 4 years and 6 months, a boy aged 4 years and 9 months, two boys aged 4 years and 11 months, two girls aged 5 years and 3 months, a girl aged 5 years and 5 months, a girl aged 5 years and 8 months, a boy aged 5 years and 1 month, three boys aged five years and 2 months, a boy aged 5 years and 4 months, a boy aged 5 years and 6 months.

The sample size is 19 children. Out of the total number of children from the sample, 13 of them are boys and 6 are girls.

The method

A descriptive method is used for research purposes. The research is carried out by the teacher reading to the children selected literary texts in which animals are the main characters.

The research flow

For this research we have chosen a novel *Black Dog* by Neil Gaiman. Neil Richard MacKinnon Gaiman is an English author of short fiction, novels, comic books, graphic novels, audio theater, and screenplays. His works include the comic book series *The Sandman* and the novels *Good Omens*, *Stardust*, *Anansi Boys*, *American Gods*, *Coraline*, and *The Graveyard Book*. He co-created the TV series adaptations of *Good Omens* and *The Sandman*.

A passage from this novel was read to the children in a day. This continued for three days. After each reading, children's answers to questions related to what they read are analyzed. The questions that were honored were aimed at highlighting the way in which children understand

literary works where animals do not take on a traditional role, as is the case with fables. In this way, the importance of literature for emotional development should have been investigated.

The activity is performed according to the following dynamics:

- Introduction to the game,
- Interpretive reading of selected stories i
- Discussion.

To begin with, children are introduced to the game. In this case, it is planned that the children will first play freely with children's songs where the main characters are animals (eg "The bumblebee swore" and "The mouse got the flu"). On the first day, a game was organized where children should imitate animals.

After reading the stories from *Black Dog* by Neil Gaiman, a discussion took place between the preschool-teacher and the children.

To the question: "How did the boy feel when he heard the barking of the dog?", the children gave the following answers:

- "He thought it was his dog."
- "He was happy, but then he became sad."
- "At first he was happy because he thought it was his dog."
- "He wanted to give him a bone."

Discussion

By introducing the game, the children were introduced to the characteristics of animals and the teacher reminded the children of the different movements and sounds that animals make. When reading, the teacher tried to bring the emotions that the writer wanted to arouse in the readers as close as possible to the children. Finally, the emotions that the children recognized in the stories were explored through the discussion. At the same time, as part of the exchange, more was learned about the individual experiences of the children, which could help them understand the read text.

Children are encouraged to think about what they hear, and to connect it with their personal experience. Relying on the reader response theory, it can be said that the children have a good understanding of the different emotions that are trying to be presented in the literary texts intended for them. It should be emphasized here that these are stories that focus more on people and their complex nature, and less on the animals themselves. In these stories, the animals were presented realistically, and there was no space to consider the different functions that can be attributed to different animals within the general places in literature.

The children shared their experiences, and it was observed that the children thought about it for a long time, it makes them happy to hear. They gave answers to simple questions like "Do you have a pet" much faster. The above indicates that children are still developing their emotional abilities, but also that they are progressing in line with what is expected for their age. A slight difference was observed between girls and boys, where girls gave more information and revealed more details in their answers, while boys gave simpler and shorter answers.

Based on the answers, it can be concluded that children often "fill in the blanks" of the literary text based on their previous experience. Also, children recognize well the basic division into "good and evil" heroes in a literary text, and they can also recognize concern and fear. In addition, children recognize in the text what they have personally experienced. At the same time, literary works can help them to understand some emotions that they don't often feel, and they can certainly encourage them to think about various situations and emotions.

Conclusion

When considering how children understand these works, it is useful to rely on the theory of reader response, and to point out that the experience they have is important for children to imagine different situations. However, at the same time, children's imagination develops and they are encouraged to think creatively.

Literary works in which animals are the main characters very often convey important moral messages addressed to the youngest. In this way, children get to know different situations in which they can find themselves, but also with the cultural heritage of their nation. Finally, children are introduced to the richness of language through various metaphors and similes used in relation to animals.

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TECHNICAL ROLE OF PRODUCED KNOWLEDGE IN THE REAL WORLD - ORGANIZATION OF UONEDU

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ABSTRACT

The original principles of science are used in the entire education and thus confirm their scientific nature. This paper aims to determine and demonstrate whether knowledge, production and action (technical), as a basic human ability, are the foundation for the technical use of the produced knowledge? The paper will analyze a sample of an organization from foundation to operation in the period of seven years, and the application of the original principles of modern science in the creation, development, as well as operation of the organization. In this case study, analysis method was applied and the data were analyzed through content analysis. According to the results of the research, it was determined that the production and transfer of knowledge is possible only by *techne*, while the possibility of technique is only the use of already produced knowledge, what is a basic human ability and determination, and which originally distinguishes us, as human beings, from the determination of technique and technology.

Keywords: Knowledge, *Techne*, Technique, Technology, UONEDU

INTRODUCTION

Considering the fact that technology affects the individual and society and that it affects the formation of the image of the world and transforms everyday and business life, it is necessary to think about the definition of technical phenomena and the development of technology and science that characterize the modern era. Achieve a certain success in this type of thinking is possible only if we start from the source and foundation that determines the phenomenon of technique. The horizon for understanding the meaning of the phenomenon of techniques and advanced technologies is the Greek term *techne*, which is defined by the meaning of knowledge, art, production and craft, and as such, gives meaning to the term technique, which is defined by the meaning of making and adopting.

Therefore, in the first place, it is necessary to deal with the definition and meaning of the term *techne* as it was understood and used by the Greeks, and then with the distinction between the terms *techne* and technique, in order to be able to reach an understanding of the content that

will show that *techne* is the fundamental determinant of modernity science and modern technology in such a way that the knowledge used by technology is produced by technology.

This paper aims to determine and demonstrate whether knowledge, production and action (technical), as a basic human ability, are the foundation for the technical use of the produced knowledge? The paper will analyze a sample of an organization from foundation to operation in the period of seven years, and the application of the original principles of modern science in the creation, development, as well as operation of the organization

1. Basic human ability - production

Man, in the world, in which he builds life and reality, is given the opportunity to produce and act in accordance with the rules and regulations defining knowledge. In this sense, production is a basic human ability, which in the modern world of technique and information technology is confusingly intertwined with the topic of technique and the progress of new technologies. In order to clarify this confused use of terms and their meaning in modern science and the modern age, it is necessary to refer to the following:

1. In the first place, the source and meaning of the term that gives meaning to today's term technique, and in the second place, the significance of understanding the term, which is basically determined by production and knowledge.

2. Reference to the necessary distinction of the use of the term that gives meaning to the term technique, which only uses what has already been produced by thought - technique does not think.

To talk about modern science and the modern age does not mean only to talk about technique and the progress of modern technologies, in fact it does not mean to talk at all about devices and machines, their use and development. To talk about science, modern science, the modern age and the progress of new technologies in the first place means to talk about the production of knowledge, that is, about understanding the meaning of the Greek term *techne*. The meaning and essence of the term *teche* are originally related to knowledge. Furthermore, the meaning and essence of the term technique do not mean knowledge but exclusively the use of already produced knowledge. Therefore, human reality and basic human ability cannot be understood from the sphere of technique but excluded from the sphere of *techne*.

1.1. The meaning of the term *teche*

The horizon for understanding the meaning of human reality, in which life and the process of knowledge takes place, and for understanding the phenomenon of technique, in which the technical use of the product takes place, is the meaning of the Greek term *techne*.

Techne translates as art, a term that covers multiple meanings. It refers not only to the fine arts, but to any technical skill, in which the perfection of the activity does not consist primarily in the activity itself but in the work. On the other hand, technology, as it is generally used today, is the name given to some special artifacts that result from the use of said technical skills.

Furthermore, the concept of technology in its entirety carries the connotation of continuous improvement of products of technical skill, development and progress, and in modern usage, often, the term especially refers to those products that were created by the industrial revolution, i.e., modern technology, products that work on electric power. (Kempe, "Techne, Physis, and Technology: Aristotle and Heidegger.")

The Greek understanding of *techne* is based on understanding this term as knowledge. Therefore, it is clear how important it is to refer to the meaning of this term here, when talking about the meanings of knowledge, science and education. To return to the meaning of the Greek term *techne* means to return to the original meaning of production and knowledge as the essence of man, which means dealing with the significant and integral determinants of human reality and action. The ancient Greek use and meaning of the term *techne* is a source to which we must return if we want to talk about the meaning and meaning of today's term technique and technology, that is, about the way modernity affects our participation and construction of reality. In the sense of real production of knowledge and action in real life situations as coping, in the multitude of challenges that affect man today, *techne* is a skill that shows practical coping in situations with which we had no experience until then, i.e., in a certain sense it can be said that it corresponds to what today we call intelligence, and the ability to manage and produce, which is always connected to knowledge (Greek: *episteme*).

Techne (Greek, 'art', 'craft'), a human skill based on general principles and capable of being taught. In this sense, a manual craft such as carpentry is a techne, but so are sciences such as medicine and arithmetic. According to Plato (Gorgias 501a), a genuine techne understands its subject matter and can give a rational account of its activity. Aristotle (Metaphysics I.1) distinguishes techne from experience on the grounds that techne involves knowledge of universals and causes, and can be taught. Sometimes 'techne' is restricted to the productive (as opposed to theoretical and practical) arts, as at Nicomachean Ethics VI.4. Techne and its products often contrast with physis, nature. (Audi & Audi, 1999).

Techne is a skill, creativity and art, craft, arrangement and education, so finding one's way in creation and education, in the rules of production and creation. Participation in the production of reality in such a way that participation is determined by the planning and rules. To understand the meaning of *techne* is to understand how the Greeks understood art, and this understanding is reflected in resourcefulness and the ability to produce. In ancient times, *techne* was understood as *episteme*, i.e., both words, *techne* and *episteme*, are names for knowledge. *Techne* is a kind of knowledge by which we know how to produce something according to certain production rules. For the Greeks, *techne* therefore means having knowledge, the kind of knowledge that allows us to manage something according to certain rules, and this understanding, or the way the Greeks understood *techne*, refers to our overall practical ability, to everything that we can work on the right things. In the use of the terms *techne*, technique and technology, which actually preoccupy man and society today, their unjustified and incorrect

synonymous use is increasingly prevalent, and then the term technique in a way that suppresses the term technology.

The key characteristics of the meaning of the word *techne* among the Greeks are the determination of the meaning of the word *techne* when the Greeks speak it, and it refers to art, skill, craftsmanship. More precisely, the term art, when we talk about the early term of art, (the translation is from the Greek *techne* and from the Latin *ars*). In the relevant literature, *techne* is translated as either craft or art. Technique, Greek. *techne*, Latin *ars* = art, in the broadest sense, is a set of certain procedures and application of means to achieve some useful goals. The meaning of *techne* is that it is a practical skill, so *techne* is knowledge, but also the application of principles involved in the production of objects and the achievement of goals, i.e., *techne* is the application of principles in practical sciences and "human skill based on principles and the ability to enter".

The Greek concept of techne can help in understanding the technological society and how it can generate the separation of business and personal life. As used by the early Greeks, techne means the knowledge needed to do a job. Today's "manager" embodies this early concept. He is trained to perform work efficiently, economically and quickly. As a result, management can take on a life of its own, and managers can lose touch with their personal values. The Greeks, however, quickly saw the flaws in the concept. Obsessed with wholeness and concerned with the telos, or "end" of things, they added an ethical and aesthetic dimension to their early definition. Techne has come to mean not only understanding how to get a job done, but also how that skill can be integrated with being a good citizen. Aristotle further defined techne to include a moral dimension. In each state in the development of concepts from basic knowledge and experience to general implications for the community to specific moral concerns, education was of primary importance. Today's education, especially the humanities, can play a role in helping our technological society take on the more humane qualities of the developed concept of techne. (Byrum, 1984).

In the context of the meaning of *techne*, where the Greeks took *techne* as a model of being in theory, we transformed beings technically in practice.

In general, the ancient Greek word "techne" is translated as "skill" or "art", but also "knowledge". Of these definitions, "knowledge" seems the best. "Craft" emphasizes the finished product of an artisan or craftsman where techne actually refers to the knowledge by which those products are created. Modern technology, on the other hand, most often refers to the product itself, instruments and machines (i.e. the computer is technology). However, the earliest uses of the word still describe the knowledge or systematic study of an art (eg metalworking) rather than the products of that knowledge. So, at least by these definitions, the technique and technology are quite similar, if not the same. However, it goes without saying that there are many things that distinguish products of ancient technology from those of modern technology. The meager crafts of the ancient blacksmith and cobbler, for example, can hardly be compared to the computers and genetic engineering of today's technologists. However, quantitative

interpreters of technology do not find a significant difference between the two methods of production. In fact, they do not accept the distinction between technique and technology at all and instead present modern technology as the result of the accumulation and development of earlier, more primitive technology (Tabachnick, 2004).

1.2. *Techne* - man's overall practical ability determined by knowledge

It is undeniable that philosophy deals with man and the world as well as the relationship between them. The Greek term *techne* was originally linked to understanding, interpretation, production and human participation in the world, to which, through all its changes and movements, today's term technique owes its meaning. The unity in which existence takes place, in which man's essence is, is in the unity of space and time, which is shown to us in the meaning of reality, and today's world, as Casey (Casey, 1986) states, is, by all accounts, technological, or has come to be taken as a fact, the best possible, which is that the concept of technology permeates modern thought and that technology is simply applied science and as such is covered by the philosophy of science. "The origin of the word "technology" has its roots in the Greek concept of *techne* or *techne*, which can be loosely defined both as the process of creating "art" or "craft" and as the knowledge (episteme) behind the creation of the final product". (Ihde, 2004).

To understand and interpret the present and reality, we need skill, that is, we need to return to the meaning of words that come from the Greek language again and again, because we want to understand reality through explanation. Understanding as participation in what is real experience points to the understanding of meaning. The key concept, the meaning and understanding of which is necessary to bring closer to today's world, the world of technology, and with which we will achieve an understanding of the phenomenon of technology, is the concept of *techne*. The question of man's real world and the life that takes place in it is actually the question that points to both the significance and the necessity of understanding the meaning of the term *techne* in the modern world. This essence cannot be determined or interpreted by technical discovery and use, it can only be done by production, knowledge and thinking, i.e. *techne*.

Human reality is shown exclusively through production and action, which we need to understand in the world of modern technology. Fundamental importance therefore, belongs to opinion. The difference between producing and making is at the same time a difference in understanding the meaning of human essence and reality. The basic guide in thinking that questions the mentioned concepts and differences is certainly in the foundations laid by Martin Heidegger. He reveals the fundamental meaning of the technique and its essence. Heidegger does not assign the same ways of disclosure of *techne* and technique, but essentially distinguishes them. He defines *techne* as that which essentially belongs to production, and technique as that which essentially belongs to the making and use of already existing things. So *techne* is the original knowledge, and technique uses that knowledge, which has already been exposed, for making. For Heidegger, the possibility of understanding and creating human

reality cannot be realized through technical action. Therefore, technique is not a work based on production, but only one way of man's attitude towards nature. Such a way is a technical way of relating man to nature, in which Heidegger sees the danger that essentially determines technique.

1.3. Techne vs technique

It can be said that today, in a certain sense, talking about technique means reflecting on Heidegger's critique of technique. In Heidegger's return to the meaning of the term *techne*, the non-mixing of today's term technique with the meaning of the term *techne* was ensured, but also the possibility of researching the basic determinants of human reality was given. Heidegger's starting point for understanding the question of technique is determined by the understanding of *techne* as that by means of which any art can be transmitted. Therefore, in Heidegger's understanding of technique, there is no place for the synonymous use of the terms *techne* and technique, because his understanding leads to an understanding of the exact opposite, that is, to the definition of *techne* as knowledge and skill, as art and as truth, as skill and familiarity with production. Technique is not meant the way *techne* is meant.

Today, when modern technology and science are one of the most serious issues that occupy the human mind, it is almost impossible to imagine life and reality without the use of technical means in everyday life and performing business tasks. Accordingly, the meaning of technique is reflected in the totality of the use of devices, where the technique itself is a device, and modern technique and science are methods of disclosure in the field of making or using already produced knowledge. Everything that is already produced knowledge, which technology uses, is produced by *techne*. "What does the essence of the technique have to do with disclosure? Answer: Everything! Therefore, technology is not just a tool. The technique is a way of revealing. If we pay attention to that, then a completely different area for the essence of technique is revealed to us. It is the area of disclosure, i.e. of truth". (Heidegger, M. (1972). Thus, Heidegger sharply demarcates technique from its essence: "what technique is includes the making and use of tools, accessories and machines, the things themselves that are made and used, the goals and needs that they serve. The totality of these devices is the device itself" (Heidegger, M. (1972).

The understanding and interpretation of the Greek term *techne*, which gives meaning to the term technique and to everything that we understand and use today as the development of technology, is a question that today concerns every science and modern society as a whole. On the basis of this understanding, it is possible to interpret what is man's possibility of production and participation in reality, as opposed to man's use of what has already been produced. Precisely because of this definition of *techne*, technique can and must not be equated with the term *techne*. Therefore, the understanding of man's essence cannot be determined by technique, because his fundamental characteristic is the ability to produce and create, in which man's essence is recognized. Heidegger's understanding of *techne* refers to the production, but production in which understanding does not refer to the use of something but ready-made,

ready-made knowledge or the use of ready-made means used for making. The the essential techne is in the disclosure that is the pro-performance. From the above it can be concluded how based and on what basis is the thought that the use of technique and technical means is possible solely on the basis of the knowledge produced by the technique.

Heidegger's question about technique, with which he asks about its essence, leads to understanding and distinguishing what is action from what is poiesis, towards what is techne and episteme, and thus towards understanding what is the life and reality of a human being. The question that is revealed here as fundamental is: How does technique relate to what is its original meaning, to techne? Dealing with issues of man and his world, in which he participates and asks about himself and other existences he encounters, in the same sphere of questions that concern today's rule of information technology, technique and technological development. "Already in 1957, Martin Heidegger noticed changes in the sense of time. He saw how the drive for technological mastery seeps into the human interior, where thought and reality meet in the language. He resisted any attempt to categorize his view of technology as optimistic or pessimistic. Whether the glass is half empty or half full, Heidegger was interested in the essence of its content". (Heidegger, 2000). So, it is clear that it is not possible to successfully talk about the issues of modern science and modern technology without understanding the meaning of the Greek term techne, i.e. the concept of knowledge and production that technology uses. How necessary this is confirmed by the fact that today the question of modern techniques and technologies cannot be bypassed or not dealt with in the technical world, which affects man's image of the world and is an integral part of his life and reality.

In the following part, the paper will analyze a sample of one organization from foundation to operation in the period of seven years, and the application of the original principles of modern science in the creation, development, as well as operation of the organization.

RESEARCH METHODOLOGY

Reserch Questions:

1. How is the organization organized?
2. What are its basic goals and activities?
3. Which models of education are offered in the analyzed sample?
4. What types of certificates does the association issue, and how is it recognizable?

Sample

UONEDU – model

From foundation to operation in the period of seven years the sample of NGO will be analyzed. The Association of Online Educators - UONEDU is a non-governmental organization that was founded in 2017 and is organized by the innovations of education educators with the aim of overcoming barriers and obstacles in the field of online education and general education. The organization itself has 3 main anchors: 1) create a bridge from formal education to continuing education of all members; 2) train teachers to teach their teaching projects online (seminars,

webinars, courses); 3) connect educators, encourage them to innovate, scientific and practical solutions, as well as involvement in academic contributions in the field of distance education and improvement of formal education. The specificity of this organization is that it is an integrative model, in which, from formal education through the training model, members are led to independence, who then create their own courses, train other members and present their developed models at the annual conference, contributing both practically and academically. Thus, they constitute the social innovation of citizens by offering transnational cooperation and academic exchange of knowledge, socializing and networking.

Methods

Content analysis is applied in all social sciences, especially in history, literature, ethnology, anthropology, sociology, and social psychology. This technique is also applied in other types of research. (Andrilović, 1988). The content of the messages is first analyzed, followed by other characteristic elements of the content. Zvonarević defines content analysis as "a procedure for classifying and quantifying various verbal and non-verbal messages in the broadest sense of the word, according to their content and formal characteristics and in accordance with established general rules." (Zvonarević, 1976, quoted in Andrilović, 1988, p. 42).

Research procedure

The research procedure is based on the analysis of the Association's documentation. The criteria for content analysis in our research are as follows:

Table 1 *Procedure and analysis criteria*

Criteria	Criteria elements
Research questions	5. How is the organization organized? 6. What are its basic goals and activities? 7. Which models of education are offered in the analyzed sample? 8. What types of certificates does the association issue, and how is it recognizable?
Units of analysis	Archive of the association: Statute, Decisions, Registers,
Content units	Organization and its elements of presentation and recognition
Content category	Qualitative criterion

After the analysis, the data were presented in tables. The criteria for further analysis were: the organization and its elements of presentation and recognition.

Results

In our research on the case study of the model analysis of an organization, we wanted to find out how it is organized and what are its basic elements, goals and programs? Table 2 presents the results of the analysis of the association's documentation. Results are presented following the research questions.

Question 1: How is the organization organized?

Table 2 *Model of the UONEDU Organization*

Terms	Characteristics
<i>Type</i>	non-governmental organization – NGO ¹
<i>association bodies</i>	a) The assembly, b) The Board of Directors.
<i>representation</i>	a) president b) vice president
<i>membership</i>	- basic membership - supporting membership - honorary membership
<i>sections</i>	- online language teachers (online language teaching school) - online advisers - online coaches

Furthermore, through the analysis of the association's documentation, we came to the results shown in Table 3 and Table 4, regarding the 2nd initial question.

Question 2: What are its basic goals and activities?

Table 3 *UONEDU Program Objectives and Activities*

Terms	Characteristics
	- creating a database of online educators, - education, development, support and integration of online educators both internally and at the level of the state of BiH as well as at the global level, for the purpose of

¹ A non-governmental organization (NGO) is defined as a non-profit organization, group or institution that operates independently from a Government and has humanitarian or development objectives (UNDP, 2024).

<i>program objectives</i>	<p>knowledge exchange and improvement, as well as monitoring courses of upbringing and education,</p> <ul style="list-style-type: none"> - implement a program of online education, training, improvement, seminars, counseling, conferences and public hearings, - develops and nurtures mutual solidarity and cooperation among members, - gathers young people and adults for the purpose of education and training of educators (under the term educator, include: teachers, teachers, professors, instructors, trainers, lecturers, advisors, educators and all other educators who deal with online upbringing and education).
<i>activities</i>	<ul style="list-style-type: none"> - organize educator training schools for online teaching on platforms or outside them, - organize summer/winter language schools, - cooperate with other similar associations and organizations, - perform other tasks that contribute to the achievement of the goals of the establishment established by the Statute, - corresponds to quality online upbringing and education, preserving the dignity of the teaching profession, following pedagogical codes, principles and rules of online pedagogy, - to organize seminars, trainings and workshops in order to contribute to upbringing and education, as well as to support the scientific research and professional work of educators inside and outside the Association. -other goals and activities in accordance with the Law and the Statute

These programs and activities are organized by educators for citizens and with mutual cooperation and networking they are together creating a program true activity for experts and citizens.

Table 4. *UONEDU Key Activities*

for expert	for citizens	experts&citizens
Conferences	Conferences	research hub
Webinars	language center courses	book club
teacher treading courses	online courses	creative hub
language courses	workshops	homework hub
internship practice	public discussions	public discussions

Onward, through the analysis of the association's documentation, we came to the results shown in Table 4, regarding the initial question.

Question 3: Which models of education are offered in the analyzed sample?

Tabela 4. *Model of education*

Program type	Description and feature
<i>training</i>	<p>Course 1. Introduction to Online Education, link: https://www.udemy.com/course/introduction-to-online-education-and-online-teaching/</p> <p>Course 2. Early Foreign Language Learning, link: https://www.udemy.com/course/early-foreign-language-learning/learn/quiz/6463781</p> <p>Course 3. How to Motivate Students? link: https://www.udemy.com/course/teach-online-how-to-motivate-your-students/</p> <p>Course 4. Online Language Teaching Methods, link: https://www.udemy.com/course/teach-online-language-teaching-methods/</p> <p>Course 5. Leadership and How to Lead in the Online Space, link: https://www.udemy.com/course/teach-online-leadership-and-how-to-lead-your-students/</p>
<i>webinars</i>	<ol style="list-style-type: none"> 1. Online Education Webinar 2. Dispelling Myths about Online Education 3. Leading Online Educators and "Editing" Social Groups 4. Webinar on Online Leadership 5. Methodological Guidelines for Organizing and Conducting Distance Learning in the Specific Circumstances 6. Parents and Online Learning 7. Management of Online Educators on Online Platforms
<i>conferences</i>	<p>1st UONEDU conference "UONEDU" (2018).</p> <p>2nd UONEDU conference "Challenges of online teaching in 2019" (2019).</p> <p>3rd UONEDU conference "Online innovations, patents, models, approaches, methods and techniques in education and for education" (2020).</p> <p>4th UONEDU conference "Global context of education: experiences and perspective" (2021).</p> <p>5th UONEDU conference "Traditions and trends in online education (2022).</p> <p>6th UONEDU conference "Position of educators in global education" (2023).</p> <p>7th UONEDU conference 7th UONEDU international conference "New Scientific Achievements and Experiences in the Field of Online Education"</p>
<i>other types of programs</i>	<p>language courses, e-mail courses,</p>

	mobile learning, demo-demonstrations, workshops, public discussions hubs clubs and sections
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The results show that the educational types are directed towards the training of educators and training for independent action and program creation.

Finally, we were interested how organization is recognizable? Table 5 shows the results of the analysis of the association's documentation and the question 4 is initially posed:

Question 3: what types of certificates does the association issue, and how is it recognizable?

Table 5. *Types of certificates issued by UONEDU*

Type of certificate	About certificate
<i>CEFR Certificate</i>	The certificate guarantees that the candidate has successfully completed the course in which the total result of the obtained test points is verified according to the CEFR (The Common European Framework of Reference for Languages) methodology for languages.
<i>Certificate of presentation and participation in the conference</i>	The certificate is issued to the presenters of topics at the conference
<i>Training Certificate</i>	The certificate guarantees that the participant has successfully completed 4 training courses on the partner platform Udemy, and thus acquires the right and license for online teaching on reference online platforms.
<i>Other type of certificate</i>	certificate of appreciation, certificate of confirmation, etc.

On the basis of the above (Table 2, Table 3, Table 4 and Table 5) to conclude the following: 1) That UONEDU has a model of organization; 2) That the organization has leadership in accordance with the legal and administrative regulations; 3) That the program contents are related to educational contents and programs and activities; 4) That after each training program, verification and evaluation of knowledge is carried out, as well as recognition in accordance with prescribed and valid Standards and methodologies and has evidence in the form of legal documents.

CONCLUSION

In this paper we wanted to determine and demonstrate whether knowledge, production and action (technical), as a basic human ability, are the foundation for the technical use of the produced knowledge? For that purpose, we analyze a sample of an organization from foundation to operation in the period of seven years, and the application of the original principles of modern science in the creation, development, as well as operation of the organization.

Based on analyzed sample and results, findings are indicating that an integral part of reality today is undoubtedly technique and the constant development and progress of new technologies. Because of this fact, it is neither justified nor permissible to ignore the meaning and role of the term that gives meaning to today's term technique, i.e. the Greek term *techne*. The production and knowledge that define the term *techne* is shown in everything that man can do with real things and the ways in which he participates in the construction of reality and real life. Therefore, understanding the term *techne* in the modern technical and scientific world is a necessary condition for thinking about technique, the significance and use of technology for making models of organizations, education, and organizing and integrating humans into it, as well as making an evidence of that production in the form of legal documents and recognition in accordance with prescribed and valid Standards and methodologies.

The content that is given to the tech and used by the tech is produced by thought and knowledge on the part of the tech. The decoding of certain contents in the technical world and the world of IT governance occurs exclusively through a person who thinks, creates, produces. It does not use what is produced, it produces it, learns, develops and perfects the art of production. Technology cannot do all this because technology does not think. Technique, which is itself one of the devices using what has already been produced by *techne* means exclusively that the essence of technique is nothing technical and that man's essence and reality cannot be explained by technique or any technical progress but exclusively by the production that is *techne*, as we have in the sample as knowledge of experts to produce new models and organize citizens around it. Accordingly, the question remains open: can we imagine life today without the use of technique and technical means, without relying on technologies and monitoring and using their progress? The fundamental part of the question is found in the meaning of the term *techne* with which we are asked: can we imagine every day and business life without the production and transfer of knowledge that enable us to use technical means and advanced technologies at all?

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PROFESSIONAL STANDARDS FOR TEACHERS IN THE IMPLEMENTATION OF CURRICULUM REFORM

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ABSTRACT

The implementation of competency-based curriculum reform has brought about significant changes in the role and responsibilities of teachers in preschool education. This shift is reflected not only in the new expectations placed on teachers but also in the demand for enhanced professional skills and a full commitment to the needs of children. This paper examines how professional standards for teachers contribute to achieving the objectives of curriculum reform and how continuous professional development is a key factor in this process.

Professional standards for preschool teachers require them to be capable of supporting the overall development and learning of children. This includes selecting appropriate games, activities, tools, and resources that make the learning process as effective as possible. For example, a teacher who uses structured games and activities integrated into children's daily lives is better equipped to support the development of their motor and cognitive skills.

The professional development package for teachers, which includes the document of professional standards, aims to help teachers stay updated with the latest information and educational developments. A teacher who is up-to-date with these developments is better equipped to address the individual needs of children and meet the expectations of curriculum reform. A study conducted in several preschool institutions found that teachers who had participated in regular professional development programs showed a significant improvement in their interaction quality with children and in their ability to adapt their teaching methods.

Continuous professional development, guided by standards and measurable indicators, helps every teacher assess and improve their performance. The professional development process involves various stages, from updating basic knowledge to acquiring new teaching methods, and reflecting on one's practices. This process is essential for the ongoing enhancement of teaching quality and ensuring that teachers are equipped to meet the diverse needs of children in the classroom.

To illustrate the impact of meeting professional standards, a study will be conducted as part of this paper, analyzing the performance of teachers in several preschool educational institutions. This study will focus on measuring the effectiveness of methods used by teachers who have undergone professional development programs aligned with the new standards and will

compare the results with those of teachers who have not participated in the same programs. The aim is to identify best practices and determine the most effective strategies for successfully implementing curriculum reform.

In conclusion, meeting professional standards is essential for the success of competency-based curriculum reform. This fulfillment requires continuous engagement in professional development and a consistent approach to the ongoing improvement of teachers. Only in this way can teachers provide quality teaching that meets the needs and interests of children, contributing to their overall development and preparation for the future. The proposed study will aid in verifying and improving these standards, providing an empirical basis for policymakers and educational institutions to further enhance the curriculum and teaching methodologies.

Keywords: Professional standards, Curriculum reform, Competency-based education, Preschool education, Teacher development

Introduction:

The landscape of education in Albania is undergoing a profound transformation with the implementation of competency-based curriculum reform. This shift, particularly in preschool education, has redefined the role of teachers, placing greater emphasis on their professional responsibilities and the necessity for advanced skills to meet the evolving needs of young learners. As educational systems strive to prepare children for a rapidly changing world, the professional standards for teachers have become a cornerstone in achieving the ambitious goals of curriculum reform.

This article explores the critical role of professional standards in guiding teachers through this transition, emphasizing the importance of continuous professional development as a means to enhance teaching effectiveness. By examining how these standards influence the practices and outcomes in preschool settings, the article seeks to highlight the direct impact of well-prepared teachers on the successful implementation of curriculum reform.

In particular, this study will investigate the relationship between adherence to professional standards and the quality of education provided in preschools. Through empirical analysis, the research will compare the performance of teachers who have engaged in ongoing professional development aligned with these standards against those who have not. The findings will offer valuable insights into the best practices for integrating curriculum reform and underscore the need for a sustained commitment to teacher development as a vital component of educational success.

This investigation is not only timely but also essential for informing policymakers, educational leaders, and teachers themselves about the strategies that can best support the educational reforms currently underway. The study aims to contribute to the broader discourse on how to

equip teachers with the necessary tools and knowledge to foster a learning environment that truly benefits the next generation of students in Albania.

Objectives of the article:

- Identifying the Real Needs of Preschool Teachers: This article aims to identify and analyze the specific needs of preschool teachers to enhance their knowledge and professional skills in the future.
- Highlighting Priority Areas for Professional Development: The article will highlight the key areas, topics, and directions where the professional development of preschool teachers should be focused.
- Providing Recommendations for Continuous Professional Development: The article will offer concrete recommendations for the training and continuous professional development of teachers, based on their needs and the requirements of curriculum reform.
- Determining Necessary Interventions and Support: The article seeks to determine the necessary interventions and support that teachers require to provide quality educational services in preschool institutions.

Methodology of the article:

The professional development of teachers is treated as an ongoing process that spans their entire professional career. The main goal is to update teachers' knowledge and develop their competencies to ensure that all children receive quality educational services. Professional development policies are based on a structured process that begins with identifying teachers' needs, collecting and analyzing data, drawing conclusions, and providing recommendations for training priorities.

To achieve these objectives, a measuring instrument was developed, considering participants' self-assessment and self-determination of their needs for training and professional development. The data collected through this instrument is quantitative, and the article is based on quantitative research to derive the relevant conclusions and recommendations.

Sampling and selection procedures:

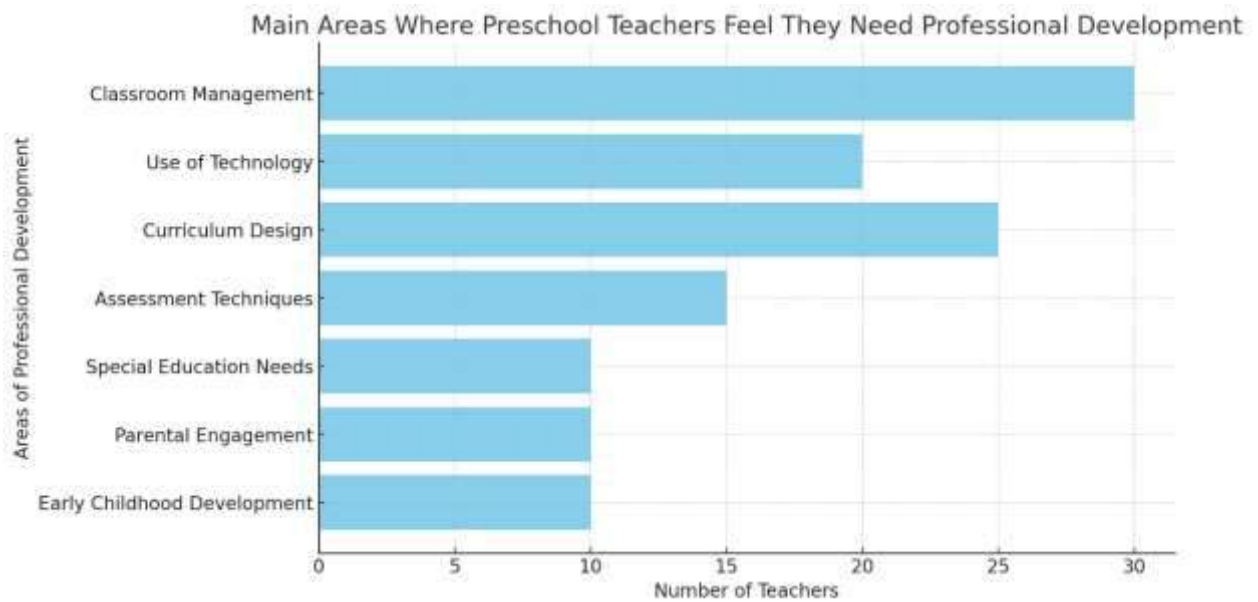
The sample for this article includes preschool teachers working in kindergartens and preparatory classes, as well as the leaders of public and private preschool institutions, selected from 4 schools in the city of Tirana. A total of 120 preschool teachers were included. The sampling procedure was non-randomized, with the measuring instrument being sent to the entire population of preschool teachers. The instrument was requested to be completed electronically via the Google Forms platform, with the generated link sent to participants. The link generated by the electronic platform was distributed to the participants through official communication (email) by the local education offices responsible for preschool teachers.

Questionnaire Questions:

1. What are the main areas where you feel you need professional development?

- Classroom Management (30 Teachers): The majority of teachers (30 out of 120) expressed a need for professional development in classroom management.
- Curriculum Design (25 Teachers): A significant number of teachers (25 out of 120) indicated a need for further development in curriculum design.
- Use of Technology (20 Teachers): The integration of technology in the classroom is another critical area, with 20 teachers seeking additional training.
- Assessment Techniques (15 Teachers): Assessment techniques are also a priority, with 15 teachers identifying this as an area for growth..
- Special Education Needs (10 Teachers): Addressing the needs of students with special educational needs is another area where 10 teachers feel they need further development.
- Parental Engagement (10 Teachers): Engaging parents effectively is crucial for early childhood education, and 10 teachers expressed a desire for professional development in this area. This reflects the challenges teachers face in building strong partnerships with parents.
- Early Childhood Development (10 Teachers): Finally, understanding early childhood development is essential for preschool teachers, with 10 respondents indicating a need for more knowledge in this area.

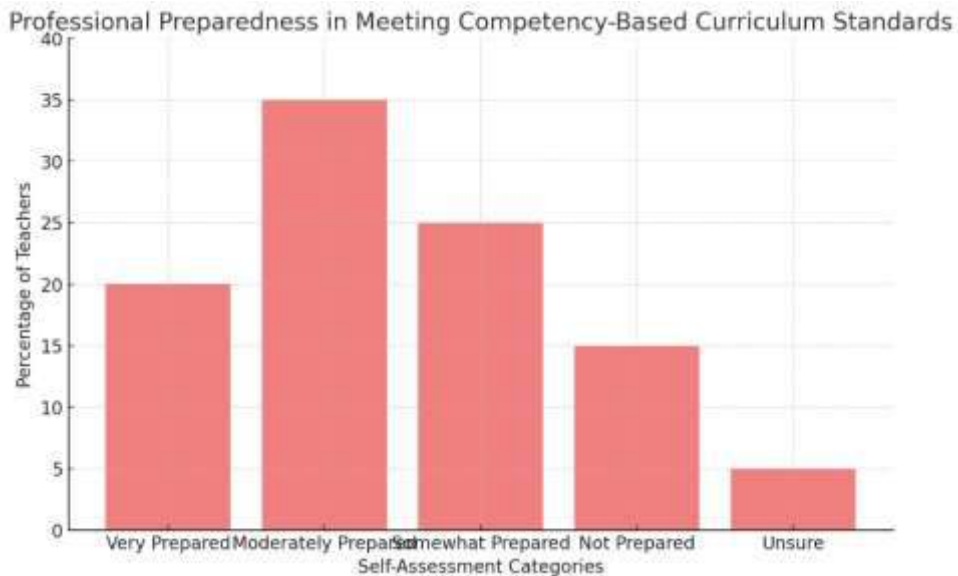
The data suggests that there is a broad range of areas where preschool teachers feel they need professional development. The highest demand is for training in classroom management, curriculum design, and the use of technology. These areas are crucial for the effective implementation of competency-based curriculum reforms and for ensuring that teachers can meet the diverse needs of their students. The insights gained from this hypothetical data can inform the design of targeted professional development programs that address the specific needs of teachers in the preschool education sector.



2. How do you currently assess your professional preparedness in meeting the standards of competency-based curriculum?

- Very Prepared (20%): Only 20% of the teachers feel "Very Prepared" to meet the standards. This suggests that a relatively small proportion of teachers are confident in their ability to fully implement the competency-based curriculum, indicating a need for ongoing support and professional development.
- Moderately Prepared (35%): The largest group, 35% of teachers, consider themselves "Moderately Prepared."
- Somewhat Prepared (25%): About 25% of the teachers feel "Somewhat Prepared." This indicates a significant number of teachers who are aware of the curriculum's demands but do not feel adequately equipped to meet them without additional training.
- Not Prepared (15%): 15% of teachers reported feeling "Not Prepared." This highlights a critical area of concern, as these teachers may struggle significantly with implementing the curriculum, necessitating immediate intervention and support.
- Unsure (5%): A small portion, 5%, are "Unsure" about their preparedness. This uncertainty could stem from a lack of understanding of the curriculum standards or insufficient training, and it underscores the importance of clear communication and comprehensive professional development programs.

The data suggests that while some teachers feel moderately or very prepared to meet the standards of the competency-based curriculum, a considerable portion still lacks confidence in their preparedness. This underscores the need for targeted professional development initiatives that address the specific gaps in knowledge and skills, particularly focusing on those who feel somewhat prepared, not prepared, or unsure. Ensuring that all teachers feel fully equipped to implement the curriculum is essential for the success of educational reforms.

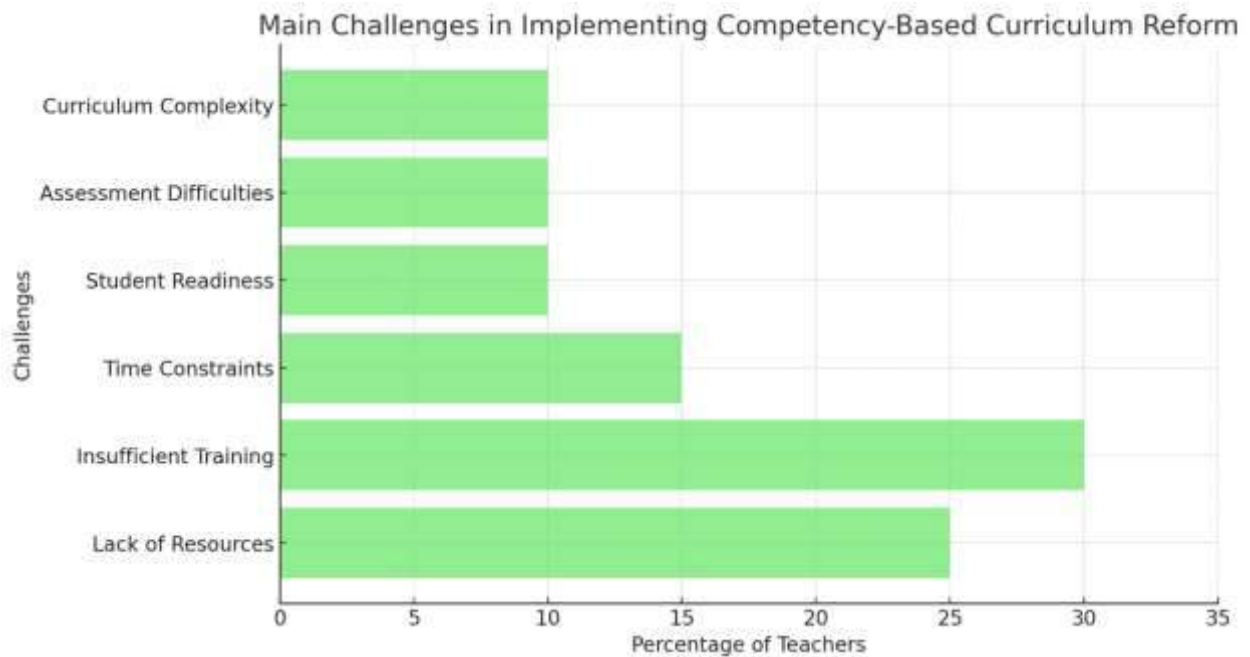


3. What are the main challenges you face in implementing competency-based curriculum reform in your teaching?

- Insufficient Training (30%): The most significant challenge, reported by 30% of teachers, is insufficient training. This indicates that many teachers feel they lack the necessary skills and knowledge to effectively implement the competency-based curriculum, highlighting a critical need for more comprehensive and accessible professional development opportunities.
- Lack of Resources (25%): The second most common challenge, cited by 25% of teachers, is a lack of resources.
- Time Constraints (15%): Time constraints are a challenge for 15% of teachers, indicating that the demands of the curriculum may be difficult to meet within the available time for planning and instruction.
- Student Readiness (10%): Another challenge, affecting 10% of teachers, is student readiness. This reflects concerns about whether students are adequately prepared to engage with the competency-based curriculum, which could be due to gaps in prior learning or varying levels of development.
- Assessment Difficulties (10%): Assessment difficulties are also reported by 10% of teachers, suggesting that evaluating students' competencies in a meaningful and effective way is a significant concern.
- Curriculum Complexity (10%): Finally, 10% of teachers identified curriculum complexity as a challenge.

The data reveals that the main challenges in implementing competency-based curriculum reform are largely centered around insufficient training and lack of resources. These findings suggest that to successfully implement the curriculum, there must be a focus on providing teachers with the necessary training and resources. Additionally, addressing time constraints, student readiness, assessment methods, and curriculum complexity will be crucial in

overcoming these obstacles and ensuring that teachers can effectively deliver the new curriculum.



**4. Do you regularly participate in professional development programs and training?
If so, how useful do you find them in improving your skills?**

Participation in Professional Development Programs:

- Regularly Participate (40%): The largest group of teachers, 40%, regularly participate in professional development programs. This indicates a strong commitment among teachers to ongoing learning and skill improvement.
- Occasionally Participate (30%): Another 30% of teachers participate occasionally, suggesting that while these teachers engage in professional development, there may be barriers such as time constraints or lack of availability that prevent more frequent participation.
- Rarely Participate (20%): 20% of teachers rarely participate in professional development, which could highlight potential issues such as lack of motivation, resources, or opportunities.
- Never Participate (10%): A small group, 10%, never participate in professional development programs, which may indicate a need for targeted outreach or support to encourage involvement.

Usefulness of Professional Development Programs:

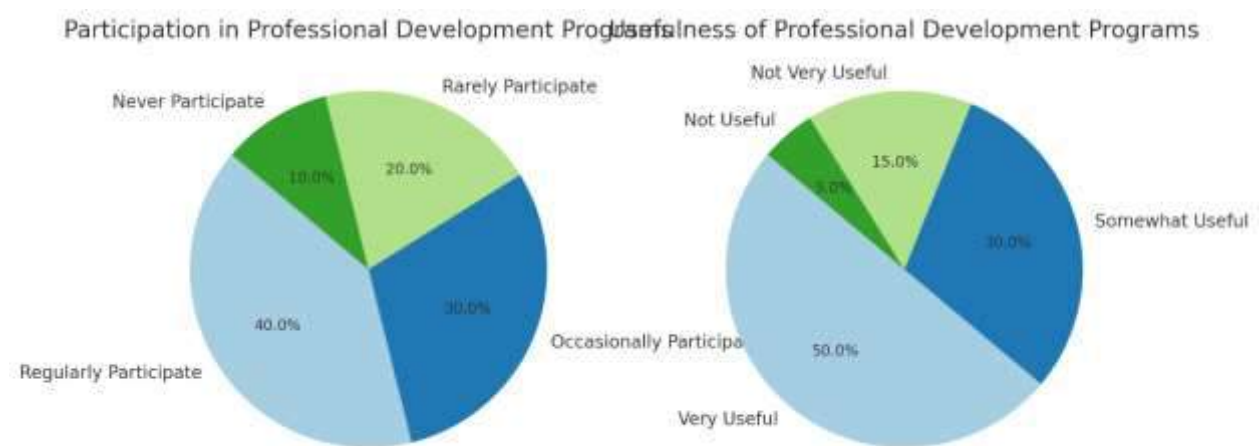
- Very useful (50%): Half of the teachers find professional development programs to be "Very Useful," indicating that these programs significantly contribute to their skill enhancement and teaching effectiveness.

- Somewhat useful (30%): 30% of teachers find the programs "Somewhat Useful," suggesting that while the programs are beneficial, there may be room for improvement in content, delivery, or relevance.

- Not very useful (15%): 15% of teachers report that the programs are "Not Very Useful," highlighting potential issues with how the programs meet their specific needs.

- Not useful (5%): A small percentage, 5%, find the programs "Not Useful," which may indicate that the current offerings are not aligned with their professional development goals or that the programs lack practical application.

The data suggests that while a majority of teachers regularly participate in professional development programs and find them beneficial, there is a significant portion that either rarely participates or does not find the programs particularly useful. This highlights the importance of not only encouraging greater participation but also ensuring that these programs are highly relevant, practical, and tailored to meet the diverse needs of teachers. Improving the content and accessibility of professional development could help to enhance teacher engagement and ensure that all educators can benefit from these opportunities to improve their skills and effectiveness in the classroom.



5. What tools and resources do you consider essential for improving the effectiveness of your teaching?

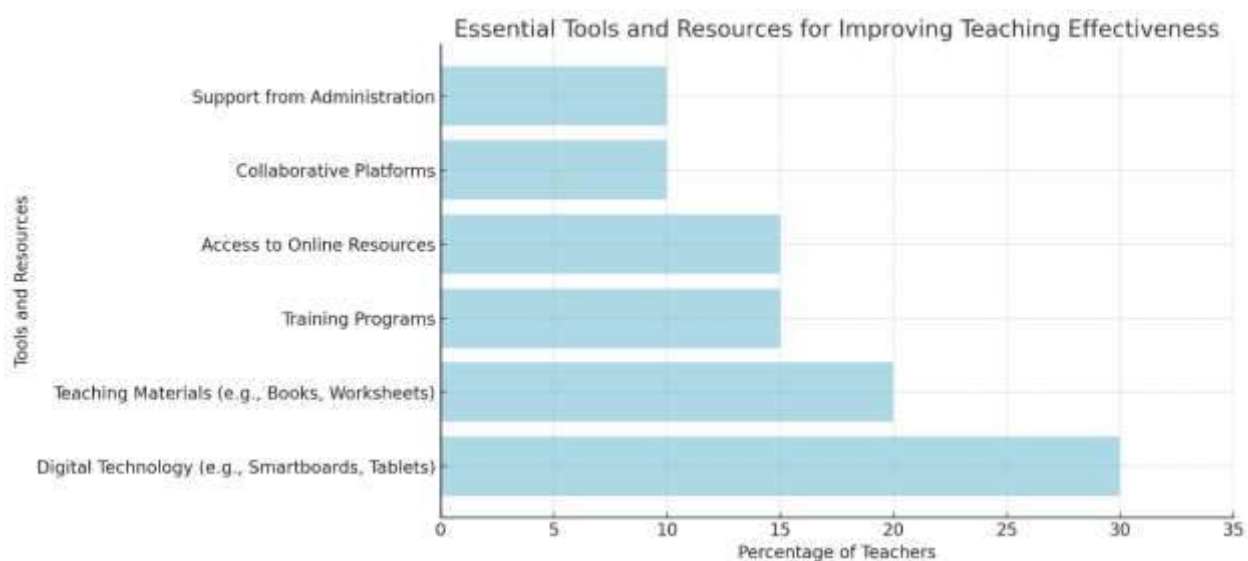
- Digital technology (30%): A significant portion of teachers (30%) identified digital technology, such as smartboards and tablets, as essential for enhancing their teaching effectiveness.

- Teaching materials (20%): 20% of teachers consider access to quality teaching materials, such as books and worksheets, to be crucial. These resources are fundamental in providing structured and varied content that supports different learning styles.

- Training programs (15%): Professional development and training programs are seen as essential by 15% of teachers. This underscores the need for ongoing skill enhancement and up-to-date pedagogical knowledge to keep pace with educational reforms.

- Access to online resources (15%): Access to online resources is also valued by 15% of teachers, highlighting the importance of having a wide array of digital content and educational tools that can be easily accessed to support diverse teaching needs.
- Collaborative platforms (10%): Collaborative platforms, which facilitate communication and resource sharing among teachers, are considered essential by 10% of respondents. These platforms can enhance collaboration and innovation in teaching practices.
- Support from administration (10%): Finally, 10% of teachers emphasized the importance of support from school administration. Administrative backing is critical in implementing new teaching strategies, accessing resources, and fostering a positive educational environment.

The data suggests that digital technology, quality teaching materials, and professional development are the top priorities for teachers when it comes to improving their teaching effectiveness. Additionally, access to online resources, collaborative platforms, and strong administrative support are also crucial elements that contribute to a more effective and supportive teaching environment. Addressing these needs can help ensure that teachers have the tools and resources necessary to deliver high-quality education and meet the demands of modern curricula.

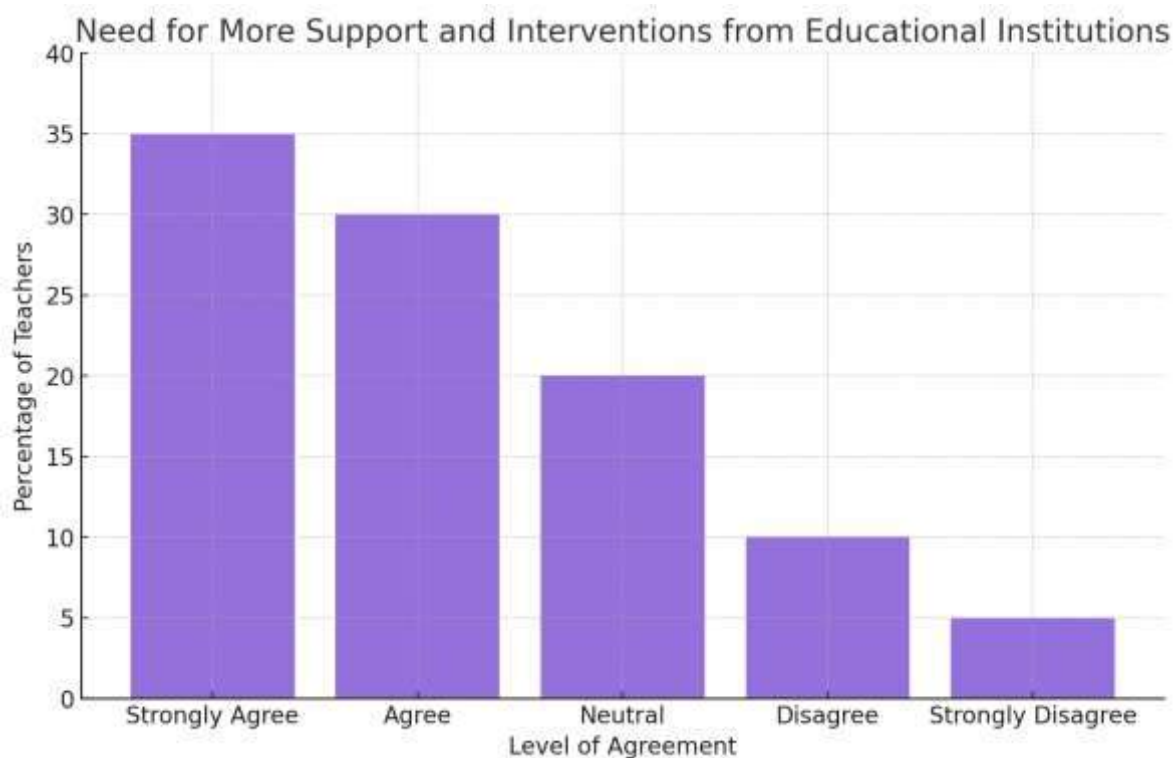


6. Do you feel the need for more support and interventions from educational institutions to meet the requirements of the new curriculum?

- Strongly Agree (35%): The largest group of teachers, 35%, strongly agree that they need more support and interventions from educational institutions.
- Agree (30%): Another 30% of teachers agree with the need for more support, reflecting a widespread recognition that current support systems may be insufficient to fully meet the demands of the competency-based curriculum.

- Neutral (20%): 20% of teachers remain neutral on the issue, which could suggest a level of uncertainty or mixed experiences with the support currently provided by educational institutions.
- Disagree (10%): A smaller portion, 10%, disagree with the need for additional support, possibly indicating that these teachers feel adequately equipped or have access to sufficient resources and interventions.
- Strongly Disagree (5%): Only 5% of teachers strongly disagree, which suggests that very few feel that no further support is necessary.

The data reveals that a majority of teachers (65%) feel a clear need for more support and interventions from educational institutions to effectively meet the requirements of the new curriculum. This highlights a critical area for educational policymakers and administrators to address, ensuring that teachers are provided with the necessary resources, training, and guidance to implement the curriculum successfully. Enhancing support structures could lead to better curriculum outcomes and improved teaching effectiveness across the board.

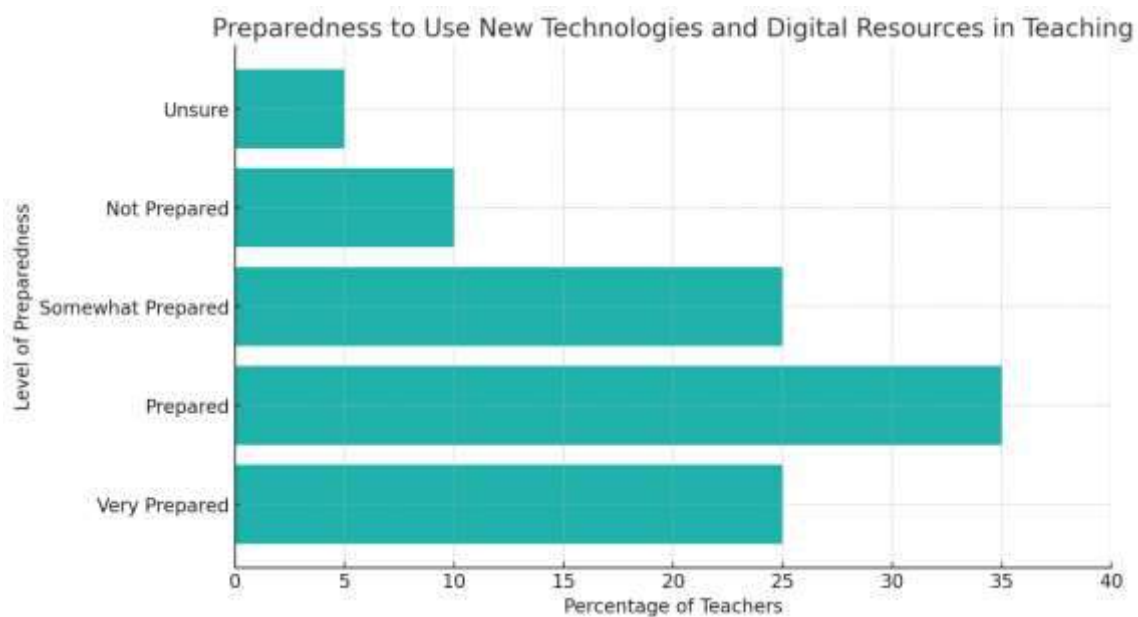


7. How prepared do you feel to use new technologies and digital resources in the teaching process?

- Prepared (35%): The largest group of teachers, 35%, feel "Prepared" to use new technologies and digital resources..
- Very Prepared (25%): A quarter of the teachers (25%) feel "Very Prepared," showing a strong level of confidence in their ability to effectively integrate technology into their classrooms.

- Somewhat Prepared (25%): Another 25% of teachers feel "Somewhat Prepared," suggesting that while they may have some knowledge of digital tools, they may not feel fully confident in using them effectively.
- Not Prepared (10%): 10% of teachers report feeling "Not Prepared" to use new technologies, indicating a need for targeted training and support to help these educators develop the necessary skills.
- Unsure (5%): A small percentage, 5%, are "Unsure" about their preparedness, which could reflect a lack of exposure to or familiarity with new technologies.

These data indicates that while a majority of teachers feel at least somewhat prepared to use new technologies and digital resources in their teaching, there is still a significant portion that requires further support and training. Ensuring that all teachers feel confident and capable of integrating technology into their classrooms is essential for modernizing education and improving student outcomes. Providing ongoing professional development and access to resources will be key to achieving this goal.



8. How can the professional development program be improved to better meet your needs as a preschool teacher?

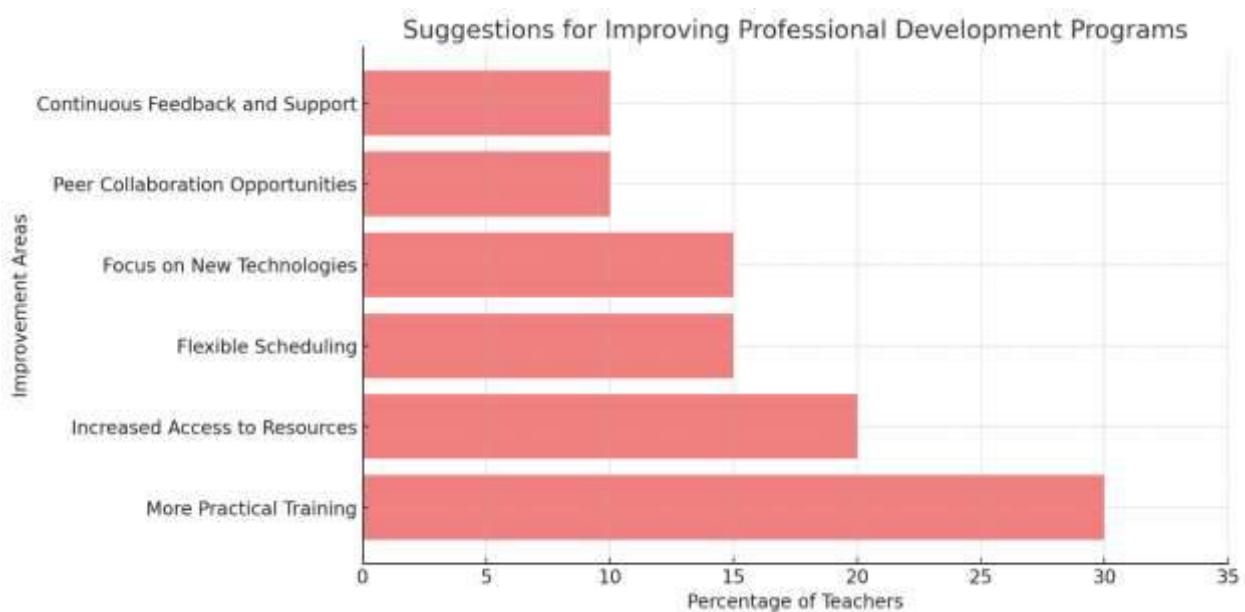
- More practical training (30%): The most significant area for improvement, identified by 30% of teachers, is the need for more practical training.
- Increased Access to Resources (20%): 20% of teachers expressed a desire for increased access to resources.
- Flexible Scheduling (15%): Flexibility in scheduling is important for 15% of teachers. This reflects the need for professional development programs to be more accommodating to the busy schedules of teachers, allowing them to participate without disrupting their teaching responsibilities.

-Focus on New Technologies (15%): Another 15% of teachers want a greater focus on new technologies within the professional development programs.

- Peer Collaboration Opportunities (10%): 10% of teachers see value in more opportunities for peer collaboration. This suggests that teachers benefit from learning from one another and sharing best practices, and that such opportunities should be incorporated into professional development.

- Continuous Feedback and Support (10%): Finally, 10% of teachers indicated a need for continuous feedback and support.

This indicates that teachers are looking for more practical, resource-rich, and flexible professional development programs. Additionally, there is a strong desire for an emphasis on new technologies, opportunities for peer collaboration, and continuous support. Addressing these needs could significantly enhance the effectiveness of professional development programs, better equipping teachers to meet the demands of modern education and improve their teaching practice.



9. What are your main priorities for professional development in the coming years?

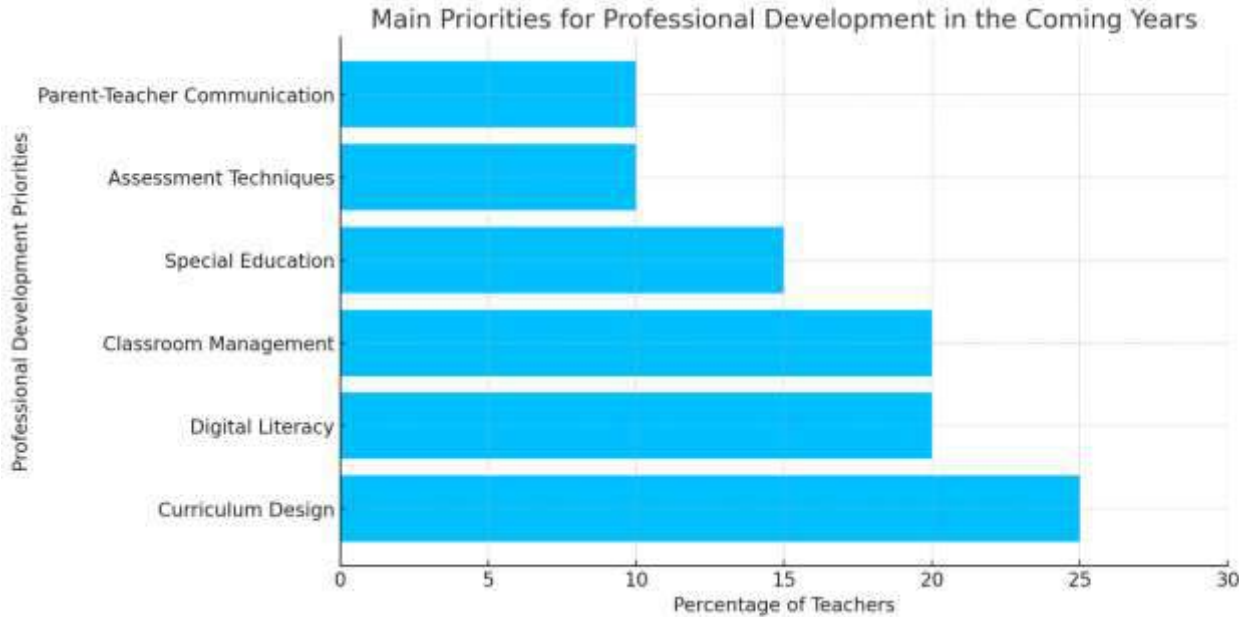
- Curriculum Design (25%): The top priority, identified by 25% of teachers, is curriculum design. This reflects a strong focus on developing and refining the skills needed to create effective, competency-based curricula that meet educational standards and student needs.

- Digital Literacy (20%): Digital literacy is a priority for 20% of teachers, indicating a recognition of the growing importance of technology in education.

- Classroom management (20%): Classroom management is also a significant priority for 20% of teachers.

- Special Education (15%): Special education is a priority for 15% of teachers, highlighting the need for professional development that equips teachers to address the diverse needs of students with disabilities or learning difficulties.
- Assessment Techniques (10%): 10% of teachers prioritize improving their assessment techniques. This shows a focus on developing more effective methods for evaluating student progress and competency, particularly in the context of the new curriculum.
- Parent-Teacher Communication (10%): Finally, 10% of teachers see improving parent-teacher communication as a priority. This underscores the importance of building strong relationships with parents to support student learning and development.

The data indicates that preschool teachers have a diverse range of priorities for professional development in the coming years, with a particular focus on curriculum design, digital literacy, and classroom management. Addressing these priorities through targeted professional development programs will be essential in helping teachers enhance their skills and effectiveness, ultimately leading to better educational outcomes for students.



Conclusions:

The analysis of the data highlights several key areas for improving the effectiveness of professional development for preschool teachers. One of the primary areas where teachers feel they need more training is in classroom management (30%) and curriculum design (25%). This indicates a strong need for focused professional development in these critical areas to better equip teachers for the demands of modern education.

In terms of preparedness to meet curriculum standards, while many teachers feel moderately prepared (35%) or very prepared (20%), a significant portion still feels underprepared. This underscores the ongoing need for support and training to ensure that all teachers are confident in their ability to implement the competency-based curriculum effectively.

The challenges faced by teachers in implementing this curriculum are also significant. Insufficient training (30%) and a lack of resources (25%) are the main issues identified, and addressing these challenges is crucial for the successful implementation of the curriculum.

Although 40% of teachers regularly participate in professional development, there is a clear need to increase participation rates and ensure that these programs are both practical and accessible. Currently, 50% of teachers find the programs very useful, but there is room for improvement to engage more educators.

Essential resources such as digital technology (30%) and teaching materials (20%) are considered critical for improving teaching effectiveness. Providing these tools is vital for teachers to succeed in the classroom.

Moreover, a majority of teachers strongly agree (35%) or agree (30%) that more support from educational institutions is needed to meet the new curriculum requirements. While 35% of teachers feel prepared to use new technologies, another 35% are only somewhat prepared or not prepared, highlighting the need for additional technology-focused training.

To improve professional development programs, teachers have recommended more practical training (30%), increased access to resources (20%), and more flexible scheduling (15%). These changes could greatly enhance the relevance and accessibility of professional development.

Looking to the future, teachers have identified curriculum design (25%), digital literacy (20%), and classroom management (20%) as their main priorities for professional development. These areas are essential for teachers to continue evolving alongside educational reforms.

In summary, there is a clear need for targeted professional development that emphasizes practical training, access to resources, and robust support from educational institutions. By focusing on these areas, teachers can be better prepared to meet the demands of modern education and successfully implement competency-based curriculum reforms.

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WOMEN PROGRAMMERS UNDER 35 IN BULGARIA: CAREER DEVELOPMENT, EDUCATION AND STRATIFICATION

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ABSTRACT

The focus of the analysis in the present study is the choice of work following the birth of a child in the family and it examines the career development of women - mothers under 35 years old. The article demonstrates how career advancement is possible for women in the field of information technology and clearly illustrates the application of the intersectional approach in the study of inequalities and stratification.

Using qualitative methods, the research showcases a case of career transformation (from a biologist in a laboratory to an IT manager in a foreign company) of a young woman, emphasizing the importance and role of education and additional qualifications. The study identifies the effective mechanisms for career development of women in the IT sector in Bulgaria. In conclusion, public policies and practices concerning the group of female programmers in Bulgaria are discussed.

Keywords: career development, female programmers, intersectional approach, gender, inequalities.

Introduction

The results of studies related to the representation of women in the IT sector show that, despite an increase in recent years, women are generally underrepresented in the sector. According to Eurostat data, the share of employed women is 17% of all employed in the IT sector in Europe.¹ Data from a European Commission study (European Commission. Women in Digital Scoreboard, 2020) indicate that women rarely reach high technological or managerial positions in technology companies.

The key issues that arise concerning the career development of women in the IT sector are related to gender discrimination, lower pay for women, and the almost non-existent opportunities for career advancement.

According to data from a study on discrimination and inequality (Atomico. The State of European Tech 2020), almost half of the women (46%) working in the IT sector reported feeling discriminated against because of their gender.

¹ <https://ec.europa.eu/eurostat/web/science-technology-innovation/data/database>

In Bulgaria, gender discrimination against women in the IT sector is also present, although their representation is higher compared to other countries in the European Union. According to data from the National Statistical Institute in Bulgaria,² women make up around 30% of those employed in the IT industry. This percentage is significantly higher than the European average, but women are still a minority compared to men. The results show that women in the IT sector are underrepresented in managerial and senior technical positions. Primarily, women in the sector work in roles related to support and testing, while men are engaged in software development and project management.³

Studies related to women in the IT sector note that women earn, on average, about 15% lower salaries compared to men for similar positions.⁴

In the discourse on barriers faced by women in the IT sector, gender discrimination and stereotypes about women in the field come to the forefront.

One of McKinsey's main conclusions is that women often encounter stereotypes that place them in lower positions compared to men in the IT sector. There are "technical" stereotypes suggesting that women are less technically skilled, as well as stereotypes about women's overall work abilities (McKinsey, 2020). These stereotypes result in women having lower expectations regarding their work skills, receiving lower pay, and being assigned more elementary tasks.

A study by the European Commission (Women in Digital Scoreboard 2023) indicates that women in the IT sector often face barriers such as lack of support from employers, lower pay, and fewer opportunities for advancement and career development compared to men.

Gender discrimination in the IT sector and its impact on women's professional lives has become an extremely sensitive topic that is very poorly researched in our country. The cases of career advancement methods for women in the sector, in general, are also very under-researched.

This article aims to demonstrate and illustrate how career advancement and professional development for women in the IT sector can be achieved. It also addresses the choice of employment after the birth of a child and examines the career development of women—mothers under the age of 35. The article clearly shows the application of an interdisciplinary approach in studying gender inequalities and stratification.

By applying qualitative methods (in-depth interviews), the study illustrates the case of a career transformation (from a biologist in a lab to an IT manager in a foreign company) of a young woman, emphasizing the importance and role of education and additional qualifications. The research identifies effective mechanisms for career development for women in the IT sector in Bulgaria. In conclusion, the public policies and practices concerning the group of women programmers in Bulgaria are discussed.

² National Statistical Institute (NSI), "Workforce in the IT Sector," 2020

³ there again

⁴ <https://ec.europa.eu/eurostat/web/science-technology-innovation/data/database>

The article seeks to answer two main questions. First, how can career advancement be achieved in the IT sector? Second, through what mechanisms can gender discrimination in the IT sector be overcome?

Social and sociological problem

The social issue of the study is the exclusion of women programmers under 35 from the workforce, while the sociological question is how discrimination is possible and what mechanisms support a successful career for women under 35 in Bulgaria.

Data and method

This study examines the significance of gender and the formation of inequalities among programmers in Bulgaria under the age of 35. It explores how discrimination and exclusion of women based on gender occur within the group of programmers. The research analyzes gender inequalities and discrimination among young programmers in Bulgaria, focusing on their role in the accumulation of social inequalities in society.

Using the case study method and qualitative data from an in-depth interview (conducted in March 2023) with a female programmer under 35 in Sofia, the study analyzes the role of gender in discrimination within the IT sector. Since the study is a case analysis, it is important to note that the results pertain only to the analyzed case and are not representative of the country as a whole, but rather provide indicative insights.

Theoretical model

The case analysis is conducted through the lens of an intersectional approach. This concept was introduced by Kimberlé Crenshaw in 1989 (Crenshaw, 1991) and explores how different elements of social stratification interact in complex power dynamics—intersecting and creating relations of privilege and dominance. The intersectional approach is a powerful tool for analyzing complex research subjects. It is an analytical framework used to examine how one or multiple social categories contribute to the exclusion of individuals in various life situations.

This approach allows for the exploration of whether certain categories intersect, influence each other, and exist in specific types of relationships. It shows how different elements of stratification and inequality—such as gender, ethnicity, age, and others—interact, and enables the assessment of the impact of each category. Intersectionality is particularly suitable for studying complex and multi-layered objects of analysis, such as women. The approach is exceptionally effective for examining discrimination and oppression and for understanding the processes of inequality in depth.

The intersectional approach is crucial for understanding inequalities in various social contexts. One of its core principles is that individuals possess multiple identities—they have more than one identity that interacts, intersects, and influences the different situations they encounter. The approach acknowledges that identities are interconnected and overlap rather than existing separately from one another (MacCall, 2005). To understand and analyze a particular situation

in depth, it is essential to examine how different forms of power—oppression and dominance—intersect, what the relationships between them are, and the social positions they occupy (Crenshaw, 1991).

The concept of intersectionality emphasizes the importance of context and situation when analyzing social actions. There is a varying sense of oppression and dominance across different social, economic, political, and other contexts, which is why contextual knowledge is of particular significance.

In contemporary social theory, intersectionality plays a crucial role in deeply understanding the complexity, multi-layered nature, and intricacies of discriminatory practices. Traditional approaches and theories often consider only a single category of social identities and stratification (e.g., age or gender alone). The strength of the intersectional concept lies in its foundation on the understanding that individuals can experience discrimination and inequality across multiple categories simultaneously.

By applying intersectionality, the individual needs of each group can be identified more effectively. The approach rejects the idea that groups are homogeneous and that all members of a group experience a given situation in the same way. The strength of the intersectional concept lies in its recognition of differences among individuals, based on more than one social category (e.g., gender, race, age).

Criticisms of the intersectional approach are based on its complexity, which some researchers argue makes it impractical, especially for developing specific programs and policies. Additionally, the challenge in analyzing and applying the approach arises from the fact that focusing on numerous different identities can lead to fragmentation (Burton, A., Gunaratnam, Y.).

The strength of the approach lies in its refusal to assume that one category has a stronger influence than another. Intersectionality represents a powerful framework for examining and analyzing the dynamic and multi-layered social reality, situations of dominance and oppression, and the multidimensionality of social inequality and identities. The approach allows for a deep measurement of the relationships and interactions between various forms of oppression and inequality.

Analysis of results

Choosing a profession after the appearance of a child in the family

The respondent shares that she holds a master's degree in biology and worked in her field for three years after graduation. During this time, she got married and became pregnant. Her salary as a laboratory biologist was slightly above the national average. While on maternity leave, she plans to retrain in the IT sector, primarily due to the higher pay in the field and the flexible working hours, which will help her balance child-rearing with career development.

"Previously, I worked as a biologist in a laboratory at the National Center for Radiological Protection. So, I worked as a biologist in a lab there. My official tenure there is five years, but two of those were maternity leave, so... I worked there in my field for about three years.

- *Why did you decide to shift to the IT sector?*
- *There are many reasons, but the main one is, of course, the salary, especially in Bulgaria. Additionally, the IT sector offers much more in terms of flexible working hours and remote work options, which are beneficial for people with children. On the other hand, working in a laboratory is quite physically demanding and requires being on-site. It also involves working with hazardous chemicals and such. Given the salary in Bulgaria, it's just not worth it..."*

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

In this case, we clearly observe the application of the intersectional approach on two levels—through education and through opportunities for work and career development. We see multiple identities: the individual possesses more than one professional identity (as a biologist and a programmer), which intersect and act together within a specific time frame. Additionally, there is the role of being a mother, which operates concurrently with her professional roles.

Regarding education, a transformation is also evident—the respondent's higher education in biology is not applicable in the new professional field she wishes to enter, thus necessitating retraining and additional education.

"I started in 2017, as I was nearing the end of a course at SoftUni, which was for Java developers. I think the entire course lasted two years, and I began it while on maternity leave. Later, towards the end of the course, I started looking for a job. When my two years of maternity leave were up, I left my old job and began searching for something new. Actually, a friend of mine told me about this position. I am currently working as a QA, which is quality assurance, not exactly what I initially set out to do as a developer, but he mentioned there was an open position. I went to the interview just to see if things would work out, and we ended up liking each other..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

In this case, the arrival of a child in the family serves as the catalyst for the woman to undertake this educational and professional transformation. We observe a shift and movement in the individual's professional and educational positions, which leads to changes in life and work opportunities and brings new career prospects. This demonstrates a significant leap from one "stage" to another.

Gender discrimination

The respondent unequivocally states that she experienced gender-based discrimination early in her career.

„ - *What are the challenges for a woman in the IT sector?*

- *The profession is definitely more male-dominated. Usually, you're not perceived as authoritative enough; people think you're not technically capable enough because, according to men, women are, for example, less intelligent. There is discrimination in that regard.*

- *Did you experience any gender-based discrimination?*

- *Maybe at the beginning, yes. You get assigned easier, less challenging tasks because no one trusts that you can handle more complex ones. Men are generally trusted more to manage such tasks. So, I would say yes... “*

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

The IT sector is perceived as "male-dominated," and women are often viewed through the lens of being "less capable" compared to men. A strong stereotype exists that women are not sufficiently qualified for work in this field, lacking the necessary knowledge and speed, which leads to them being assigned easier tasks. The discrimination is based solely on gender, with no apparent intersection with other categories. Gender plays a significant role in excluding individuals in the workplace and in shaping attitudes and stereotypes about their characteristics and skills.

There is a noticeable disparity in how the respondent is treated compared to others in the work environment. She is excluded from more challenging and responsible tasks due to her biological sex and the prevailing stereotypes and barriers associated with gender.

The social construction of gender also plays a crucial role in defining "male" and "female" professions. Gender is a construct of socially shared understanding that categorizes professions in ways that exclude women from roles like programming, making it much more challenging for them to advance their careers in this field.

Career development

As a primary mechanism and tool for career development, the respondent highlights ongoing education, emphasizing the critical importance of training courses and additional qualifications.

"You need to continuously educate yourself and work with various new frameworks and tools. Things are constantly being updated. Programming languages themselves evolve and receive updates, so there's no avoiding it! Clients' needs also develop in many ways, and this should not be overlooked..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

Training courses are a means for employees to gain specific and expert knowledge and obtain the qualifications necessary to be assigned important and responsible tasks. Completing a training course and acquiring the subsequent certification validate and guarantee the acquired skills. Graduates of these courses often receive leading roles in significant projects, promotions, or salary increases.

It is important to note that the respondent mentions that all employees have equal access to training courses, and anyone interested can participate. Educational courses are a company resource available to all employees, with no privileged individuals having exclusive access to training while others do not.

"Anyone who wants to can request training, and it will be paid for by the company. No one has been denied training so far. As long as you want to, you can train as much as you like..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

The respondent also emphasizes that accumulating professional experience related to developing important skills is crucial for establishing oneself in the job and advancing in the career. For her career growth, she relies on being assigned more complex tasks, which allows her to establish and prove herself as a professional. Repeatedly handling more challenging tasks over an extended period is seen as a guarantee for job success.

"There is a fairly long process during which you need to prove yourself, and it tends to be longer than it would be if you were not a woman. Once you are taken seriously, I think there is less discrimination..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

The career development opportunities provided by the company are what keep the respondent with her current employer and often serve as a driving motivator for diligence and progress in her work.

"— Does your company provide you with opportunities for professional development?"

— Yes, for now, that's why I've stayed there for so long. I started there as a junior QA, and I was given the chance to work as an automation QA to gain experience in other areas. In three years, I became a senior, which, as far as I know, is relatively fast even in this field. So yes, there have been quite a few opportunities and chances..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

Proactivity and initiative are also highlighted by the respondent as tools for effective adaptation at work. She uses these approaches to demonstrate and assert her interest, involvement, and commitment to the work process.

"Being proactive and suggesting something new is always viewed positively..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

Taking on additional work and working outside of regular hours are also highlighted as important steps for establishing oneself within the team, demonstrating commitment to the job and the work processes.

"If you work hard, including on weekends, it's also good; they take you seriously..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

Relevance to new trends is crucial in the sector and is a mandatory condition if one wants to remain competitive and advance in their career.

"Things are constantly being updated. Programming languages themselves evolve and receive updates, so there's no avoiding it! They develop in many ways, and client preferences also change. For instance, they might initially want a certain type of website, and then later decide that it's outdated and ask for something different. Overall, you need to engage in continuous learning and training. This is at least half of your work process."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

Thanks to her personal qualities, continuous learning, additional work, and initiative, and after many years of effort, the respondent not only overcame the initial discriminatory attitudes she faced but also advanced to a managerial position within the company.

„The position I recently accepted as QA Lead is more of a compromise. Although it represents a significant career advancement, it also involves much more administrative work, and I will be focusing more on management and resource coordination, rather than coding and actual development and automation, which I find more enjoyable. So, this role is a bit of a compromise..."

(woman, 35 years old, higher education in biology, completed programming courses, manager in a foreign company)

In summary, the examined case clearly illustrates the application of the intersectional approach as a powerful and effective tool for analyzing discrimination and inequalities, specifically regarding women as a subject. The analyzed case represents an example of upward professional and social mobility. The analysis indicates that after the birth of a child, mothers often reorient themselves towards higher-paying jobs that offer flexible working hours and the option to work

from home. Discrimination against women in the IT sector has been observed, particularly in relation to the assignment of more complex tasks and involvement in important projects. This discrimination is attributed to the prevailing stereotypes of 'male' and 'female' professions, as well as the stereotype that women in the IT sector have less knowledge and skills to handle the assigned tasks.

Overcoming discrimination against women in the sector is achievable through continuous training, additional qualifications, proactivity, working beyond regular hours, and involvement in significant company projects.

Public policies

The implementation of public policies and effective practices is crucial for increasing the percentage of women in the IT sector relative to men. To boost the number of women in this field, early education in information technology should be introduced in schools. Another successful practice is presenting women as successful role models who can inspire and motivate younger girls to enter the field.

Encouraging policies for gender equality within IT companies would also contribute to increasing the number of women in the sector. Companies should promote equality and provide equal opportunities for professional development. Potential solutions could include offering tax incentives for companies that hire women in leadership positions within the IT sector or implementing quota systems.

Flexible working hours and the enforcement of internal policies that strictly penalize gender discrimination would also help increase the representation of women in the industry.

Conclusion

It is important to note that the conclusions and findings of this study are not generalizable but pertain specifically to the individuals examined. The study is not representative of the entire country and serves only as a preliminary guide. Based on the examined case, it can be concluded that the entrenched perceptions of women in the IT sector contribute to their exclusion and marginalization, particularly from important projects and tasks.

This research aimed to investigate the reasons why a woman might choose a career in the IT sector and to illustrate how upward career progression within this field can lead to a managerial position. The results indicate that the decision to enter the IT sector and pursue a career in this field, in the case studied, was primarily influenced by financial necessity. With the arrival of a child, the woman sought better-paying employment. The opportunities provided by many companies for remote work and flexible working hours also significantly influenced her choice of profession and field.

The data reveal that gender discrimination in the sector represents a serious barrier to women's professional development in IT. These stereotypes are a major factor in assigning women

simpler and less complex tasks. It appears that these stereotypes have a long-lasting impact, especially in traditionally 'male' fields, and systematic efforts are required to dismantle them.

Career advancement for women in the IT industry is achievable through the demonstration of strong personal qualities—initiative, proactivity, and the willingness to extend working hours at the expense of personal time and family. The respondent emphasizes the critical importance of educational courses and additional qualifications, which serve as a guarantee for acquiring the necessary knowledge and skills for the job.

In conclusion, the study highlights the significant impact of gender as a factor and demonstrates its profound influence on the career development of women in the IT sector. The case analysis illustrates how well the intersectional approach is suited for understanding instances of inequality and discrimination in society.

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THE EFFECTS OF CONNECTING READING AND WRITING ON SECONDARY STUDENTS' WRITING PERFORMANCE, ATTITUDES, AND BELIEFS

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ABSTRACT

This paper explored the effects of connecting reading and writing on secondary students' writing performance, attitudes, and beliefs. The primary purpose of this study was to see whether there was a significant difference in the writing performance of EFL secondary students before and after the reading-writing connection. Also, this study investigated whether there was a substantial difference in EFL secondary students' attitudes towards writing before and after the connection. In addition, EFL secondary students' beliefs about writing were inspected after the intervention. In so doing, 16 EFL students from a Lebanese secondary public school participated in the present study. The data were collected by using the students' pre and post writing tests (essays) to measure students' writing performance, a questionnaire adopted from Podson's writing attitude questionnaire, and students' interviews. The data analysis via paired t-test for comparing students' performance revealed that students' writing performance after the reading-writing connection was better than their performance in writing-only task, and the use of expressions that appeared in the original texts and used in students' writing were tracked, coded, and analysed quantitatively. Additionally, the results using SPSS showed that there was a difference in students' attitudes towards writing in favor of the intervention. Finally, a qualitative analysis of data collected from the interviews indicated that students had positive beliefs about writing after reading-writing connection because they believed that reading has exerted an enhancing effect on their writings.

Keywords: connecting reading and writing; transfer; writing performance; beliefs and attitudes.

INTRODUCTION

Writing has always been seen as the most difficult and challenging area of language learning for both teachers and learners especially in a foreign language. Most students cannot meet the expectations of the instructors both communicatively and linguistically. One of the factors that affect the students' writing performance is their attitudes and beliefs towards writing (Jabali, 2018). Jabali claims that students are, in fact, of varied backgrounds, different writing methodologies, varied levels of language skills and experience, let alone different insights, attitudes and conceptions about the writing skill. Ghabool, Neda, Mariadass, Marian, Kashef, and Sayed Hossein (2012) contend that ESL students complain about learning and focusing on the English word order or word forms. Pak-TaoNg (2003) has stated that the first idea

which comes to mind whenever you think about writing is that it is a part of obligatory course work. The thought seems to be true for students who should write long or short assignments. If writing is just an anxiety for students, it means they should do nothing except a chore. They are not likely to go beyond learning. To Pak-TaoNg (2003), writing consists of a lot of activities which result in understanding. Such an understanding includes a process of thinking about the topic, taking notes, collecting data, etc. which makes a reflective thought for you at the end. In addition, Students' beliefs about writing can be recognized through their engagement in writing tasks (Collie, Martin, & Curwood, 2015). While there has been significant amount of comment on how to improve students' engagement in writing, especially by advocates of the 'process' approach to teaching writing (Hirvela, 2016), little of this work refers to the growing research into motivation that shed light on students' beliefs (Bruning & Horn, 2000). In a task as complex as writing, issues of engagement assume great importance as it is necessary for developing writers to persist and practice skills to become proficient (Hammond, Flook, Cook-Harvey, Barron & Osher, 2020).

Despite collecting evidence in both reading and writing, the EFL field continues to struggle with how best to guarantee that students get higher levels of reading comprehension and to explain best routes for writing development. Although students receiving facilitation make important gains, it is not clear what support(s) are needed for them to build on these skills and preserve them (Miller, Scott, & McTigue, 2018). The patterns of connections between reading and writing are still subject to debate, and more studies are needed to explore and study how reading can affect writing and vice versa. Research on connections between reading and writing and their impact on students is relatively limited. In particular, this study was developed to tackle the area that covers the effects of connecting reading and writing on secondary students' performance, beliefs, and attitudes. This research purports to address the following research questions:

1. Is there any significant difference in the secondary EFL learners' writing performance between writing-only and reading-to-write tasks?
2. What are the secondary EFL students' attitudes towards writing before and after connecting reading and writing?
3. Is there any significant difference in the secondary EFL learners' beliefs about writing tasks before and after connecting reading and writing?

MATERIALS AND METHOD

The mixed methods approach was used to answer three research questions. This approach involved one group of participants who served as their own controls. This study engaged 22 Lebanese secondary students (12 males and 8 females) aged between 15 and 16 in Grade 10 at a secondary public school in Mount Lebanon. Due to personal circumstances, only 16 students were able to participate completely in the study. Examining the effect of connecting reading and writing on students' performance, beliefs and attitudes called for particular

research methods. As a result, the researcher used different tools and mixed methods approach to meet the research questions. Students were subjected to two different instructional and assessment strategies (Writing-only and reading-to-write) by sitting for the same writing task before and after the reading-writing connection in order to identify the effects of connecting reading to writing on the students' writing performance. Moreover, a writing attitude questionnaire and face to face interviews were used to explore the change in participants' beliefs and attitudes after the reading-writing connection. All these elements were utilized to fulfill the purpose of the study and to explore possible alternatives that may help in the problem's treatment.

Descriptive statistics was used to compare the means of the students' writing scores in the subcomponents of essay (content and language) in the writing tasks 1 and 2. Paired t-test was used to determine the significance of the difference in compared means. Means of different items in the questionnaire were compared. To analyze the data of the attitude questionnaire, the 20 items were categorized into two subscales, and descriptive statistics was used to provide means, standard deviations, and frequencies. Students' answers from the interviews before and after the intervention were coded and categorized into themes. After that, they were analyzed and described statistically. To analyze the qualitative data, thematic content analysis was done. The eight questions of the first interview revolved around the students' general beliefs toward writing, the difficulties they face whenever they want to write, and finally the idea of connecting reading and writing. For each of these themes, data was read and then coding (labeling) was inaugurated; eventually themes were designed with approximate patterns of meaning and reviewed to make sure they fit the data. A coherent narrative including quotes from participants was initiated.

RESULTS AND DISCUSSION

The results of the first question showed that students' performance improved since the paired t-test shows that there is a difference between students' scores in the pre- and post-writing tasks - before and after the intervention. Thus, using Reading-Writing Connection technique in teaching writing has enhanced the students' performance, noting that the tasks score improvement with the Reading-Writing Connection method is 25% (the students' average score increased from 5.77 to 7.19). The improvement in the students' performance echoes what Flippo, Gehsmann, and Halladay (2021) determined that the relationship between reading and writing is so prominent to be beyond question, grounded on his correlational study. Soltani and Kheirzadeh (2017) also had similar results in their study; they found that students in reading-to-write group performed better than students in writing-only group. Moreover, this improvement in the participants' scores is caused by the constructive processes of the reading-writing connections since they were studied as processes instead of products (Fan, 2018). This shift on focus from decoding language to encoding language strengthened the idea that reading and writing are both constructive processes that are not certainly linear, but rather are recursive (Reynolds, , 2017). The improvement that is shown in the results is

also related to the instructional strategies – such as brainstorming, making predictions, analyzing characters, evaluating events, and making sentences on vocabulary words related to the chosen stories - that the researcher used to promote transfer that in a way or another helped students to link what they learned to their everyday life and make use of it. These findings assure Bradford and Schwartz’s notion that found transfer matters because it “lies at the heart of our educational system.” Hirvela (2016) also support this notion by claiming that our instructional work relies heavily on the core assumptions that (1) what we teach is transferable and (2) students will want to transfer what they have been taught. As well, James (2020) observed that something must support the movement between the two skills; it might be called “space between” reading and writing and there may be also a “space” between what we teach and how students use what we teach. It is this “space between” that must be accounted for and filled if the connections are to occur and be utilized.

Table 1. Pre and Post Writing Scores

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Pre-intervention Students' Scores	5.7756	16	1.28343	.32086
Post-intervention Students' Scores	7.1844	16	.72698	.18175

Before the intervention, the trend of students’ fear from writing was moderate, whereas, after the connection, the trend of students’ fear became low. On the other hand, the trend of students’ confidence attitude toward writing was at a moderate level before the intervention; however, it became a high-level trend after the intervention. Most of the students feel more confident to sit for a writing task after the literacy approach. The mentioned results are supported with what Reynolds (2017) found, that underscoring the personal attitude aspect of students towards writing is considered as a means of expressiveness. The positive change in the students’ attitude towards writing also reflects Martin and Poly’s (2017) findings about the benefits or learning outcomes that arise from interrelating or connecting reading and writing. Soltani and Kheirzadeh (2017) perceived that students had positive attitudes towards reading-to-write class because they assumed that reading enriched their writings. The encouraging results related to students’ attitudes also confirm studies that focused on the important role and the impact of culture on these broader notions of literacy.

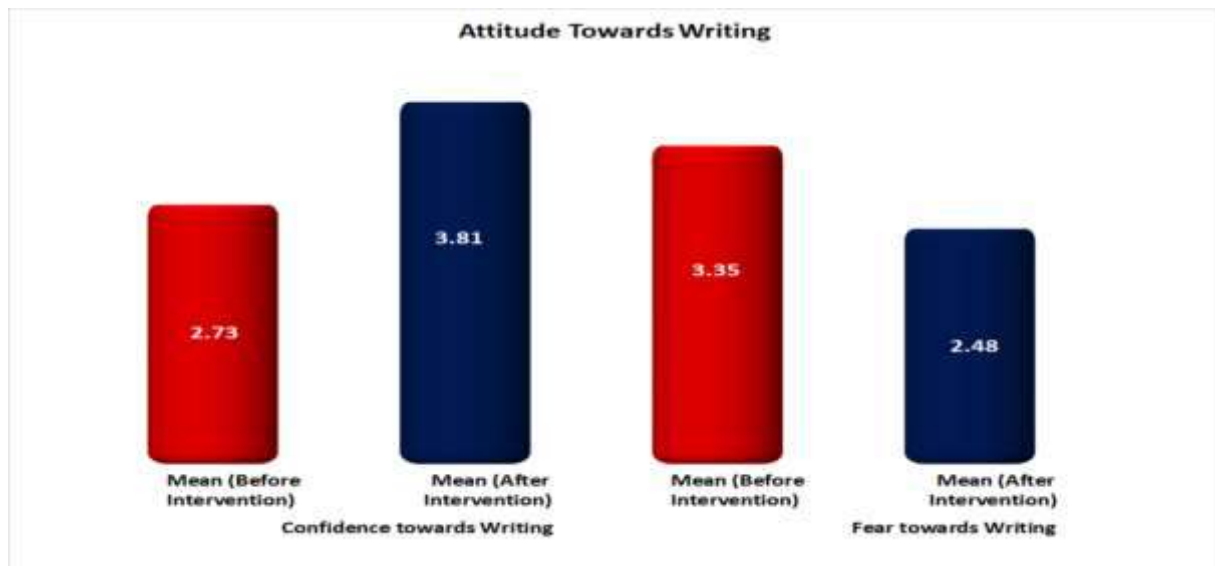


Figure 1. Students' Attitudes towards Writing.

How students feel about writing is an important aspect that may directly affect students' engagement during writing sessions or even their performance whenever they sit for a writing task (Collie, Martin, & Curwood, 2015). Students' responses were coded into themes, and a qualitative analysis was used to discuss the results. Before the intervention, the reading-writing connection, 80% of the participants believed that writing is not enjoyable, and 20% thought that writing is an enjoyable task; however, after the reading-writing connection, the results changed obviously, 90% of the students think that it is enjoyable to sit for a writing task and 10% agree that it is unenjoyable. These results mirror Linda Rosenblatt's (1939) transactional theory of reading, cited by Vytņiorgu (2018), which states meaning is co-constructed by the text and the reader; as a forerunner of the reader-response theory which provided the foundation for later arguments that reading, like writing, is a process of constructing meaning.

Concerning students' beliefs towards connecting reading and writing, in the first interview, 60% of the participants believed that previous life experiences were their main source of ideas whenever they sat for a writing task, 20% answered that their source was only the teacher, and 10% relied on what they read and discussed in class with their teacher and classmates. The students' answers, after the intervention, were different. The stories read and the discussions related to them that were held in class have got 80% of the replies, and the teacher has got 20% of the responses – the same percentage it got before the intervention; no one mentioned previous real-life experiences. Moreover, in relation to idea fluency problem, the participants' responses were mainly about having blank minds whenever they sat for a writing task, some talked about the boring topics used in such tasks, some considered being nervous, and a few mentioned the unfamiliar and difficult topics used. After the reading-writing connection - in the second interview - most of the replies revealed being confident about what they wrote since they got many ideas in their minds, and the other students claimed that they felt more

comfortable since the topic was familiar because they read and examined it in class – having a vocabulary and phrases bank in mind that they could use in their writing.

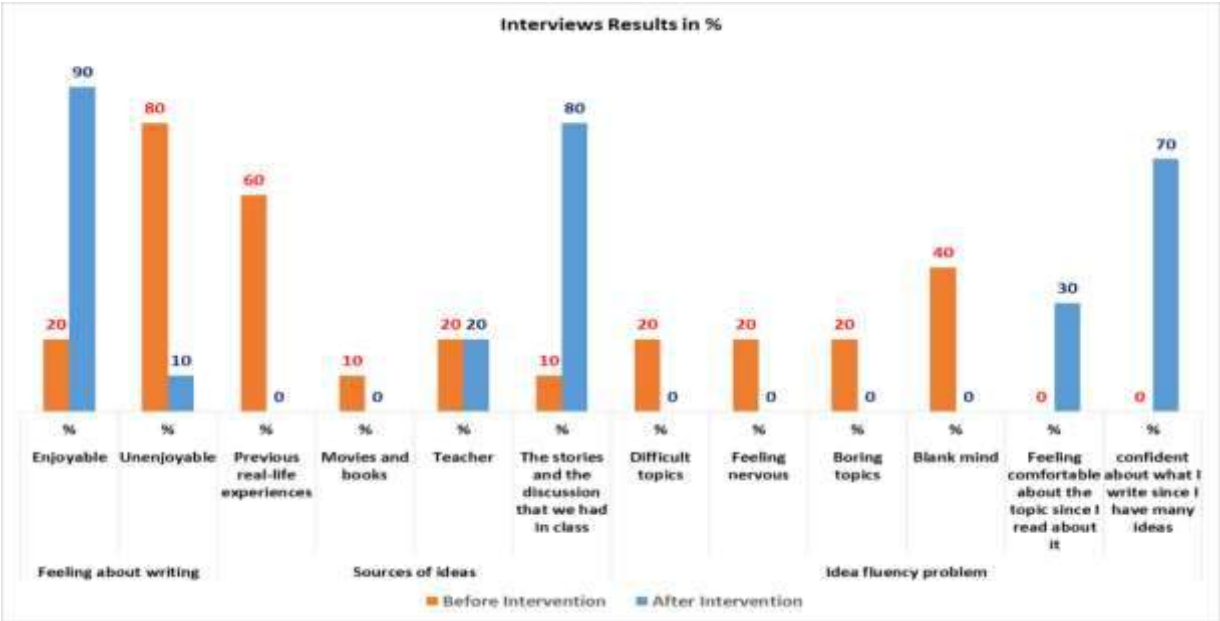


Figure 2. Students’ Beliefs towards Writing.

CONCLUSION

Investigating the role of connecting reading and writing in improving grade 10 learners’ performance in writing and examining their attitudes and beliefs towards writing-only and reading-to-write tasks were the major purposes of this study. Adding a social dimension to the originally cognitive focus of connecting reading and writing literacy approach is a plus in the study because it provided a rich learning environment related to the interactive approach of connecting reading and writing. Several interesting and encouraging findings have emerged, and they could be of great interest and benefit to writing teachers. Although the initial results of this study are positive, further suggestions for future research are endorsed. It is clear that additional research is needed on an ongoing basis. Overall, there is a need to better understand the reading-writing connection across the developmental trajectory from preschool through high school, and beyond, and indeed to more clearly allocate that developmental trajectory. Additional research is required to address how reading and writing can be effectively integrated in interventions for students at various reading/writing levels, and for those who are struggling with reading and/or writing. Moreover, the interrelationship among reading, writing, listening, and speaking needs to be investigated from the perspective of how early intervention for one or the other affects the remaining areas, and how combinations of these can influence student outcomes. Finally, Longitudinal and randomized controlled studies will be essential to increase our understanding of the complex developmental route of writing, including how such development is linked with or independent of literacy development. Such research will increase our understanding about how to support the development of students’ reading-writing developmental track.

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SPOR ORTAMLARINDA TEKNOLOJİK DOPİNG KULLANIMI VE NEURALİNK KAVRAMI

USE OF TECHNOLOGICAL DOPING IN SPORTS ENVIRONMENTS AND THE CONCEPT OF NEURALINK

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ÖZET

Spor insanoğlunun tarihi kadar eski dönemlere giden önemli bir kavramdır. Sporun ilk örneklerine ilkçağdan itibaren rastlanılmaktadır. İçinde mücadele duygusu barındıran spor her zaman daha iyiye ve başarıya odaklanmış yarışmacılarla birlikte özünde farklı anlamlar barındıran tarihi bir olgu olarak karşımıza çıkmaktadır. Modern dünyada insanların boş zamanlarını değerlendirmek, sağlıklı kalmak gibi amaçlarla yapmış oldukları aktiviteler ilkçağlarda ortaya çıkan spor felsefesine ters düşmektedir. Eskiçağlarda yapılan spor aktiviteleri, şehirleri tanıtmak, şehirlerin ve devletlerin birbirlerine üstünlük sağlamak amaçlı yapılan ciddi uğraşlardı. Bu dönemlerden günümüze kalan felsefe ise her şart altında başarıyı elde etmek olmuştur. Bu düşünce sporcuları doping yaparak diğer sporculardan daha güçlü veya daha hızlı olmalarını sağlayacak arayışlara itmiştir. Sporda doping kavramının yaygınlaşması sonucunda bu durumla mücadele edebilecek kurumlara ihtiyaç duyulmuş ve uluslararası örgütlerin ortaya çıkmasına neden olmuştur. Doping, en başta dışarıdan alınan uyarıcı maddelerle başlarken daha sonraları işin içine teknolojinin de dahil olmasıyla birlikte farklı bir boyut kazanmıştır. Günümüzde yasaklı maddelerin yanına gen transferleri, nano teknolojik ürünler ve son zamanlarda çok konuşulmaya başlanan Beyin Bilgisayar Arayüzü (BCI) neuralink kavramıyla birlikte sporda teknoloji, etik, ahlak gibi konularda daha derin tartışmaların ortaya çıkması ve bununla mücadele edilebilmesi adına hukuki alt yapıların oluşturulması problemini doğurmuştur. Sporda başarıdan önce sporcu sağlığının korunması ve toplumsal ahlakın sağlanabilmesi önemlidir.

Anahtar Kelimeler: Sporda teknoloji kullanımı, neuralink, teknolojik doping

ABSTRACT

Sport is an important concept that goes back as far as human history. The first examples of sports have been seen since ancient times. Sport, which includes a sense of struggle, appears as a historical phenomenon with different meanings in its essence, with competitors always focused on betterment and success. In the modern world, the activities that people do for purposes such as spending their free time and staying healthy are contrary to the sports philosophy that emerged in ancient times. Sports activities carried out in ancient times were serious efforts to promote cities and give cities and states superiority over each other. The philosophy that has survived from these periods is to achieve success under all circumstances. This idea has led athletes to seek ways to become stronger or faster than other athletes by doping. As a result of the widespread use of the concept of doping in sports, institutions that can combat this situation have been needed and this has led to the emergence of international organizations. While doping started with external stimulants, it later gained a different dimension with the involvement of technology. Today, in addition to banned substances, gene transfers, nano-technological products and the Brain Computer Interface (BCI) neurolink concept, which has become much talked about recently, have created the problem of creating deeper discussions on issues such as technology, ethics and morality in sports and creating legal infrastructures to combat this. Before success in sports, it is important to protect the health of athletes and ensure social morality.

Keywords: use of technology in sports, neuralink, technological doping

GİRİŞ

Toplumsal hayatın önemli unsurları arasında yer alan kavramlardan biri de ahlakıdır. Ahlak kavramı gündelik hayatımızı önemli ölçüde kapladığı gibi kurumlar arasına da yerleşmiş ve birey-birey, birey-devlet, devlet-birey ilişkilerinin oluşturulmasında da önemli faktörler arasında yer almaktadır. Spor müsabakaları her ne kadar hukuksal boyutlarla çerçevenilmiş olsa da ahlaki yapıları göz ardı etmeden oluşturulması genel kabul açısından eksiklik barındıracaktır. Bilimsel gelişmelerin özellikle 2000'li yıllardan sonra hızlı bir biçimde artması ve buna bağlı olarak spor alanlarında faaliyette bulunan kurum ve sporcuların bu yeni bilgiler ışığında antrenman ve müsabakalarda teknolojik gelişmelerden faydalanmak istemesi hukuksal ve spor ahlakı üzerinde tartışmaları da beraberinde getirmektedir.

Etik kavramı her ülkenin kendi oluşturduğu sistem üzerine şekillenmekte ve toplumun, bireyin buna göre davranmasını istemesi olarak açıklanabilir. Sporda etik, yüzyıllar boyu süregelen yarışmalar sonucunda insanların, toplumların ve organizatörlerin birçok anlamda üzerinde uzlaşa sağladıkları bir konudur. Ancak insanoğlunun daha fazlasını isteme içgüdüğü doğal olarak bu alanda da karşımıza çıkmaktadır. Her ne olursa olsun, tüm şartlar altında kazanma düşüncesi insanoğlunu doping denilen kavrama yönlendirmektedir. IOC ve WADA gibi bu

konu üzerinde yoğun çabalar gösteren ciddi kuruluşlar dopinge mücadele için ciddi uğraşlar göstermekte ve bununla ilgili kurallar hazırlamaktadırlar.

Spor alanlarında kullanılan teknolojiler her geçen gün kendini yenilemektedir. Sportif başarıyı kendine hedef alan takımlar ya da bireyler bu teknolojik değişimlerden kendilerine avantaj sağlamayı hedefledikleri gözlemlenmiştir. Bu etki teknoloji firmalarının AR-GE çalışmalarını hızlandırmakta ve araştırma kuruluşlarını da bu alana yönlendirmektedir. Teknoloji, ortaya çıktığı ilk dönemlerdeki kavramından uzaklaştırılmış ve sportif rekabeti etkileme üzerine ciddi çalışmaları karşımıza çıkarmıştır. Uluslararası rekabetten doğan gücü yönlendiren önemli kavramlardan biride teknolojidir. Sporcu performanslarının artırılabilmesi için spor dünyası daha yoğun teknoloji kullanımına ihtiyaç duymaktadır (Ratten, 2020).

Spor teknolojileri, sporcuların hedeflerine ulaşabilmelerinde aracı bir rol üstlenmektedir. Kullanılan bu teknolojiler sporcuların müsabaka esnasında birbirleriyle ve kendileriyle yaptıkları rekabet ortamında kullanılabilir. Bu rekabet esnasında geleneksel spor teçhizatları yardımıyla vücut tekniklerinden, performans artırıcı makinelere, maddelere ve müsabaka dışında kullanılan yöntemlere kadar uzanmaktadır (Loland, 2002). Teknolojik ürünler, müsabaka esnasında sporcuların performansını artırıcı bir etkiye sahip olabilirler. Bu teknolojik avantaj eşitliği ortadan kaldırmakta ve bir anlamda doping etkisi gösterebilmektedir (Anam & Pujiyono, 2023). Neuralink şirketi tarafından geliştirilmeye çalışılan Beyin Bilgisayar Arayüzü (BCI) tıp dünyasında ciddi karşılık bulmuştur. Bazı bilim insanlarına göre önemli bir adım atılmadığı yönünde eleştiriler olurken diğer bir grup tarafından BCI lar açısından ciddi ilerlemelerin kaydedildiği savunulmaktadır. İlk insan hastası olarak 29 yaşındaki Nolan ARBARBAGH' a başarılı bir şekilde BCI nin yerleştirildiğini ve hiçbir olumsuz yan etkinin görülmediğini duyurmuşlardır. Hasta sadece düşünerek fareyi hareket ettirebiliyor açıklaması yapılmıştır (Hurley, 2024). Bu aşamadan sonra eğer şirket deneyler üzerinde gelişmeler gösterebilirse insan hayatının birçok noktasında kullanılabilir bir ürün geliştirmiş olacaktır. İleriki dönemlerde bu etki spor müsabakalarına yansiyabilir ve eşitlik kavramı ciddi zarar görebilir. Sporcuların kendi içsel kararlarından uzak yeni davranışsal durumlar karşımıza çıkabilir. Yakın zamanda Massachusetts Teknoloji Enstitüsünde (MIT) yapılan bir çalışmada elde edilen bulgular özellikle dezavantajlı insanlar açısından önem taşıyabilecek ancak ürünün iyileştirilmesi ve topluma sunulmasıyla birlikte spor müsabakaları açısından problem teşkil edebilecek ürünü halka tanıttılar. Arnav Kapur tarafından geliştirilen ve AlterEgo adı verilen bu ürün sayesinde konuşmaya gerek kalmadan kişinin düşüncelerini sesli olarak karşı tarafa aktarabilmesi sağlanmıştır. Cihazın çalışma prensibi yüzün dört bölümüne temas edecek şekilde yüze yerleştirilmekte, kemik iletim sistemi sayesinde sesin duyulması ve cevap verilebilmesi sağlanmıştır (MIT, 2024). AlterEgo insan-bilgisayar etkileşimini mümkün kılan bir ürün haline getirilmiştir. İleriki dönemlerde bu sistemin spor organizasyonlarında da kullanılmak istenmesi kaçınılmaz olacaktır. Uzaktan bağlantı sistemleri yardımıyla kişiyle iletişime geçebilir, kişiye direktif verme ya da direktif almanın önü açılmış olacaktır. Spor organizasyonlarında kişinin organik düşünmesinin önü kesilecek ve en doğru kararı verebilmesi dışarıdan yapılacak müdahaleler sonucunda oluşacaktır. Sportif

organizasyonlar açısından ele alındığında spor etiği ile ilgili yeni tartışma konusu haline gelebilecek önemli bir gelişmedir.

DOPİNG NEDİR VE TÜRLERİ NELERDİR

Uluslararası Olimpiyat Komitesi (IOC) yayınlamış olduğu dopinge mücadele kurallarında madde 2.1.1 'de yasaklı maddelerin sporcuların vücutlarında bulunmasıyla ilgili olarak kendilerini sorumlu tutmuştur (Olympics.Com, 2024). Dopinge mücadele edebilmek için uluslararası alanda iş birliği yapılabilmesi adına Dünya Anti-Doping ajansı (WADA) kurulmuştur. Dopinge küresel mücadele edebilmek için 1999 yılında başlatılan bu mücadeleyle sporcuların eşit şartlar altında mücadele edebilmeleri sağlanmaya çalışılmaktadır. Dünya Dopinge Mücadele Ajansı dopingi şu şekilde tanımlamaktadır. Doping, belirtilmiş olan dopinge mücadele kural ihlallerinden bir ya da birden fazlasının gerçekleşmesi olarak tanımlanmaktadır. Bu kurallar 10 başlıkta toplanmıştır. Bunlar;

Sporcunun örneğinde yasaklı bir maddenin tespit edilmesi

Yasaklı bir madde veya yöntemi kullanmak ya da kullanmaya teşebbüs etmek

Bildirim yapılmasının ardından örnek vermeyi reddetmek

Sporcu bulunabilirlik bildirimlerini yapmamak ve doping kontrollerini kaçırmak

Doping kontrolünün herhangi bir bölümünü bozmak

Yasaklı bir madde veya yöntemi bulundurmak

Yasaklı bir maddenin veya yöntemin yasadışı ticaretini yapmak

Yasaklı bir maddeyi veya yöntemi herhangi bir sporcuya tatbik etmek ya da tatbik etmeye teşebbüs etmek

Herhangi bir dopinge mücadele kural ihlaliyle alakalı suç ortalığı yapmak

Ceza almış sporcu destek personeliyle yasak işbirliği yapmak (WADA, 2021).

KİMYASAL DOPİNGLER

Kullanımı her zaman yasaklı maddeler ve yöntemler;

S0 Onaylanmamış maddeler

S1 Anabolik maddeler

S2 Peptid hormonlar, büyüme faktörleri, ilgili maddeler ve mimetikler

S3 Beta-2 agonistler

S4 Hormon ve metabolik modülatörler

S5 İdrar söktürücüler ve maskeleyici maddeler

M1-M2-M3 Yasaklı yöntemler

Müsabaka içinde kullanımı yasaklı maddeler ve yöntemler;

S6 Uyarıcılar

S7 Narkotikler

S8 Kannabinoidler

S9 Glukokortikoidler

Bazı özel sporlarda kullanımı yasaklı maddeler;

P1 Beta-bloke ediciler

PROTEZLER

Güney Afrikalı atlet Oscar PİSTORİUS 2008 Pekin’de gerçekleştirilen yaz Olimpiyatlarında atletizm pistlerinde yarışan ilk ampute sporcu olma unvanını kazanmıştır. Dünya Atletizm Federasyonları Birliği (IAAF) kendine avantaj sağladığı gerekçesiyle ilk aşamada başvuruyu reddetmiş olsa da uluslararası spor mahkemesine başvuran sporcunun başvurusu kabul edilmiş ve olimpiyatlarda yarışma hakkı kazanmıştır.

TEKNOLOJİK DOPİNGLER

2008 Pekin Olimpiyatlarında kullanılan nano teknoloji ürünü mayoların sporcuların performanslarını%10 oranında artırması ve sağlamış olduğu diğer faydalar nedeniyle Uluslararası Yüzme Federasyonu (FINA) tarafından müsabakalarda kullanımı yasaklanmıştır (Test, 2018).

SONUÇ

Spor bütünlüğünü oluşturabilmek için kurulmuş ve birbirlerinin çalışmalarını destekler organizasyonlar bulunmaktadır. Bu yapılar sporda adaletin sağlanabilmesi için, spor hukuku, ilkeleri, ahlakı ve etiği dışına çıkılmasının önüne geçilebilmesi adına oluşturulmuş uluslararası kuruluşlardır. Bu kuruluşlar şunlardır;

Uluslararası Olimpiyat Komitesi (IOC), Sporda Yolsuzluğa Karşı Uluslararası Ortaklık (IPACS), Dünya Anti Doping Ajansı (WADA), Uluslararası Futbol Federasyonları Birliği (FIFA), Uluslararası Polis Komisyonu (INTERPOL), Küresel Uluslararası Spor Federasyonları Birliği (GAISF), Sport Radar, Avrupa Konseyi Genişletilmiş Kısmi Spor Anlaşması (EPAS), Uluslararası Şeffaflık Örgütü (Transparency International), Uluslararası Spor Güvenliği Merkezi (ICSS).

Spor müsabakalarında sporcuların kullanmış oldukları enerji miktarı normal insanlara göre çok daha farklıdır. Periyodik antrenmanlar yapmayan bireylerin vücutlarında bulunan enerjinin %70’ini kullanabilirken, antrenman yapmış bireyler bu oranı %90’lara kadar çıkarabilmektedirler (Yoncalık & Gündoğdu, 2007). İnsan vücudu kendini korumak ve yaşamsal faaliyetlerini devam ettirebilmek için vücutta bulunan enerjinin tamamını kullanmaz. Canlının kendisini koruyabilmesi adına %10’luk bir enerji vücut tarafından saklanır. Bu dönemde metabolizma daha fazla enerji harcanmaması adına hareketin kesilmesini sağlamaya çalışır. Her şart altında başarı odaklı olan bazı sporcular doping etkisiyle kullanılmayan bu %10’luk enerjinin

yardımla yorgunluk hissini ortadan kaldırabilmek için dopinge başvurmaktadırlar. Vücuda alınan uyarıcılar sinir sistemini etkileyerek yorgunluk hissini ortadan kaldırabilir veya solunum-dolaşım sistemini uyararak canlının yedek olarak bıraktığı enerjinin kullanılmasına zorlanabilir (Yoncalık & Gündoğdu, 2007). Bu aşamada neuralink kavramı yeni bir doping tehlikesini ortaya koyma ihtimalini karşımıza çıkarmaktadır. Beyin arayüz programı (BCI) olarak adlandırılan bu sistemde öne çıkan ürünler arasında ve en popüler olanı Neuralink ürünüdür. Beyin ile bilgisayar arasında bir bağlantı sağlayan bu ürün, beyinde var olan elektiriksel aktiviteleri dışarıdan müdahale ile beyin ile bilgisayar arasında bir bağlantı oluşturulmasını sağlamaktadır (Kurutay vd., 2023). Beyinde gerçekleştirilen bu elektiriksel aktivitelere dışarıdan bir müdahale gelmesi sonucu insanda yorgunluk hissini isterse ortadan kaldırılabilir ve bunun sonucunda sporcuların yapmış oldukları ağır antrenmanlarda ve spor müsabakalarında daha dirençli hale gelebilmelerini sağlayabilir. Bu durum sporcunun enerjisinin tamamını kullanabilmesine ve kas-iskelet sisteminde avantaj sağlayacak bir duruma gelmesinin önü açılacaktır. Eşit şartlar altında yapılacak olan antrenmanlarda sporcunun kişisel gelişiminde hiçbir sakınca yoktur. Ancak dışarıdan verilecek bir müdahale ile sporcunun dayanıklılığının artması ve bu durumun sonucunda antrenman alanlarında daha çok ve ağır tekrarların yapılması doğal olarak diğer sporculara karşı bir avantaj elde etmesine neden olabilir. Beyne yapılacak dışarıdan müdahale ile spor organizasyonlarında sporcuların doğal davranışlarının dışına çıkılmasına neden olabilir. Örneğin; bir futbol organizasyonunda bazı anlarda sporcular bireysel davranarak müsait pozisyonda olan bir arkadaşına pas vermek yerine gol şansını kendisi değerlendirmek isteyebilir. Sonradan maçı izlendiğinde kendisinin de pişman olacağı bir an olarak hafızalarda kalabilir. Bu durum, sporcunun kendisini, takım arkadaşlarını, skoru ve belki de ligin şampiyonunu etkileyecek bir an olarak kalacaktır. Ancak tam bu noktada sporcuya dışarıdan yapılabilecek bir müdahale ile sporcunun beynine yollanacak bir sinyal sonrasında o pozisyonda kendisi değerlendirmek yerine arkadaşına pas verebilir. Bu durum sporun temel felsefesi ile çatışacaktır. Spor, öncesinde yapılan çalışmalar ve müsabakalarda bireylerin tercihleri ile ortaya çıkan bir yarışmadır. Doğal olmayan bu tür müdahaleler sporda eşitlik, adalet ve etik konularında ayrıca bir tartışma yaşanabilmesinin önünü açacak gibi durmaktadır.

ÖNERİLER

- Dünyada dopingin önlenmesi için uluslararası eğitim-iş birliği protokollerinin oluşturulması
- Olimpiyat oyunlarına katılacak olan ülkelere, kendi milli eğitim sistemlerinde dopingin fizyolojik, ruhsal ve ahlaki boyutlarını açıklayan içeriklere yer verilmesi
- Sporcuların sağlık durumlarıyla ilgili kullanabilecekleri ya da kullanmaları gereken ilaç, protez, gıda vb. ürünlerinin uluslararası olimpiyat komitesi tarafından izlenebilmesi amacıyla ülkelerin sağlık bakanlıkları ile protokol yapılması

- Uluslararası anti doping ajansı (WADA) ileride gerçekleşme ihtimali bulunan teknolojik gelişmelere karşı hukuki alt yapıların şimdiden hazırlanması ve kamuoyuna duyurması
- Doping yaptığı tespit edilmiş sporculara ve temsil etmiş oldukları ülkeye daha ağır cezalar verilerek bu tip uygulamalardan kaçınmaları sağlanabilir.
- Doping yaptığı tespit edilmiş olan sporculara destek veren devlet kuruluşları ya da özel işletmelere de sınırlı cezalar gündeme getirilerek, işletmelerin sporcular üzerinde baskı kurmaları sağlanabilir.
- Spor hukuku alanında kürsüler oluşturulmalı, spor-hukuk arasındaki ilişkiyi geliştirmek için çalışmalar yapılmalı

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THE IMPACT of INFORMATION MANAGEMENT on EFFICIENCY in MANUFACTURING SMEs: A CASE STUDY

Dr. Deniz Çınar

ABSTRACT

It is becoming difficult for small and medium-sized businesses to survive in rapidly developing technology and a globalizing economy. Therefore, it is of great importance for SMEs to increase their efficiency and survive in the competition. The most basic factors that determine the efficiency of a manufacturing company are the amount of scrap and machine downtime. Good analysis and prevention of these two basic expenses increase the efficiency of the company and, as a natural result, its profitability. The starting point for minimizing these basic expenses is the transfer of information from production to the experts of the business, that is, department managers. The concept of knowledge management consists of four different dimensions: acquisition of knowledge, transformation of knowledge, application of knowledge, and protection of knowledge, and plays a very important role in increasing the efficiency and profitability of businesses.

The aim of this study, in addition to providing general information about knowledge management and processes, is to contribute to the literature and convey the importance of knowledge management to other SME companies by explaining the effect of knowledge management on efficiency in SMEs with a case study. In this context, the scrap amounts and machine downtimes before and after the knowledge management processes of a foreign-capital automotive company located in the Gebze region were examined and the improvements made were reported.

Keywords: SMEs, Information, Information Management, Information Management Dimensions, Efficiency

1. INTRODUCTION

Our world has witnessed significant changes and transformations in recent years due to COVID-19, technological advancements, and economic shifts. These changes and transformations impact both our daily lives and professional environments. In the global market, these changes significantly affect businesses' competitive power. To survive in the competition, businesses must quickly adapt to these changes and transformations, seize even the smallest opportunities, and make fast and accurate decisions. The most effective way to do this is by consistently generating information, disseminating it throughout the organization, rapidly adopting new technologies and products, and ensuring the security of the information. Information, considered a crucial competitive weapon, has recently led researchers and practitioners to focus on how to use organizational knowledge most effectively. In other words, it has made the 'Information Management' process increasingly important. Information management

encompasses the processes through which businesses, aiming to survive in competition, create, retain, share, and develop information.

The global economy, the economic downturn brought by COVID-19, and intense competitive conditions have also significantly impacted SMEs, which are fundamental to the Turkish economy. For this reason, it is essential for SMEs to increase productivity in production to survive in intense competition or to maintain their current position and increase profitability. This can only be achieved through the effective implementation of information management processes.

This study is divided into four main sections: Introduction, Literature Review, Objectives, Scope and Methodology, Findings, and Conclusion. The Introduction section provides general information about the study. The Literature Review section explains general concepts such as SMEs, information, information management, and dimensions of information management. The third section provides general information about the objectives and scope of the study. In the final section, results before and after the implementation of information management processes are presented, comparing the number and rates of product defects and machine downtime minutes and rates for an automotive company operating in Gebze, and differences are discussed.

2. CONCEPTUAL FRAMEWORK

2.1 Small and Medium sized Enterprises (SMEs)

Considering recent developments in the global economy, it is understood that Small and Medium-sized Enterprises (SMEs) are fundamental building blocks in a country's economic development process. SMEs are the primary tools in the competition that arises as a natural consequence of the globalizing economy. Due to their organizational flexibility, SMEs are much faster in decision-making processes and can quickly adapt to innovations. They are an indispensable element of a country's trade practices, proper urbanization, and industrialization (Oktav, 1990).

When defining SMEs, criteria such as turnover, business size, and added value are considered. Therefore, there are various definitions of SMEs (Yılmaz, 2000, p. 142).

Since our study focuses on manufacturing SMEs, our definitions are based on production criteria. Until 2006, various institutions such as KOSGEB, Eximbank, Halk Bank, the Treasury Undersecretariat, and the Ministry of Foreign Trade had different definitions for SMEs. However, according to the "Regulation on Small and Medium-sized Enterprises" published on May 25, 2023, by the Presidential Decree No. 7297, the definitions of SMEs are as follows:

- a) Micro Enterprise:** Businesses with fewer than ten employees and a financial balance sheet or annual net sales revenue not exceeding ten million Turkish Lira.
- b) Small Enterprise:** Businesses with fewer than fifty employees and a financial balance sheet or annual net sales revenue not exceeding one hundred million Turkish Lira.

c) **Medium-Sized Enterprise:** Businesses with fewer than two hundred fifty employees and a financial balance sheet or annual net sales revenue not exceeding five hundred million Turkish Lira.

Table 1- SME Definition Criteria and Classification in Turkey

SCALE /CRITERION	NO of EMPLOYEES	FINANCIAL BS	ANNUAL NET SALES
Micro Enterprise	< 10	≤10 Milyon ₺	≤10 Milyon ₺
Small Enterprise	< 50	≤100 Milyon ₺	≤100 Milyon ₺
Medium-Sized Enterprise	< 250	≤500 Milyon ₺	≤500 Milyon ₺

Source: Regulation on Small and Medium-sized Enterprises No. 32201, published in the Official Gazette on May 25, 2023, based on the Presidential Decree No. 7297 dated May 24, 2023.

2.2 Information and Information Management

The concepts of information and information management have attracted the interest of many researchers across various disciplines. A review of the literature reveals that research on topics such as tacit and explicit knowledge, organizational intelligence, intellectual capital, and the knowledge creation process has been conducted from the 1950s to the present.

Since the concept of information is used for different purposes and in various forms, it is sometimes confused with the concepts of data and information. However, these three concepts have distinct contents and represent outputs at different stages of the information processing process (İraz, 2005: 244). To summarize these three concepts: data refers to raw and actual numbers, information refers to processed data, and knowledge refers to information that has been validated and can be used for strategic decision-making. Knowledge is the processed and validated form of the other two concepts, personalized with interpretations, ideas, facts, and judgments in individuals' minds (Davenport and Prusak, 1998: 27; Alavi and Leidner, 2001: 109).

At first glance, the concepts of information and information management may appear to be different. Information is a personal concept related to knowing and understanding, while management refers to a process that requires teamwork. Although information workers may not enjoy being managed, information management has become a crucial process within businesses due to its significant role in providing competitive advantage in the market (Barutçugil, 2002: 55).

Since the concept of information management has been addressed by very different disciplines, many definitions of this concept have been proposed. The first contribution to the literature on

information management came from Wiig. Wiig (1986) emphasized that information management should be viewed as a conscious strategy to apply knowledge to enhance organizational performance. With the radical changes of the 1990s, information management began to gain a broader place in the literature. A comprehensive treatment of information management was presented in Drucker's (1993) work, *Post-Capitalist Society*. Subsequently, Nonaka and Takeuchi (1995) contributed to the development of the concepts of information management and knowledge-based companies with their work *The Knowledge-Creating Company*. Senge (1990), with his work *The Fifth Discipline*, and Davenport and Prusak (1992) with their studies, contributed to the various definitions of information management. In addition to these researchers' contributions, the practices of large companies have played an important role in the development of information management (Atak, 2011). According to Chong et al. (2000), information management is a process that supports information technology, enhances the skills and expertise of business employees. Bhatt (2001: 71) defined information management as the process of creating, validating through various tests, presenting, distributing, and applying information within the business.

Today, new methods are emerging for creating information within businesses, storing this information, and sharing and utilizing it within the organization. These methods have been observed to be extremely effective in influencing how businesses operate and their customer relationships. Therefore, it is undeniable that businesses that place information management at their core achieve competitive superiority in their respective industries (Dinç, 2002, p. 7).

2.3 Dimensions of Information Management

Managing external information is as crucial as managing internal information for a business. A review of the literature reveals that many researchers have examined the dimensions of information management in different ways. However, the most widely accepted dimensions of information management are information acquisition, transforming it into a useful form, application, and protection (Gold, Malhotra, and Segars, 2001: 190).

a) Information Acquisition: The first dimension of information management is information acquisition. This process involves the accumulation of knowledge through methods such as obtaining, searching, generating, creating, and discovering information. Another method of acquisition is innovation, which means creating new knowledge from the application of existing information. After these processes, the organization can capture information (Gold, Malhotra, and Segars, 2001: 190).

b) Transformation of Knowledge: The process of making existing knowledge useful is referred to as the transformation of knowledge in information management. For knowledge to be transformed within a business, the organization must have the skills to organize, structure, integrate, coordinate, and distribute the information (Gold, Malhotra, and Segars, 2001: 190). To maximize efficiency within the organization, businesses should integrate the different knowledge possessed by various employees. Therefore, a primary goal for any

organization should be to consolidate the expertise of different employees (Grant, 1996: 114-115).

c) Application of Knowledge: A review of the literature reveals that there is very little discussion on the outcomes of applying knowledge. To survive in competition, organizations must create corporate knowledge, capture it, and embed it within the business. Additionally, organizational knowledge and expertise must be shared within the company (Gold, Malhotra, and Segars, 2001: 191). As a result of this knowledge sharing, businesses will experience reduced product development times, increased functionality speeds, wider adoption of knowledge, enhanced productivity, and decreased costs (Davenport and Klahr, 1998: 197-198).

d) Protection of Knowledge: The final process in information management is the protection of knowledge. This process is crucial to prevent the illegal extraction or theft of information from the business. For a company to achieve a competitive advantage in the market, the information within the organization must be unreplicable and secure from leakage. Although protecting information is challenging, measures such as encouraging collaborative efforts, legal contracts, employee conduct rules, and job designs should be implemented. Additionally, a company can develop software that restricts access to critical information. Without security-focused measures, information risks losing its important attributes (Gold, Malhotra, and Segars, 2001: 192).

3. OBJECTIVES, SCOPE and METHODOLOGY

3.1 Purpose

The main objective of this study is to highlight the importance of information management in increasing productivity in SMEs. Additionally, the study aims to contribute to the literature by explaining the concepts of SMEs, information, information management, and the dimensions of information management with the most fundamental and up-to-date definitions found in the literature.

3.2 Scope

This study was conducted by analyzing the production processes of a company located in the Gebze region that manufactures plastic parts for the automotive industry.

3.3 Methodology

For this SME with 210 employees, the number of defects and machine downtime before implementing information management processes were determined. Subsequently, after establishing and applying the information management systems within the same company, the number of defects and machine downtime were measured again and reported by using graphs.

4. RESULTS and DISCUSSION

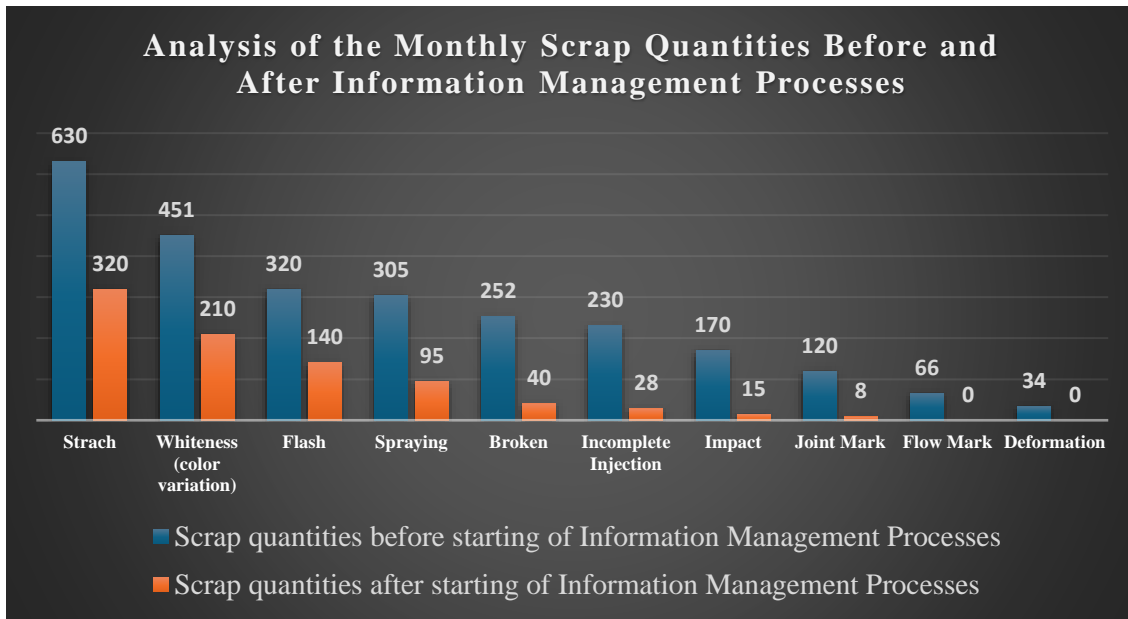
The company in our study has a total of 210 employees and operates with a three-shift working system. It is an automotive sector company that produces plastic parts, with departments for plastic injection, painting, and assembly. After preliminary evaluations with the managers, two separate machines were selected to analyze the role of information management in affecting production efficiency: the machine with the highest material waste (Material A) and the machine with the most downtime (Machine B). In Table 2, we have listed the causes of material waste for Material A and the causes of machine downtime for Machine B. As seen in Table 2, a total of 10 material waste causes and 8 machine downtime causes are included in our analysis. These causes of waste and downtime were determined based on the past experiences of the production manager and the injection team leader.

Table 2- Scrap reasons for machine A and down time reasons for machine B

Scrap Reasons for Machine A	Down Time Reasons for Machine B
Strach	Missing Operator
Whiteness (color variation)	Machine Problem
Flash	Power Failer
Spraying	Material Shortage
Broken	Line Side Additional Processes
Incomplete Injection	Quality Issue
Impact	Line Changeover
Joint Mark	Sorting Semi-Finished Product
Flow Mark	
Deformation	

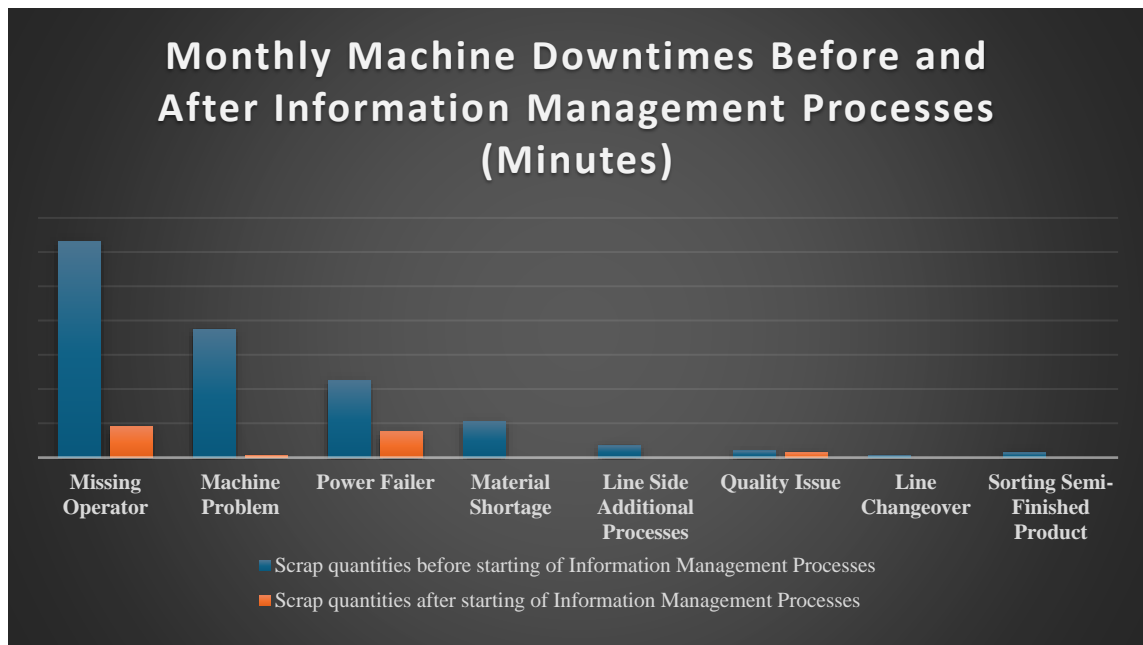
In this section of our study, the monthly waste quantities before the active use of the business's information management processes have been compared with the monthly waste quantities after the active implementation of these processes. A reduction in the number of all types of waste has been observed on a quantitative basis. This reduction has been attributed to the managers reviewing processed data as information every morning during management meetings and taking necessary actions.

Figure 1: Scrap Quantity Before and After Starting the Information Management Processes



In another part of our study, the downtime durations of Machine B before actively using the company's information management processes were compared with the downtime durations after actively implementing these processes. It was observed that, on a minute-by-minute basis, the downtime of Machine B decreased due to certain reasons and was eliminated for other reasons. This improvement is explained by the actions taken by managers during their daily production meetings to address the relevant downtime reasons.

Figure 2: Downtime Reasons Before and After Starting Information Management Processes



4.2 CONCLUSION

In the company where we conducted our study, scrap data and machine downtime were collected daily. After collecting this data, the company started to organize daily production

meetings to see previous day's production report. Following these meetings, action plans for the relevant scrap reasons and machine downtimes were maintained by the quality system manager, responsible individuals were assigned to the issues, and deadlines for solutions were set.

After tracking these actions, the solutions and results for the relevant scrap reasons and solutions are listed below.

Scratch Problem: With the improvements made by the mold team in the mold, scrap rate due to scratch problem was reduced by 49% in one month.

Color Problem: By reducing the proportion of regrind (the process of converting processed plastic pieces back into raw material) added during production, scrap loss has been reduced by 53%.

Burr Problem: Similar to the scratch problem, the scrap loss rate has been reduced by 56% through improvements made to the mold.

The spraying problem was reduced by 68.8% by decreasing the regrind rate of the raw material used.

Broken Problem: By warning employees about the processes during the packaging of the manufactured products, scrap rate reduced by 84.1%

Incomplete Injection Problem: By reducing the regrind raw material rate, our scrap rate due to incomplete injection has been reduced by 87.8%.

Impact Problem: The scrap rate was reduced by 91.1% by retraining employees on the packaging process and regular follow-up by the team leader.

The joint mark problem was reduced by 93.3% in the waste rate as a result of improvements made to the mold.

The flow mark problem was eliminated by reducing the regrind rate of the raw material used.

The deformation problem was eliminated by providing re-training to employees on the packaging process and having the team leader regularly monitor the employees afterward.

The results and solutions for the relevant machine down time causes are listed below.

Employee shortage was identified as an issue actually related to the Human Resources department based on the data collected from production. The Human Resources department resolved the employee shortage problem by improving its own processes, resulting in an 85.7% reduction in machine downtime caused by this issue.

Machine malfunction: The machine downtime caused by this issue was reduced by 98% due to repairs and subsequent maintenance performed on the relevant machine. It has been decided that in the future, the maintenance processes for the machine will be monitored in a timely manner by the quality control system manager.

Material shortage: It was determined that the production could not find the required material in the warehouse due to disorganization, which caused the machine to stop. By organizing products in the warehouse by project, defining products and shelves, and providing training to warehouse staff, downtime caused by material shortages was reduced by 66.6%. It is recommended that improvements to the warehouse system continue.

Electrical shortage: A voltage-related fault in the company's electrical system was identified and corrected, and no further machine downtime has occurred due to this issue.

Line Side Additional Processes: Due to the corrections made to the mold, additional line side processes such as flash removal are no longer required.

Although there was a 25% reduction in downtime caused by quality issues, a definitive identification and solution for this cause of downtime have not yet been found by the time this work was complete

Line changeover, also known as shift changeover, was one of the causes of downtime due to operators arriving late to their machines. Team leaders were alerted to address this issue, and these downtimes have been prevented

Due to the corrections made to the mold, there is no longer a need for semi-finished product inspection.

As a result of the study, it is seen that the sharing of correct information collected from the production site in the production meeting held with the participation of all department managers and the creation of action plans have a great effect on reducing company losses and increasing efficiency. With this study, it has been seen that the effective implementation of information management processes in businesses will provide the company with the advantage of reducing production losses, traceability and competition.

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DIGITALIZATION, TRANSFORMATION, and FUTURE PERSPECTIVES in the HEALTHCARE SECTOR: SWOT ANALYSIS in TURKEY

Dr. Deniz ÇINAR

ABSTRACT

Digitalization has led to profound changes in the healthcare sector in the 21st century, enhancing the effectiveness and accessibility of healthcare services. Key components of digital health technologies include Electronic Health Records (EHR), telemedicine, mobile health applications (mHealth), and wearable devices. EHR systems collect patient information in digital form, providing healthcare professionals with immediate access to this data and accelerating treatment processes. Telemedicine overcomes geographical barriers by offering remote healthcare services, while mobile health applications and wearable technologies allow individuals to monitor their health status in real-time.

The impact of digitalization on the healthcare sector encompasses a broad range of effects. EHRs facilitate centralized management of health data, improving service quality and reducing error rates. Telemedicine applications increase access to healthcare, particularly in rural areas, while mobile health applications and wearable technologies support personal health management. Additionally, artificial intelligence (AI) and big data analysis play a crucial role in early diagnosis and the development of personalized treatment methods.

In Turkey, the digital transformation of the healthcare sector is assessed through a SWOT analysis, identifying strengths, weaknesses, opportunities, and threats. Strengths include government support, growing digital infrastructure, and the high technological adaptability of the young population. Weaknesses encompass gaps in digital literacy, data security issues, and infrastructure deficiencies. Opportunities are represented by technology investments and telemedicine applications, while threats include cybersecurity risks and digital divide challenges. In this context, the future development of digital health technologies holds the potential to enhance the quality and accessibility of healthcare services.

Keywords: Digital Health Technologies, Electronic Health Records (EHR), Artificial Intelligence and Big Data

1. INTRODUCTION

One of the most significant and important transformations of the 21st century is digitization. Just like in many other sectors, the healthcare sector has been profoundly affected by this digital transformation, resulting in fundamental changes in the delivery of healthcare services. Today, the rapid development of digital health technologies not only enhances the effectiveness of healthcare services but also increases accessibility. Moreover, the swift advancement of digital

health technologies is transforming and improving the experiences of both patients and healthcare professionals (Smith, 2020).

Digital health technologies encompass a range of technological tools, including telemedicine, mobile health applications (mHealth), electronic health records (EHR), and wearable devices. Telemedicine provides remote healthcare services without the need for physical examinations, while mobile health applications and wearable devices play a crucial role in health management by continuously monitoring individuals' health data (Lee et al., 2022). EHR systems, on the other hand, collect patient information in a digital format, allowing healthcare professionals to access this data instantly. These systems standardize data collection and sharing, making the treatment processes for patients faster and more seamless (Jones & Roberts, 2021).

2. THE IMPACT of DIGITALIZATION on the HEALTHCARE SECTOR

In the healthcare sector, digitalization impacts not only the services provided but also health management, research, and patient relationships. Electronic Health Records (EHR) enable the collection and sharing of all patient health data in a centralized system, allowing healthcare professionals to access patient histories quickly. This improves the overall coordination and quality of healthcare services while significantly reducing error rates (Smith, 2020). Telemedicine applications enhance access to healthcare by overcoming geographical barriers, while mobile health applications and wearable technologies provide opportunities for real-time monitoring of individual health conditions and greatly support personal health management (Brown & Green, 2021).

3. THE HISTORY and DEVELOPMENT of DIGITALIZATION in the HEALTHCARE SECTOR

The history of digital health technologies spans from the early use of computers in the healthcare sector to the present day. This journey began in the 1960s and gained momentum from the 1980s with the broader adoption of data management and Health Information Systems (HIS). By the early 2000s, the widespread adoption and popularization of Electronic Health Records (EHRs) and the integration of the internet into healthcare services marked a more pronounced and accepted digital health revolution. In recent years, the integration of technologies such as artificial intelligence (AI), big data analytics, information management, and machine learning has further strengthened this transformation (Nguyen et al., 2023).

3.1 Mobile Health Applications (mHealth)

Mobile health applications, or mHealth apps, are used to monitor, manage, and expedite access to healthcare information. These applications allow users to track their health data and personalize their health management. For instance, apps used for diabetes management can help patients monitor their blood sugar levels and share this data with their doctors (Smith, R., Green, M., & Taylor, L., 2023).

3.2 Telemedicine

Telemedicine refers to the delivery of healthcare services through digital communication tools. This enables patients to receive medical consultations and treatment without the need to physically visit healthcare providers, saving both time and energy. In the context of our country, telemedicine applications can particularly enhance access to healthcare services in rural and hard-to-reach areas, both speeding up and increasing access to care. Studies conducted so far indicate that telemedicine has a highly positive impact on patient satisfaction and improves the accessibility of healthcare services (Lee, C., Brown, P., & Evans, J., 2022).

3.3 Wearable Technologies

Wearable technologies provide patients with the opportunity to continuously monitor their own health data. These technologies include smartwatches and fitness trackers that track metrics such as step count, heart rate, and sleep quality. As technology advances, the variety of such products continues to grow. This data helps users keep track of their health status and achieve their health goals. Wearable technologies are shown to play a significant role in proactively managing health (Brown, T., & Green, L., 2021).

3.4 Health Information System

Health Information Systems (HIS) are digital tools used to collect, manage, and analyze health data. This category includes Electronic Health Records (EHRs) and Health Information Management Systems. EHR systems store patient information in a digital format and allow healthcare providers to access patient data securely and quickly. EHRs are recognized for playing a critical role in enhancing the quality of healthcare services and ensuring efficiency (Jones, A., & Roberts, K., 2021).

3.5 Artificial Intelligence and Big Data

Today, artificial intelligence (AI) and big data analytics are crucial components of digital health tools, much like in other sectors. AI offers potential for early disease diagnosis and personalized treatment recommendations. Big data analytics enables the analysis of large datasets to enhance the quality and effectiveness of healthcare services. These technologies have the potential to bring about revolutionary changes in the healthcare sector and clinical decision support systems, driven by ongoing advancements (Nguyen, T., Wang, S., & Li, H., 2023).

4. OPPORTUNITIES and RISKS of DIGITALIZATION in the HEALTHCARE SECTOR

With advancing technology worldwide, digital health technologies offer numerous opportunities within the healthcare sector. These opportunities include increased speed of service accessibility, improved patient care, and much more effective and efficient health management. However, the digitalization process has also introduced certain risks to the healthcare sector. One of the primary concerns with digital health applications is data security. Protecting health data is crucial for ensuring patient privacy and enhancing information security

against cyberattacks (Miller, 2020). Additionally, issues such as the lack of necessary digital skills for effective use of digital tools and system incompatibilities are noteworthy challenges (Thompson, 2021).

In this context, understanding the current impacts of digitalization on the healthcare sector is essential for predicting how healthcare services will evolve in the future and for making appropriate plans. In the next section of our study, we will evaluate the potential future developments of digital health technologies and conduct a SWOT analysis of the current situation.

5. SWOT ANALYSIS

5.1 Strengths

5.1.1 Investments and Support: Turkey has been making significant investments in health information technologies, particularly following the COVID-19 pandemic. The Ministry of Health's digital health projects include numerous programs and incentives that support the digital transformation of healthcare services (Ministry of Health of the Republic of Turkey, 2022).

5.1.2 Growing Digital Infrastructure: Recent increases in internet access and the widespread use of mobile devices in Turkey are enhancing the accessibility of digital health applications. In particular, mobile health apps and telemedicine services are reaching a broad user base (Kara, 2021).

5.1.3 Health Information Systems: The integration of health information systems, such as Electronic Health Records (EHR), has recently progressed rapidly in Turkey. EHR systems facilitate centralized management of health data, quick access to information, and ease of data sharing, which significantly enhances the quality of healthcare services (Aydın & Yılmaz, 2020).

5.1.4 Young Population and Technology Adoption: Turkey's relatively young population provides a high adaptability to digital health technologies. This demographic characteristic fosters the adoption of digital health applications (Demir & Şahin, 2023).

5.2 Weaknesses

5.2.1 Digital Literacy and Training Gaps: Effective use of digital health technologies requires digital literacy among healthcare professionals and, especially, patients. In Turkey, there are evident gaps and training needs in the use of digital health systems (Yurtsever, 2022).

5.2.2 Data Security and Privacy Issues: There are cybersecurity threats related to the protection of digital health data. In Turkey, adequate measures may not have been implemented to ensure the security of health data (Kaya, 2021).

5.2.3 Infrastructure Issues: In rural areas with low population densities, inadequate health IT infrastructure makes it challenging to effectively use digital health applications (Kara, 2021).

5.2.4 System Integration Challenges: Lack of integration between different health information systems can create issues with data sharing and communication between systems (Aydın & Yılmaz, 2020).

5.3 Opportunities

5.3.1 Technology and Innovation Investments: Turkey, with its geographic location and foreign policy strategies, has the potential to attract both national and international investments in health technologies. These investments could accelerate digital transformation in the healthcare sector (Turkish Foundation for Technology Development, 2023).

5.3.2 Telemedicine for Rural and Hard-to-Reach Areas: Telemedicine applications can enhance access to healthcare services in rural and hard-to-reach areas, supporting a more equitable distribution of healthcare services (Demir & Şahin, 2023).

5.3.3 Artificial Intelligence and Big Data Analytics: Innovative technologies such as artificial intelligence (AI) and big data analytics offer significant opportunities for early disease detection and personalized treatment approaches (Yurtsever, 2022).

5.3.4 International Collaborations and Projects: International health projects and collaborations can contribute to the advancement of Turkey's digital health technologies and help align with global health standards (Turkish Foundation for Technology Development, 2023).

5.4 Threats

5.4.1 Cybersecurity Threats: The security of digital health data may be vulnerable to cyberattacks. Threats to the protection of health data can impact the reliability of health systems (Kaya, 2021).

5.4.2 Digital Divide: Inequality in access to technology may lead to ineffective use of digital health applications in some regions. This situation can create regional disparities in the quality of healthcare services (Yurtsever, 2022).

5.4.3 Legal and Regulatory Barriers: Laws and regulations governing the use of digital health technologies can sometimes hinder innovative applications or slow down the adaptation process (Demir & Şahin, 2023).

5.4.4 Cultural and Social Resistance: There may be cultural and social resistance to digital health technologies among healthcare professionals and patients. Such resistance can impede the adoption of digital health systems (Kaya, 2021).

6. FUTURE PERSPECTIVES in HEALTHCARE

6.1 Digitalization in Healthcare

The healthcare sector is expected to see a significant increase in digitalization. This shift will likely be driven by advancements in various technologies, particularly artificial intelligence

(AI) and machine learning. These technologies are poised to transform many aspects of healthcare, from disease diagnosis to treatment planning.

6.2 Artificial Intelligence and Early Diagnosis

AI and machine learning have the potential to revolutionize early disease detection and diagnosis. According to Nguyen et al. (2023), AI systems can analyze vast amounts of data quickly and accurately, which can lead to more precise and timely diagnoses. For example, AI algorithms can sift through electronic health records, medical images, and genetic data to identify patterns and anomalies that may not be immediately apparent to human clinicians.

6.3 Personalized Medicine

The integration of AI into personalized medicine is another promising development. Wilson and Adams (2024) discuss how AI can utilize genetic information and individual health data to tailor treatment plans to each patient. This approach allows for the development of more effective and individualized treatment strategies, enhancing patient outcomes and minimizing adverse effects. Personalized medicine also leverages AI to predict disease risks and optimize preventive measures based on individual genetic profiles and health histories.

7. CONCLUSION

Digitalization has brought significant changes and improvements to the healthcare sector in the 21st century. Innovations like Electronic Health Records (EHRs), telemedicine, and digital health tools have enhanced the quality and accessibility of healthcare services. EHRs collect patient data in a digital format, allowing quick access to this information. This speeds up treatment processes, reduces error rates, and improves the coordination of healthcare services. Telemedicine overcomes geographical barriers, making healthcare more accessible, while mobile health apps and wearable technologies help individuals monitor their health in real time and manage their health more personally.

However, the digitalization process also comes with challenges. Data security is a major concern, as protecting digital health data from cyberattacks and maintaining patient privacy are critical. Additionally, the lack of digital skills among healthcare professionals and patients, along with difficulties in adapting to new technologies, can hinder the effective use of digital health tools and slow down the transformation process.

In the future, technologies like artificial intelligence (AI) and personalized medicine will play an even bigger role in healthcare. AI has the potential to revolutionize early disease detection and personalized treatment recommendations by analyzing large amounts of data. AI systems can identify patterns and abnormalities in electronic health records, medical images, and genetic data that human clinicians might miss. Personalized medicine will use genetic information and individual health data to create customized treatment plans. These approaches can make treatment strategies more effective and tailored to each person, improving patient outcomes and minimizing negative effects.

In summary, while digitalization has made significant progress in healthcare, challenges like data security, digital skills, and adaptation remain. In the future, innovative technologies like AI and personalized medicine will help make healthcare more effective and personalized, speeding up the transformation of the sector.

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SESLİ ASİSTANLARIN ALIŞVERİŞ AMAÇLI KULLANIM NİYETİNE ETKİ EDEN FAKTÖRLER: TÜKETİCİ DİRENCİ VE ALGILANAN ÜRKÜTÜCÜLÜĞÜN ETKİSİ

FACTORS AFFECTING THE INTENTION TO USE SMART VOICE ASSISTANTS FOR
SHOPPING PURPOSES: CONSUMER RESISTANCE AND PERCEIVED CREEPINESS

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ABSTRACT

Despite the potential value offered by smart voice assistants in the field of marketing, the expected increase in usage among both consumers and retailers has not been achieved, and even a decline in usage rates has been observed. While the factors affecting the adoption and intention to use voice assistants have been investigated in the literature, it is seen that the factors affecting consumer resistance have been neglected. The aim of this study, which aims to fill this gap, is to investigate the factors affecting the use of voice assistants for shopping purposes. In this context, the effects of consumer resistance and perceived creepiness on the intention to use voice assistants for shopping purposes are discussed. The study was conducted with quantitative research method. The sample of the study consists of voice assistant users aged 18 and over. Using online survey technique with convenience sampling, 252 sample units were reached. The data were analyzed using partial least squares structural equation modelling (Smart PLS). SPSS package program was used for descriptive statistics. As a result of the analyses, it was concluded that perceived creepiness increases consumers' resistance to the use of voice assistants and this resistance negatively affects the intention to use voice assistants for shopping purposes. In addition, it was revealed that consumer resistance has a mediating role in the effect of perceived creepiness on the intention to use voice assistants. In line with the findings of the study, some suggestions were presented to practitioners. Accordingly, businesses and brands can reduce the perception of creepiness in consumers by informing users about why personal data should be used in voice assistant applications. In this context, advertising slogans for trust and control perceptions may be useful.

Keywords: Smart voice assistants, Perceived creepiness, Consumer resistance, Intention to use

ÖZET

Pazarlama alanında akıllı sesli asistanların sunduğu potansiyel değerlere rağmen hem tüketiciler hem de perakendeciler arasında beklenen kullanım artışı sağlanamamış, hatta kullanım oranlarında bir düşüş gözlemlenmiştir. Alan yazın sesli asistanların benimsenmesi ile

kullanma niyetine etki eden faktörler araştırılırken, tüketici direncine etki eden faktörlerin ihmal edildiği görülmektedir. Bu boşluk doldurmayı hedefleyen bu çalışmanın amacı, sesli asistanların alışveriş amaçlı kullanımına etki eden faktörleri araştırmaktır. Bu bağlamda tüketici direnci ile algılanan ürkütücülüğün sesli asistanların alışveriş amaçlı kullanma niyeti üzerindeki etkisi ele alınmıştır. Çalışma nicel araştırma yöntemi ile yapılmıştır. Çalışmanın örneklemini 18 yaş ve sesli asistan kullanıcıları oluşturmaktadır. Kolayda örnekleme ile çevrimiçi anket tekniği kullanılarak 252 örnek birime ulaşılmıştır. Veriler kısmi en küçük kareler yapısal eşitlik modellemesi (Smart PLS) kullanılarak analiz edilmiştir. Tanımlayıcı istatistikler için SPSS paket programı kullanılmıştır. Yapılan analizler sonucunda algılanan ürkütücülüğün tüketicilerin sesli asistanları kullanımına yönelik direncini arttırdığı, bu direncin de sesli asistanları alışveriş amaçlı kullanma niyetini olumsuz etkilediği sonucuna ulaşılmıştır. Bununla birlikte algılanan ürkütücülüğün sesli asistanları kullanma niyetine etkisinde tüketici direncinin aracılık rolü olduğu ortaya konmuştur. Çalışmanın bulguları doğrultusunda uygulayıcılara bazı öneriler sunulmuştur. Buna göre; işletmeler ve markaların sesli asistan uygulamalarında kişisel verilerin neden kullanılması gerektiği konusunda kullanıcıları bilgilendirerek tüketicide ürkütücülük algısını düşürebilirler. Bu bağlamda güven ve kontrol algılarına yönelik reklam sloganları faydalı olabilir.

Anahtar Kelimeler: Sesli asistan, Algılanan ürkütücülük, Tüketici direnci, Kullanma niyeti

INTRODUCTION

AI-based Smart Voice assistants are artificial intelligence-based digital software with the ability to interact with voice commands to users. Nowadays, AI-based voice assistants play an important role in personalizing, facilitating and enriching consumers' interaction with the digital world, shaping consumer behavior in a wide range of areas from shopping habits to daily tasks. People use virtual assistants to play music, control lights, send messages, or request information such as the current weather and news (Rhee and Choi, 2020).

The American Marketing Association and various other sources state that smart voice agents is the future of marketing and can replace mobile apps for shopping as they can be integrated with messaging apps such as Facebook, WhatsApp and Skype (DuHadway, 2017). Despite the potential value offered to consumers by the features of voice assistants, which are seen as the future of marketing, it is seen that the expected increase in the use of voice assistants among both consumers and retailers has not been realized, and even the usage rates have decreased. So, it is important to investigate the factors causing resistance to SVA usage for online shopping. Previous studies primarily approach to factors affecting SVA usage from adoption perspective (Fernandes & Oliveira, 2021, Kasilingam, 2020; Al-Fraihat et al., 2023) whereas factors affecting resistance are limited (Handrich, 2021; Jan et al., 2023). To bridge this gap this study aims to explore the factors affecting the resistance intention use SVA usage for shopping purposes. In this context perceived creepiness examined as predictor of resistance intention towards SVA usage. Also, effect of consumer resistance on intention to use SVA for

online shopping is investigated. Mediating role of resistance intention between perceived creepiness and intention to is explored. Perceived creepiness is a novel construct in high tech AI based devices in consumer behavior reflecting negative response of consumers to a particular situation such as experience with technological product such as SVAs (Raff et al., 2024). Privacy concerns, uncontrolled data collection causes perceived creepiness which can lead negative feelings and decreased loyalty toward products (Rajaobelina et al., 2021). In this study perceived creepiness is elaborated as a barrier to adoption in the context of SVA usage online shopping in Turkey. By doing so, it is aimed to contribute to the resistance and adoption literature of consumer behavior in the context of SVA usage for online shopping.

RESEARCH AND FINDINGS

Literature review and Hypothesis Development

Resistance is defined as “an attitudinal outcome that follows an unfavourable evaluation of a new product” It is a rejectionist attitude which leads to innovation product failures. Also, resistance hinders the adoption of products (Talke & Heidenreich, 2014, p. 898). Perceived creepiness is defined as “a potentially unsettling and negative emotional reaction, accompanied by feelings of ambiguity toward a person, technology, or even within a particular situation” (Langer & König, 2018, p. 3). In the context of AI-based chatbots privacy concerns, technology anxiety, need for human causes the perception of creepiness. (Rajaobelina et al., 2021). Also, *Perceived creepiness* is a construct that leads to negative emotions. According to Sohn & Kwon, (2020) negative feelings may lead to resistance behaviour. Handrich, (2021) showed that perceived creepiness positively effects innovation resistance towards intelligent personal assistants. Raff et al. (2024) revealed that perceived creepiness positively effects resistance on smart home devices. So, it is reasonable excepting perceived creepiness which leads to negative feelings (Rajaobelina et al., 2021) will contribute to the resistance intention towards SVA usage for online shopping context. So, it is proposed that:

H1. Perceived creepiness positively effects resistance intention.

Previous research showed the negative effect of resistance on intention to use in different contexts. Prakash & Das (2022) revealed that citizens’ resistance negatively effects the intention to use in the context of tracking apps. Guo et al., (2013) showed that resistance intention has negative effect on intention to use in the context of mobile health services. Also, Raff et al., (2024) showed that resistance to smart home devices negatively affects the usage intention of consumers. In line with this evidence, it is expected that resistance towards smart voice assistant will negatively affect the intention to use SVAs for online shopping. It is proposed that:

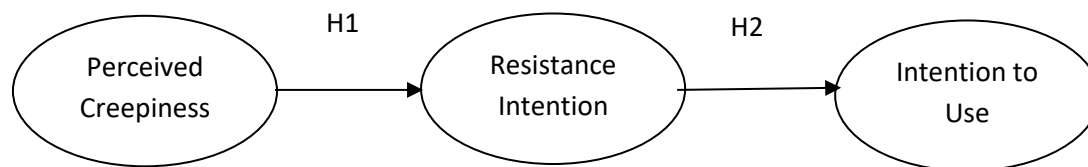
H2. Resistance intention towards SVA usage for online shopping negatively effects intention to use.

Handrich, (2021) showed that perceived creepiness positively effects innovation resistance towards intelligent personal assistants. Raff et al., (2024) showed that resistance to smart home devices negatively effects the usage intention of consumers Thus, perceived creepiness positively effects resistance(H1). Resistance negatively affect intention to use (H2). In accordance with this it can be said that perceived creepiness affects intention to use SVAs through the resistance intention. It is proposed that:

H3. Resistance intention has a mediating role between perceived creepiness and intention to use.

Figure 1 demonstrates the research model of the study.

Figure1. Research Model



Methodology

Sampling

The sample consists of voice assistant users in Turkey aged 18 and above. Convenience sampling method was applied to reach the sample units to represent the main population. Data were collected by online survey method through delivering to the participants via online channels such as WhatsApp, Instagram.

Measures

The questionnaire includes two parts with paragraph provides information about research. The first part includes questions about the demographic characteristics of the participants. The second part is consisting of scales measuring perceived creepiness, resistance intention and behavioural intention constructs. 13 items were employed to assess all the constructs. Scales whose validity and reliability have been tested in the literature were used. All items were adapted from the current literature to enhance efficiency in terms of the validity and reliability of the measurement model. The perceived creepiness scale (Raff et al., 2024) consisting of seven items is adapted to the context of current study. Resistance intention was measured using three items modified from the research by Handrich (2021). Adoption Intention items were adapted from the study of Jan et al., (2024) The items causing meaning errors were corrected according to the suggestions. A five-point Likert scale (1=strongly disagree, 5=strongly agree) was employed. 252 surveys were analysed to test the hypothesis

Analyses and Findings

Firstly, the demographic properties of the sample were described. Then, hypotheses were tested by using partial least square structural equation modelling (PLS-SEM) with SmartPLS4 software.

Demographic characteristics of the sample

Table 1 shows the demographic characteristics of sample. According to the results half of the sample is female and most of the participants are in 18-25 age group. Majority of the consumers use SVA one or two times in a week. Participants commonly use SVAs for alarm setting (%29.4) weather forecast control (%26.2) and online shopping purposes(% 15.9).

Table 1: Demographic Characteristics of the Sample

Variable	Categories	N	%
Gender	Female	128	50.8
	Male	124	49.2
	Total Sum	252	100

Age	18-25	160	63.5
	26-35	59	23.4
	36-45	28	11.1
	46-+	5	2.0
	Total Sum	252	100
Income	-10000	87	34.5
	10001-20000	62	24.6
	20 001-30000	61	24.2
	30 001-50 000	27	10.7
	50001- +	5	2.0
	Total Sum	252	100
SVA usage Purposes	Setting alarm	74	29.4
	Checking weather forecast	66	26.2
	Online Shopping	40	15.9
	Playlist organizing	30	11.9
	Others	147	58,3
SVA Usage Frequency	1-2 times per year	14	5.56
	1-2 times per month	50	19.8
	1-2 times per week	93	36.9
	Non	46	18.3
	Everyday	49	19.4

Common method bias

CMB was checked with (VIF) scores which is recommended to be lower than of 3.3 threshold (Kock, 2015). As seen table 6 inner VIF are lower than 3.3 confirming the data were not contaminated with CMB errors (Kock and Lynn, 2012).

Measurement model assessment

First, CFA was carried out to evaluate the measurement model of research. In this context reliability, convergent validity and discriminant validity are checked. As seen at Table 4 all factor loadings were greater than 0.70 and AVE was exceeding the recommended limit of 0.50 which justifies convergent validity (Bagozzi and Yi, 1988).

Reliability is assessed with CR, Cronbach's alpha and AVE scores. Cronbach's alfa ranged from 0.835 to 0.956. CR values were greater than 0.50 and AVE scores were greater than 0.70 shows that all scales are reliable (Fornell and Larcker, 1981). Results of measurement model demonstrated in Table4.

Discriminant validity is assessed with Fornell and Larcker criteria and HTMT ratios (Henseler et al., (2015). Table 2 shows that the square root of AVE values of all the reflective constructs are higher than the inter-construct correlations which confirms Fornell Larcker criteria have been achieved (Fornell and Larcker ,1981). Henseler et al., (2015), recommends that HTMT ratios of each construct should be lower than 0.90 to establish discriminant validity. As seen at Table3 HTMT ratio of all constructs were lower than 0.40 justifying the discriminant validity of measurement model.

Table2. Fornell Larcker Criteria Evaluation			
Factors	Creepiness	Intention to use	Resistance
Creepiness	0,890		
Intention to use	-0,095	0,921	
Resistance	0,350	-0,190	0,867

Table 3. Heterotrait-monotrait Ratio (HTMT)			
Factors	Creepiness	Intention to use	Resistance
Creepiness			
Intention to use	0,101		
Resistance	0,389	0,216	

Table 4. Measurement Model Evaluation Results**Table4.** Results of Measurement Model

Constructs	Labelled items	Factor Loadings	Cronbach Alfa	CR	AVE
Perceived Creepiness	CRP1.Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğunu düşündüğümde bulunduğum ortamda sesli asistanların olması beni tedirgin eder.	0.818	0.956	0.964	0.792
	CRP2.Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanlar bana rahatsız edici/ürkütücü geliyor.	0.863			
	CRP3. Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanları kullanmak tedirgin olmama neden olur.	0.922			
	CRP4. Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanları kullanmak tüylerimi ürpertiyor.	0.907			
	CRP5.Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanlar beni ürkütüyor.	0.903			
	CRP6. Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanların kullanılması durumu beni huzursuz ediyor.	0.908			
	CRP7. Ortam dinleme, veri gizliliği, mahremiyet ihlaline neden olduğu düşünüldüğünde sesli asistanların etrafımda olması bana güvensiz hissettiriyor.	0.903			
Resistance	RESIST1.Sesli asistanları online alışverişlerde kullanmam.	0.887	0.835	0.901	0.752
	RESIST2.Online alışverişlerde sesli asistanları kullanmak pek akıllıca değil.	0.865			
	RESIST3.Online Alışverişlerde sesli asistan kullanmayı başkalarına tavsiye etmem.	0.850			
Intention to Use	INTENT1Günlük hayatımda sesli asistanları daha çok kullanmayı düşünüyorum	0.934	0.911	0.944	0.849
	INTENT2.Sesli asistanları gelecekte daha düzenli kullanmayı düşünüyorum	0.911			
	INENT3.Çevremdekilere sesli asistan kullanmalarını önereceğim	0.919			

Finally, fit indices of measurement model were assessed. As seen Table 5 shows, the model yielded good fit (SRMR<0.10, NFI≥.80). So, the validity and reliability analyses of the measurement model were completed that resulted in construct validity of the measurement model of was achieved.

Table 5. Model Fit

	Saturated model	Estimated model
SRMR	0,043	0,045
d_ ULS	0,171	0,182
d_ G	0,207	0,208
Chi-square	318,565	318,681
NFI	0,887	0,887

The measurement model was assessed with VIF (multicollinearity), R^2 (explanatory power), f^2 (effect size) and Q^2 (prediction size) coefficients (Table 6). Inner VIF scores of all constructs are below 5 (Hair et al., 2018:194) that indicates there is no multicollinearity problem of constructs. R^2 scores of the endogenous variables were found as 0.123 and 0,036 respectively for resistance intention and usage intention indicating the %12 of resistance intention and %4 of usage intention is explained. By model. According to Cohen (1992) f^2 value ranged with 0.02 and above indicates a low effect size; 0.15 and above indicates a medium effect size; 0.35 and above indicates a high effect size. In the model the effect size of perceived creepiness on resistance ($f^2=0.140$, $R^2=0.123$) is at medium level, whereas effect size of resistance intention on usage intention is low ($f^2=0.037$, $R^2=0.036$). The Q^2 the coefficient reflects predictive power of dependent variables, A value greater than zero indicates dependent variables of the research model have predictive power (Hair et al., 2018). As seen Table 6, Q^2 coefficients are positive indicating dependent constructs of our model have predictive power.

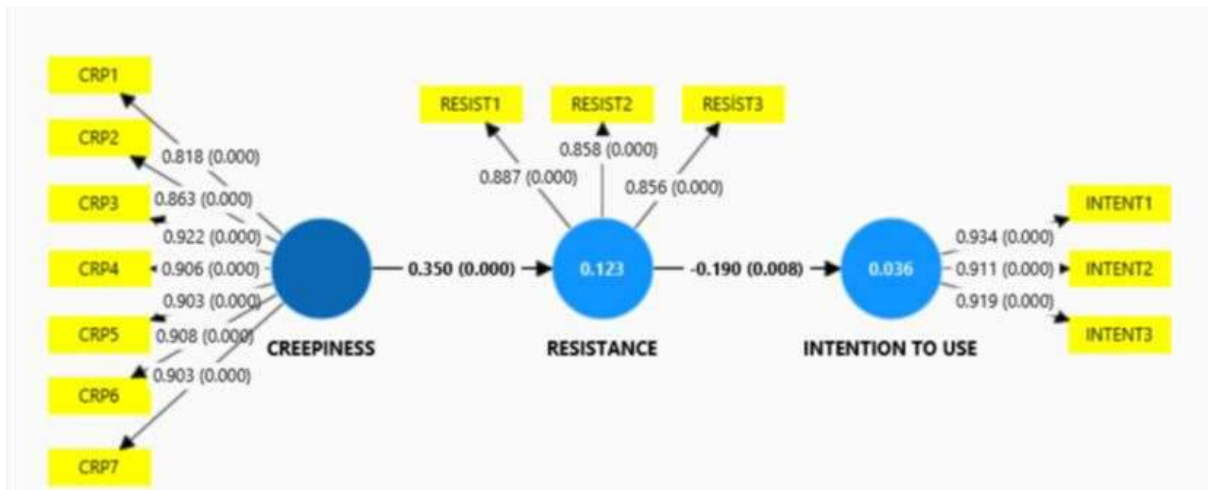
Table 6. Measurement Model Results

Constructs	VIF	f^2	R^2	Q^2
Perceived Creepiness -> Resistance Intention	1.000	0,140	0,123	0.110
Resistance Intention -> Intention to use	1.000	0,037	0,036	0,006

Hypotheses testing

The hypotheses of structural model were tested with Smart PLS 4.1.0.6. Results of structural model analyses were shown in Figure 2 and Table 7.

Figure2. Results of Structural Model Analyses



The results showed that the effect of Perceived Creepiness on Resistance Intention is positive ($\beta = 0.35$, $p = 0.00$), H1 supported. Also, the effect of resistance intention on intention to use is negative ($\beta = -0.190$, $p = 0.08$), that supports H2. Mediation effects were tested using confidence intervals (the lowest and highest confidence intervals) of specific indirect effects. As seen in Table 6, the values were different from the zero and within the desired range. According to the mediation analysis result resistance intention towards SVA usage for online shopping mediates the relationship between perceived creepiness and intention to use (H3 supported).

Table 7. Results of Structural Model

Hypotesis	β	B	Standard Deviation	t statistics	P	Supported/unspported
H1.Perceived Creepiness -> Resistance Intention	0,350	0,355	0,062	5,603	0,000	SUPPORTED
Resistance Intention-> İntention to use	-0,190	-0,196	0,072	2,651	0,008	SUPPORTED
Spesific İndirect Effects						
Hypotesis	β	BBCI [%2,5; %97,5]	Standard Deviation	T statistics	P	Supported/unspported
Creepiness -> Resistance -> İntention to Use	-0,067	[-0,133; `-0,020]	0,029	2,300	0,021	SUPPORTED

CONCLUSION

The aim of this study is exploring the factors against adoption of smart voice assistant assistants for shopping in Turkey. In this context effect of perceived creepiness on resistance intention is investigated. Also, effect of resistance intention on intention to use is examined. Results showed that perceived

creepiness of consumer was positively affects the resistance intention towards SVA usage. This finding supported the literature (Handrich, 2021; Raff et. All., 2024). Handrich (2021) stressed the importance of the perceived creepiness and privacy concerns for resistance behaviour in the context of Artificial intelligence apps. Sharing Personal data especially financial data such as password of credit card etc. SVA for online shopping may cause creepy feelings on consumers which leads to resistance intention. Another finding of study revealed that resistance intention is negatively effects intention to use SVA for online shopping purposes. Finding is consistent with Raff et al., (2024) which revealed that resistance intention has negatively effects adoption behaviour by hindering the crucial enablers of adoption behaviour such as perceived usefulness, ease of use on smart technologies. Another finding of study is mediating effect of resistance intention in the relationship between perceived creepiness and intention to use SVA assistants on online shopping. Perceived creepiness negative influences the adoption behaviour through creating resistance on consumers. This finding provides deep understanding how perceived creepiness influences the adoption behaviour negatively. This finding makes contribution to the resistance and adoption literature in AI-based smart voice assistant context. Also, this study enriches SVA literature by investigating factors affecting resistance and adoption intention of SVA on consumer level in Turkey.

This study has limitations. The first limitation of study is age of the sample. Most of the sample is in 18-25 age group which hinders the generalizability of findings. It is recommended to further studies to test the model for different age groups. Also, privacy concerns may be added to the model as antecedent of perceived creepiness.

This study provides implications for practitioners. Perceived creepiness contributes to resistance intention. Since data collection-based privacy concerns motivates perceived creepiness of consumers product managers should avoid the secret personal data collection for personalized advertising strategies and publicly communicate and reflect the privacy concern sensitivity of company with the consumers.

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**AKADEMİ ÖDÜLLÜ(OSCAR) FİMLERİN VERİ ZARFLAMA ANALİZİ İLE
ETKİNLİKLERİNİN DEĞERLENDİRİLMESİ**
EVALUATION OF THE EFFECTIVENESS OF ACADEMY AWARDS (OSCAR)
FOR THE BEST PICTURE WITH DATA ENVELOPMENT ANALYSIS

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ÖZET

Sinema sektörü veya diğer adı ile film sektörü, üretimi sürekli olarak devam eden bir sektör olarak, durmaksızın değişen ve gelişen dünyaya ayak uydurabilen, büyük bir endüstridir. Endüstrinin büyüklüğünün bir sonucu olarak rekabet yoğun yaşanmakta ve daha fazla tüketiciye ulaşmak üzere çeşitli pazarlama uygulamaları bulunmaktadır. Filme harcanan bütçe ve filmin gösterime girdiği pazar sayısı bu noktada önem kazanmakta, dolayısıyla, hem filmde elde edilecek hasılatı hem de filmlerin beğenilme oranını etkileyebilmektedir.

Bu doğrultuda, bu çalışmanın temel amacı pazarlama literatürüne katkı sağlamak ve sinema sektörüne öneride bulunmaktır. Belirlenen amaç çerçevesinde bu çalışmada, dünya çapında en prestijli sanat ve bilim akademilerinden biri olarak bilinen Oscar (Akademi)'dan son 15 yılda (2010-2024 yılları arasında) En İyi Film kategorisinde ödül alan filmlerin etkinlikleri Veri Zarflama Analizi ile değerlendirilmektedir. Uygulama, Veri Zarflama Analizinin girdi odaklı CCR modeli ile DEAP 2.1. programı kullanılarak gerçekleştirilmiştir. Yapılan analizin bulgularına göre tam etkinliğe ulaşan filmlerin, Oscar (Akademi) En İyi Film Ödülü'nü, 2024 yılında alan Oppenheimer, 2022 yılında alan Coda, 2020 yılında alan Parasite, 2017 yılında alan Moonlight ve 2011 yılında alan The King's Speech filmleri olduğu sonucuna ulaşılmıştır. Etkin olmayan filmlerin ise, tam etkinlik derecesine ulaşabilmeleri için etkin olan filmleri hangi yoğunlukta referans almaları gerektiği ve girdi değişkenlerini hangi oranda azaltmaları gerektiği hesaplanmıştır.

Anahtar Kelimeler: Oscar Akademi Ödülleri, Film Sektörü, Sinema Sektörü, Veri Zarflama Analizi, VZA.

ABSTRACT

The cinema industry, or the film industry as it is also known, is a large industry that is constantly producing and can keep up with the ever-changing and evolving world. As a result of the size of the industry, competition is intense and there are various marketing practices to reach more consumers. The budget spent on the film and the number of markets (countries) in which the film is released become important at this point, thus affecting both the revenue to be obtained from the film and the rate at which the film is appreciated.

Within the framework of the determined purpose, the activities of the films that have received awards in the Best Picture category from the Oscars (Academy), known as one of the most prestigious art and science academies in the world, in the last 15 years (between 2010-2024) are evaluated with Data Envelopment Analysis. The application was carried out using the DEAP 2.1. program with the input-oriented CCR model of Data Envelopment Analysis. According to the findings of the analysis, it was concluded that the films that reached full effectiveness were Oppenheimer, which won the Oscar (Academy) for Best Picture in 2024, Coda, which won in 2022, Parasite, which won in 2020, Moonlight, which won in 2017, and The King's Speech, which won in 2011. In order for ineffective films to reach full efficiency, it was calculated at what intensity they should refer to the effective films and at what rate they should reduce the input variables.

Keywords: Oscar Academy Awards, Film Industry, Motion Pictures Industry, Data Envelopment Analysis, DEA.

1. GİRİŞ

Teknolojinin sürekli gelişmesiyle küresel dünyada hayatta kalabilmek ve isteklere daha hızlı bir şekilde yanıt verebilmek için ihtiyaçlar öncelikli olarak belirlenmeli, gelişim ve değişimler takip edilmeli, sistematik ve hızlı bir şekilde hareket edilmelidir. Bu durum rekabet ortamındaki birçok işletmeyi ilgilendirmektedir (Doğan ve Özdemir, 2017: 1162). İnternetin aktif bir şekilde kullanıldığı bilgi ve iletişim teknolojileri, insanlara eskiye oranla daha düşük bir maliyetle yeni gösterime giren filmleri izleme gibi ev de rahatlıkla yapabilecekleri dijital boş zaman etkinliklerini sürdürme konusunda daha fazla özgürlük sağlayarak dönüşüme sebep olmaktadır (López-Sintas vd., 2017: 87; Ablanado Rosas vd., 2024: 120). Kısacası teknoloji aynı zamanda tüketicilerin eğlence arzını da değiştirmiştir. İlk önce varlığını gösteren tiyatrodan, sinema sektörüne kaymış ve sonrasında sırasıyla müzik, radyo, televizyon ve son olarak da internet yükselişe geçerek eğlence arzı giderek değişmiştir (Hauptert, 2006: 6).

Sanatın eğlenceli bir dalı olarak görülen filmler artık büyük bir sektörde ticari bir ürün olarak kullanılmaktadır. Filmlerin ticari bir ürün olarak kimlik kazanmasıyla birlikte başarı göstergesi olarak piyasa performansları ve sanatsal mükemmelliği ölçülmeye başlanmıştır. Piyasa performansı, gişe gelirleri ve elde edilen kar ile ölçülürken; sanatsal başarısı, filmin dünya genelinde tanınması ve aldığı ödüller ile ölçülmektedir (Lee, 2009: 240).

Performans deęerlendirmede en ok kullanılan metotlardan biri verimlilik analizidir. Üretim karar biriminden elde edilecek en yüksek verimlilik etkinlik olarak ifade edilmektedir (Yalama ve Sayım, 2008: 90). Verimlilik, en basit şekilde ifade edilecek olursa ıktının girdiye oranı olarak tanımlanabilir. Etkinlik ise Maksimum ıktıyı elde etmeyi saęlayacak kaynakların başarılı bir şekilde kullanılmasını ifade etmektedir. Etkinlik, ıktı sabit tutulurken girdilerin en aza indirilmesiyle veya girdilerin sabit tutulurken ıktıların en yüksek seviyeye ıkarılmasıyla veya her ikisinin bir kombinasyonu ile artırılmaktadır (Din ve Haynes, 1999: 472; Eroęlu ve Atasoy, 2006: 74; Özata ve Sevin, 2010: 78).

Dolayısıyla etkinlik analizi yaparak, bir organizasyonun, iřletmenin veya piyasaların performansı ölçülebilmektedir. Etkinlik analizi yapılmasındaki ama, mal ve hizmet (ıktı) üreten organizasyon, iřletme veya piyasaların kaynaklarını (girdilerini) ne kadar etkin ve verimli kullandıkları belirlemektir (Özden, 2008: 168). Bu alıřmada ise filmlerin verimlilięini belirlemek için etkinlik analiz metotlarından biri olan Veri Zarflama Analizi kullanılmıřtır.

alıřmada literatür taramasında sinema sektörüne, akademi ödülleri ve Veri Zarflama Analizi metoduna yer verilmiřtir. Daha sonra arařtırma metodolojisine ve uygulamaya yer verilerek sonuçlar açıklanmıřtır.

2. KAVRAMSAL EREVE

Kavramsal ereve bařlıęı altında arařtırmaya konu olan sinema sektörü, arařtırmanın verilerinin alındıęı Dünya genelinde Oscar olarak da bilinen Akademi Ödülleri ve son olarak da Veri Zarflama Analizi hakkında bilgi verilmektedir.

2.1. Sinema (Film) Sektörü

Bazı evrelere göre filmler estetik ve sanatsal bir ama için yapılmaktadır. Fakat film tarihileri, filmlerin sadece sinema sanatı olmanın dıřında; zaman içinde teknolojiyi de iine alan sosyal bir gü ve ekonomik bir kurum olarak iřlev gördüęünü savunmaktadırlar (Allen ve Gomery, 1985: 5).

Sinema sektörü dünyada birok teknolojik geliřmenin yařanmasıyla birlikte ortaya ıkmıř bir sektör olarak ifade edilebilir. İlk önemli adımları 19. Yüzyıl'da (Louis ve Auguste Lumiere kardeřler) Avrupa'da atılmasına karřılık, dünya genelinde yařanan sosyal, ekonomik ve siyasi deęiřiklikler neticesinde bu sektördeki egemenlięi Amerika Birleřik Devletleri'ne kaptırmıřtır. İkinci Dünya Savařından sonra, Avrupa'da sinema sektöründe yapılan yeniliklere ve geliřimlere raęmen, Amerika halen sinema sektöründeki üstünlüęünü devam ettirmektedir (Orta, 2008: 162; Gökdenir ve Kurtoęlu, 2013: 38).

Sinema sektörü, filmin yapımı, daęıtılması ve gösterilmesi bileřenlerinden oluřmaktadır (Allen ve Gomery, 1985: 131; etin Erus, 2007: 6). Film yapımcıları (özellikle Hollywood stüdyoları ya da baęımsız yapımcılar) tarafından üretilen (ekilen) filmler, genellikle daęıtım firmaları aracılıęıyla pazarlanmakta ve sinema salonu iřletmelerine daęıtılmaktadır. Son ařama olan gösterim ařamasında ise sinema salonlarında, sinema salonu hizmetleri erevesinde, filmlerin gösterimi gerekleřmektedir (Tomur vd., 2016: 3).

Son yıllarda yerli ve yabancı pazarlara hükmeden büyük film şirketleri (Walt Disney Stüdyoları, Motion Pictures Şirketi, Paramount Pictures Şirketi, Sony Pictures Eğlence Şirketi, Twentieth Century Fox Film Şirketi, Universal City Stüdyoları ve Warner Bros. Eğlence Şirketi) yurtiçinde ve özellikle yurtdışında pazar konumlarını güçlendirmeye yönelik bir üretim modeli benimsemektedir. Piyasada serbestçe rekabet edebilecekleri ve her yerde piyasaya sürülebilecek filmler üreterek, dağıtmakta ve pazarlanmasına büyük yatırımlar yapmaktadırlar (Richeri, 2016: 316).

2.2. Oscar (Akademi) Ödülleri

Dünyanın en bilinen ödüllerinden biri olan Oscar heykelciği, 1927 yılında “Sinema Sanatları ve Bilimleri Akademisi”nin kurulmasında kısa bir süre sonra Los Angeles şehir merkezindeki Biltmore Oteli'nin Kristal Balo Salonu'nda, “olağanüstü film yapımcılığının başarılarını en iyi şekilde onurlandırmak ve sinema filmi yapımının tüm yönlerinde mükemmelliği teşvik etmek” gibi hedeflerle bir akşam yemeği esnasında doğmuştur. Yılda bir kez verilmesi onaylanan ödülün heykelciği ise, Metro Goldwyn Mayer (MGM) sanat yönetmeni Cedric Gibbons tarafından “bir film makarası üzerinde duran, bir haçlının kılıcını tutan görkemli bir şövalye heykelciği” olarak tasarlanmıştır. Akademi, tasarımı üç boyutlu olarak yapması için Los Angeles heykeltıraşı George Stanley'e başvurmuştur. 16 Mayıs 1929'da Hollywood Roosevelt Hotel'in Blossom Room'unda düzenlenen ilk ödül töreninden bu yana 3.000'den fazla heykelcik sunulmuştur. Her Ocak ayında, New York'un Hudson Vadisi'ndeki Polich Tallix güzel sanatlar dökümhanesi tarafından ek yeni altın heykelcikler dökülmektedir (www.oscars.org, 2024).

Akademi ödülleri, sinema alanında 1929 Yılından itibaren 6.000 profesyonel üyeden oluşan Sinema Sanatları ve Bilim Akademisi (Academy of Motion Picture Arts and Sciences) tarafından verilen en prestijli ödüller olarak bilinmektedir. Aslında sinema sektöründe Akademi ödülleri olarak bilinen fakat tüm dünya da görkemli törenlerin yapılması sürecinde törenlerde verilen ödül olan “OSCAR” ismiyle anılmaktadır (Yurdigül vd., 2015: 7; Kaplan, 2006: 23). Resmi olarak Merit Akademi Ödülü olarak adlandırılan heykelcik, Oscar takma adını, Akademi kütüphanecisi (ve nihai yönetim direktörü) Margaret Herrick'in kupayı ilk defa gördüğünde Oscar Amca'sına benzetmesiyle almıştır. Hollywood köşe yazarı Sidney Skolsky'nin, 1934 yılında ilk En İyi Kadın Oyuncu ödülünü Katharine Hepburn'ün kazandığı açıkladığı yazısında Oscar takma adını kullanmasıyla bu isim yaygınlaşmış ve Akademi, Oscar takma adını 1939'dan sonra resmi olarak benimsemiştir (www.oscars.org, 2024).

Oscar 1953'te ilk kez televizyonda yayınlanmaya başlamıştır (www.oscars.org, 2024). Günümüzde pek çok ülkede takip edilmektedir. Bu nedenle bir Oscar adaylığı veya ödülü insanlara farklı şeyler ifade etmektedir. Bir aktris, oyuncu veya yönetmen için bir Oscar adaylığı, sektörde profesyonel olarak tanınmayı ve gelecekte alacakları maaşların artmasına ve daha fazla rol almaya veya filmde yer almaya yol açacaktır. Film yapımcıları için ise Oscar adaylığı veya ödülü genellikle ek gişe gelirleri anlamına gelmektedir (Nelson vd., 2001: 1).

2.3. Veri Zarflama Analizi

Veri Zarflama Analizi (Data Envelopment Analysis), benzer yapıdaki karar verme birimlerinin performansını ölçmede kullanılan doğrusal programlama tabanlı bir analiz metodudur (Savaş, 2018: 201). Veri Zarflama Analizi (VZA) genel olarak etkinliğin parametrik olarak ölçülemediği durumlarda kullanılmaktadır (Salimi Altan, 2010: 190). Son dönemde, bu analiz metodunun uygulama alanı olarak çok çeşitlilik gösterdiği ve farklı karar birimlerinin performansını belirlemede kullanıldığı görülmektedir (Altın, 2010: 17).

Fanchon, (2003: 175) VZA metodunu bir üretim fonksiyonunun parametrelerini tahmin etmek için istatistiksel tekniklere dayanan parametrik metodun yerine ve her bir işletmenin gözlemlenen girdi ve çıktıları en iyi performans gösterenlerle karşılaştıran parametrik olmayan yaklaşım olarak ifade etmektedir. Cooper vd. (2011: 1) ise Veri Zarflama Analizini (VZA), birden çok girdiyi birden çok çıktıya dönüştüren Karar Verme Birimleri (KVB) adı verilen bir dizi benzer varlığın performansını değerlendirmek için “veri odaklı” bir yaklaşım olarak tanımlamışlardır. Kısaca Veri Zarflama Analizi, birden çok girdi ile elde edilen birden çok çıktının en etkin performans ile karşılaştırılan non-parametrik bir karar verme analizi olarak tanımlanabilir.

Veri Zarflama Analizi Yöntemi, homojen oldukları farz edilen üretim birimleri arasında bir karşılaştırma yapmaktadır. Yapılan en iyi gözlemin sonucu etkinlik sınırı olarak kabul edilerek, diğer gözlemler etkinlik sınırı olarak kabul edilen gözleme göre değerlendirilmektedir. Bu nedenle etkinlik sınırı, farz edilen bir durumu değil; gerçekleşen bir gözlemi ifade etmektedir. Bu şekilde tespit edilen etkinlik sınırında, rastsal hata kullanılmamaktadır (Seyrek ve Ata, 2010: 70). Şahin vd. (2018: 325) Veri Zarflama Analizi için büyük önem taşıyan “etkinlik” kavramını, “gözlenen girdi ve çıktıların gözlenen değerleri ile optimal değerleri arasındaki karşılaştırma” olarak ifade etmiştir.

Veri Zarflama Analizinin temelini 1957 yılında Farrell tarafından yapılan ve bir firmanın etkiliğini belirlemeyi hedefleyen fakat daha sonra bir çok endüstriye uygulanabilirliğini açıklayıcı bir örnekle gösterilen çalışma oluşturmaktadır (Farrell, 1957: 254). Farrell’in çalışmasının temel olarak alındığı ve geliştirilerek kamu programlarında kâr amacı gütmeyen kuruluşların verimliliğini ölçmek için Charnes vd.’leri literatürde CCR modeli olarak bilinen veri zarflama analzi modelini geliştirmişlerdir (Charnes vd., 1978: 429). Banker vd.’leri ise 1984 yılına gelindiğinde literatürde BCC modeli olarak da bilinen bir diğer modeli geliştirmişlerdir (Banker, Charnes, ve Cooper, 1984).

Veri Zarflama Analizi ile ilgili zaman içerisinde bir çok model geliştirilmiştir. Bu modellerden en yaygın kullanılan CCR modeli, BCC modeli ve toplamsal model bu çalışma kapsamında açıklanacaktır. Charnes, Cooper ve Rhodes tarafından geliştirilen CCR modeli, çoklu girdi ve çoklu çıktı birimlerinin görece etkinliğini ölçen ve ölçeğe göre sabit getiri varsayımından hareket edilen bir modeldir. Buna karşılık Banker, Charnes ve Cooper tarafından geliştirilen BCC modeli, ölçeğe göre değişken getiri varsayımından hareketle kullanılan bir modeldir. Charnes, Cooper, Golany, Seiford ve Stutz tarafından geliştirilen toplamsal model ise girdi odaklı ya da

çıktı odaklı olarak bir ayırım yapmadan her iki durumuda birlikte değerlendirilen bir modeldir (Savaş, 2018: 209-215). CCR, BCC ve toplamsal modeller aşağıda matematiksel olarak yer almaktadır.

CCR modeli (Charnes vd., 1978: 430):

$$\max h_o = \frac{\sum_{r=1}^s u_r y_{ro}}{\sum_{i=1}^m v_i x_{io}}$$

Kısıtlar

$$\frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \quad j = 1, \dots, n$$

$$u_r, v_i \geq 0 \quad i = 1, 2, \dots, m$$

$$r = 1, 2, \dots, s$$

Modelde kullanılan indeksler aşağıdaki şekilde açıklanmıştır (Savaş, 2018: 210):

h_o : o karar biriminin etkinliği

j (n): Karar verme birimlerinin sayısı

i (m): Girdi sayısı

r (s): Çıktı sayısı

u_r : o. karar verme birimi tarafından r. çıktıya verilen ağırlık

v_i : o. karar verme birimi tarafından i. girdiye verilen ağırlık

y_{ro} : Etkinliği ölçülen o. karar verme birimine ait r. çıktı miktarı

x_{io} : Etkinliği ölçülen o. karar verme birimine ait i. girdi miktarı

y_{rj} : j. karar birimine ait r. çıktı miktarı

x_{ij} : j. karar birimine ait i. girdi miktarı

BCC modeli (Banker vd., 1984: 1085):

$$\min h - \epsilon \left[\sum_{i=1}^m s_i^+ + \sum_{r=1}^s s_r^- \right]$$

Kısıtlar

$$h x_{io} - \sum_{j=1}^n x_{ij} \lambda_j - s_i^+ = 0, \quad i = 1, \dots, m,$$

$$\sum_{j=1}^n y_{rj} \lambda_j - s_r^- = y_{ro}, \quad r = 1, \dots, s,$$

$$\sum_{j=1}^n \lambda_j = 1, \quad \lambda_j, s_i^+, s_r^- \geq 0$$

Modelde kullanılan indeksler aşağıdaki şekilde açıklanmıştır (Yolalan, 1993: 33; Şahin vd., 2018: 328):

h : girdiye ait büzülme katsayısı

j (n): Karar verme birimlerinin sayısı

i (m): Girdi sayısı

r (s): Çıktı sayısı

ϵ : yeterince küçük pozitif bir sayı

s_i^+ : o karar biriminin i. girdisine ait atıl değer

s_r^- : o karar biriminin r. çıktısına ait atıl değer

x_{ij} : j. karar birimi tarafından kullanılan i. girdi sayısı

x_{io} : o. karar birimi tarafından kullanılan i. girdi sayısı

y_{rj} : j. karar birimi tarafından üretilen r. çıktı

y_{ro} : o. karar birimi tarafından üretilen r. çıktı

λ_j : j karar biriminin aldığı yoğunluk değeri

Toplamsal model (Cooper vd., 2001: 224):

$$\max \sum_{r=1}^s s_r^+ + \sum_{i=1}^m s_i^-$$

Kısıtlar

$$y_{ro} = \sum_{j=1}^n \lambda_j y_{rj} - s_r^+, \quad r = 1, 2, \dots, s;$$

$$x_{io} = \sum_{j=1}^n \lambda_j x_{ij} + s_i^-, \quad i = 1, 2, \dots, m;$$

$$1 = \sum_{j=1}^n \lambda_j$$

$$0 \leq \lambda_j, s_i^-, s_r^+; \quad \forall i, j, r.$$

Modelde kullanılan indeksler aşağıdaki şekilde açıklanmıştır:

j (n): Karar verme birimlerinin sayısı

i (m): Girdi sayısı

r (s): Çıktı sayısı

s_i^- : o karar biriminin i. girdisine ait atıl değer

s_r^+ : o karar biriminin r. çıktısına ait atıl değer

x_{ij} : j. karar birimi tarafından kullanılan i. girdi sayısı

y_{rj} : j. karar birimi tarafından üretilen r. çıktı

λ_j : j karar biriminin aldığı yoğunluk değeri

Bu çalışmada yukarıda yer alan girdi odaklı CCR modeli kullanılmıştır. Etkinliklerin ölçümünde ve iyileştirmelerin hesaplanmasında DEAP 2.1. programı kullanılmıştır. Veri Zarflama Analizinin uygulama aşamaları aşağıdaki şekilde sıralanmaktadır (Savaş, 2018: 205; Şahin İ. , 2012: 134; Behdioğlu ve Özcan, 2009: 303; Erpolat ve Cinemre, 2011: 210):

Karar verme birimlerinin seçimi: Veri Zarflama Analizinin uygulanmasındaki birinci basamak, karar birimlerinin karşılaştırmalı etkinlik ölçümünün yapılabilmesi için benzer yapıda (homojen) olanları tercih etmektir. Karar verme birimlerinin sayısını belirlemek için iki şart bulunmaktadır. Bu şartlardan ilki “m” sayıda girdi, “p” sayıda çıktı olduğunda en az $(m+p+1)$ sayıda karar biriminin olması, ikincisi ise, karar birimi sayısının en az girdi ve çıktı sayının iki katı sayıda olmasıdır (Şahin vd., 2018: 326).

Girdi ve çıktı seçimi: Veri Zarflama Analizinin sağlıklı bir ölçüm yapabilmesi için ölçümde kullanılan girdi ve çıktıların anlamlı olması ve ölçümü yapacak en iyi girdi ve çıktıların seçilmesi gerekmektedir (Erpolat ve Cinemre, 2011: 210).

Verilerin elde edilebilirliği ve güvenilirliği: Veri Zarflama Analizini yapabilmek için girdi ve çıktılar belirlendikten sonra, kullanılan bütün karar birimlerinin girdi ve çıktı verilerinin eksiksiz olarak, kesin ve güvenilir kaynaktan elde edilmesi gerekmektedir (Savaş, 2018: 207).

Görelî etkinlik ölçümü: Veri Zarflama Analizi için karar birimlerinin belirlenmesi ve ilgili karar birimleri için girdi ve çıktı değişkenlerine ait verilerin elde edilmesi aşamasından sonra analiz amacına yönelik en uygun Veri Zarflama Analizi modeli seçilmelidir (Yolalan, 1993: 66). Girdi odaklı modelde belirli bir çıktı seviyesinin en etkin şekilde elde edilebilmesi için hangi oranda girdi seviyesine ihtiyaç olduğu hesaplanırken; çıktı odaklı modelde ise belirli bir girdi seviyesi ile en fazla hangi oranda çıktı seviyesi elde edilebileceği hesaplanmaktadır (Günay ve Ayyıldız, 2017: 121). CCR modelinde ölçüğe göre sabit getiri varsayımı söz konusu iken; BCC modelinde ölçüğe göre değişken getiri varsayımı söz konusudur (Özer vd., 2010: 238).

Etkinlik değerleri: Veri Zarflama Analizinde yer alan karar birimlerinin görelî etkinlik değerleri 0 ile 1 arasındaki değerlerden oluşmaktadır. Karar biriminin görelî etkinliğinden bahsedebilmek için değer 1'e eşit olması gerekmektedir. 1'den farklı değer alan karar birimlerinin görelî olarak etkin olmadıkları ifade edilebilir (Kara, 2019: 95).

Referans kümesi: Veri Zarflama Analizinde etkin olmayan karar birimlerinin görelî olarak etkin olan karar birimlerine göre etkinlik düzeylerini artırmak için referans kümesi belirlenmektedir. Görelî olarak etkin olan karar verme birimleri, etkin olmayan karar verme birimlerine belirli bir yoğunluk değeriyle referans gösterilmektedir (Savaş, 2018: 207).

Etkin olmayan karar verme birimleri için iyileştirme: Veri Zarflama Analizinin en büyük yararlarından bir tanesi etkin olmayan karar birimleri için ulaşılabilir hedefler belirleyerek, bu karar birimlerinin performanslarının iyileştirilmesine yardımcı olmaktır. Etkin olmayan bu karar birimlerinin de etkinlik düzeyine ulaşmaları için performansı en etkin olan karar birimlerinin kullandığı yöntemleri kullanarak etkinliğe ulaşabileceği varsayılmaktadır (Bülbül ve Akhisar, 2005: 27).

Sonuçların değerlendirilmesi: Detaylı olarak incelenen karar birimleri için bütün girdi ve çıktılar göz önüne alınarak sonuçlar değerlendirilmektedir (Behdioğlu ve Özcan, 2009: 304).

Film sektörüne ait literatür incelendiğinde filmlerin performanslarını farklı analizler ile ele alan çalışmalara ulaşılmıştır (Sochay, 1994; Jansen, 2005; Sharda ve Delen, 2006; Hadida, 2009;

Verhoeven vd., 2015). Ayrıca Veri Zarflama Analizi kullanılarak ABD sinema işletmelerinin operasyonel etkinliğini (Ablanedo Rosas vd., 2024), İran sinema salonlarının etkinliğini (Izadi ve Amiri, 2022) ve film yapım etkinliğini (Lee ve Choeh, 2023) ölçen çalışmalara ulaşılmıştır. Fakat sinema sektöründe filmlerin etkinliklerini değerlendirmek üzere Veri Zarflama Analizi kullanan, Türk literatüründe ve yabancı literatürde ulaşılabilen tek çalışma Hababou vd. (2016)'nin "*Measuring Economic Efficiency in The Motion Picture Industry: A Data Envelopment Analysis Approach*" başlıklı çalışmasıdır. Hababou vd. (2016)'nin çalışmasında "negatif maliyetler, reklam ve baskı maliyetleri, dağıtım ve gösterim (gösterime girilen pazar sayısı)" olmak üzere 3 girdi ve "Birleşik Devletler brüt gişesi, Birleşik Devletler izlenmesi (film sinemada izleyen kişi sayısı) olmak üzere 2 çıktı ile 10 yıllık gişe verileri çerçevesinde 898 adet filmin etkinlikleri Veri Zarflama Analizi ile değerlendirilmiştir. Etkin olan ilk 10 film ve etkin olan son 10 film listelenerek verileri açıklanmış, ardından regresyon analizi yapılarak ve filmlerin etkinliklerinde akademi ödüllerinin, devam filmlerinin, eleştirmen puanlarının, kullanıcı incelemelerinin önemli olduğu sonucuna ulaşılmıştır (Hababou vd., 2016: 156).

3. METODOLOJİ

Günümüz koşullarında sinema sektörünün gelişmesi, bir filmin dünyanın birçok ülkesinde gösterime girmesini ve daha çok tüketiciye (izleyici) ulaşmasını sağlamıştır. Dünya genelinde gösterime giren filmlere her yıl farklı şirketler tarafından ödüller verilmektedir. Dünya genelinde verilen bu ödüllerden en prestijli olanlardan ve ödül törenleri için en büyük organizasyon yapanlardan biri Oscar (Akademi) Ödülleri'dir. Bu araştırmanın temel amacı pazarlama literatürüne katkı sağlamak ve film (sinema) sektörüne öneride bulunmaktır. Belirlenen amaç doğrultusunda bu çalışmada, son 15 yılda Oscar (Akademi) Ödülleri En İyi Film Kategorisinde ödül alan filmlerin etkinlikleri Veri Zarflama Analizi ile değerlendirilmektedir. Filmlerin, sabit getiri varsayımı altında, çıktı olarak belirlenen "gişe hasılatı" ile etkinliğe ulaşmaları için girdi değişkenlerini hangi oranda azaltmaları gerektiği analiz edilmek üzere, analiz için "girdi odaklı CCR modeli" tercih edilmiştir. Veri Zarflama Analizi ile filmlerin etkinlikleri ve etkin olmayan filmlerin etkin duruma gelebilmeleri için hedef değerleri ve iyileştirmeleri DEAP 2.1. programı yardımıyla hesaplanmıştır.

Türkiye literatürü incelendiğinde Oscar (Akademi) Ödülleri'ne sahip olan filmlerin Veri Zarflama Analizi ile etkinliklerinin karşılaştırıldığı herhangi bir çalışmanın bulunmaması, bu araştırmanın önemini oluşturmaktadır.

4. ARAŞTIRMANIN UYGULAMASI

Bu başlık altında araştırma çerçevesinde Veri Zarflama Analizine ait uygulama aşamalar, elde edilen bulgular ve değerlendirmelerle birlikte yer almaktadır.

4.1. Karar Birimlerinin Belirlenmesi

Araştırmanın uygulama bölümü için belirlenen karar birimleri, son 15 yılda (2010-2024) Oscar (Akademi) Ödülleri "en iyi film kategorisi"nde ödül alan filmlerden oluşmaktadır. Bu doğrultuda karar birimleri, her biri farklı yıllarda Oscar (Akademi) Ödülü alan en iyi 15 film

oluşmaktadır. Ödül alan filmlere yönelik bilgilere Oscar'ın resmi web sayfasından ulaşılmıştır (www.oscars.org, 2024). Tablo1'de karar birimleri kümesi yer almaktadır.

Tablo1. Karar Birimleri Kümesi

Kodu	Filmler	Ödül Aldığı Yıl
1	The Hurt Locker	2010
2	The King's Speech	2011
3	The Artist	2012
4	Argo	2013
5	12 Years A Slave	2014
6	Birdman (The Unexpected Virture of Ignorance)	2015
7	Spotlight	2016
8	Moonlight	2017
9	The Shape of Water	2018
10	Green Book	2019
11	Parasite	2020
12	Nomadland	2021
13	Coda	2022
14	Everything Everywhere All At Once	2023
15	Oppenheimer	2024

Tablo 1'deki karar birimlerinin kümesini oluşturan Oscar (Akademi) ödüllü filmler ödül aldığı yıla göre sıralanmaktadır.

4.2. Girdi ve Çıktı Değişkenlerinin Belirlenmesi

Veri Zarflama Analizinde kullanılan karar birimlerinin görelî etkinlikleri seçilen girdi ve çıktı değişkenlere göre hesaplandığı için girdi ve çıktı değişkenlerinin dikkatle belirlenmesi önem arz etmektedir (Savaş, 2015: 206). Bu sebeple, girdi ve çıktı değişkenlerinin belirlenmesinde literatürde yer alan daha önce yapılmış çalışmalardan yararlanılmıştır (Sochay, 1994: 4; Jansen, 2005: 197; Sharda ve Delen, 2006: 247; Hababou vd., 2016: 145). Ayrıca Veri Zarflama Analizinin yapılabilmesi için karar birimleri sayılarının belirlenmesinde, girdi ve çıktı

değişkenlerinin sayısını da etkileyen, iki koşul bulunmaktadır (Şahin, 2011: 169). Bu koşullar yapılan Veri Zarflama Analizinin güvenilirliğini sağlamaktadır (Kara, 2019: 97). Birinci koşul, girdi değişkeni sayısı “m” ve çıktı değişkeni sayısı “n” olmak üzere en az “m+n+1” sayıda karar birimi bulunması gerekmektedir (Kecek, 2010: 78). İkinci koşul ise, en az “m+n”nin iki katı sayıda karar birimi bulunması gerekmektedir (Atan, 2002: 61). Bu araştırmanın amacı, son 15 yılda (2010-2024 yılları arası) Oscar (Akademi) En İyi Film Ödülü’ne layık görülen filmlerin etkinliklerini ölçmek olduğu için, uygulamanın çıktı değişkeni olarak “gişe hasılatı” (Hababou vd., 2016: 145) ve “IMDb puanı” (www.imdb.com, 2024) belirlenmiştir. Girdi değişkenleri de literatürde incelenen ilgili çalışmalarda kullanılmış ve bütün karar birimleri (filmler) için ulaşılabilir olan “film bütçesi” (Sochay, 1994: 4; Jansen, 2005: 197) ve “filmin gösterime girdiği pazar sayısı” (Sharda ve Delen, 2006: 247) olarak belirlenmiştir. Böylelikle 2 adet girdi ve 2 adet çıktı değişkeni ile iki koşul da sağlanmış olmaktadır. Karar birimlerine ait girdi ve çıktı değişkenleri verileri Box Office’in web sayfasından alınmıştır (www.boxofficemojo.com, 2024). Tablo2’de uygulamada kullanılan girdi ve çıktı değerleri yer almaktadır.

Tablo 2. Girdi ve Çıktı Değişkenleri

Girdi		Çıktı	
1	Film Bütçesi	1	Gişe Hasılatı
2	Filmin Gösterime Girdiği Pazar (Ülke) Sayısı	2	IMDB Puanı

4.3. Veri Zarflama Analizi ile Elde Edilen Etkinlik Değerlerine Ait Bulgular ve Değerlendirmeler

Belirlenen girdi ve çıktı değişkenleri çerçevesinde karar birimleri olan filmlerin etkinlikleri analiz edilecektir. Elde edilecek etkinlik değerleri ile etkin film/filmler ve etkin olmayan film/filmler belirlenecektir. Elde edilen etkinlik değerlerine göre etkin olan film/filmlerin referans yoğunlukları ve bu yoğunluklarla etkin olmayan film/filmlerin etkin olan film/filmlere göre iyileştirmeleri hesaplanacaktır. Tablo3’te gözlem kümesi olan filmlerin etkinlik değerleri yer almaktadır.

Tablo 3. Gözlem Kümesi İçin Etkinlik Değerleri Tablosu

Kodu	Filmler	Teknik Etkinlik
1	The Hurt Locker	0,491
2	The King's Speech	1,000
3	The Artist	0,609

4	Argo	0,471
5	12 Years A Slave	0,544
6	Birdman (The Unexpected Virture of Ignorance)	0,478
7	Spotlight	0,445
8	Moonlight	1,000
9	The Shape of Water	0,470
10	Green Book	0,562
11	Parasite	1,000
12	Nomadland	0,966
13	Coda	1,000
14	Everything Everywhere All At Once	0,560
15	Oppenheimer	1,000
	Ortalama	0,706

Tablo 3’de filmler yıllara göre sıralanarak etkinlik değerleri yorumlanmaktadır. Veri Zarflama Analizinde her bir karar birimi için etkinlik değeri 0 ile 1 arasında bir değer ile ifade edilmektedir. Etkinlik değerinin 1’e eşit olması ilgili karar biriminin etkinliğini ifade ederken, 1’den farklı olan etkinlik değeri ise ilgili karar biriminin etkin olmadığını ifade etmektedir (Farrell, 1957: 254; Çelik, 2016: 74). Bu doğrultuda Tablo 3 incelendiğinde etkin olan filmlerin, Oscar (Akademi) En İyi Film Ödülü’nü 2011 yılında alan “The King’s Speech”, 2017 yılında alan “Moonlight”, 2020 yılında alan “Parasite”, 2022 yılında alan “Coda” ve 2024 yılında alan “Oppenheimer” olduğu görülmektedir. Kısaca gözlem kümesini oluşturan 15 filmde 5 adet filmin etkinliğe ulaştığı sonucuna ulaşılmaktadır. Ortalama etkinlik değeri 0,706 olan 15 adet film arasından etkinlik derecesi en düşük olan filmin, %44,5 etkinlik değeri ile 2016 yılında ödül alan “Spotlight” olduğu görülmektedir.

Tablo 4’te etkin olmayan filmlerin etkin duruma gelebilmeleri için, etkin olan “The King’s Speech”, “Moonlight”, “Parasite”, “Coda” ve “Oppenheimer” filmlerini referans almaları gereken yoğunluk değerleri yer almaktadır.

Tablo 4. Etkin Olmayan Filmlerin Referans Kümeleri ve Yoğunluk Değerleri Tablosu

1	The Hurt Locker	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,086	0,480	0,396
3	The Artist	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,455	0,311	0,209
4	Argo	Referans Kümesi	The King's Speech	Coda	Oppenheimer
		<i>Yoğunluk</i>	0,251	0,595	0,113
5	12 Years A Slave	Referans Kümesi	The King's Speech	Coda	Parasite
		<i>Yoğunluk</i>	0,056	0,308	0,611
6	Birdman (The Unexpected Virture of Ignorance)	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,330	0,386	0,244
7	Spotlight	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,304	0,431	0,280
9	The Shape of Water	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,718	0,051	0,107
10	Green Book	Referans Kümesi	The King's Speech	Parasite	Coda
		<i>Yoğunluk</i>	0,487	0,327	0,191
12	Nomadland	Referans Kümesi	Moonlight	Coda	
		<i>Yoğunluk</i>	0,818	0,156	
14	Everything Everywhere All At Once	Referans Kümesi	Parasite	Coda	Moonlight
		<i>Yoğunluk</i>	0,447	0,132	0,397

Veri Zarflama Analizinde etkin olan karar birimleri %100 etkinliğe ulaşmaları sebebiyle 1,00 değerini almaktadırlar. “The King’s Speech”, “Moonlight”, “Parasite”, “Coda” ve “Oppenheimer” filmleri de etkin olan filmler olarak bu tabloda yer almamakta ve dolayısıyla etkin olmayan filmlere referans olmaktadır. Etkin olmayan filmlerin, tam etkinliğe ulaşabilmeleri için etkin olan filmleri hangi yoğunlukta referans almaları gerektiği hesaplanmıştır ve tabloda hesaplanan ilgili yoğunluk değerleri verilmektedir.

Araştırma Veri Zarflama Analizinin girdi odaklı CCR modeli ile yürütüldüğü için, araştırmada etkin olmayan filmlerin tam etkin konuma gelebilmeleri üzere çıktı değişkenleri olan “gişe hasılatı” ve “IMDb puanı” sabit tutularak, girdi değişkenleri olan “film bütçesi” ve “gösterime girdiği pazar sayısı”nda ne oranda azaltma yapılması gerektiği analiz edilmektedir. Bu

doğrultuda etkin olmayan filmlerin, mevcut çıktılarla yani mevcut “gişe hasılatı” ve “IMDb puanı”yla etkin konuma gelebilmeleri için hangi girdide ne oranda azaltma yapmaları gerektiği, etkin olan “The King’s Speech”, “Moonlight”, “Parasite”, “Coda” ve “Oppenheimer” filmleri referans alınarak, yoğunluk değerleri yardımıyla hesaplanmıştır. Etkin olmayan filmlere ait hesaplanan girdiler ve iyileştirme oranları Tablo 5’te yer almaktadır.

Tablo 5. CCR VZA Modeliyle Elde Edilen Hedef Değerler ve Potansiyel İyileştirme Tablosu

Film Adı	Etkinlik Değeri	Gerçekleşen Değer		Hedef Değer		İyileştirme Düzeyi	
		Girdiler		Çıktılar		Girdiler	
		1	2	1	2	1	2
The Hurt Locker	0,491	15.000	49	7.360,1	24	-50,93%	-51,02%
The Artist	0,609	15.000	46	9.131,3	28	-39,12%	-39,13%
Argo	0,471	44.500	52	20.970,8	25	-52,87%	-51,92%
12 Years A Slave	0,544	20.000	49	10.878,2	27	-45,61%	-44,90%
Birdman (The Unexpected Virture of Ignorance)	0,478	18.000	53	8.601,3	25	-52,22%	-52,83%
Spotlight	0,445	20.000	59	8.893,0	26	-55,54%	-55,93%
The Shape of Water	0,47	19.400	68	9.119,0	32	-52,99%	-52,94%
Green Book	0,562	23.000	71	13.937,4	40	-39,40%	-43,66%
Nomadland	0,966	5.000	42	4.829,0	41	-3,42%	-2,38%
Everything Everywhere All At Once	0,56	14.300	65	8.011,4	36	-43,98%	-44,62%

Tablo 5 incelendiğinde 2010 yılında ödül alan “The Hurt Locker” filminin etkin hale gelebilmesi için; “filmin bütçesi” olan birinci girdisinin 15 \$m (milyon USD)’dan 7,4 \$m’a getirilmesi gerektiği, yani %50,93 oranında bir iyileşmeye ihtiyaç duyduğu görülmektedir. İkinci girdisi olan “filmin gösterime girdiği pazar (ülke) sayısı”nda ise gerçekleşen pazar sayısı 49 iken hedeflenen girdisinin 24 pazar olduğu görülmektedir, yani %51,02 oranında bir iyileştirmeye ihtiyaç duyduğu hesaplanmıştır. Diğer bir ifadeyle, “The Hurt Locker” filminin mevcut çıktılar (Gişe Hasılatı ve IMDB Puanı) ile etkinliğe ulaşabilmesi için çok daha az kaynak kullanımına ihtiyaç duyduğu söylenebilir. 2023 yılında ödül alan “Everything Everywhere All At Once” filminin etkin duruma gelebilmesi için, “film bütçesi” olan birinci girdisinin 14,3 \$m (milyon USD)’dan 8,01 \$m’a getirilmesi gerektiği, yani %43,98 oranında iyileşmeye ihtiyaç duyduğu görülmektedir. Başka bir ifadeyle, mevcut girdileri olan “gişe hasılatı” ve “IMDb puanı”yla etkinliğe ulaşabilmesi için daha az kaynak kullanımına ihtiyacı olduğu görülmektedir. Dolayısıyla, “The Hurt Locker” ve “Everything Everywhere All At Once” filmlerinin ilgili gişe hasılatı ve IMDb puanları için, seçilen girdiler ekseninde girdilerini etkin kullanamayıp kaynak israfı yaptıkları sonucuna ulaşılmıştır. Girdi kaynaklarında yapılan bu israf, filmlerin etkinlik değerinin düşmesine sebep olmuş ve etkinlik seviyesine ulaşmalarının önüne geçmiştir.

Araştırmaya dahil edilen “The Artist”, “Argo”, “12 Years A Slave”, “Birdman”, “Spotlight”, “The Shape of Water”, “Green Book” ve “Nomadland” filmleri de girdileri için gerçekleşen ve

hedef deęerleri incelendięinde, ilgili filmlerin girdilerindeki kaynak israfı nedeniyle etkin duruma gelemedikleri grlmektedir. Bu nedenle, filmlerin girdilerini, hesaplanan iyileřtirme oranları dzeyinde azalttıklarında etkinlik derecesine ulařacakları ifade edilebilir.

5. SONUÇ

Sinema sektrnn teknolojik geliřmelerle birlikte hem dnyada hem Trkiye’de ilerleme kaydetmesi, filmlerin daha çok pazarda gsterime girmesine olanak saęlamıřtır. Daha fazla pazarda gsterime giren filmlerin giře hasılatlarında artıř saęlanmaktadır. Sinema sektrnn geliřmesi de tketicilere çeřitli seenekler sunmaktadır. Gsterime giren tm filmlerin btn tketiciler tarafından izlenmesi mmkn olmadıęı iin filmlerin btnceleri artırılarak tketiciler nezdinde fark oluřturan filmler yapılmaktadır. Bylelikle filmin hem gsterime girdięi pazar sayısı hem de btncesi filmde elde edilecek giře hasılatına ve izleyicilerin oylamalarından elde edilen IMDb puanlarına katkı saęlamaktadır.

Filmin btncesi ve gsterime girdięi pazar sayısının girdi deęiřkeni ve filmin giře hasılatı ve IMDb puanının da ıktı deęiřkenleri olarak belirlendięi arařtırmada, son 15 yılda Oscar (Akademi) En İyi Film dl alan filmlerin etkinlikleri Veri Zarflama Analizinin girdi odaklı CCR modeli yardımıyla hesaplanmakta ve deęerlendirilmektedir. Yapılan analiz sonucunda 2011 yılında dl alan “The King’s Speech”, 2017 Yılında dl alan “Moonlight”, 2020 yılında dl alan “Parasite”, 2022 yılında dl alan “Coda” ve 2024 yılında dl alan “Oppenheimer” filmlerinin tam etkin konuma ulařtıęı sonucuna ulařılmıřtır.

Etkin konuma ulařamayan filmlerin, The King’s Speech, Moonlight, Parasite, Coda ve Oppenheimer filmlerini referans alarak, mevcut ıktı deęerlerini elde etmek iin girdi deęiřkenlerinde ne oranda azaltma yapmaları gerektięi hesaplanmıřtır. Etkin olmayan filmlerin mevcut ıktı deęerlerini yani mevcut “giře hasılatı”nı ve “IMDb puan”ını elde edebilmek iin girdi kaynaklarında israf yaptıkları sonucuna varılmıřtır.

Elde edilen sonulara gre, “The Hurt Locker” filminin birinci girdisinde %50,93 ve ikinci girdisinde %51,02 oranında; “The Artist” filminin birinci girdisinde %39,12 ve ikinci girdisinde %39,13 oranında; “Argo” filminin birinci girdisinde %52,87 ve ikinci girdisinde %51,92 oranında; “12 Years A Slave” filminin birinci girdisinde %45,61 ve ikinci girdisinde %44,90 oranında; “Birdman” filminin birinci girdisinde %52,22 ve ikinci girdisinde %52,83 oranında; “Spotlight” filminin birinci girdisinde %55,54 ve ikinci girdisinde %55,93 oranında; “The Shape of Water” filminin birinci girdisinde %52,99 ve ikinci girdisinde %52,94 oranında; “Green Book” filminin birinci girdisinde %39,4 ve ikinci girdisinde %43,66 oranında; “Nomadland” filminin birinci girdisinde %3,42 ve ikinci girdisinde %2,38 oranında; “Everything Everywhere All At Once” filminin ise birinci girdisinde %43,98 ve ikinci girdisinde %44,62 oranında bir iyileřtirmeye ihtiya duyduęu sonucuna ulařılmıřtır. Kısaca, etkin olmayan tm filmlerin, daha az girdi kaynaęıyla etkin konuma gelebilecek iken, girdilerinde kaynak israfı yaptıkları iin etkinlięe ulařmadıkları sylenbilir.

Elde edilen sonular ıřıęında sinema sektrnde yer alan Őirketlerin hazırladıkları filmler iin daha az girdi yani daha az btncesi ve daha az gsterim yeri ile ıktıya ulařmaları yani giře hasılatı

ve IMDb puanı elde etmelerinin mümkün olduğu görülmektedir. Filmlerin, yapım aşaması dâhil gösterimleri için yapılacak tüm pazarlama uygulamalarından önce olası verilerle etkinliklerinin değerlendirip o doğrultuda pazara sunulmaları önerilebilir. Bu araştırma yalnızca 2010-2024 yılları arasında Oscar (Akademi) Ödülleri En İyi Film Kategorisinde ödül alan 15 filmin etkinliğini, ilgili girdi ve çıktı değerleri çerçevesinde değerlendirmektedir. Dolayısıyla, bu alanda farklı girdi ve çıktı değerleriyle veya farklı karar birimleri ile yapılacak araştırmalardan farklı sonuçlar elde edilerek literatüre katkı sağlanabilecektir.

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EU FOREIGN AID DURING THE COVID-19 PANDEMIC: KEY ASPECTS AND CHALLENGES

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ABSTRACT

In response to the COVID-19 pandemic, the EU redirected its foreign aid budget to support its partner countries in the fight against the crisis. In this sense, the EU provided emergency funding to address both the health and socio-economic repercussions of the pandemic in partner countries. The funding is mainly designed to provide medical equipment and supplies, support healthcare systems as well as financial assistance to businesses in partners countries. In addition, the EU put emphasis on cooperation with international organizations to support efforts for effective global response to the pandemic. This paper discusses the key aspects of EU's approach in response to the crisis and analyses EU foreign aid during the pandemic based on the related official data and reports. It is found out that although the EU had a proactive and comprehensive approach in reallocating its foreign aid budget to address the impact of the pandemic on partners countries, EU foreign aid efforts during the pandemic faced with numerous challenges ranging from limited resources to logistical problems, increased demand for aid as well as geopolitical complexities.

Keywords: EU foreign aid, COVID-19 pandemic, emergency funding

INTRODUCTION

The European Union (EU) stands as one of the largest donors globally and plays a crucial normative role within the multilateral development framework. The EU's development policy has been in a state of continuous evolution considering the changing dynamics of the international development system and the EU's own political realities. Over the past decade, the EU has encountered numerous crises, including economic, political, and social challenges. Notably, since 2015, the migration crisis has tested the EU's solidarity and governance, while the emergence of radical right populism and skepticism towards the EU has also been significant concerns. In addition, the COVID-19 crisis highlighted shortcomings of solidarity among EU member states. There various tensions impacted the EU's standing in the international development system and its relationships with developing countries.

In response to the COVID-19 pandemic, the EU redirected its foreign aid budget to support its partner countries in the fight against the crisis. In this sense, the EU provided emergency funding to address both the health and socio-economic repercussions of the pandemic in partner

countries. The funding is mainly designed to provide medical equipment and supplies, support healthcare systems as well as financial assistance to businesses in partners countries. In addition, the EU put emphasis on cooperation with international organizations to support efforts for effective global response to the pandemic. This paper discusses the key aspects of EU's approach in response to the COVID-19 pandemic and analyses EU foreign aid in the framework of Team Europe initiative and humanitarian and emergency aid during the pandemic, based on the related official data and reports.

EU DEVELOPMENT COOPERATION POLICY: A HISTORICAL OVERVIEW

EU development cooperation policy has progressed towards a more integrated and coordinated approach to European development efforts, establishing itself as a significant foreign policy tool in its external relations, underpinned by a comprehensive framework externalized multilateralism. Key milestones in the development of the EU's cooperation policy can be identified at several critical junctures: from the Treaty of Rome to the Lomé Conventions, from Lomé to Maastricht, and from Maastricht to Lisbon and beyond (Frisch, 2008).

Since the late 1990s, EU development cooperation policy has been significantly shaped by its goal of becoming a “global actor”. During the period of Cotonou partnership, which succeeded Lomé IV in 2000, the development agenda became increasingly focused on security concerns, leading to greater emphasis on conflict prevention and addressing political crises beyond Europe's borders (Carbone, 2007; 33). The scope of the political dialogue was broadened to emphasize “the respect for human rights, democracy, and the rule of law” (OJ L317, 2000). The promotion of human rights, democratization, the strengthening of the rule of law, and the support of good governance were continuously highlighted (OJ L317, 2000). These goals were additionally supported by the European security strategy, which asserts that “security is a precondition of development” (Council of the European Union, 2009).

The EU's development policy is shaped by the principles of external action stated in Article 21 of the Treaty of Lisbon. These principles state that any external action undertaken by the EU shall be guided by “democracy, rule of law, universality, the indivisibility of human rights and fundamental freedoms, respect for human dignity, equality, and solidarity”, as well as respect for the principles of the UN Charter and international laws (EEAS, 2016). Moreover, the main objective of the EU's development policy is to diminish and eventually eradicate global poverty (Article 208, 210 TFEU). The Lisbon Treaty also highlights the importance of complementarity, coherence, and mutual reinforcement between the development policies of both the EU itself and its member states. These all signify the importance of development policy in the EU's external relations and enhance EU's visibility in the international development system (Seters and Klavert, 2011).

Since 2015 the EU has placed increased importance on global development initiatives. In 2015, the EU aligned itself with the UN's ambitious 2030 Agenda for Sustainable Development (SDGs) and made significant changes to its Official Development Assistance (ODA) framework, creating notable opportunities to enhance its visibility in international development.

The EU continues to be recognized as a “normative power” (Manners, 2002; Whitman, 2011), promoting value-based policies across various global policy areas, while emphasizing good governance and human rights in its external policies. Given its colonial legacy and the fact that it is collectively the world’s largest donor of ODA, the EU also takes geopolitical factors into account (Furness, et. al, 2020).

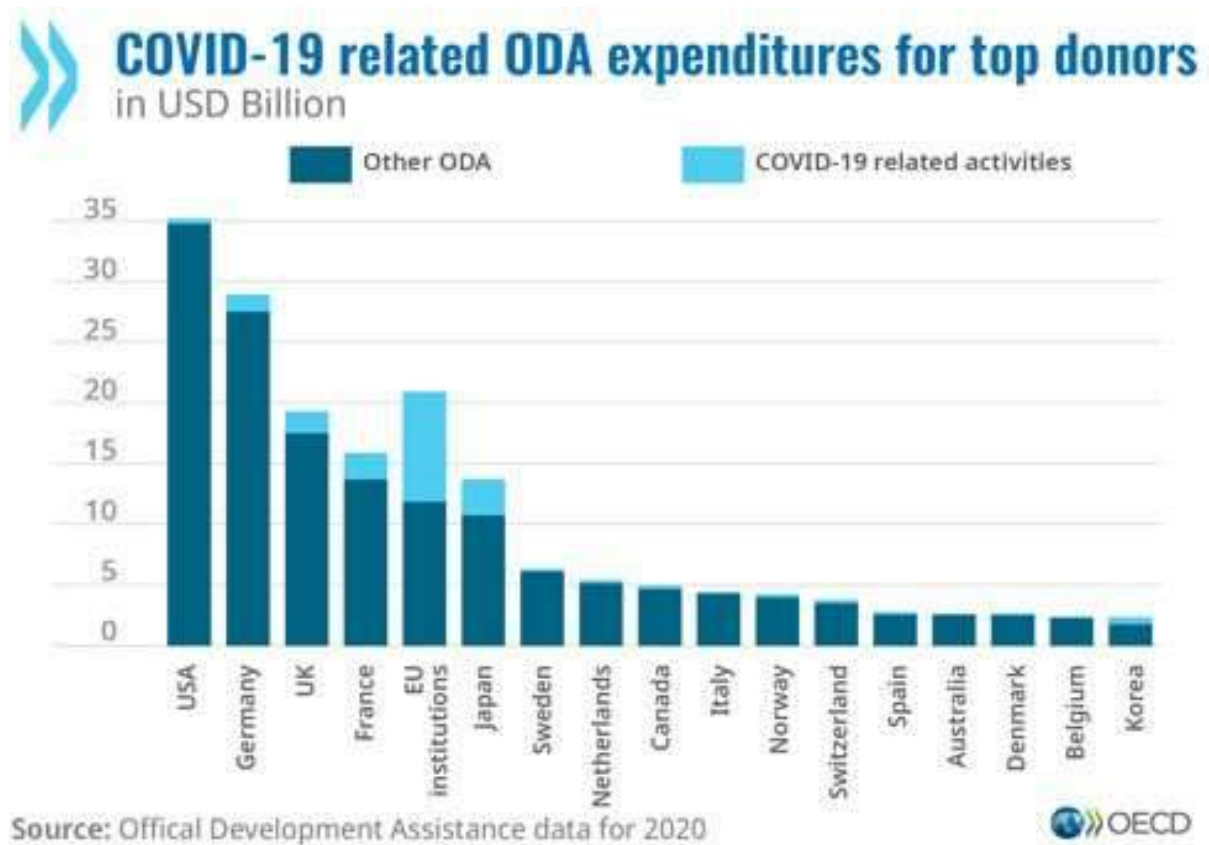
This analysis on the evolution of EU development cooperation policy indicates that it progressed based on established norms, particularly emphasizing democracy, human rights, and rule of law (Broberg, 2011). This emphasis influenced not just the EU’s relationships with developing countries in terms of external affairs, but also its role within international development system, as a key player in revitalizing the multilateral development agenda, and as a major contributor to the development and implementation of the Sustainable Development Goals (SDGs). Thus, the EU continuously updates its ODA policy framework to adapt to the changing global context, characterized by the emergence of donor countries from the Global South, alternative financing options provided by private funds and philanthropies, as well as emerging global threats to development like climate change (European Commission, 2016).

The discourse surrounding EU development cooperation revolves around the interplay of norms and geopolitical factors in its development and instruments (Beringer et al., 2019). Initially, EU development policy started as a modest initiative focused on former colonies but has since significantly evolved into a comprehensive global policy aligned with the external policy interests of integration. This policy has not only broadened its reach by including more countries and enhancing the resources available, but the policy has also improved qualitatively, increasing the effectiveness of its aid. While elements of post-colonialism remain, the policy currently functions as an instrument of external policy supporting the EU’s global ambitions.

EU FOREIGN AID AND THE COVID-19 PANDEMIC: DATA AND ANALYSIS

COVID-19 related Official Development Assistance (ODA) expenditures of the EU have been significant as part of the Union’s response to this health crisis (Table 1). The EU and its member states mobilized funds to support healthcare systems, provide vaccines, and address the socio-economic impacts of COVID-19 in developing countries. These are designed in the framework of emergency response programs, humanitarian aid and Team Europe initiative.

Table 1. COVID-19 Related ODA Expenditures for Top Donors



Since the early stages of the COVID-19 pandemic, the EU revealed its global approach to the pandemic in two perspectives. The normative perspective emphasized the EU’s desire to promote “peace, democracy, human rights, the rule of law and good governance” (Burni et al, 2021). The second perspective highlights the EU’s commitment to multilateralism alongside its aspiration to become a global actor (Burni et al, 2021). As seen in official documents and the EU’s international commitments to fight against the pandemic, the EU and its member states’ response to COVID-19 is based on the notion of multilateralism and the basic values and norms promoted by EU foreign policy.

The initial step in the EU’s response to the pandemic was taken by the Team Europe initiative. According to a Joint Communication by the European Commission and the European External Action Service, the EU called for a ‘fast, massive and coordinated global response’ to the pandemic (European Union, 2020a: 1). The ‘Team Europe’ initiative represented a single framework for Europe’s external actions with partner countries to promote further integration in development cooperation (European Union, 2020b: 1). This initiative signifies a process that has the potential to enhance collaboration among the EU, its member states, the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD). The four priorities of Team Europe were establishing a common financial package, enhancing global preparedness, promoting multilateralism, and emphasizing the EU’s core values (European Union, 2020a: 2). This initiative mobilized funds for the development of a universal

vaccine and secured financial contributions from its member states, revealing a global strategy to combat COVID-19 pandemic (European Union, 2020a; European Union, 2020b). Thus, through this initiative, the EU concentrated on a cohesive European approach to support multilateral solutions to the pandemic.

Analyzing how the norms and principles of Team Europe are implemented, annual reports and figures reveal that the EU put emphasis on the mobilization of fund, specified the amount needed and the methods for providing these funds. This reveals the EU's global ambitions to increase the visibility of its external actions (Burni, et al., 2021). The financial resources of the EU's response to COVID-19 have included a mix of grants, loans, and guarantees. Additionally, the 'Next Generation EU' (NGEU) package, agreed among the member states, revealed the EU's comprehensive strategy for addressing the pandemic. This represented a major turning point for the region, which gives the European Commission and its president Ursula von der Leyen unprecedented capacity for action.

In 2020 annual report of ECHO (European Civil Protection and Humanitarian Aid Operations), it is stated that Team Europe mobilized nearly €38.5 billion in 2020, with the EU contributing €14.1 billion (European Commission, 2020: 13). Overall, DG ECHO's humanitarian response to the need arising from the pandemic reached €450 million (European Commission, 2020: 13). The direct and indirect effects of COVID-19 were most severely experienced by populations already facing humanitarian crises and individuals in conflict areas severely affected by climate change. To enhance the emergency response and preparedness against the pandemic, the European Commission promptly allocated an additional €80 million in humanitarian funding, particularly targeting countries with fragile healthcare systems (European Commission, 2020: 13-14).

According to the annual report of ECHO, in 2021, DG ECHO provided extensive support to numerous countries worldwide that were significantly impacted by the COVID-19 pandemic by supplying personal protective equipment, medical supplies and vaccines (European Commission, 2021: 14). As the situation worsened in some member states, the rescEU (Union civil protection mechanism) stockpiling was activated. DG ECHO facilitated the transportation of medical personnel, equipment, and relief supplies from non-EU countries into the EU. DG ECHO also worked to ensure synergy between the Union Civil Protection Mechanism (UCPM), including rescEU, and the Emergency Support Instrument (ESI). Under the ESI mobility package, DG ECHO allocated €22.5 million in 2021 to nine member states for transporting COVID-19 vaccination equipment and transfer of patients and medical teams (European Commission, 2021:15). In addition, with the revision of the UCPM (Union Civil Protection Mechanism) legislation, Europe's collective response to large scale emergencies was enhanced.

In response to the impacts of the COVID-19 pandemic, DG ECHO continued its involvement in Team Europe initiative in 2022, and built on the interventions initiated in 2021 by providing further humanitarian funding to the COVAX Humanitarian Buffer and supporting the vaccination rollout in Africa (European Commission, 2022). The ESI for the COVID-19

response and its associated “mobility package” program officially concluded on 31 January 2022, resulting in the closure of all components related to the transfer of patients and medical personnel (European Commission, 2022).

The EU was at the forefront of international responses to the pandemic, particularly in vaccination efforts. In early 2021, the EU launched a humanitarian initiative aimed at delivering COVID-19 vaccines to populations living on African continent. According to the ECHO data, €100 million was allocated for humanitarian support to COVID-19 vaccination rollout in Africa. Team Europe contributed €425 million to COVAX facility to help speed up the pace of vaccination in Africa. 145 million doses under Team Europe vaccines were shared with Africa until February 2022 (ECHO web site, 2022). The Commission President Ursula von der Leyen emphasizes the significance of the issue with her statement “no one is safe until everyone is safe” (COM (2021) 35 Final), highlighting the interconnectedness of global health security in the context of COVID-19 pandemic.

Like all pandemics, the COVID-19 pandemic had a transboundary character. The EU emphasized not only a European level approach to the pandemic as mentioned above, but also a multilateral approach to commit a coordinated response to the crisis via cooperating with the international organizations such as United Nations, UNDP (UN Development Program), WHO (World Health Organization) etc. the EU embraced this leadership role in accordance with Article 21 of the TEU (Treaty on European Union), which pertains to the Union’s commitment to promoting multilateral solutions for common challenges within the framework of the United Nations (Lisbon Treaty, 2007). Additionally, individual EU member states have prioritized multilateralism. Official EU documents clearly indicate that the EU is strongly dedicated to multilateralism as a central principle in its comprehensive response to the pandemic.

The EU’s global response to COVID-19 can be characterized by a priority for a collaborative European approach with a multilateral emphasis. This may be seen as a way for the EU to fulfill its role as a normative power and a global actor. Similarly, the EU’s commitment can be interpreted as an effort to promote a normative image of Europe internationally. EU’s commitments and actions on the global stage through multilateral cooperation with other international organizations in the fight against COVID-19 highlight the pandemic’s geopolitical significance for the EU (Borrell, 2020).

Based on the above-mentioned data, in addition to the multilateralism and normative perspective in EU’s global response to the COVID-19 pandemic, main aspects of EU foreign aid during the COVID-19 pandemic include emergency funding aimed at assisting partner countries in tackling urgent health and socio-economic effects of the pandemic, as well as flexible humanitarian funding mechanisms designed to better respond to the changing needs of these partner countries throughout the pandemic. The EU also emphasized providing socio-economic support to partner countries to lessen the pandemic’s impact on vulnerable populations. This includes funding for social protection programs, food security initiatives etc. The EU also emphasizes supporting partner countries in their recovery and resilience efforts in

the post-pandemic period. Thus, the EU foreign aid during the COVID-19 pandemic reflects its commitment to supporting partner countries in overcoming the challenges posed by the crisis and building a more sustainable and inclusive future.

There are several factors that affected the allocation of EU foreign aid during the COVID-19 pandemic. Although the EU committed significant financial contributions, it faced challenges in allocating resources effectively to all countries in need. Distributing aid and vaccines to various regions was hindered by logistical difficulties. Moreover, foreign aid was also affected from political dynamics and administrative hurdles. At the global level, the pandemic intensified competition for limited resources including vaccines and medical supplies. Thus, while the EU demonstrated a commitment to foreign aid during the pandemic, these various factors limited its effectiveness and reach in addressing the global health crisis comprehensively (European Commission, 2021; European Commission, 2022).

CONCLUSION

The COVID-19 pandemic placed an unprecedented strain on the whole world. The EU was already strained by ongoing challenges to its foreign policy in the forms of the migration crisis, increasing radical right populist parties, and Brexit when the COVID-19 pandemic struck, and these existing challenges added further strain and affected the EU's approach towards the COVID-19 crisis. The Union acted quickly after a somewhat slow start and was very effective in mobilizing a variety of resources (Boin and Rhinardi, 2023).

This paper discusses the key aspects of EU's approach in response to the COVID-19 pandemic and analyzes EU foreign aid during the pandemic based on the related official data and reports. It is found out that the EU had a proactive and comprehensive approach in reallocating its foreign aid budget to mitigate the effects of the pandemic on partner countries within the framework of Team Europe initiative and humanitarian and emergency funding mechanisms. The EU official documents also reveal that EU's global approach to the pandemic was based on the basic norms of its foreign policy as a normative actor and the principle of multilateralism. At the international level related data indicate that the EU had a significant role in the COVID-19 related ODA expenditures for top donors of the multilateral development cooperation system.

While the EU's global response to the pandemic was in line with EU foreign policy norms, geopolitical interests, and global actor ambitions, EU foreign aid efforts during the pandemic faced with numerous challenges ranging from limited resources to logistical problems, increased demand for aid as well as political, administrative, and geopolitical complexities. The pandemic tested the EU's foreign policy process, challenged the principles of solidarity and its ability to manage crisis collectively. Although the EU's response to the pandemic has been largely ad hoc, in reacting in this manner, the EU has made progress towards deeper integration (Quaglia and Verdun, 2023). However, the progress has come with challenges including the ongoing war in Ukraine and potential economic complexities.

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**İKLİM DEĞİŞİKLİĞİNİN ÜÇÜNCÜ DÜNYA ÜLKELERİNDEKİ ETKİLERİNİN
AVRUPA’NIN GÜVENLİĞİNE YANSIMALARI**
REFLECTIONS OF THE EFFECTS OF CLIMATE CHANGE IN THIRD WORLD
COUNTRIES ON EUROPE'S SECURITY

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ÖZET

Günümüzde gündemi en çok meşgul eden konulardan biri iklim değişikliğidir. Uzun bir dönem boyunca alçak politika alanı olarak görülen iklim değişikliği son yıllarda ciddi sonuçları olan afetlere sebep olması ve hava kirliliği gibi nedenlerle dünyanın metropol şehirlerini yaşanılmaz hale getirmektedir. Sorun sadece Avrupa’yı doğrudan etkilemekle kalmamakta ve Avrupa tarafından dünyanın “periferi” olarak görülen; Afrika, Ortadoğu ve Latin Amerika’yı içerisine alan Üçüncü Dünya bölgesinde yaşanan iklim değişikliğinin sonuçları Avrupa’yı da etkilemektedir. Günümüzde küreselleşmenin artmasıyla beraber dünyanın bir veya birkaç bölgesinde yaşanan sorunlar spillover etkisiyle sonuçlarını her yerde hissettirmeye başlamıştır. Küreselleşme süreci ile birlikte değişen güvenlik algısı iklim değişikliği gibi küresel sorunları da içerisine almaya başlamıştır. İklim krizinden en çok etkilenen bölge Üçüncü Dünya olmakla birlikte burada iklim krizine bağlı yaşanan sorunlar Avrupa’nın güvenliğini de etkilemektedir. Bu nedenle iklim sorunları gün geçtikçe daha fazla güvenikleştirilmektedir. Biz bu çalışmamızda iklim değişikliğinin doğrudan etkilerinin en çok hissedildiği Üçüncü Dünya’da yol açtığı sorunların Avrupa üzerindeki etkisini ele almayı amaçladık. Üçüncü Dünya tanımını içerisine giren Latin Amerika bölgesinde yaşanan iklim sorunlarının sonuçları ABD ve Kanada gibi devletlerde iklim göçü olarak yansımaktadır. Latin Amerika bölgesindeki iklim kaynaklı sorunların sonuçları daha çok Kuzey Amerika’da hissedilmektedir. Bizim çalışmamızın kapsamı Avrupa ile sınırlı tutulduğundan Latin Amerika bölgesini çalışmamızın kapsamı dışında bırakır. Birinci bölümde iklim değişikliğinin nedenleri, yol açtığı sorunlar ve iklim değişikliğinin güvenikleştirilmesi ele alınacaktır. İkinci Bölümde spesifik olarak Üçüncü Dünya’da iklim sorunlarının sonuçları ele alındıktan sonra son bölümde bu sorunların Avrupa üzerindeki etkileri istatistiksel veriler kullanılarak analiz edilmeye çalışılacaktır.

Anahtar Kelimeler: İklim Değişikliği, Üçüncü Dünya, Çevresel Güvenlik, Avrupa, İklim-Güvenlik İlişkisi

ABSTRACT

One of the issues that occupies the agenda the most today is climate change. Climate change, which has been seen as a low-policy area for a long time, has made the world's metropolitan

cities uninhabitable due to reasons such as air pollution and causing disasters with serious consequences in recent years. The problem does not only directly affect Europe, but also affects Europe, which is seen by Europe as the "periphery" of the world; The consequences of climate change in the Third World region, which includes Africa, the Middle East and Latin America, also affect Europe. Today, with the increase in globalization, the problems experienced in one or more regions of the world have started to make their consequences felt everywhere with the spillover effect. The changing perception of security with the globalization process has started to include global problems such as climate change. Although the region most affected by the climate crisis is the Third World, the problems experienced here due to the climate crisis also affect the security of Europe. For this reason, climate problems are becoming more and more securitized day by day. In this study, we aimed to address the impact of the problems caused by climate change on Europe in the Third World, where the direct effects of climate change are felt the most. The consequences of the climate problems experienced in the Latin American region, which is included in the definition of the Third World, are reflected as climate migration in states such as the USA and Canada. The consequences of climate-related problems in the Latin American region are mostly felt in North America. Since the scope of our study is limited to Europe, the Latin American region is excluded from the scope of our study. In the first part, the causes of climate change, the problems it causes and the securitization of climate change will be discussed. In the second part, the consequences of climate problems in the Third World are discussed, and in the last part, the effects of these problems on Europe will be analyzed using statistical data.

Keywords: Climate Change, Third World, Environmental Security, Europe, Climate-Security Linkage

GİRİŞ

Son yıllarda uluslararası ilişkiler literatüründe ve dünya gündeminde oldukça tartışmalı bir konu olan iklim değişikliği ile ilgili çalışmaların sayısı gün geçtikçe artmaktadır. Her ne kadar Ortadoğu, Afrika ve Avrupa gibi bölgelerde iklim değişikliğinin sonuçlarını ele alan onlarca çalışma da olsa bu çalışmaların büyük çoğunluğu iklim değişikliğinin örneklem olarak seçilen bölgedeki güvenliğe doğrudan etkilerini ele almaktadır. Oysa günümüzde küreselleşmenin artması ile küresel bir köyde yaşamaya başlamış bulunmaktayız. İklim değişikliğinin etkileri ve boyutu etkilenen bölgelerin coğrafi, ekonomik, siyasal ve toplumsal dinamiklerine göre değişse de bir veya birkaç bölgede sonuçların daha ağır hissedilmesi dünyanın her bölgesindeki güvenlik ve istikrara dolaylı olarak etki etmektedir. Biz de çalışmamızda iklim değişikliğinin güvenliğe etkilerini dolaylı etkilerini ele almaya çalıştık.

Çalışmamızda örneklem olarak iklim değişikliğinin sonuçlarından en çok etkilenen, Üçüncü Dünya ülkelerini seçtik. Bu terimi kullanmamızın nedeni Üçüncü dünya içerisinde sayılan Ortadoğu ve Afrika'yı tek kapsam altında toplamaktır. Çalışmamızın ilerleyen sayfalarında da aktarılacağı gibi Üçüncü Dünya tanımına Latin Amerika da dahildir ancak bu çalışmanın

kapsamından çıkarılmasının nedeni çalışmamızın amaç ve kapsamının Üçüncü Dünya'daki iklim değişikliğinin Avrupa üzerindeki etkilerini ele almak olması ve Latin Amerika'da iklim krizine bağlı sorunların Avrupa'dan ziyade Kuzey Amerika'yı etkilemesidir.

Çalışmamızla ilgi genel bir çerçeve verecek olursak, çalışmamızda iklim değişikliğinin öncelikle genel anlamda güvenliğe etkileri kapsamlı bir şekilde ele alınacaktır. Çevresel Güvelik ve Güvenikleştirme kavramlarına da değinildikten sonra Afrika ve Ortadoğu'da iklim değişikliğinin yol açtığı zararlar ve güvenlik zaafırları ele alınacaktır. Son olarak da bu bölgelerdeki güvenlik risklerinin Avrupa güvenliğini nasıl etkilediği üzerinde durulacaktır.

1. İKLİM DEĞİŞİKLİĞİNİN GÜVENLİĞE ETKİLERİ

Son yıllarda gündemde gittikçe daha çok yer eden iklim değişikliği şüphesiz uluslararası ilişkiler disiplini ve güvenlik gündemini de etkilemiştir. Günümüzde güvenlik sadece askeri güvenlik veya çatışmanın yokluğundan ibaret olmaktan çıkmış ve çevresel güvenlik insani güvenlik gibi kalemler de güvenliğin kapsamı içerisine girmiştir. Artık güvenlik denildiğinde aklımıza sadece devletler gelmemekte ve yeni güvenlik anlayışı bireyleri ve hatta bazen insan dışı canlıları da kapsamaktadır. Öznenin doğrudan bir tehdide maruz kalmaması günümüzde yeterli olmamakta aynı zamanda kendini güvende hissetmesi de önemli olmaktadır. İklim değişikliği konusu bu yeni güvenlik anlayışının önemli ayaklarından biridir. İklim değişikliği hem bireyleri hem de devletlerin güvenliğini etkileyen bir olgudur. Kaynak azlığı, iklim değişikliği, kuraklık gibi çevresel sorunlar çevresel güvenliğin içerisinde değerlendirilmektedir. İklim değişikliği dediğimiz kavram, küresel ortalama sıcaklıkların uzun vadede değişimini ifade eder(Vural, 2018, s. 58). Dünya, tarihi boyunca ısınma ve soğuma dönemlerinden geçmiştir. 11.000 yıl önce buzul çağı daha teknik bir ifadeyle Pleistosen Çağ bitmiş ve bundan sonraki çağ olan Holosen Çağında sıcaklıklar genelde istikrarlı olmuştur ancak son yıllarda yaşanan ortalama sıcaklık artışı beklenenin üzerinde gerçekleşmiştir. Bu gelişmenin Sanayi Devrimleri sonrasında oluştuğu tahmin edilmektedir. İklim değişikliğinin yol açtığı çevresel değişimlerden dolayı içerisinde bulunduğumuz çağ Antroposen Çağ olarak adlandırılmaktadır.

Küresel Isınma ve İklim Değişikliği kavramları genelde eş anlamlı olarak kabul edilir. Ancak bu iki kavram birbirinden farklıdır. İklim değişikliği dediğimiz kavram uzun bir süre zarfında aynı şekilde devam eden iklim koşullarının fark edilir biçimde değişmesidir. Daha çok buzul miktarı, deniz seviyesi, sıcaklık seviyesi gibi parametrelerdeki değişimin yeryüzündeki yaşamın üzerindeki etkilerini konu alan kapsamlı bir olgudur. Küresel ısınma ise iklim değişikliğinin bir parçasıdır ve daha dar bir çerçeveyi karşılar. Küresel ısınma dünya ve yüzeyinde yükselen sıcaklık değerlerini ifade eder(Vural, 2018, s. 59). İklim değişikliğinin geleceği hakkında birtakım kuşklar bulunmaktadır. Bunun en önemli sebebi devletlerin ve bireylerin önlem almaya istekli olmamasıdır. Bunun nedeni bazı devletlerde temiz enerji üretecek altyapı olmaması ve bu altyapıyı edinmenin çok maliyetli olmasıdır. Ancak özellikle Avrupa'da hava kirliliğinin aşırı artmasından dolayı Avrupa şehirlerinin yaşanamaz hale gelmemesi için temiz enerjiye zorunlu bir geçiş süreci başlamıştır(Daşcıoğlu & İnat, 2021, s. 36).

İklim deęişiklięi birçok doęal kaynaęın verimini, sürdürülebilirlięini ve kullanım imkanını kısıtlamaktadır(Vural, 2018, s. 61). Homer- Dixon'a göre doęal kaynaklar yenilenebilir ve yenilenebilir olmayan olmak üzere iki kategoriye ayrılır. Yenilenemeyen kaynaklar petrol, demir cevheri vb. gibi madenlerdir. Yenilenebilir doęal kaynaklar ise tatlı su, ormanlar, verimli topraklar gibi kaynaklardır. Ancak yenilenebilir kaynaklar da tükenmektedir. Bunun temel nedeni ise bu kaynakların insan tarafından kendini yenilemeleri beklenmeden tekrar tüketilmesi sonucu tükenmeleridir(Homer-Dixon, 1994, s. 8). Örneęin su kaynaklarını ele alacak olursak yağış rejiminin deęişmesine baęlı olarak sel veya kuraklık yaşanma oranlarının artmasıyla beraber su seviyesi ve hacmi etkilenmiştir. Bu daralmanın en önemli etkisi Nijerya'daki Çad Gölü üzerinde olmuştur.

Çad Gölü, Sahra Çölünde bir vaha olma görevi görmekte; tarım, balıkçılık, ulaştırma gibi faaliyetlerin yapılabilmesini sağlamaktadır. Ancak Çad Gölü, iklim deęişiklięi nedeniyle kurumaktadır. Bu gölün kurumakta olması Nijerya'da insani gelişim oranını oldukça zayıflatacaktır(Vural, 2018, s. 62).

İklim deęişikliğinin hidrografya üzerinde yarattığı tek olumsuz etki tatlı su kaynaklarının kuruyarak yok olması deęildir. Okyanus ve deniz seviyelerindeki artış, okyanusun asitleşmesi ve su sıcaklığında meydana gelen deęişimler özellikle mercan resifleri üzerinde etkili olmaktadır. Okyanus sıcaklıklarının artışı El-Nino olaylarıyla hızlanmış ve birçok yerde mercan ölümlerine neden olmuştur. İki önemli parametre olan El-Nino ve La-Nina olayları Pasifik Okyanusunun ısınmasına neden olmakta özellikle orta ve doęu kuşaklarla birlikte tropikal kuşacı etkisi altına almaktadır.

Burada El-Nino ve La Nina olaylarını biraz açmakta yarar görüyoruz. El Nino teriminin kullanım alanı yıllar içerisinde deęişmiş ve gelişmiştir. Bu nedenle üzerine anlaşılmış bir tanım yoktur. İspanyolca bir kelime olan "El Nino"nun anlamı oęlan çocuğudur. İklim ve coęrafya bilimlerinde ise Peru ve Ekvador sahilleri boyunca her yıl yaşanan sıcak su akıntısına verilen isimdir. El Nino terimi yakın bir zaman önce birkaç yılda bir görülen normalin üzerindeki sıcaklık deęerleriyle ilişkilendirilmiştir(Trenberth, 1997, s. 2771). El Nino ile ilintili olan atmosfere olayı ise Güney Salınımı olarak adlandırılmaktadır. Atmosfer ve okyanuslar birlikte ENSO (El Nino Southern Oscillation- El Nino Güney Salınımı) adı verilen fenomeni ortaya çıkarır. El Nino'nun tersi olan ve İspanyolca "kız çocuęu" anlamına gelen La Nina ise tropikal Pasifik tabanında yaşanan soęumaya verilen isimdir. Bu fenomen ENSO'nun serin aşamasında gözlemlenir.

El Nino olayının kapsamı bilim insanları arasında farklı deęerlendirilmekte olup bir grup bilim insanı El Nino'yu dar yorumlayarak yukarıda bahsedilen kıyı şeritlerindeki fenomen olarak yorumlarken dięer bir grup bilim insanı geniş yorum getirerek El-Nino'yu tüm okyanus tabanını kaplayan bir olgu olarak deęerlendirmiştir. En nesnel tanım ise 1980'li yılların başlarında Scientific Comitee for Ocean Research (SCOR) tarafından yapılmış tanımdır. Bu tanıma göre El- Nino Ekvador ve Peru sahilleri boyunca ortaya çıkan sıcak sudur. Bu sıcak nedeniyle su

yüzev sıcaklığının standardı aşar bu durum ve en az dört ay boyunca sürer(Trenberth, 1997, s. 2772).

El- Nino fenomeni bir kerelik bir olay olmaktan ziyade döngüsel olarak kendini tekrarlayan bir doğa olayıdır. İlk El- Nino'nun 1726 yılında tecrübe edildiği düşünülmektedir. 1891 yılında görülen aşırı yağışlar de El- Nino ile ilişkilendirilmiştir(Cane, 2008, s.7). Bu fenomen yalnızca kaynaklandığı coğrafyadan fazlasını etkilemektedir. Hatta global etkiler de mevcuttur. Özellikle 1891 ve 1982 yılında meydana gelen iklim dalgalanmalarının ciddi ekolojik ve ekonomik sonuçları olmuştur(Cane, 2008, s. 44). Endonezya ve Papua Yeni Gine gibi ülkeler bundan olumsuz etkilenmektedir(Vural, 2018, s. 63). Bununla birlikte Pasifik, Atlantik ve Hint okyanuslarında oksijen oranı düşük olan "hipoksik" alanların diğer bir deyişle ölü bölgelerin sayısı ve kapladıkları alanda artış gözlenmektedir.

İklim değişikliğinin üzerinde majör bir etkisi olduğu bir diğer güvenlik konusu da gıda güvenliğidir. Gıda güvenliği insanların sağlıklı bir yaşam sürmelerine yetecek güvenli ve besin değeri yüksek gıdalara erişiminin ne düzeyde olduğuna ilişkin bir kavramdır. İklim değişikliği tarımsal üretim üzerinde doğrudan etki sahibi olduğunda etkilenen sektörler arasında tarım ve hayvancılık en başlarda gelmektedir. Özellikle mısır ve buğday üretimi üzerinde ciddi etkileri olmaktadır. Gıda güvenliğinin tek parametresi ürün üretmek ve hasat etmekten ibaret değildir. Ürünlerin depolanması, taşınması, ambalajlanması ve pazarlara erişimi de önemlidir. Bütün bunlar iklim değişikliğinden etkilenmekte ve güvenli gıdaya erişimin azalması savaş ve çatışmaları tetiklemektedir. Örneğin çevre ve güvenlik tartışmalarının ilk dönemlerinde çevrenin tahribatı, kıtlık ve çatışma arasında doğal bir korelasyon olduğu kabul edilmiştir. Dalby'a göre kaynak yoksunluğu ve çatışma arasındaki bu bağlantı kabul edilebilir olup, çatışmaların nerede ve ne zaman ortaya çıkacağı konusunda çatışmaya yol açan ara nedenler belirleyicidir(Dalby, 2008, s. 183). Hükümetler yaşanan kıtlığa çözüm bulamadıkları zaman yetersiz konuma düşmektedirler.

İklim değişikliği denildiğinde birçoğumuzun aklına ilk olarak su sıkıntısı gelmektedir. Su sıkıntısı kendisini özellikle siyasi anlamda da sorunların olduğu bölgelerde daha çok gösterir. Ortadoğu ülkeleri ciddi su fakiri ülkelerdir. Su sıkıntısının bölgede yaşanan devletlerarası ve iç çatışmalarda etkili olduğu düşünülmektedir. Bu sorun Ortadoğu bölgesinde devletleri bazen çatışmanın eşiğine getirmiş, bazen de doğrudan çatışmaya sevk etmiştir. Bu çatışma ve yakın çatışma risklerinin bizce en önemli olanları Suriye ve İsrail arasında devam eden Golan Tepeleri sorunu ve 1964-1987 arasında Türkiye, Irak ve Suriye arasında yaşanmış olan Fırat Nehrinin sularının paylaşımı sorunudur.

Golan Tepeleri Suriye'ye ait kayalık bir bölgedir. Uluslararası toplumun Suriye toprağı olarak kabul ettiği Golan, İsrail'in işgali altında bulunmaktadır. Uluslararası toplum bu işgali gayri meşru kabul etmektedir. İsrail bu bölgeyi 1967 yılında yaşanan Altı Gün Savaşları sırasında işgal, 1981 yılında çıkardığı bir yasa ile de ilhak etmiştir(Süvari & Salihi, 2022, s. 97). İsrail yasalarının Golan Tepelerinde de geçerli olmasını öngören bu yasadan önce bölge askeri yönetim statüsündedir. BM bu yasayı 497 sayılı kararı ile geçersiz ve uluslararası hukuk

açısından etkisiz saymıştır. Oybirliği ile kabul edilen bu karardan sonra Golan Tepelerini İsrail toprağı olarak tanıyan tek BM üyesi devlet ABD olmuştur. BM nezdinde bu topraklar işgal altındaki bölge olarak kabul görmektedir(Çınar, 2022, s. 20).

Golan tepeleri Suriye, Ürdün, İsrail ve Lübnan sınırlarının kesiştiği bir bölgededir. Volkanik bir arazi olan bölgenin(Çınar, 2022, s. 21) ihtilafli bir arazi olmasının nedenlerinden biri de dört devletin sınır bölgesinde ve doğal kaynak açısından da zengin bir bölgede kalıyor olmasıdır. Golan'ın bu derece soruna ve çatışmaya neden olmasının sebebi Ortadoğu'nun ciddi su fakiri bir bölge olmasıdır. Bu gibi durumlarda sınır aşan su kaynakları üzerinde devletler arasında barışçıl yönetim stratejileri ve rejimlerin oluşturması ilgili devletlerin güvenliğini artırırken böyle girişimlerin olmaması savaş riskini yükseltmektedir. Su sıkıntısı çeken Ortadoğu ülkeleri için bu gibi sorunların savaşa dönüşmesi yüksek bir risktir. Ürdün, Filistin, Suriye, Irak ve Lübnan gibi körfez ülkelerinde kişi başına yılda 1000 metreküpten az miktarda su düşmektedir.

Golan Tepeleri bölgedeki birçok nehre ve göle kaynaklık etmektedir. İsrail su gereksiniminin büyük bir kısmını yine burada bulunan Taberiye Gölünden sağlamaktadır. İsrail'in Golan'daki gayrimeşru varlığının devamının en büyük nedeni buradaki su kaynaklarına ciddi gereksinim duymasıdır. Zira Taberiye Gölü de Golan'dan beslenmektedir. Bu kaynaklardan en önemlisi Şeria Nehri'dir. Taberiye gölünün ana kaynağı olan Şeria Nehri aynı zamanda İsrail'in ana yerüstü tatlı su kaynağıdır(Çınar, 2022, s. 23).

Fırat Nehrinin sularının paylaşımı sorunu ise ilk defa bu kaynaktan yararlanan Türkiye, Suriye ve Irak'ın su kaynaklarını işlemeye yönelik altyapı projeleri ile başlamıştır. Krizin fitilini ateşleyen olay Türkiye'nin Fırat üzerinde Keban ve Karakaya barajlarını inşa etmeye başlamasıdır. Barajların 1964 yılında inşasına başlanması Irak ve Suriye tarafından tepkiyle karşılanmış ve bu devletler Türkiye'yi suyu siyasi bir koz haline getirerek Ortadoğu'da söz sahibi olmakla itham etmişlerdir(Dursun, 2006, s. 141). Bunu üzerine Türkiye, barajlarının Fırat Nehrinin sularını %70'ini düzenleyeceğini ve Suriye ve Irak'ın su kullanımına bir etkisi olmayacağını söylese de Suriye yönetimi bu açıklamadan tatmin olmamış ve misilleme olarak Tabka Barajının inşaatına başlamıştır. Keban ve Tabka barajları aynı anda tamamlanmış ve Tabka Barajı su tutmaya başladığına Irak kendisine az su bırakıldığı gerekçesiyle Suriye ile karşı karşıya gelmiştir. İki ülke savaşın eşiğine gelmiş, Suudi Arabistan ve SSCB'nin arabuluculuk çabaları sayesinde savaş önlenmiştir(Dursun, 2006, s. 142).

Sorunlar burada da bitmemiştir. Türkiye'nin 1980 yılında GAP projesine başlamasıyla Suriye Türkiye aleyhinde faaliyet gösteren terör örgütlerini Şam'da büro açmaya davet etmiştir. Suriye yönetimi; PKK, ASALA ve DEV-YOL gibi terör örgütlerine açık destek vermiştir(Dursun, 2006, s. 143). Sorunun çözümü için diplomatik girişimler 1987 yılında başlamıştır. 17 Temmuz'da Türkiye-Suriye Teknik İş birliği Ortak Komitesi toplanmış ve Türkiye Cumhuriyeti ve Suriye Arap Cumhuriyeti Arasında Ekonomik İş birliği Protokolü imzalanmıştır. Protokole göre Türkiye'nin Suriye tarafına saniyede 500 metreküp su bırakmasına karar verilmiştir(Dursun, 2006, s. 162).

Türkiye taahhütlerine uysa da Suriye Türkiye aleyhine çalışmaya devam etmiş, Türkiye'yi hedef alan terör örgütlerine desteğini sürdürmüştür. Suriye ve Irak, hatalı kaynak yönetimleri ve suyu idaresiz kullanmaları sonucunda yaşadıkları sorunlardan Türkiye'yi sorumlu tutmuşlardır. Özellikle Suriye, sulama ihtiyacını ve tarım topraklarının boyutunu abartmış ve Fırat'ın sularından gereğinden fazla yararlanmaya çalışmıştır(Dursun, 2006, s. 163).

2006-2010 yıllarında Suriye'de yaşanan kıtlık ve kuraklığın 2011'de başlayan Suriye iç savaşının çıkmasında önemli bir etken olduğu düşünülmektedir(Vural, 2018, s. 64). Sorun sadece siyasi veya askeri olmaktan uzaktır. Kırsal alanlarda yaşayan insan toplulukları geçim kaynakları açısından doğal kaynaklara bağımlı durumdadırlar(Vural, 2018, s. 65). Kırsal nüfusun tarıma bağımlı olması, tarımsal üretimin iklim değişikliğinden etkilenmesi sonucunda kırdan kente göçü tetiklemektedir. Sel baskınları gibi olaylar büyük maliyetlere neden olmaktadır. Bu durumdan aynı zamanda sigortacılık sektörü de olumsuz etkilenecek ve sel, taşkın, kuraklık gibi iklim değişikliğine bağlı olaylardan etkilenen sigortalı ziraatçıların zararlarını karşılamak için gerekli ödemelerin miktarını artıracaktır(Vural, 2018, s. 66).

İklim değişikliği konusunu ele alırken doğrudan aklımıza gelen bir olgu olmasa da İklim değişikliğinin halk sağlığı ile de yakından bağlantısı vardır. Yağışlardaki değişim su kaynaklı hastalıkların görülme sıklığını artırmaktadır. 1990'lı yıllarda Güney Amerika'da ortaya çıkan dang humması, Karayipler ve Hindistan'a yayılmış ve salgın haline gelmiştir. Dang humması hastalığı döküntü ve kas ağrısı ile başlamakta ve virüs taşıyıcı sivrisinekler vasıtasıyla yayılmaktadır. Dang humması iç kanamaya neden olarak enfekte olan kişinin ölümüne yol açabilen tehlikeli bir hastalıktır. Virüs kalabalık bölgelerde daha hızlı yayılmaktadır(Vural, 2018, s. 67).

Dang humması ile beraber birçok farklı hastalık da insan hayatını ve güvenliğini tehdit etmektedir. İklim değişikliği olgusunun 2030-2050 arasında 250 bin ek ölüme neden olacağı tahmin edilmektedir. Bu ölümlerin 38 bininin yaşlı ve çocuklarda yüksek sıcaklığa bağlı, 95 bininin yetersiz beslenme nedeniyle olacağı düşünülmektedir(Kavuncuoğlu & Kiraz, 2022, s. 23). Vektörle bulaşan hastalıklar yani bir haşerat sokması suretiyle bulaşan hastalıkların yayılması ile iklim değişikliği arasında doğrudan bir korelasyon vardır. Lyme, hantavirüs, fascioliasis, kene kaynaklı ensefalit gibi hastalıklarda iklim değişikliği sonucunda bulaşın artacağı ve hastalık mevsiminin uzayacağı düşünülüyor.

Sıtma da iklim değişikliğinden doğrudan etkilenen bir başka hastalıktır. Özellikle Afrika'da her sene 400 binden fazla insan sıtmadan dolayı hayatını kaybetmektedir. En çok etkilenen grup ise 5 yaş ve altındaki çocuklardır. Zira bu yaş grubundaki çocuklar virüslere karşı yeterli bağışıklık geliştirememişlerdir. Sıtma hastalığının endemik hale gelmemiş olduğu bölgelerde 260 ila 320 milyon kişinin virüsten bir şekilde etkileneceği öngörülmektedir. Sıtma sıcaklık artışından doğrudan etkilenir. Zira her 0.1 C sıcaklık artışı on kat sivrisinek üremesine neden olmaktadır(Kavuncuoğlu & Kiraz, 2022, s. 24).

1.1. Çevresel Güvenlik ve İnsani Güvenlik Kavramları

Klasik güvenlik yaklaşımları iklim değişikliği açıklamakta yetersiz kalmıştır. Bu durumda devreye Kopenhag okulu girmiştir(Vural, 2018, s. 68). Kopenhag Okuluna göre başvuru nesnesinin varoluşuna yönelik herhangi bir tehdit varsa bu bir güvenlik sorunudur. Başvuru nesnesinin güvende tutulması için tedbir alınması gerekmektedir(Vural, 2018, s. 69). Klasik güvenlik anlayışında devlet uluslararası siyasetin temel aktörü olarak kabul edilir. Devletin en önemli görevi ulusal güvenliği sağlamaktır. İklim değişikliği de ulusal güvenliği zaafa uğratmaktadır. İklim değişikliğinin neden olduğu sorunlar devletin güç unsurlarını zayıflatmakta ve devletin başarısız olmasına neden olmaktadır(Vural, 2018, s. 73). Devletin ulusun temel ihtiyaçlarını karşılayacak hizmetleri sunamaması ve iklim olaylarına karşı ulusu koruyamaması ikinci bir güvenlik tehdididir. Bununla birlikte kıtlıkların çatışmalara neden olması da bir ihtimaldir(Vural, 2018, s. 74).

UNDP'ye göre İnsani güvenlik (human security) bir konsept olarak güvenliğin yeni bir çerçevede değerlendirilmesidir. Devlet yerine bireyin güvenliğini önceleyen bir analiz aracıdır. Bireylerin güvenlik kaygılarının yumuşatılmasının politika yapıcılarının temel amacı olmasına vurgu yapar. İnsani güvenlik yukarıda bahsedilen gıda güvenliği, sağlık ve çevresel tehditleri güvenleştirebilir. Bu yaklaşım ordulara atfedilen önemi düşüren bir nitelik arz eder. İnsani güvenlik; insan merkezci, çok boyutlu, bileşik ve evrensel bir konsepttir. Güvensizliğe yol açan her etkeni tek tek ele alarak bertaraf etme sonucunda elde edilecek toplam çıkara önem verir. Salgın hastalıklar, doğal afetler gibi olayların sonucunda bireylerin yaşadığı güvensizliğe vurgu yapar. Gelişmenin insan hakları ve insani gelişim çerçevesinde nispi kazancın artırılmasını önceler ve nispi çıkarın sadece askeri çıkarla sağlanamayacağı varsayımına sahiptir(Jolly & Ray, 2006, s. 5).

Çevre/iklim sorunlarına yönelik kaygıların başlangıcı Soğuk Savaş'a kadar geri götürülebilir. 1960'lı yılların sonunda gelişmiş ülkelerde çevre hareketleri güçlenmeye başlamıştır. Bu hareketler çevre sorunlarını uluslararası toplumun dikkatine sunmuşlardır(Kaya, 2019, s. 41). Çevresel güvenlik kavramı ise ilk olarak 1980'li yıllarda güvenlik literatüründe yer etmeye başlamıştır(Kaya, 2019, s. 43). Çevresel güvenliğin keskin bir tanımı olmamakla birlikte üzerinde durduğu belli başlı konular bulunmaktadır. Bu konular; kaynak kıtlığının politik istikrarsızlığa neden olması, iklim değişikliği ve çevrenin tahrip olmasının ulusal güvenliği olumsuz etkilemesi, savaş öncesi, sırası ve sonrasında ortaya çıkan tahribatın giderilememesi, çevresel tahribatın birey güvenliğini tehdit ettiği, insan faaliyetlerinin canlı yaşamı için tehdit oluşturması ve bütün bunların engellenmesi için geleneksel egemenlik anlayışından uzaklaşılması ve çevresel sorunların bertaraf edilmesi için işbirliği mekanizmaları oluşturulmasına vurgu yapmaktadır. Bu eserlerden biri de çevre ve güvenlik ilişkisine ilk vurgu yapan eser olan Richard Falk'un This Endangered Planet adlı eseridir. 1990'lı yıllarda çevresel güvenlik literatürü daha çok çatışma ve kıtlık bağlantılarına odaklanmıştır(Kaya, 2019, s. 44).

Çevresel güvenlikle ilgili verilen ilk eserlerde uluslararası güvenlik vurgusu bulunmaktadır. Çevresel güvenlik literatürü geliştikçe çevre sorunlarının devlet güvenliğine de önemli bir

tehdit olduđu ortaya çıkmıştır(Kaya, 2019, s. 45). Örneğin Norman Myers, iklim deęişiklięinin 200 milyondan fazla insanın yer deęiřtirmesine neden olacaęını ve bunun Batı için ciddi bir tehdit oluřturacaęı tahmin etmiştir(Kaya, 2019, s. 47). Çevresel güvenlięin ilk aşaması devlet düzeyindeki Kıtık-çatıřma baęlantısı gibi güvenlię risklerine odaklanırken ikinci aşaması güvenlię bireyin çıkarları doęrultusunda ele almaktadır(Kaya, 2019, s. 48).

2. ÜÇÜNCÜ DÜNYADA İKLİM DEęİŐİKLİęİNİN SONUÇLARI

2.1. Üçüncü Dünya Nedir?

Üçüncü dünya terimi yirminci yüzyılın ikinci yarısında oldukça fazla kullanılan bir terim olmuřtur. Ancak gerçekten bir analiz kategorisi mi yoksa belli bir grup devleti tanımlamak için kullanılan içi boş bir kavram mı olduđu tartışma götürür bir konudur. Literatürde terim analitik bir kavram olmaktan ziyade normatif bir kavram olarak kullanılmıştır. Üçüncü dünya ülkelerinin hangileri olduđu ile ilgili elimizde herhangi bir kriterler listesi yoktur. Bu kavram daha çok gelişmiş ve endüstriyelmiş ülkelerin kendilerini gelişmiş, dięerlerini de az gelişmiş olarak kategorize etmeleriyle karakterize bir kavramdır(Tomlinson, 2003, s. 307). Bir dięer yaklaşım da Üçüncü dünyanın bir bilinçli kimlik inřası olduđunu savunmaktadır. Bu yaklařıma göre Üçüncü Dünya, ortak deęerler, kültür ve Batı'ya karşı ortak bilinç ile oluřturulmuş bir kavramdır. Üçüncü Dünya kavramının kullanımı son yıllarda terk edilmeye başlanmıştır(Tomlinson, 2003, s. 308).

Kapladığı alan olarak Üçüncü Dünya, gelişmiş olarak kabul edilen Kuzey Amerika, Avrupa, Uzakdoęu'nun bir kısmı dışında kalan ülkelerin tamamı olarak görölmektedir. Üçüncü Dünya esasında bir Soęuk Savaş terimidir. İki kutuplu sistemin sonlanmasının ardından kullanım alanı azalmıştır(Sönmezoglu, 2011, s. 1). Soęuk Savaş döneminde dünya Doęu (sosyalist) ve Batı (liberal) olmak üzere iki kutup olarak ayrıřmıştır. Bu iki temel güç merkezinin dışında kalan birçok ülke bulunmaktadır. Bu ülkeler bu iki zıt kutup dışında da bir alternatif olduđunu göstermek için Üçüncü Dünya olarak adlandırılmışlardır. Özellikle dekolonizasyon döneminde bu Üçüncü Dünya'ya dahil olan devlet sayısında artış olmuřtur. Avrupa, Kuzey Amerika ve Kuzey Asya gibi gelişmiş bölgelerin dışında kalan ve genelde fakir, az gelişmiş, güney, tarafsız, baęlantısız olma özellięine sahip olan devletler olarak tanımlanmıştır.

Toparlayacak olursak terim ikili bir anlam ve kullanıma sahiptir. Birinci kullanım daha çok dünyanın iki kutuplu olduđu Soęuk Savaş döneminde geçerli olan Batı ve Doęu bloklarının dışında kalan devletleri tanımlamak için kullanılır. İkinci kullanım ise daha kapsayıcı olan, sömürge geçmiři olan ve az gelişmiş devletleri ifade eden normatif kullanımdır.

Sömürge geçmiři olan ve baęımsızlıklarını yeni elde eden devletler de Üçüncü Dünya içerisine katılınca az gelişmişlik vurgusu artmıştır. Zira bu devletler ekonomik açıdan yoksul siyasi ve askeri olarak da zayıftırlar. Birçoęunda ordu bulunmamakta veya çok zayıf, eęitimi yetersiz az sayıda personelden ve envanterleri demode silah ve ekipmanlardan oluřan ordulara sahiptirler. Bu ülkelerin bir dięer ortak özellięi ise dekolonizasyon döneminde baęımsızlık mücadelelerinin başında bulunmuş lider kadroları tarafından yönetiliyor olmalarıdır(Sönmezoglu, 2011, s. 3).

Bu devletler herhangi bir blok içerisinde yer alırlarsa hiyerarşik olarak sıralamanın en altlarında kalacaklardı. Sömürge yönetimlerinden yeni özgürleşmiş ve bağımsızlıklarını yeni kazanmış bu ülkeler tekrar sömürge benzeri hiyerarşik yapıların içerisinde yer almak istememişlerdir. Bu güç ve tahakküm ilişkileri dışında kalmak ve kendilerini uluslararası politikanın yeni aktörleri olarak kabul ettirmek amacıyla Bağlantısızlar Bloğunu kurmuşlardır(Sönmezoğlu, 2011, s. 4).

Dünyada üçüncü bir grup oluşturma çabaları ilk olarak Asya-Afrika ülkelerinin katılımıyla gerçekleşen 1955 Bandung Konferansında ortaya çıkmıştır. Bu konferans Üçüncü Dünya'nın bilinçli bir siyasi kutup olarak ortaya çıkmasında bir milat işlevi görmüştür. Ancak Bandung'da "Üçüncü Dünya" terimi kullanılmamıştır. Bir diğer önemli konferans ise 1961 yılında Yugoslavya'nın başkenti Belgrad'da yapılan Bağlantısızlık Konferansıdır. Böylece Üçüncü Dünya devletleri rakip bloklar ve başlarındaki süper güçlerden bağımsız olduklarını duyurmuşlardır(Tomlinson, 2003, s. 309). Belgrad Konferansının düzenlenmesinde öncü olan Mısır ve Yugoslavya, Hindistan tarafından da desteklenmiştir. Bu dönemde gündemde olan konuların başında anti-kolonyalizm gelmekteydi. Bu gündem Arap ve Afrika ülkelerini ortak paydada birleştirmiştir(Tomlinson, 2003, s. 310). Bağlantısızlar blokundaki devletleri birleştiren bir diğer sorun da az gelişmişliktir. Bu az gelişmişlik algısı nedeniyle Üçüncü Dünya devletleri periferi gibi görülmüş ve Üçüncü dünya vatandaşlarını emperyalizmin kurbanı olarak görülmeye başlanmıştır(Tomlinson, 2003, s. 311). Üçüncü Dünya kavramı en çok 1970'li yıllarda kullanım alanı bulmuştur.

UNCTAD (United Nations Conference on Trade and Development) 'ın ilk toplantısında kendilerini "gelişmekte olan ülkeler" olarak tanımlayan devletler 77'ler grubun oluşturmuşlardır. Bu grup, 1960'larda yapılan Bağlantısızlık zirvelerine katılmamış Latin Amerika ülkelerini de kapsamaktaydı(Tomlinson, 2003, s. 312).

Soğuk Savaş'ın bitmesiyle Doğu Bloku yani "İkinci Dünya" çökmüştür. Bu döneme kadar Batı bloku Birinci Dünya, Doğu Bloku İkinci Dünya, Bağlantısız Blok da Üçüncü Dünya olarak tahayyül edilmekteydi. Doğu Blokunun çökmesiyle birlikte bu sınıflandırma işlevsiz kalmış dolayısıyla Üçüncü Dünya terimi de anlamını kaybetmeye başlamıştır(Sönmezoğlu, 2011, s. 6). Bu aşamada alternatif sınıflandırmalar ortaya çıkmaya başlamıştır. Bunlardan biri merkez (center) devletler olan Kuzey Amerika ve Asya ülkelerinin ağırlıkta olduğu G20 veya G8 (günümüzde Rusya'nın çıkarılmasıyla G7 olarak adlandırılmaktadır) devletlerdir. Günümüzde Üçüncü Dünya bu fraksiyonların dışında kalan devletler olarak sayılabilir ancak bunun yerine çevre ülkeler (periphery states) terimi tercih edilmektedir.

Günümüzde NAFTA (Trump döneminde feshedilmiştir), AB, dört Asya devleti (Çin, Hindistan, Japonya ve Rusya) G7 üyeleri olmak üzere toplamda 42 ülke geriye kalan 200'den fazla ülkenin ürettiğinin yaklaşık 5 katını üretmektedirler. Bu 42 ülke dışında kalan devletler ise çevre ülkeleri bir diğer deyişle Üçüncü Dünya ülkeleri sayılmaktadır(Sönmezoğlu, 2011, s. 7).

Bu çalışmanın konusu iklim krizinin Üçüncü Dünyadaki etkilerinin Avrupa'ya yansımaları olduğundan ve Üçüncü Dünya tanımı içerisinde kabul edilen Latin Amerika'da yaşanan

sorunların coğrafi uzaklık sebebiyle Avrupa'ya kayda değer bir etki yapmaması nedeniyle Latin Amerika'daki iklim değişikliğinin sonuçları bu çalışmanın dışında bırakılmıştır. Bu çalışmada Üçüncü Dünya ülkeleri olarak Afrika ve Ortadoğu ülkeleri ele alınacaktır.

2.2. Üçüncü Dünyada İklim Krizinin Yol Açtığı Sorunlar

2.2.1. Afrika'da İklim Krizi

Afrika'nın iklimi üç temel küresel fenomenden etkilenir. Bu etkenler; Tropik Birleşim Noktası, ENSO ve Batı Afrika Musonlarıdır. Bu etkenlerin birbirleriyle nasıl etkileşime girdikleri çok bilinmese de tamamının küresel ısınmadan etkilendiği bilinmektedir. Genel olarak daha kuru olan bölgeler, nemli bölgelere göre daha fazla ısınmaktadır. Kuzey ve güney bölgelerinde sıcaklık artışı beklenirken Afrika Boynuzunu da içerisine alan doğu bölgesinde ise yağışların %15 civarına artacağı tahmin edilmektedir. Küresel ısınmanın da kuraklığı artıracığı düşünülmektedir(Collier vd., 2008, s. 339).

Afrika kıtası günümüzde 100 yıl önce olduğundan daha sıcaktır. Afrikalılar zaten sosyo-ekonomik sorunlar içinde yaşamaktayken iklim değişikliği ile birlikte daha da büyük sorunlara sürüklenmişlerdir. Zira Afrika ekonomisi büyük oranda doğal kaynaklara ve tarıma dayanmaktadır. Bu gibi kaynaklar da iklim değişikliğine bağlı kuraklık ve sel gibi afetlerden doğrudan etkilenmektedir. Maddi durumu iyi olmayan kesimler dayanıksız şekilde inşa edilmiş meskenlerde yaşamaktadırlar bu nedenle yaşamları ve mülkleri de sel, taşkın, heyelan gibi afetlerle yok olma riski içerisindedir. Bu gibi bölgelerde sağlık hizmetlerine erişimde de büyük sorunlar yaşanmaktadır.

İklim çalışmaları literatüründe genelde sera gazı salınımının dünyanın sıcaklığının yükselmesine neden olduğuna dair yaygın bulgular vardır. Bu sera gazı salınımında genelde fosil yakıtların yakılması, endüstriyel üretim ve yağmur ormanlarının yok olması gibi insan faaliyetleri sonucu ortaya çıktığı düşünülmektedir.

Afrika kıtası yukarıda bahsedilen surette iklim değişikliğine en az katkı yapan kıta olmasına rağmen iklim değişikliğinden en çok etkilenen kıtadır. Afrika'da endüstriyelleşmiş ülkelerin az sayıda olması nedeniyle kıta, dünyada ortaya çıkan karbon emisyonunun sadece %3'ünü üretmektedir. Sera gazları ve karbon salınımı daha çok zengin ülkeler tarafından yapılır(Hope, 2009, s. 451). Öyle ki, zengin-gelişmiş-endüstrileşmiş ülkeler dünyadaki tüm karbon emisyonunun 7/10'undan sorumludurlar. Öte yandan özellikle Sahra-Altı Afrika dünya nüfusunun %11'ine ev sahipliği yapmasına rağmen %3'ten daha az emisyon değerine sahiptir. Bu %3 emisyon oranı ise fosil yakıtların kullanımı, lojistik vb. uygulamalardan kaynaklanmaktadır. Afrika gezegenimizin en hızlı ısınan bölgesidir. Kıtanın 2080-2090 arasında 3 ila 4 C daha ısınacağı tahmin edilmektedir. Kuzey Afrika için bu tahmin 9 C bandındadır(Hope, 2009, s. 452).

Son yıllarda her ne kadar Afrika'nın refah düzeyi artmış olsa da kıta halen dünyanın en fakir bölgesidir. 2005 yılı itibariyle Afrika'nın %51'inde kişi başına düşen gelir 1 dolardan, %73'ünde de 2 dolardan azdır. Afrika'da açlık çeken popülasyon tek ve homojen özellikler

sahip değildir. Afrika'daki yoksullar 3 gruba ayrılır. Birinci grup kronik yoksullardır. Bu gruba mensup kişiler genelde toplumun dışına itilmiş ve marjinalleştirilmiş gruptur. İkinci grup ise sınırda yoksullardır. Bu gruptaki aileler ve bireyler belli dönemlerde geçim sorunları yaşarlar. Genelde mevsimlik tarım işçileri bu gruba dahildir. Üçüncü ve son kategori ise, esasında yoksul olmayan ancak sonradan yoksul duruma düşmüş gruptur. Yoksul duruma düşmelerinin nedenleri, ekonomik veya politik krizlerden dolayı işten çıkarılma, bir doğal afet sonucu geçim kaynaklarını kaybetme olabilmektedir.

Afrika dünyada gelir dağılımının en adaletsiz olduğu yerlerden birisidir. Gini indeksi gelir dağılımının ele alınan bölge bağlamında ne kadar eşit olduğunu saptamaya yarar. Gini indeksinin sıfır olması gelir dağılımının tamamen eşit olduğu, 100 olması da tamamen eşitsiz olduğu anlamına gelir. Afrika için Gini indeksi 72.2'dir. Bu rakam bize gelir dağılımının oldukça dengesiz olduğu hakkına fikir verir.

Özellikle büyük şehirler çevresel açıdan istikrarsız ve elverişsiz bölgelerde bulunurlar(Hope, 2009, s. 454). Bununla birlikte Sahra Çölünün yıllar içerisinde her yöne doğru genişlediği ve bu genişleme devam ederse Sahel bölgesinin tamamen çölleşeceği tahmin edilmektedir. Çölleşme yıllar içerisinde birçok göç ve nüfus hareketine neden olmuştur. Bu göç dalgalarının toplumsal değerlerin ve onurun kaybı gibi sosyal sonuçları da olmuştur. Göçmenler ve yerliler arasında yaşanan çatışmalar 1998-2006 yılları arasında 186 kişinin ölmesine neden olmuştur(Akpodigaga-a & Odjugo, 2010, s. 50).

2.2.2. Ortadoğu'da İklim Krizi

Son zamanlarda yapılan istatistiklere göre Ortadoğu'da sıcaklıkların 21. yüzyılın ortalarına doğru 1,4 kat, sonlarına doğru ise 4 kat artacağı öngörülmektedir. Inter Tropik Bölgenin kuzeye doğru kaymasının bunda etkisi olduğu düşünülüyor. İklim değişikliğinden en çok etkilenecek coğrafyaların Doğu Akdeniz havzası, Türkiye, Suriye, kuzeydoğu İran ve Kuzey Irak olacağı tahmin edilmektedir(Evans, 2009, s. 417). Ortadoğu bölgesinde iklimsel sorunlar daha çok kuraklık, çölleşme ve su sıkıntısı üzerinedir. İçme suyu kaynaklarının oldukça sınırlı olması bölgeyi iklim değişikliği açısından riskli hale getirmektedir(Evans, 2009, s. 418).

Ortadoğu'nun özellikle MENA olarak bilinen, son zamanlarda majör bir uluslararası rekabet sahası olarak öne çıkan Doğu Akdeniz bölgesinin nüfusunun 2080 yılı itibariyle iki katına çıkması beklenmektedir. Bu nüfus artışı, iklim değişikliği ile birleşince bölgedeki su, toprak gibi doğal kaynakların paylaşımında ve işlenmesinde sorunlar ortaya çıkarmaktadır. Özellikle Körfez ülkeleri bir yıl içerisinde dünya ortalamasından daha fazla su tüketmektedirler. Bizce bu durumun nedeni bu devletlerde önde olan turizm ve otelcilik sektörüdür. Bununla birlikte Bahreyn, Kuveyt, Umman, Katar, Suudi Arabistan ve BAE gibi ülkelerin yıllık elektrik tüketimi dünya ortalamasından iki kat daha yüksektir.

Doğu Akdeniz havzası da Afrika'da olduğu gibi gıda ve gelir kaynağı olarak tarıma dayanır. Fırat-Dicle arasında bulunan "bereketli hilal" ve Nil nehri çevresi tarım için önemli bölgelerdir. Doğu Akdeniz bölgesi yılda 300 mm'den az yağış alır. Buna karşılık konvansiyonel tarım için

alt yağış sınırı yıllık 200-300 mm'dir. Bölge ülkeleri su sorunuyla, yeraltı suyu sondajı, atık suyun geri dönüştürülmesi gibi yöntemlerle mücadele etmektedirler. Ayrıca bölgenin pirinç ihtiyacının %70'i, mısır ihtiyacının da %60'ı ithalat yoluyla karşılanmaktadır. Gıda temininde dışa bağımlı bu ülkeler nüfus artışıyla birlikte daha da dışa bağımlı hale gelmektedirler(Waha vd., 2017, s. 1624).

İklim sorunlarının her biri her aktörü farklı şekilde etkilemektedir. Bu bölgede yaşanan en yıkıcı klimatolojik afetlerden biri 2007-2010 yılları arasında süren kuraklık dönemidir. Bunun yaşanmasının nedeninin iklim değişikliği olduğu düşünülmektedir. Özellikle Fırat-Dicle havzaları tehlike altındadır. Bazı çalışmalar iklim değişikliği-çatışma ilişkisine odaklanırken bazıları da çatışmanın iklim değişikliğini etkilediği yönündedir. Bu ilişki karşılıklıdır. İklim değişikliği çatışmaya neden olmakta ve çatışmalar da çevreye zarar vererek kurak bölgeleri etkilemektedir(Feitelson & Tubi, 2017, s. 40).

Kuraklığın bir afet olarak sayılması, yaşandığı toplum ve çevre üzerindeki etkilerine bağlıdır. Su kaynaklarının idaresinin bölge devletleri arasındaki ilişkiler üzerinde yoğun etkisi bulunmaktadır. Devletlerin su kaynakları üzerinde iş birliğini mi yoksa rekabeti mi tercih edeceği ilişkilerde ve çatışma ihtimalinde temel belirleyici olmaktadır. Devletlerin yeni durumlara adapte olma kapasitesi de önemli bir değişkendir(Feitelson & Tubi, 2017, s. 41). 2007 kuraklık dönemiyle birlikte Suriye'nin yenilenebilir enerji kaynakları %160 daralmış ve sürdürülebilirlik seviyesinin altına düşmüştür. Irak, Fırat havzasının en altında bulunan ülke olmasına rağmen kurak sezondan daha az etkilenmiştir çünkü Irak, Dicle Nehrinin sularından da istifade etmektedir. Kuraklıktan en çok etkilenen devlet Suriye olmuştur. Yukarıda bahsedildiği gibi, 2010'da sonlanan kuraklıktan hemen bir sene sonra iç savaş çıkmıştır(Feitelson & Tubi, 2017, s. 43).

2007 ve 2008 yıllarında Suriye'nin tahıl ve arpa verimliliği %47 azalmıştır. Hayvancılık sektöründe %80 daralma yaşanmıştır. Bir süre sonra kriz güney kesimlere de yayılmış ve Suriye yönetimi BM'den yardım istemek zorunda kalmıştır. Irak'ta ise Fırat Nehri çevreleyen bölgelerdeki 100 bin çiftçi tarlalarını bırakarak şehirlere göç etmişlerdir. Sorunlar karşısında Irak hükümetinin bir şey yapamaması ülkede tansiyonun yükselmesine neden olmuştur. Arap Baharı sonrası bölgede terör örgütleri hakimiyet kurmaya başlamıştır. DEAŞ terör örgütü Fırat nehrinin kritik bölgelerini ele geçirmiştir. Özellikle örgütün barajları ele geçirmesi suyu bir savaş aracı haline getirmiştir. Suyun militarize edilmesi Fırat'ın debisini daha da olumsuz etkilemiştir. Diğer yandan Türkiye bu dönemden ağır bir zarar görmeden çıkmıştır. Ancak Türkiye'nin de hayvancılık sektöründe %50 daralma yaşanmıştır.

Ortadoğu'nun diğer bölgelerine değinecek olursak, İsrail, Ürdün ve Batı Şeria'da kişi başına düşen su miktarı hem dünyanın hem de Ortadoğu'nun en düşük seviyesindedir. Ürdün'ün ana su kaynağı Şeria Nehridir. İsrail'in kontrolü altındaki Degania Barajı'nın su tutması nedeniyle Ürdün Şeria Nehrinden yeterince yararlanamamaktadır. Bununla birlikte İsrail'in Yermuk Nehri üzerine inşa ettiği barajlar da Ürdün'deki su sorununu derinleştirmektedir. Bu durum İsrail-Ürdün arasında birçok gerginliğin yaşanmasına neden olmuştur. İsrail ve Ürdün arasında

1994 yılında imzalanan barış antlaşması ve Oslo B antlaşması sorunları biraz olsun hafifletmiştir ancak kesin bir çözüm sunma noktasında yetersiz kalmıştır. Ürdün de artık İsrail'e güvenilmeyeceği varsayımı üzerinden siyasetine şekil vermektedir(Feitelson & Tubi, 2017, s. 44).

3. ÜÇÜNCÜ DÜNYA KAYNAKLI İKLİM SORUNLARININ AVRUPA YANSIMALARI

İklim krizi Dodo'ya göre Avrupa'nın güvenliği için temelde iki tür risk oluşturmaktadır. Bu risklerin ilki, Avrupa'nın enerji teminin açısından bağımlı olduğu Nijerya, Cezayir gibi devletlerin iklim değişikliğinden etkilenmesi sonucunda Avrupa'nın enerji güvenliğinin riske girmesidir. Petrol fiyatlarının artması sonucunda Avrupa ülkeleri Avrupa'nın ekonomik büyümesi yavaşlamaktadır(Dodo, 2014, s. 11). Enerji güvenliğinin etkileri sadece Avrupa ile sınırlı olmayacak, bu durum tüm dünya için ekonomik daralmaya neden olabilecektir(Dodo, 2014, s. 12).

İkinci önemli güvenlik tehdidi iklim temelli göçtür. Göç sonucu göçmenler ve yerli halk arasında ayrımcılık temelli çatışmalar yaşanması olasıdır. Hollanda, Belçika, İtalya gibi ülkelerde Müslüman göçmenler ve yerliler arasında devam eden sorunlar vardır. Bu gibi sorunlar yabancı düşmanlığı, İslamofobi gibi duyguları perçinlemektedir. Özellikle Fransa, Danimarka ve Hollanda'da son yıllarda İslamofobi ve yabancı düşmanlığı kaynaklı sorunlar sıkça yaşanmaktadır. Bununla birlikte ekonomik açıdan bazı sıkıntıları bulunan ve AB'nin güney sınırında bulduklarından göçe oldukça açık olan İtalya, Yunanistan ve Portekiz gibi ülkeler ülkelere milyonlarca göçmen almış ve ekonomileri de göçten olumsuz etkilenmiştir(Dodo, 2014, s. 11). Avrupa güvenliğine yönelen bu iki temel tehdit aşağıda daha detaylı şekilde tartışılacaktır.

3.1. Enerji Sektörüne Yansımaları

Enerji kaynakları dünya genelinde eşit olarak dağılmamış ve bazı bölgelerde yoğunlaşmıştır. Bu da bazı devletlerin enerji tedariki açısından dışa bağımlı olmalarına neden olmaktadır. AB ülkeleri de enerji tedarikinde dışa bağımlı durumdadırlar. Bu bağımlılık durumu özellikle petrol ve doğalgazın yoğunlaştığı bölgelerin iklim değişikliğinden en kötü etkilenen ve bu nedenle istikrarsızlaşan veya istikrarsızlaşma riski olan bölgelerden enerji ithalatını zorunlu kılmıştır. Bu nedenle Basra bölgesindeki enerji rezervleri AB için endişe konusu olmaktadır. AB tarihsel olarak da birçok kez enerjide dışa bağımlılık nedeniyle sorunlar yaşamıştır. AB, 1973 ve 1979 yıllarında yaşanan büyük çaplı petrol krizlerinden etkilenmiştir. 1973 yılında OPEC'in İsrail destekçisi olduğu varsayılan devletlere petrol ambargosu uygulaması ve 1979'da İran İslam Devrimi'nin meydana getirdiği siyasi karışıklık petrol fiyatlarının artmasına neden olmuştur. Bir yıllık bir süre içinde AB'nin büyüme oranı %6'dan %3,1'e düşmüştür. Aynı yıl AB'nin ekonomisinde %0,6 daralma yaşanmıştır(Elüstü, 2021, s. 139).

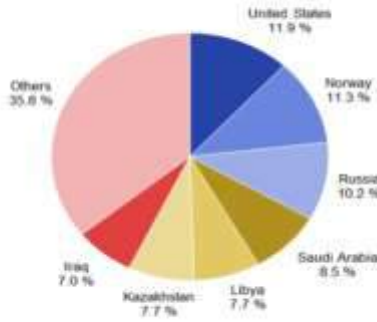
2022 yılına kadar Avrupa'nın temel petrol ve doğalgaz sağlayıcısı Rusya'dır. Ancak 24 Şubat 2022 tarihinde başlayan Rusya-Ukrayna savaşı sonucunda AB, Rus ham petrolüne 5 Aralık

2022 tarihinde ambargo koymuştur. 2023 yılının son çeyreğinde Rus petrolünün AB pazarındaki payı %3,5'e gerilemiştir. Doğalgazda da benzer bir tablo ortaya çıkmış ve Rus gazının AB pazarındaki payı 2022 yılının son çeyreğinde %19,0 iken 2023'ün aynı döneminde %12,7'ye gerilemiştir. Bu daralmanın sonucunda AB için üçüncü dünyadan gelen fosil yakıt kaynaklarının önemi artmıştır.

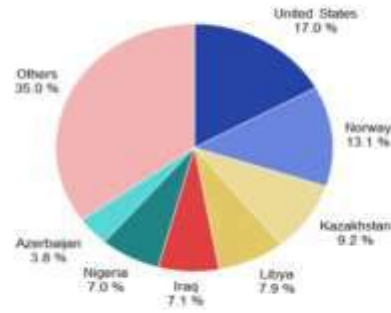
Tablo 1: AB'nin Petrol İthalatı %

EU imports of petroleum oils by partner
(share (%) of trade in value)

Fourth quarter of 2022



Fourth quarter of 2023



Source: Eurostat database (Comext) and Eurostat estimates

eurostat

Kaynak: European Commission

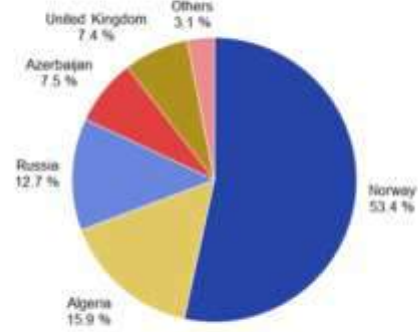
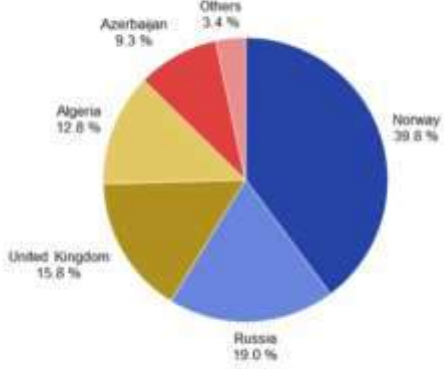
Tablo 1'deki verileri incelediğimizde 2022 yılının son çeyreğinde toplamda Libya, Irak ve Suudi Arabistan olmak üzere toplam 3 Ortadoğu ülkesinden yapılan petrol ithalatı ön plandadır. 2023 yılında ise bu ülkeler arasında Suudi Arabistan geride kalırken onun yerini yine bir üçüncü dünya ülkesi olan Nijerya almıştır. 2022 yılının son çeyreğinde Libya'dan sağlanan petrol %7,7, Suudi Arabistan'dan sağlanan petrol %8,5, Irak'tan sağlanan petrol ise %7,0 ve toplamda %23,2 olarak kayıtlara geçmiştir. 2023 yılının verilerinde baktığımızda ise Nijerya'dan gelen petrol %7,0, Libya'dan %7,9, ve Irak'tan sağlanan petrol %7,1, toplamda Ortadoğu'dan sağlanan petrol %22 olarak gerçekleşmiştir.

Tablo. 2: AB'nin Doğalgaz İthalatı

EU imports of natural gas in gaseous state by partner
(share (%) of trade in value)

Fourth quarter of 2022

Fourth quarter of 2023



Source: Eurostat database (Comext) and Eurostat estimates

eurostat

Kaynak: European Commission

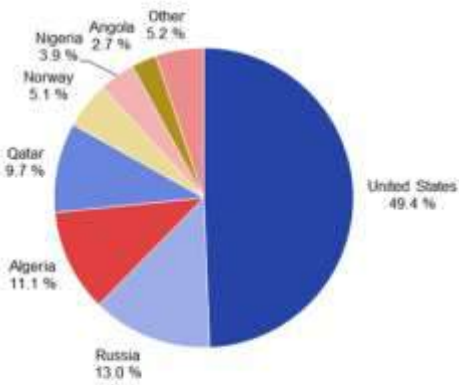
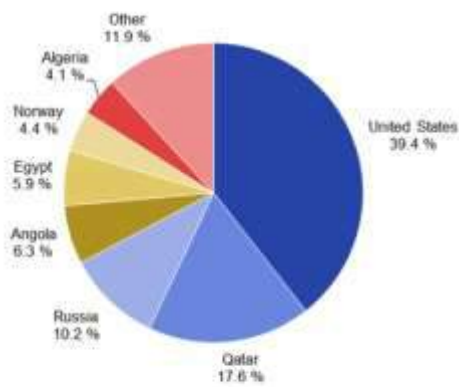
AB'nin doğalgaz ithalatı istatistiklerine baktığımızda ise yalnızca tek bir üçüncü dünya ülkesi olan Cezayir ile karşılaşırız. 2022 yılının son çeyreğinde AB'nin Cezayir'den ithal ettiği doğalgaz %12,8 ilen 2023 yılının aynı döneminde %15,9 olarak gerçekleşmiştir. Grafiğe göre AB'nin en çok doğal gaz ithalatını Norveç'ten yaptığını görüyoruz.

Tablo. 3: AB'nin LNG İthalatı

EU imports of liquefied natural gas by partner
(share (%) of trade in value)

Fourth quarter of 2022

Fourth quarter of 2023



Source: Eurostat database (Comext) and Eurostat estimates

eurostat

Kaynak: European Commission

Sıvılaştırılmış doğalgaz (LNG) ithalatında ise oldukça farklı bir durum göze çarpmakta. 2022'nin yon çeyreğindeki istatistiklere baktığımızda toplamda 4 üçüncü dünya ülkesinden yapılan ithalat öne çıkmaktadır. Bunlar %4,1 ile Cezayir, %5,9 ile Mısır, %6,3 ile Angola ve %17,6 ile Katar'dır. Bu ülkelerden yapılan toplam sıvılaştırılmış doğalgaz ithalatı %33,9 rakamına tekabül eder. 2023 yılının aynı döneminde ise ithalat yapılan Ortadoğu ve Afrika ülkelerinin sayısında değişim olmamış Mısır'ın yerini Nijerya almıştır. Bu yılın istatistiklerine göre Nijerya'dan sağlanan gaz %3,9, Angola'dan sağlanan %2,7, Katar'dan sağlanan %9,7 ve Cezayir'den sağlanan ise %11,1, toplamda %27,4'tür(*EU Imports of Energy Products - Latest Developments*, 2023).

AB enerji ithalatında daha çok Rusya'ya bağımlıdır. Rusya'nın AB'nin bu zayıf yönünü baskı aracı haline getirmesi ve bunu elinde politik bir koz olarak bulundurması AB'ni alternatif enerji tedarikçilerine yönlendirmiştir. Bu alternatiflerden biri Norveç'tir. Tablo.2'de bu durum açıkça görülmektedir. Norveç'in AB enerji tedarikinde önemli bir yere gelmesi 1982 yılında olmuştur(Elüstü, 2021, s. 141).

Enerji tedarikinin yapıldığı ülkelerin istikrarsız olması, enerji kaynakları üzerinde rekabet yaşanması, doğal afetler vb. enerji güvenliğini olumsuz etkilemektedir. Avrupa Komisyonu enerji güvenliğini “enerji kaynaklarının çevresel kaygılara da uyarak uygun fiyata kesintisiz tedariki” olarak tanımlamıştır(Elüstü, 2021, s. 143).

Avrupa, Ortadoğu ve Afrika'dan ithal ettiği enerjinin kesilmesi durumunda eğer kaynaklarını çeşitlendirmese Rusya'ya uyguladığı ambargolardan vazgeçmek durumunda kalacak ve enerji ithalatında tamamen Rusya'ya bağımlı kalma riski taşıyacaktır. Rusya ile sık sık sorun yaşayan Avrupa, Rusya'nın enerjiyi bir siyasi baskı aracı olarak kullanması durumunda enerjiye erişememe riski taşıyacaktır. Bu durumda Avrupa'nın yapabileceği en önemli hamle ithalat kaynaklarını çeşitlendirmek, kendi bünyesinde bulunan yenilenebilir enerji kaynaklarını kullanmak veya emekli ettiği nükleer santralleri yeniden devreye sokmak olabilir.

3.2. Avrupa'da İklim Göçünün Yansımaları

İklim değişikliğinin tetiklediği göç daha çok ülke içinde olsa da günümüzde bu tür göç ülke hudutlarını aşmaya başlamıştır(Sağsen, 2020, s. 301). Bu göçler ülke içerisinde veya sınır ötesi olabileceği gibi geçici veya kalıcı olabilir. Literatürde klimatolojik afetler veya kıtlık nedeniyle göç etmek zorunda kalmış kişiler “iklim mültecileri”, “çevre mültecileri” veya “iklim göçmenleri” olarak geçmektedir(Külüşlü, 2021, s. 1180).

2009-2017 yılları arasında 2.2 Milyondan fazla düzensiz göçmen AB sınırlarına gelmiştir. 2009-2016 arasında AB üyesi olmayan ülkelere gelen göçün 13 milyon kişi civarı olduğu düşünülmektedir. Özellikle düzensiz göçmenler AB'nde milliyetçi duyguları tetikleyerek popülist partilerin yükselişine zemin hazırlamıştır(Cottier & Salehyan, 2021, s. 2). Avrupa'ya yönelik düzensiz göç yoğun olarak Suriye, Irak ve Afganistan'dan gelmektedir. Bununla birlikte AB'nin göç aldığı ana bölgeler Afrika ve Ortadoğu ve Güney Asya yani Üçüncü

Dünya'dır. Suriye, Afganistan, Irak, Eritre ve Nijerya'dan gelen göç AB'te gelen tüm göçün %64'üne denk gelmektedir(Cottier & Salehyan, 2021, s. 3).

Üçüncü Dünya'dan Avrupa'ya yönelen göç iklim değişikliğinin ortaya çıkardığı birçok güvenlik tehdidinden biridir. Güvenlikleştirilen iklim değişikliğine bağlı göçle ilgili olarak AB bünyesinde farklı sesler yükselmektedir. Bir grup klasik tepki vererek iklim göçünde karşı alınacak en iyi önlemin daha sıkı göç politikaları takip etmesi olduğunu düşünmektedir. Bir diğer görüş iklim göçünün güvenlikleştirilmesinin temelsiz olduğunu ve göç dalgalarının süresi, yapısı ve yönü ile ilgili verilerin çarpıtıldığı yönündedir. Son olarak İklim göçünü göç kontrolü politikalarının Avrupa dışında da taşınması için bir sebep olarak gören bir görüş bulunmaktadır(Goff vd., 2012, s. 195).

Göç olgusu yekpare bir olgu değildir. Farklı türdeki göçler farklı güvenlik zaafiyetleri meydana getirmektedir. Üçüncü Dünyadan Avrupa'ya doğru gelen göç temelde normal veya yasal göç (legal migration) yasa dışı veya düzensiz göç (irregular/illegal migration) ve zorunlu göç (involuntary migration) olarak üç kategoriye ayrılabilir(Goff vd., 2012, s. 196). Son grup daha çok deniz seviyesindeki yükselmeye bağlı olarak sular altında kalma riski taşıyan devletler için geçerlidir. 2011 yılında yaşanan göç dalgasıyla birlikte Avrupa Komisyonu'nun gözlemlerine göre göç konusunda AB ülkeleri arasındaki iş birliğinin artması gerektiğini ve göçe daha yoğun şekilde maruz kalan devletlere destek sağlama noktasında AB'nin kaynaklarının yeterli olmayacağı görülmüştür(Goff vd., 2012, s. 197).

Afrika'da yaşanan ani fırtınalar ve tarım alanlarının kaybı Avrupa üzerinde baskı oluşturmaktadır. Zira Afrika ve Ortadoğu coğrafi açıdan Avrupa'ya yakındır. Avrupa'ya akan göç sosyal ve politik sonuçlar da meydana getirmekte, Avrupa'nın ekonomisini kötü şekilde etkilemektedir. Avrupa'ya gelen göçmenler geri dönme konusunda isteksizdir. Çünkü göçmenler burada aileler kurmuş veya çalışmakta olup geldikleri ülkede kalan ailelerinde para göndermektedirler(Goff vd., 2012, s. 198). Sonuçları açısından göç işsizliği artırabilmekte, gruplar arasında çekişmelere yol açabilmekte ve aşırı durumlarda çatışmaya bile neden olabilmektedir(Goff vd., 2012, s. 199). Afrika nüfus artış ve şehirleşme hızı dünyanın geri kalanına göre en çok olan kıtadır. Bu hızlı nüfus artışı ve şehirleşme olağan dışı hava olaylarında taşkın ve su baskını riskini artırmakta ve milyonlarca insanı göç etmeye mecbur bırakma potansiyeli taşımaktadır(Goff vd., 2012, s. 202).

İklim göçüne bağlı güvenlik riskleri temelde dört kategoride toplanabilir:

- Uluslararası sistemin istikrarsızlaşması
- Göç alan ülkelerin hükümetleri ve kurumlarının karşılaşılabileceği zorluklar
- Etnik/Kültürler Arası çatışma
- Göç alan devlet vatandaşlarından göçmenlere karşı gelebilecek (ayrımcılık vb.) tehditler(Goff vd., 2012, s. 207)

Tablo:10. Afrika Kaynaklı Göçün Güvenliğe Etkisinin Analizi

Göç Türü	Göçün Boyutu	Mevcut Afrika Nüfusu	Mevcut Afrika Nüfusunun 10 Katı
Kontrollü/Yasal Göç		DÜŞÜK Güvenlik Riski -Etnik gerginlik -Sosyal hizmetler üzerinde baskı -Yükselen Milliyetçi duygular	DÜŞÜK/ORTA Güvenlik Riski -Etnik gerginlik/çatışma -Sosyal hizmetler üzerinde baskı -Yüksek Milliyetçi Duygular
Düzensiz/Yasadışı Göç		DÜŞÜK Güvenlik Riski -Etnik gerginlik - İnsan ticareti ve kaçakçılığı - Suç oranında yükselme	ORTA/YÜKSEK Güvenlik Riski -Etnik gerginlik -Yüksek Suç Oranı -Paralel yönetim oluşumları -Hükümete olan güvende azalma
Toplu Yer Değiştirme		ORTA Yerel Risk -Etnik gerginlik -Sosyal hizmetlerde kilitlenme -İnsan hakları ihlalleri	YÜKSEK Güvenlik Riski -Çevresel kriz -Sosyal hizmetlerde kilitlenme -Mülteci kampı benzeri yapıların ortaya çıkması

Kaynak: Goff, Zarin ve Goodman (2012) s. 207

Tablo 4.'te görüldüğü üzere şimdiki Afrika nüfusunu göz önüne aldığımızda ve kontrollü bir göç yaşandığında öngörülen riskler etnik gerginlik, milliyetçi duyguların artması ve sosyal hizmetler yük binmesi gibi sorunlardır. Bu sorunlar tabloda her ne kadar “düşük risk” olarak kategorize edilmiş olsa da olağanüstü durumlarda ciddi sonuçları olabilecek sorunlardır. Afrika nüfusunun on katına çıkması durumunda aşırı milliyetçilik, sosyal programlar üzerindeki aşırı yüklenme ve etnik çekişmelerin çatışmaya dönüşmesi durumu riski orta düzeye çıkarmıştır.

Düzensiz göç yaşanması durumunda yaşanabilecek güvenlik sorunları her üç durumda gözlemlendiği gibi etnik çekişme dışında insan kaçakçılığı ve suç oranında artış olarak tespit edilmiştir. Nüfusun on katıyla çarpıldığında ise risk orta-yüksek olarak görülmüştür. Nüfusun on katı olması durumunda paralel yönetimlerin oluşması ve hükümete güvenin azalması gibi risk unsurları da eklenmektedir. Kısa bir dönemde toplu yer değiştirme gibi ekstrem bir durumda ise şimdiki Afrika nüfusuna göre yapılan risk tanımlamasında Orta risk görülmüştür. Ancak nüfusun on kat fazla olduğu düşünülürse yüksek risk tanımlaması yapılmaktadır. Bu gibi bir durum en kötü senaryo olup çevresel krizlere, sosyal hizmetlerin çökmesine ve mülteci kamplarının/geçici barınma tesislerine yönelik gereksinimin ortaya çıkmasına neden olabilecektir.

IPCC, 2050 yılına kadar deniz seviyelerinin 15 ila 25 cm yükseleceğini öngörmektedir. Su seviyesinin yükselmesi verimli toprakların erozyonu, sahil bölgelerinin sular altında kalması gibi sonuçları olacağını ve bunun da iklim göçünü tetikleyeceğini açıklanmıştır(Amelie, 2022, s. 1). Göç alan ülkeler açısından ciddi güvenlik risklerinden bahsedilebilir. Göç devletlerin kasasından para çıkması anlamına gelmektedir. Bu durum kamu hizmetleri ve altyapı üzerinde baskı oluşturmakta ve kıt kaynaklar üzerinde anlaşmazlıklara neden olmaktadır. Risk sadece Avrupa özelinde değildir. Riskler spill-over etkisi ile kolayca küresel güvenlik risklerine dönüşebilmektedir.

Ortadoğu ve Afrika özellikle tehlikeli alanlardır. Avrupa'nın bölgeye coğrafi yakınlığı ise Avrupa'nın iklim göçmenlerinin ilk durağı olmasına neden olmaktadır. AB'nin yapmış olduğu bazı düzenlemeler göçe karşı önleyici ve ön alıcı tedbirler alınması açısından işlevsel olabilecektir. Örneğin Avrupa Yeşil Sözleşme (European Green Deal) ve Avrupa İklim yasası (European Climate Law) gibi mevzuatlar iklim değişikliğinin önünü alarak iklim temelli göçün de önüne geçebileceği düşünülmektedir. Bu şekilde AB, iklim değişikliğinden kötü etkilenen Sahel, Doğu Akdeniz havzası gibi bölgelerde de iklim değişikliği ile mücadele ve adaptasyon stratejileri konusunda destekte bulunarak göçle mücadele etmek için alternatif bir strateji kurgulamıştır. Ayrıca iklim temelli göç ile ilgili ulusal/uluslararası mevzuat eksikliğini gidermek yönünde çalışmaların yapılması da AB için önemli bir stratejidir(Amelie, 2022, s. 2).

Bize göre en büyük güvenlik sorunu hukuksal sorunlardır. Sağsen'in de belirttiği gibi Uluslararası hukukta göç ile ilgili düzenlemelerinde diğer devletlerin koruma sorumluluğu bulunan kişiler olarak mülteciler, vatansızlar, vb. kişiler zikredilmektedir. Bu tanımlamalar genelde çatışma ve savaş sonucunda ülkesinden ayrılmak zorunda kalmış kişileri kapsar. Ancak İklim göçü gibi olgular nedeniyle yer değiştirmek zorunda kalmış kişilerle ilgili hukuki düzenleme bulunmamaktadır(Sağsen, 2020, s. 304). Göçmenlerin iklimsel sorunlardan mı yoksa başka sorunlardan dolayı mı göç ettiklerinin tespit edilmesi de zor olduğundan bu gibi düzenlemelerde tam olarak kimlerin iklim mültecisi sayılacağı ile ilgili net ilkeler belirlenmelidir.

SONUÇ

İklim deęişikliği günümüzde Avrupa güvenliğini etkileyen en önemli sorunlardan biri haline gelmiştir. Bulgularımıza göre Avrupa'nın enerjide dışa bağımlılığı, coğrafi konumu nedeniyle küresel iklim deęişikliğinin en ciddi etkilerinin hissedildiği Üçüncü Dünya'dan göç almaya yatkın olması başlıca güvenlik tehditleridir. Bunlara ek olarak Üçüncü Dünya'da yer alan başarısız ve serseri devletlerden dolayı ana arter ticaret yollarının tehdit altına girmesi, göç sonucunda insan hakları ve onurunun korunmasının zorlaşacağı öngörülebilir. Avrupa kendisini bu gibi tehditlerden korumak adına Afrika ve Ortadoğu'ya yönelik politikaları bu bölgedeki devletlerin tepkisine neden olmaktadır.

Üçüncü Dünya, Avrupa'nın sanayi toplumuna geçiş sürecinde henüz çevre ile ilgili kurallar ve düzenlemeler yokken ve iklim deęişikliği bir güvenlik tehdidi olarak tanımlanmamışken sanayileşmek adına çevreyi kirleterek ekonomik olarak gelişmiş ancak Üçüncü Dünya ülkeleri kalkınma adımlarına henüz yeni başlarken iklim deęişikliği ve küresel ısınma olgusunu bahane ederek henüz yeni kalkınan ülkelerin gelişimini engellediğini öne sürmüştür. İklim deęişikliğine karşı alınması gereken önlemler ve ekonomik kalkınma arasında bir kontrast olduğu göz önünde bulundurulursa, devletlerin çevrenin korunmasını mı yoksa iklim deęişikliğinin yol açtığı tahribatı mı önceleyeceklerini zaman gösterecektir.

Realist bakış açısı ile yaklaşacak olursak, devletler nispi çıkar peşinde olduklarından ve yüksek politika alanlarına önem vermelerinden dolayı ekonomik kalkınmayı önceleyebileceklerinin tahmin edebiliriz. Realist bakış açısına göre iklim düşük politika alanı içerisinde kabul edilmektedir. Yukarıda bahsedildiği gibi şehirleşme ve sanayileşmenin devam etmesi, nüfus artışı nedeniyle ormanlık alanların imara açılması vb. sebeplerden dolayı birçok bölgede hava kirliliğinin artacağı ve bunun da akciğer hastalıkları ve kanser gibi hastalıkların artmasına neden olacağı göz önünde bulundurulursa, devletler için iklim artık bir yüksek politika alanına dönüşecektir. Şehirler yaşanamayacak bir hale gelirse devletler aksiyon almak zorunda kalacaklardır.

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SUSTAINABLE DEVELOPMENT AND DISTANCE EDUCATION: THE IMPACT OF ONLINE PLATFORMS AND DIGITAL TOOLS

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ABSTRACT

This study analyzes various distance education programmes implemented in the fields of sustainable development education and language learning. The programmes examined include "The Science of Well-Being" (Yale University & Coursera), "Global Action Programme (GAP) on ESD" (UNESCO), "Language for Resilience" (UNDP), "Learn Turkish" (Yunus Emre Enstitüsü), and "TEMA Vakfı Nature Education Programmes" (TEMA Foundation). These programmes leverage modern technologies to reach a broad audience and contribute to sustainable development goals. Additionally, these programmes utilize communication strategies and public relations tools to enhance outreach and engagement, ensuring that educational content is effectively disseminated and that learners remain engaged and motivated. Effective communication strategies are crucial in maintaining high levels of engagement and ensuring the educational content reaches its intended audience. The qualitative method and content analysis used in the research allowed for a comprehensive evaluation of the programmes' goals, technological infrastructure, accessibility, and costs. The selection criteria for the programmes included their ability to reach a wide audience, use of technological infrastructure, contribution to sustainable development goals, positive feedback, and interaction levels. "The Science of Well-Being" programme offers science-based strategies to increase happiness and well-being; GAP aims to integrate sustainable development education into all learning processes; "Language for Resilience" supports the social and economic integration of refugees; "Learn Turkish" provides education for those who want to learn Turkish as a foreign language; and TEMA Foundation conducts environmental education programmes to raise awareness of sustainability. These programmes reach a wide audience through online platforms, mobile applications, and digital educational materials, ensuring educational equity. Positive feedback from participants demonstrates the effectiveness of these programmes and their contribution to sustainable development goals. The study's findings indicate that such programmes play a significant role in achieving sustainable development objectives and highlight the critical importance of developing and expanding similar programmes. This study emphasizes the effectiveness of using modern technologies and digital tools in education to achieve sustainable development goals. The results underline the importance of digital transformation in ensuring educational equity and reaching a broad audience.

Keywords: Sustainable Development, Distance Education, Digital Tools, Online Platforms, Social Integration.

INTRODUCTION

In the first decade of the 21st century, the world faced complex and interconnected challenges. Unsustainable growth is the root cause of these challenges. Addressing these issues requires stronger political responsibility and effective actions. At this point, societies equipped with knowledge, technology, and skills are crucial for building a sustainable future. Education for Sustainable Development (ESD) is an investment in the future and can be a lifesaving measure, especially in post-war and underdeveloped countries. The role of education in this context is not limited to transmitting knowledge but also equipping individuals with the competencies needed to participate in a sustainable life, society, and business world (ESD in Action, 2012). Effective communication and public relations strategies are integral to ensuring the success and reach of educational programmes, making them accessible and engaging for diverse audiences (Thoms & Eryilmaz, 2014).

Distance education is a method of education where learners and instructors are separated by time and place. Distance education is delivered through printed materials, audio and video recordings, computer programmes, and web-based applications. Saykılı (2018) defines distance education as an institutional-based form of education where learners and instructors are separated and interactive telecommunications systems are used. The development of distance education can be explained through various generations parallel to technological advancements: first-generation correspondence education, second-generation multimedia methods, and third-generation internet-based education. Today, fifth-generation intelligent flexible learning methods utilize interactive multimedia and automated response systems to make individual pedagogical experiences more economical and effective (Garlinska et al., 2023).

Sustainable development (SD) is a development model aimed at maintaining economic, social, and environmental balances to meet the needs of present and future generations. The core principle of SD is to achieve economic growth while preserving natural resources and ecosystems. This model targets not only environmental sustainability but also social justice and economic prosperity. Today, sustainable development is further reinforced by the United Nations' 2030 SDGs. These goals include ending poverty, achieving social equality, conserving essential resources like water and energy, and combating climate change (United Nations, 2020). SDG 4 (Quality Education) emphasizes the integration of education with sustainable development, and while SDG 13 (Climate Action) focuses primarily on combating climate change, education plays a crucial role in raising awareness and equipping individuals with the knowledge and skills needed to adapt to and mitigate the effects of climate change. UNESCO plays a critical role in achieving sustainable development through education.

The mission of ESD significantly contributes to these goals. ESD is supported by monitoring and evaluation processes in education and requires global cooperation. For instance, the GAP on ESD, launched in 2015, aims to make ESD more effective and widespread. The framework for ESD for 2030, which follows GAP, continues these efforts, aiming to increase the role of education in building a more just and sustainable world (UNESCO, 2020). The COVID-19

pandemic has accelerated the digital transformation of education systems and increased the importance of distance education. During the pandemic, billions of students worldwide were introduced to remote learning, highlighting the need for access to digital technologies and the development of digital skills. However, the digital divide has led to significant inequalities in education access, particularly in low-income countries. Therefore, increasing the accessibility and use of digital technologies is a critical step toward achieving sustainable education goals (World Bank, 2021).

Today, environmental issues such as climate change, biodiversity loss, and the depletion of natural resources require urgent action for sustainable development. In this context, ESD aims to foster environmental awareness and enable individuals to actively participate in combating climate change. Digital learning platforms and distance education have become important tools supporting this process. The importance of using technology in education is emphasized, and the individual and institutional benefits of distance education are evaluated. The correct selection of technologies in distance education is a factor that directly impacts the success of the programmes. Recent studies highlight that the use of technology in education is feasible only if students have access to these technologies. In this context, it is crucial for students who will receive education at home to have technological equipment and internet access. The need for distance education technologies became even more apparent during the COVID-19 pandemic (Brasca et al., 2022). Additionally, a UNESCO report emphasizes the importance of ensuring effective distance learning during the pandemic, indicating the necessity for increased accessibility and the development of digital skills to bridge the digital divide (UNESCO, 2023).

Managing costs in distance education is critical for the sustainability of the programmes. Developing and distributing these programmes can be expensive, and these costs can vary depending on the number of students. Recent studies indicate that while television broadcast courses become more economical as they reach larger audiences, the opposite is true for online education (Prescott, 2020). To increase the cost-effectiveness of the technologies used in education, open-source software and local technological solutions are emphasized (Puckett et al., 2021). Success in distance education is achieved not only through technological infrastructure but also through effective teaching strategies. Behavioral theories argue that learning occurs through external environmental influences and that managing this environment is essential for achieving desired learning outcomes. These theories have been effective in developing computer-based educational programmes in DE. Cognitive and humanistic psychology, on the other hand, emphasize the importance of strategies that enable learners to manage their own learning processes and contribute to their personal development (Mehrpooyan, 2022; Koh&Daniel, 2022).

Effective planning of the online curriculum is key to success in distance education. The effectiveness of web-based courses depends on the accessibility of all course content for both students and teachers. Resources and materials must be presented digitally and diversified to cater to different learning styles. Email and discussion forums allow shy students to express

and develop their thoughts (Sato et al., 2024; Chan et al., 2021). Student-teacher and student-student interactions in DE are crucial elements that enhance the effectiveness of the learning process. Interactive lessons provided through online platforms increase students' motivation and help them understand the course material better. Many of today's online education platforms support these interactions through tools such as live lessons, discussion forums, and instant messaging (Sun et al., 2022).

The study aims to address the challenges of integrating sustainable development education into various learning processes and evaluate the effectiveness of distance education programs, including The Science of Well-Being, Global Action Programme on ESD, Language for Resilience, Learn Turkish, and Nature Education Programs, in achieving Sustainable Development Goals.

MATERIALS AND METHOD

This study employs a qualitative research method to analyze various programmes implemented in the fields of sustainable development education and language learning. The qualitative research method allows researchers to gain a comprehensive understanding of a particular topic (Creswell, 2013). The primary reason for selecting this method is to obtain rich data about the goals of the examined programmes, the technological infrastructure used, accessibility, costs, and their contributions to the SDGs. The qualitative research method and content analysis were chosen because they provide detailed information about the programmes being examined. These methods allow for a comprehensive evaluation of the programmes' impact on their target audiences, technological infrastructure, accessibility, and contributions to SDGs. Additionally, these methods facilitate the collection and analysis of qualitative data, such as student feedback and interaction levels. The platforms used for these courses, such as Coursera and various UN-related digital platforms, serve as critical means of communication, facilitating interaction between educators and learners. According to Thoms and Eryilmaz (2014), the choice of media significantly affects learner interactions in distance learning environments. These platforms not only deliver educational content but also enhance engagement through features like discussion forums, live chats, and interactive assignments. This integration of communication tools ensures that the programmes are accessible and effective, reaching a wide audience while fostering an interactive and supportive learning environment.

The research included five different programmes selected as exemplary in the fields of sustainable development and distance education, using various digital tools and online platforms to reach a broad audience. The selected samples are:

1. The Science of Well-Being (by Yale University & Coursera)
2. Global Action Programme (GAP) on ESD (by UNESCO)
3. Language for Resilience (by UNDP)
4. Learn Turkish (by Yunus Emre Enstitüsü)

5. Nature Education Programmes (by TEMA Foundation)

These samples were chosen for their innovative approaches and effectiveness in leveraging digital tools and platforms to achieve their educational goals and contribute to sustainable development objectives.

During the data collection process, the official websites of the programmes, published reports, and academic literature were reviewed. Additionally, the online courses, mobile applications, and digital educational materials offered by these programmes were examined. The data obtained from these sources were analyzed using the content analysis method. Content analysis is a systematic process of examining the meaning and content of texts to identify specific themes and patterns (Krippendorff, 2018).

RESULTS AND DISCUSSION

This study examines different programmes implemented in the field of sustainable development education. In the Findings section, both international and Turkey-based programmes are discussed, and the objectives of these programmes, the technological infrastructure used, accessibility, costs, and their contributions to the SDGs are evaluated.

The selected programmes as samples are exemplary in the fields of sustainable development and distance education, utilizing various digital tools and online platforms to reach a broad audience. The criteria considered in the selection of these programmes are as follows:

1. **Scope and Accessibility:** The programmes' ability to appeal to a broad audience and reach various demographic groups has been prioritized.
2. **Technological Infrastructure:** The use of modern technologies, such as online platforms, mobile applications, and digital educational materials, has been evaluated.
3. **Contribution to SDGs:** The alignment of the programmes with the United Nations' 2030 SDGs and their contribution to these goals have been taken into consideration.
4. **Positive Feedback and Interaction:** Feedback from students and the level of interaction within the programmes have been examined.
5. **Diversity:** A balanced distribution of programmes implemented both internationally and in Turkey has been ensured.

Table 1 below outlines the sample sustainable development education programmes analyzed in this study. Each programme's objectives, technological infrastructure, accessibility, costs, and contributions to the SDGs are evaluated.

Table 1. Online Sustainable Development Education Programmes

Programme	Organization	Goals	Technological Infrastructure	Accessibility & Cost	Student Feedback and Interaction	SDG Contributions
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The Science of Well-Being	Yale University & Coursera	Increase happiness and well-being through science-based strategies	Online courses, mobile applications, interactive assignments	Free access with optional paid certificate	Positive feedback, practical strategies for daily life, interactive lessons and assignments	Good Health and Well-being (SDG 3), Quality Education (SDG 4)
Global Action Programme (GAP) on ESD	UNESCO	Integrate sustainable development education into all learning processes	Online courses, webinars, digital libraries, interactive learning tools	Mostly free or low-cost educational resources	Positive feedback, enhanced awareness and competencies in sustainable development, interactive platforms	Quality Education (SDG 4), Climate Action (SDG 13), Sustainable Cities and Communities (SDG 11)
Language for Resilience	UNDP	Support social and economic integration of refugees through language learning	Online platforms, mobile applications, digital educational materials	Mostly free or low-cost, funded by international donors and local partners	Positive feedback, practical language skills, interactive classes and language exchange programmes	Quality Education (SDG 4), Decent Work and Economic Growth (SDG 8), Peace, Justice and Strong Institutions (SDG 16)
Learn Turkish	Yunus Emre Enstitüsü	Promote Turkish language and culture, support social and economic integration of Turkish learners	Online courses, mobile applications, digital educational materials	Mostly free or low-cost, supported by local cultural centers	Positive feedback, improved understanding of Turkish language and culture, interactive classes and resources	Quality Education (SDG 4), Peace, Justice and Strong Institutions (SDG 16)
Nature Education Programmes	TEMA Vakfi	Increase environmental awareness and promote sustainable living practices	Online educational materials, webinars, interactive learning tools	Free, funded by donors and sponsors	Positive feedback, increased environmental awareness and sustainable practices, interactive tools and field activities	Quality Education (SDG 4), Sustainable Cities and Communities (SDG 11), Climate Action (SDG 13)

Programme 1: "The Science of Well-Being" Course by Coursera and Yale University

Goals of the Programme: A current example of sustainable development education in distance learning is "The Science of Well-Being" course offered by Yale University on Coursera. This course teaches scientifically supported strategies to enhance happiness and well-being, promoting equality and accessibility in education by reaching a broad audience.

Based on research in the science of happiness and positive psychology, the course provides practical strategies to increase happiness. Main topics include myths about happiness, developing positive habits, the importance of social connections, and living a meaningful life (Yale University, 2024).

Technological Infrastructure and Accessibility: The Coursera platform delivers course materials through video lectures, reading materials, quizzes, and interactive assignments. Its user-friendly interface allows students to easily access the course and track their progress. Additionally, Coursera's mobile applications enable students to participate in classes anytime and anywhere.

Cost and Access: "The Science of Well-Being" course is offered for free, with an optional paid certificate available for students who wish to obtain one. This model supports the principles of equality and accessibility in education by reaching a wide audience. Given the increased demand for digital education during the pandemic, such free courses make significant contributions to educational equity.

Student Feedback and Interaction: The course has been completed by millions of students worldwide and has received positive feedback. Students have noted that the course content positively impacts their lives and that the strategies they learn are applicable in their daily routines. Additionally, Coursera's discussion forums and group projects enhance interaction among students, providing a deeper learning experience.

Contribution to SDGs: "The Science of Well-Being" course directly contributes to the United Nations' 2030 SDGs, specifically good health and well-being (SDG 3) and quality education (SDG 4). By improving individuals' psychological and emotional health, the course helps create healthier and happier communities. Additionally, by offering free access, it supports the principle of equality in education.

Programme 2: UNESCO's Global Action Programme (GAP) on ESD

Goals of the Programme: The GAP on ESD, initiated by UNESCO, is a significant initiative widely implemented worldwide. Launched in 2015, GAP builds on the success of the United Nations Decade of Education for Sustainable Development (2005-2014).

GAP aims to integrate ESD into all education and learning processes. The programme focuses on five main priority areas:

1. Providing policy support
2. Integrating sustainability into education and learning
3. Increasing the capacity of educators
4. Empowering youth and engaging students
5. Developing education practices for sustainable development at the local level (UNESCO, 2016)

Technological Infrastructure and Accessibility: GAP aims to increase access to EDS by utilizing digital education resources and online platforms. UNESCO offers a variety of digital resources, such as online courses, webinars, digital libraries, and interactive learning tools. These resources enable educators and students to acquire knowledge and develop competencies in sustainable development topics.

Cost and Access: Educational resources within GAP are typically offered for free or at a low cost. Provided through UNESCO's digital platforms, these resources reach millions of students and educators worldwide, contributing to educational equity. In particular, in low-income countries, such free resources play a crucial role in promoting EDS (UNESCO, 2020).

Student Feedback and Interaction: The GAP programme has received positive feedback worldwide. Educators and students have reported that the resources provided by the programme have increased their awareness of sustainable development issues and enhanced their competencies in practical applications. Additionally, UNESCO's interactive platforms foster the sharing of knowledge and experiences among users, offering a more effective learning experience.

Contribution to SDGs: GAP directly contributes to the United Nations' 2030 SDGs, including quality education (SDG 4), climate action (SDG 13), and sustainable cities and communities (SDG 11). The programme promotes awareness and active participation in environmental, social, and economic sustainability through education (United Nations, 2020).

Programme 3: UNDP's "Language for Resilience" Programme

Goals of the Programme: The "Language for Resilience" programme, initiated by the United Nations Development Programme (UNDP), aims to support the social and economic integration of refugees and displaced persons through language learning. This programme highlights the importance of ESD and links language learning with social cohesion and economic opportunities.

Technological Infrastructure and Accessibility: GAP enhances access to EDS through digital resources and online platforms provided by UNESCO, including online courses, webinars, digital libraries, and interactive learning tools.

The "Language for Resilience" programme supports refugees and displaced persons in adapting to new environments and promoting social integration. Its main objectives are to enhance social cohesion through language learning, facilitate access to economic opportunities, ensure educational equity, and promote cultural awareness and tolerance (UNDP, 2020). The programme employs online platforms, mobile applications, and digital educational materials, offering flexible and accessible learning experiences. Additionally, it provides face-to-face support through local language teachers and volunteers.

Costs and Accessibility: The "Language for Resilience" programme predominantly offers free or low-cost educational materials and courses. UNDP collaborates with international donors and local partners to ensure the programme's funding and sustainability. This collaboration

enables the programme to reach a broad audience and makes language learning accessible, particularly for low-income individuals (UNHCR, 2021).

Student Feedback and Interaction: The programme has received positive feedback from participants. Refugees and displaced persons have reported that the language learning process has significantly helped them adapt to new living environments and expand their social networks. Additionally, interactive lessons and language exchange programmes provided through digital platforms allow participants to practice their language skills and enhance their cultural understanding.

Contribution to SDGs: The "Language for Resilience" programme directly contributes to the United Nations' 2030 SDGs, including Quality Education (SDG 4), Decent Work and Economic Growth (SDG 8), and Peace, Justice, and Strong Institutions (SDG 16). By supporting the social and economic integration of refugees through language learning, the programme helps create more inclusive and sustainable communities (United Nations, 2020).

Programme 4: Yunus Emre Enstitüsü "Learn Turkish" Programme

Programme Objectives: The "Learn Turkish" programme by Yunus Emre Enstitüsü (2024) is a language education programme designed for individuals who wish to learn Turkish as a foreign language. This programme aims to promote the Turkish language and culture worldwide. Additionally, it supports the social and economic integration of Turkish language learners with Turkey.

Technological Infrastructure and Accessibility: The programme offers online courses, mobile applications, and digital educational materials. Yunus Emre Enstitüsü delivers lessons through distance education platforms, supported by video conferences, interactive materials, and digital libraries. This enables students from around the world to have the opportunity to learn Turkish.

Costs and Accessibility: The "Learn Turkish" programme is generally offered for free or at a low cost. Yunus Emre Enstitüsü organizes these courses through its cultural centers worldwide and collaborates with local partners to increase access to language education.

Student Feedback and Interaction: The programme has received positive feedback from students worldwide. Participants have noted that the resources provided significantly contribute to their ability to learn Turkish and understand Turkish culture better. Additionally, the student-teacher interaction facilitated through online platforms and interactive lessons makes the learning process more effective.

Contribution to SDGs: The "Learn Turkish" programme directly contributes to the SDGs, specifically Quality Education (SDG 4) and Peace, Justice, and Strong Institutions (SDG 16). Enhancing cultural understanding and tolerance through language learning supports the creation of more inclusive and sustainable societies.

Programme 5: TEMA Vakfi's Nature Education Programmes

Programme Objectives: The TEMA Vakfi's Nature Programmes (2024) aim to raise awareness about environmental issues and promote sustainable living practices. These programmes are designed to educate individuals of all ages on the importance of protecting natural resources and fostering a sense of responsibility towards the environment.

Technological Infrastructure and Accessibility: TEMA utilizes online courses, mobile applications, and digital educational materials to reach a broad audience. Their educational content is accessible through their website and various digital platforms, ensuring that learners can participate from anywhere. Interactive materials and virtual workshops enhance the learning experience by providing hands-on activities and real-time discussions.

Costs and Accessibility: The environmental education programmes offered by TEMA are generally free or available at a low cost. The foundation collaborates with schools, universities, and other educational institutions to expand the reach of their programmes and ensure that environmental education is accessible to a wide audience.

Student Feedback and Interaction: The programmes have received positive feedback from participants, who have highlighted the practical and engaging nature of the educational content. The interactive lessons and real-life applications provided through the programmes help students understand and apply sustainable practices in their daily lives.

Contribution to SDGs: TEMA Vakfi's Nature Education Programmes contribute to several SDGs, including Quality Education (SDG 4), Sustainable Cities and Communities (SDG 11), and Climate Action (SDG 13). By educating individuals about environmental sustainability, the programmes support the development of more sustainable and resilient communities.

CONCLUSION

This study meticulously analyzes various distance education programmes, focusing on their contributions to sustainable development and language learning. The selected programmes include "The Science of Well-Being" by Yale University and Coursera, UNESCO's GAP on ESD, UNDP's "Language for Resilience," Yunus Emre Enstitüsü's "Learn Turkish," and TEMA Foundation's Nature Education Programmes. Each of these programmes demonstrates significant impact and effectiveness in leveraging digital tools and online platforms to promote educational equity and contribute to the SDGs. Detailed evaluations of these programmes are based on several criteria, including scope and accessibility, technological infrastructure, contributions to SDGs, positive feedback, and interaction levels. The findings highlight the broad reach and accessibility of these programmes, facilitated by the use of modern technologies such as online courses, mobile applications, and interactive digital materials. For instance, Yale University's "The Science of Well-Being" successfully increases happiness and well-being among participants through science-based strategies delivered via Coursera. Similarly, UNESCO's GAP on ESD integrates sustainable development education into various

learning processes worldwide, emphasizing the importance of policy support, capacity building, and youth empowerment.

The study also underscores the role of these programmes in supporting social and economic integration. UNDP's "Language for Resilience" is particularly effective in aiding the social and economic integration of refugees through language learning, while Yunus Emre Enstitüsü's "Learn Turkish" programme promotes Turkish language and culture, enhancing social cohesion and cultural understanding. TEMA Vakfi's Nature Education Programmes raise environmental awareness and promote sustainable living practices through their comprehensive digital education resources. Positive feedback from participants is a common theme across all programmes, indicating high levels of engagement and satisfaction. Interactive elements such as discussion forums, live chats, and group projects significantly enhance the learning experience, fostering a supportive and collaborative environment. These interactive features are crucial in maintaining student motivation and ensuring the effectiveness of the educational content.

Moreover, the study highlights the critical importance of managing costs and ensuring accessibility in distance education. Programmes like those offered by UNESCO and UNDP, which are predominantly free or low-cost, play a vital role in bridging the educational divide, particularly in low-income countries. The use of open-source software and local technological solutions is recommended to enhance cost-effectiveness and accessibility.

In conclusion, this study demonstrates that distance education programmes are instrumental in advancing SDGs by providing inclusive, accessible, and engaging educational opportunities. The integration of modern technologies in these programmes not only supports educational equity but also addresses broader sustainability objectives, contributing to a more just and sustainable world. The continuous development and expansion of such programmes are essential to meet global educational needs and support sustainable development initiatives.

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**PSİKODRAMA GRUP TERAPİSİNİN İLİŞKİDE DUYGUSAL ŞİDDETE MARUZ
KALAN ÜNİVERSİTE ÖĞRENCİLERİ ÜZERİNDEKİ ETKİSİ¹**
EFFECTS of PSYCHODRAMA GROUP THERAPY on STUDENTS in UNIVERSITY
WHO EXPOSED to SENSITIVE DISABLICATION

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ÖZET

Psikodrama bir sahne içerisinde bireylerin, geçmişte yaşadıkları veya gelecekte yaşamaları muhtemelen olayları, pişmanlıklarını, hayallerini, öfkelerini, travmalarını ve hayatta olmayan yakınları ile vedalaşma fırsatını buldukları grup psikoterapi yöntemlerinden birisidir. Bireyler bir grup ortamı içinde, diğerleriyle etkileşim içinde girdikleri rollerle kendileriyle ilgili farkındalık kazanırlar.

Yukarıdaki bilgilerden yola çıkarak bu çalışmanın amacı; psikodrama grup terapisinin ikili ilişkilerinde duygusal şiddete maruz kalan öğrenciler üzerindeki etkisini belirlemektir. Araştırmanın evrenini Kırıkkale üniversitesinde öğrenim gören öğrenciler oluşturmaktadır. Araştırmanın örneklemini ise Sağlık Bilimleri Fakültesinde okuyan öğrenciler oluşturmaktadır. Çalışma 2023-2024 eğitim öğretim bahar döneminde gerçekleştirilmiştir. Atölye çalışması fakülte öğrencilerine duyuru yapılmış ve dersleri atölye zamanı ile uygun olan öğrencilerden 10 öğrenci çalışmaya katılmıştır. Öğrenciler sosyal hizmet ve hemşirelik bölümü öğrencilerinden oluşmaktadır. Çalışma haftada 1 gün ortalama 2 saat sürmüştür.

Araştırma sonucunda elde edilen veriler incelendiğinde psikodrama grup terapisinin ilişkilerinde duygusal şiddete maruz kalan öğrenciler üzerinde olumlu etki bıraktığı, yaşadıkları sorunlarla baş etme becerilerinin geliştiği ve psikososyal yönden güçlendikleri görülmüştür. Bu sonuçlar doğrultusunda sadece duygusal şiddet uygulanan öğrenciler için değil aynı zamanda anksiyete, depresyon, umutsuzluğa sahip olan bütün öğrenciler için psikodrama atölyelerinin yapılması ve oturum sayılarının artırılması önerilmektedir.

Anahtar Kelimeler: Anksiyete, Duygusal Şiddet, Grup Terapisi, Öğrenci, Psikodrama, Sosyal Hizmet

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ABSTRACT

In a psychodrama scene, individuals engage in group psychotherapy wherein they are allowed to bid farewell to past events, regrets, dreams, anger, traumas, and those who are no longer alive. Individuals gain self-awareness through the roles they interact with others in a group environment.

In light of the aforementioned information, the objective of this study is to ascertain the impact of psychodrama group therapy on students who have been subjected to emotional violence in their interpersonal relationships. The research universe comprises students enrolled at the University of Kırıkkale. The research sample comprises students enrolled in the Faculty of Health Sciences. The study was conducted during the spring semester of the 2023-2024 academic year. The workshop was publicized to the faculty's students, and 10 students participated in the workshop, whose lessons were scheduled to correspond with the workshop time. The student cohort comprises individuals enrolled in the social services and nursing departments. The study was conducted for an average of two hours per day per week.

The findings of the study indicated that psychodramatic group therapy had a beneficial effect on students who had been subjected to emotional violence in their relationships, enhancing their capacity to cope with challenges and fortifying their psychosocial resilience. In light of these findings, it is recommended that psychodrama workshops be conducted and the number of sessions increased, not only for students who have experienced emotional violence, but also for all students who suffer from anxiety, depression, and despair.

Keywords: Anxiety, Emotional Violence, Group Therapy, Student, Psychodrama, Social Work

GİRİŞ

Şiddet yaşamın her döneminde bireylerin karşılaşma olasılığı olduğu, bazılarının uzun yıllar sürdüğü ve birey üzerinde travmatik etkiler bırakan bir durumdur. Literatürde fiziksel, cinsel, duygusal, ekonomik ve siber şiddet olmak üzere beş tipinden bahsedilmektedir. Şiddet türleri arasında günlük yaşamda yüksek oranda görülen ve en çok göz ardı edilen şiddet türü duygusal şiddettir (Polat, 2016).

Türkiye’de romantik bir ilişkisi olan kadın öğrenciler ile yapılan bir araştırmada, öğrencilerin %88’inin partneri tarafından duygusal şiddete maruz kaldığı tespit edilmiştir (Alan Dikmen ve ark, 2018).

Duygusal şiddet iki tip özelliğiyle diğer şiddet türlerinden farklılaşmaktadır. Birincisi, cinsel ve fiziksel şiddette görüldüğü gibi somut fiziksel belirtilerin olmayışı, ikincisi ise, kendine has özelliklerinin yanında diğer şiddet türlerinin sekonder sonucu olarak ortaya çıkmaktadır. Yani fiziksel veya cinsel şiddete maruz kalan bir birey aynı şekilde duygusal şiddete de uğramaktadır (Polat, 2016). Duygusal şiddetin temelinde insanın yaşadığı psikolojik hasar bulunmaktadır.

Duygusal şiddete maruz kalma kadınlarda ve gençlerde daha fazla görülmektedir (Sarıhan, 2019).

Psikodrama ise, grup terapisi, sosyometri ve psikodramadan oluşan üçlü bir yöntemin parçasıdır. Yaratıcısı Dr. Jacob Levi Moreno'dur (1889-1974). Gücünü insandaki yaratıcılık, spontanlık ve eylemden alan ve insanda varolan empati, tele ve transferans ilişkilerini araştıran bir grup psikoterapisi yaklaşım ve yöntemidir. Psikodrama, gerçeği, dramatik yöntemler kullanarak bulmaya ve incelemeye çalışır. Bu yaklaşım, davranışların yeniden düzenlenmesi yoluyla bireylerdeki ve gruplardaki değişimleri kolaylaştıran rol kuramına dayalıdır (Fine, 1979). Psikodrama sözcüğü, "psişe" ve "drama" kavramlarından oluşur. Anlamı, "ruh dünyasının eyleme dönüşmesi" olarak tanımlanabilir.

Psikodrama, bireylerin yaşamdaki farklı roller almalarına ve yaşam sürecinde yeni rollere uyum sağlamalarına, yeni roller geliştirmelerine olanak verir.

Psikodrama 3 aşamadan oluşmaktadır. Bu aşamalar; ısınma, oyun ve geribildirim aşamasıdır. Psikodramada bir konuya ısınmak, giderek daha spontan bir hâl almaktır. Psikodramada spontanlık arzu edilen bir durumdur, yaratıcılığın üretilebilmesinin en iyi yoludur. Isınma, grup üyelerinin birbirleriyle ve eldeki görevle daha rahat hâle geldiği psikodramatik bir canlandırmanın ilk aşamasını ifade eder. Bundan, ikinci aşamaya, eyleme götürecek bir başoyuncu ve sorun ortaya çıkar. Etkili bir ısınma gerçekleştirmek için ısınma sürecinin önemini ve doğasını takdir etmek gerekir çünkü etkili bir ısınma olmadan birçok rol oyunu veya psikodramatik canlandırma başarısız olur. Yeterince ısınma gerçekleştirilmeden oynanan oyun çoğu zaman geri teper, özellikle de bu yönlendirici olmayan veya psikanalitik tekniğe çok az toleransı olan danışanlar için uygun olmayabilir (Vuçinas ve Akgün, 2021: s.44).

Oyun aşamasında ısınan başoyuncu gerçekleştirmek istediği çalışmasını sahnede yardımcı egolar aracılığı ile sergiler. Başoyuncunun çalışması onun geçmişteki travmaları olabileceği gibi, gelecek kaygıları, henüz gerçekleşmemiş olaylar veya gerçekleşme ihtimali olmayan durumlardan da oluşabilir. Sahnede başoyuncu hangi çalışmayı gerçekleştirmek isterse özgürdür.

Geribildirim aşaması psikodrama çalışmasının son aşamasını oluşturmaktadır. Bu aşamada önce oyunda rol alan kişiler ardından izleyiciler gerçekleştirilen çalışma ile ilgili geribildirim verirler. Son olarak başoyuncudan çalışma ile ilgili görüşleri alınarak sahne kapatılır.

Psikodramada yukarıdaki belirtilen aşamalar gerçekleştirilirken 5 temel öğeden yararlanır. Bunlar sahne, psikodrama yöneticisi, başoyuncu, yardımcı ego ve gruptur. Bu öğelere bakıldığında;

Sahne: psikodrama çalışmasının gerçekleştirildiği alandır. Bu alanda başoyuncu hangi çalışmayı yapmak isterse, hangi materyalleri kullanmak isterse özgürdür. Sahne başoyuncunun oyun alanıdır ve istediği gibi kullanmakta serbesttir.

Psikodrama yöneticisi: psikodrama çalışmasını yöneten ve psikodrama eğitimi almış olan kişidir. Psikodrama yöneticisi, başoyuncunun çalışmasında onu yönlendirmekten ziyade

sürecinde ona destek olan duygularının açığa çıkmasını sağlayan kişidir. Yöneticinin bu süreçte iyi bir empati becerisinin olması gerekmektedir.

Başoyuncu: psikodrama çalışmasını gerçekleştiren kişidir. Geçmişte yaşadığı travmaları, gelecek kaygıları, kararsızlıkları kısaca onu rahatsız eden yaşamındaki tüm belirsizlikleri sahnede oynama gücü olan kişidir.

Yardımcı ego: psikodrama çalışması gerçekleştirilirken başoyuncuya sahnesini gerçekleştirme sırasında destek olan başoyuncunun söylediği rollere giren ve başoyuncunun söylediği sözleri tekrar eden kişilerdir. Bu kişiler gerçek bir kişi rolüne girebildikleri gibi aynı zamanda duygular, istekler gibi soyut rollere de girmektedir.

Grup: psikodrama çalışmasına katılan kişilerin oluşturduğu topluluktur. Süreç içerisinde yardımcı ego, başoyuncu bu gruptan çıkar. Kişiler çalışmaya katılmadıklarında da çalışmanın sonunda duygularını ve onlara ne hissettirdiklerini anlatırlar.

Psikodrama bireylerin sorunlarının farkına varmaları, kendilerini dışarıdan görebilme ve davranışlarının farkına varabilme olanağı sağlayan bir grup psikoterapi yöntemlerindedir. Psikodrama grup terapisi hastanelerde, cezaevlerinde, okullarda, engelli bireylerle veya bakım verenlerle, dezavantajlı gruplarla kısaca yaşamın her alanında kullanılır.

Yukarıdaki bilgilerden hareketle bu çalışmanın amacı, Sağlık bilimleri fakültesinde psikodrama atölyesinin duygusal şiddete maruz kalan öğrencilerin umutsuzluk, yetersizlik ve anksiyete düzeylerine etkisinin incelenmesidir. Bu kapsamda aynı zamanda öğrencilerin okul ortamında sosyal becerilerinin geliştirilmesi, sosyal içermenin sağlanması, iletişim becerilerinin kuvvetlendirilerek sosyalleşmenin artırılması, stresle baş etme yöntemlerinin geliştirilmesi hedeflenmektedir.

YÖNTEM

Bu çalışmada araştırma yöntemlerinden, nicel araştırma yönteminden deneysel araştırma yöntemidir. Deneysel araştırmalar ön test -son test uygulaması ile gerçekleştirilen, bireylere verilen eğitimin etkililiğini ölçmeye yarayan araştırma yöntemlerinden birisidir.

Araştırmanın bağımsız değişkenleri; cinsiyet, yaş, kardeş sayısı, ekonomik durum, meslek, medeni hal, duygusal ilişkisi olma durumu, okudukları bölüm şeklindedir. Araştırmanın bağımlı değişkeni; Beck anksiyete ölçeği, Beck Umutsuzluk Ölçeği, Yetersizlik Duygusu Ölçeğidir.

Bu araştırmanın evren grubu Kırıkkale Üniversite öğrencilerinden oluşurken; örneklem grubu Kırıkkale Üniversitesi Sağlık Bilimleri Fakültesi öğrencilerinden gönüllülük esasına dayanılarak duygusal şiddete maruz kalan atölyeye katılmayı kabul eden 10 öğrenciden oluşmaktadır. Araştırmada örneklem seçiminde belirlenen ölçütler, Kırıkkale Üniversitesi Sağlık Bilimleri Fakültesi'nde öğrenci olması, duygusal şiddete maruz kalma ve öğrencilerin çalışmaya düzenli olarak katılmayı kabul etmesidir.

Katılımcılara ilişkin çeşitli sosyo-demografik bilgilere ulaşmak amacıyla; 'Kişisel Bilgi Formu' oluşturulmuştur. Bu formda, katılımcılar hakkında ve psikososyal durumlarını açıklayıcı nitelikte değişkenler yer almaktadır. Katılımcılara ilişkin sosyo-demografik bilgileri belirlemek amacıyla araştırmacılar tarafından geliştirilmiş olan bilgi formu, 25 maddeden oluşmaktadır.

Ergen ve yetişkinlere uygulanabilen Beck, Lester ve Trexler (1974) tarafından geliştirilen ölçekte, bireyin geleceğe yönelik karamsarlık derecesini belirlemek amaçlanmaktadır. Sorulara evet-hayır şeklinde cevap verilmekte ve negatif beklentileri yansıtmaktadır. Alınan puanlar yüksek olduğunda bireydeki umutsuzluğun yüksek olduğu varsayılır. Geçerlik ve güvenilirlik çalışması Durak ve Palabıyıkoglu (1994) tarafından yapılmıştır.

Akdoğan ve Ceyhan (2014) tarafından geliştirilmiş ve uyarlanmıştır. Ölçekten alınan puanın yüksekliği bireyin yetersizlik duygusunun kuvvetini göstermektedir. Yetersizlik Duygusu Ölçeği (YDÖ)' den elde edilen puanın yüksekliği, aynı zamanda bireyin psikolojik sorunlara yatkınlığının veya çeşitli düzeylerde yaşadığı psikolojik sorunların bir göstergesi olarak da değerlendirilebilir. YDÖ'nün üç alt boyutu vardır. Bunlar, cesaretin kırılması, kendi değerini yadsıma ve yararsız üstünlük çabasıdır. YDÖ 5'li likert seçeneği içerir (Akdoğan ve Ceyhan, 2014).

Beck ve arkadaşları (1988) tarafından geliştirilen bireylerin yaşadığı anksiyete belirtilerinin sıklığının belirlenmesi amacıyla kullanılan kendini değerlendirme ölçeğidir. 21 maddeden oluşan, 0-3 arası puanlanan likert tipi bir ölçektir. Türkiye'de geçerlik ve güvenilirliği Ulusoy ve arkadaşları (1998) tarafından yapılmıştır.

Araştırmanın, Nisan 2024-Haziran 2024 tarihleri arasında tamamlanması gerçekleştirilmiştir. Araştırma kapsamında ön test-son test uygulaması yapılmıştır.

Araştırmanın sınırlılıkları

- Öğrencilerin çoğunluğunun son sınıf olması ve sınav kaygısının olması
- Psikodrama atölyesinin öğle aralarında gerçekleşmesi nedeni ile zaman sınırının olması
- Bayramlar ve vize haftası gibi nedenler atölyenin düzenliliğini etkilemesi

Psikodrama Oturumları

1. Oturum: Çalışmanın amacının açıklanmış ve psikodrama hakkında bilgi verilmiştir. Ardından ısınma oyunları ile grubun birini tanıması için oyun gerçekleştirilmiştir. Sonrasında grup kuralları hakkında bilgiler verilmiştir.

2.Oturum: Üyeler arasında grup dinamiğinin oluşması, **kendilerini tanıyıp duygularını dile getirme becerilerinin gelişmesini** kazandırılması ve rol alma cesareti göstermelerinin sağlanması amaçlanmıştır. Gönüllü üye ile psikodrama çalışması gerçekleştirilmiştir.

3. Oturum: Üyelerin ilişkide **duygusal şiddete maruz kalmaları durumunu** fark etmelerini amaçlanmıştır. Grup üyelerinin role girme becerilerini geliştirilmesi, farklı

rolleri deneyimlemelerinin sağlanması ve üyelerin grupta kendilerini açabilecekleri ortamın oluşması ve spontanlıklarının geliştirmesi amaçlanmıştır.

4. Oturum: Üyeler arasında gönüllü olan üye ile psikodrama çalışması gerçekleştirilmiştir.

5. Oturum: Grup üyelerinin **hayatta önem verdikleri değerleri, önemi ve bunların kendi içindeki yerleri** ve kendilerini rahatsız eden ve çıkarmak istedikleri şeyin farkına varmasını sağlamak amaçlanmıştır.

6. Oturum: İlişkide Duygusal Şiddete maruz kalmaya yönelik yapılan psikodrama çalışmasının tamamlanması, grup sürecinin bitiminde her üyenin kendisi için önemli olan, bu çalışmada **kazandıklarının belirlenmesi** ve sonlandırmanın gerçekleştirilmesi amaçlanmıştır. Rol oynama tekniği kullanılmıştır. Ardından Son-test ölçümleri gerçekleştirilmiştir.

ARAŞTIRMA BULGULAR ve YORUM

Bu bölümde psikodrama atölyesine katılan öğrencilerin sosyodemografik özellikleri ve anksiyete, umutsuzluk ve yetersizlik duygularına ilişkin sonuçlarına yer verilecektir.

TABLO 1: Öğrencilerin Sosyodemografik Bilgileri

		N	%
Yaş	18-20	1	10
	21-23	9	90
Gelir durumu	1000-4000	7	70
	4001-12000	1	10
	12001 ve üstü	2	20
Kronik rahatsızlık	Evet	3	30
	Hayır	7	70
İlaç kullanımı	Evet	3	30
	Hayır	7	70

Tablo 1’de öğrencilerin sosyodemografik özelliklerine bakıldığında yaşlarının 21-23 arasında değiştiği, gelirlerinin çoğunun 1000-4000 arası değiştiği, öğrencilerin çoğunluğunun kronik rahatsızlığının olmadığı (%70) ve ilaç kullanmadıkları görülmüştür (%70).

TABLO 2: Psikodrama Atölyesine Katılan Öğrencilerin Beck Anksiyete Ölçeğine İlişkin Bağımlı İlişkiler T Testi Puanına İlişkin Sonuçlar

	N	x	sd	t	p
Anksiyete ön test	10	2,80	0,42	1,000	0,34
Anksiyete son test	10	2,70	0,48		

Tablo 2’de psikodrama tölyesine katılan öğrencilerin beck anksiyete ölçeğinden aldıkları puanlara bakıldığında anksiyete puanlarında düşüş olmasına karşın ön test ve son test puanları arasında anlamlı bir fark görülmemiştir($p<0.05$). Pınar vd.(2021) psikodramanın üniversite öğrencilerinin anksiyete düzeylerine etkisi ile ilgili çalışmada anlamlı fark bulunmamıştır. Bu araştırmada anksiyete ölçeğinden anlamlı fark görülmemesinin sebebi öğrencilerin kpss sınavına hazırlanıyor olması ve anksiyetelerinin yüksek olması ve atölye süresinin kısa bir zamanda yapılması nedeni ile anlamlı çıkmadığı düşünülmektedir.

TABLO 3: Psikodrama Atölyesine Katılan Öğrencilerin Beck Umutsuzluk Ölçeğine İlişkin Bağımlı İlişkiler T Testi Puanına İlişkin Sonuçlar

	N	x	sd	t	p
Umutsuzluk ön test	10	38,10	1,595	2,900	0,02*
Umutsuzluk son test	10	36,00	3,651		

*** $p<0.05$**

Tablo 3 incelendiğinde öğrencilerin umutsuzluk ölçeğinde ön test son test arasında anlamlı fark vardır ($p<0,05$). Buna göre öğrencilerin katıldıkları atölye çalışması sonucu umut düzeylerinin arttığı görülmektedir. Gökkaya vd. (2019) yaptığı çalışmada üniversite öğrencilerinin psikodramanın umut düzeylerine etkisine ilişkin çalışmada anlamlı fark bulunmamıştır.

TABLO 4: Psikodrama Atölyesine Katılan Öğrencilerin Yetersizlik Duygusu Ölçeğine İlişkin Bağımlı ilişkiler T Testi Puanına İlişkin Sonuçlar

	N	x	sd	t	p
Yetersizlik ön test	10	71,60	8,32	-3,01	0,01*
Yetersizlik Son test	10	64,30	11,13		

***p<0,05**

Tablo 4 incelendiğinde psikodrama atölyesine katılan öğrencilerin yetersizlik duygularına ilişkin öğrencilerin ön test ve son test puanları arasında anlamlı far bulunmuştur ($p<0,05$). Buna göre atölye çalışmasının öğrencilerin yetersizlik duygusunun azalmasında etkili olduğu görülmektedir.

Psikodrama Atölyesine İlişkin Nitel Sonuçlar

Psikodrama atölyesine katılan öğrenciler atölye sonrasındaki psikodramaya ilişkin görüşleri aşağıda vermiştir.

Flört şiddeti konulu psikodrama çalışmasına katılmak benim için çok faydalı oldu ilk başta katıldığımda bu kadar faydası olacağını düşünmemiştim gerek kendim canlandırırken gerek canlandıran arkadaşlarımdan hikayesine tanık olarak kendimi çok özel hissettim herkesin hayatında bir defa olsun mutlaka deneyimlemesi gereken bir şey olduğunu düşünüyorum

Psikodrama atölyesi ile Başkalarının bana yaptığı değer yargılarını bu benim diye kabullenmeyip kendi değerimi sadece kendimin belirlediğini fark ettim.

Gördüğüm ama kabullenemediğim konuları aslında tek ben yaşamıyordum bunu öğrendim ve artık kabullenmek istediğimi fark ettim. Bana çok şey kattı özellikle kendi değerimin farkına varmamı sağladı.

Yapılan psikodrama sahneleri ve benim baş oyuncu oldum sahne kendimi dışardan görmeme yardımcı oldu. Bu şekilde geçmişte yaşanan olayları içimde bitirip kendimi çok daha iyi hissetmemi sağladı. İyi ki psikodrama.

Bana en büyük katkılarından birisi yalnız olmadığı farkettim. Aslında dışarıdan bakınca birbirini tanımayan insanların ne kadar çok ortak yaşadığı durumlar varmış. Psikodrama bana yalnız olmadığımı hiçbir şeyin tesadüf olmadığını öğretti.

Yukarıdaki ifadelerden de görüldüğü üzere psikodrama çalışması öğrencilerin kendi benliklerinin farkında olmasına, geçmişle yüzleşmelerine fırsat verdiği görülmüştür.

SONUÇ

Psikodrama atölyesinin duygusal şiddet gören öğrencilerin aksiyete, yetersaizlik ve umutsuzluk durumlarına etkisini incelemeyi amaçlayan bu araştırmada çalışmanın öğrencilerin anksiyete düzeylerinde etki etmediği görülürken yetersizlik duyguları ve umutsuzluk durumlarını etkilediği görülmüştür. Atölye sonucunda öğrencilerin duygusal şiddet konusunun yanı sıra kendilerinin farkında oldukları, yalnız olmadıklarını fark ettikleri ve kendilerini dışarıdan görüp davranış değişikliği oluşturabilmelerini sağlamıştır. Çalışma süresinin az olması, öğrencilerin KSPSS sınavına hazırlanmaları nedeni ile gergin olmalarına karşın atölye çalışmasından verim aldıkları görülmüştür. Bu sonuçlar doğrultusunda;

Psikodrama atölye çalışmasının sadece duygusal şiddete uğrayan öğrencilere değil, üniversiteye yeni gelmiş ya da farklı sorunları olan öğrencilerle de yapılması,

Sınav dönemlerinde olan öğrenciler için sınav kaygısını azaltmaya yönelik psikodrama çalışmalarının yapılması,

Psikodrama atölye çalışmalarının sayısının artırılması,

Ders saatleri dışında öğrencilerin kendilerini daha rahat hissedecekleri ortamlarda ve geniş zamanlarda atölye çalışmalarının yapılması önerilmektedir.

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**SANAT TERAPİSİNİN FİZİK TEDAVİ VE REHABİLİTASYON MERKEZİ
YATAKLI SERVİSİNDE TEDAVİ GÖREN HASTA VE HASTA YAKINLARININ
PSİKOSOSYAL İYİLİK HALİ ÜZERİNDEKİ ETKİLERİ: EBRU SANATI¹**
EFFECTS OF ART THERAPY ON THE PSYCHOSOCIAL WELL-BEING OF PATIENTS
AND RELATIVES TREATED IN THE BEDROOM OF THE PHYSIOTHERAPY AND
REHABILITATION CENTRE: EBRU ART

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ÖZET

Sanat, bireylerin kendilerini çeşitli yollarla ifade etmesiyle hayatlarına hâkim olan çaresizlik ve ümitsizlik duygularını ortaya çıkarmakta ve bireylere bu duyguları kontrol etme ve bunlarla baş etme becerileri kazandırmaktadır. Sanat terapisiyle bireyler toplumdan uzak, yalıtılmış bir hayat yerine, ortak bir hedef ve duyguda birleşerek grup üyeleriyle birlikte çeşitli etkinlikler yapmak için toplanırlar. Sanat terapilerinin bireylerin sorunlarını hızlı bir şekilde ortaya koymada yardımcı olduğu, değerlendirme ve müdahaleyi hızlandırdığı ve bu kapsamda hastalıkların iyileştirilmesinde sanatın farklı dallarının kullanıldığı çeşitli çalışmalara konu olmuştur.

Yukarıdaki bilgiler ışığında bu çalışmanın amacı, ebru sanatıyla uygulanan sanat terapisinin Kırıkkale Üniversitesi Tıp Fakültesi Fizyoterapi ve Rehabilitasyon Merkezinde tedavi gören hasta ve hasta yakınlarının depresyon ve anksiyete düzeyleri üzerindeki etkisini incelemek; uygulanacak etkinliklerin katılımcıların psikososyal iyilik hali üzerindeki etkilerini saptamak ve bu çerçevede katılımcıların hastane ortamında sosyal becerilerini geliştirmek, iletişim becerilerini kuvvetlendirerek sosyalleşme düzeylerini arttırmak, depresyon ve anksiyete düzeylerini düşürmek ve stresle baş etme yöntemleri kazandırmaktır.

Çalışmaya fizik tedavi hastanesinde tedavi gören ve refakat eden 15 kişi katılım sağlamış, çalışmalar toplam 12 hafta, haftada bir gün 1,5 saat sürmüştür 8 hafta ebru etkinliği

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gerçekleştirilmiş, 4 hafta depresyon, anksiyete, stres ve bu durumlarla nasıl baş edilebileceği hakkında eğitimler verilmiştir.

Araştırma sonucunda elde edilen veriler incelendiğinde ebru sanatının ve beraberinde verilen eğitimlerin hastaların tedavi süreçlerinde olumlu etkilediği, yaşadıkları sorunlarla baş etme noktasında yol gösterici olduğu ve sosyal içermenin sağlandığı, depresyon düzeylerinde düşüş olduğu, katılımcıların kendilerini daha sağlıklı bir biçimde ifade edebildikleri, fiziksel iyilik halleri ile psikolojik ve sosyal iyiliklerinin de önemli ölçüde sağlandığı sonuçlarına ulaşılmıştır. Bu sonuçlar doğrultusunda, özellikle müracaatçıların psikososyal iyilik halini hedefleyen meslek grubu olan sosyal hizmet uzmanlarının müracaatçıya özel hazırladığı planlı müdahale süreçlerinde ebru sanatına veya sanat terapisinin çeşitli birimlerine yer vermesi önerilmektedir.

Anahtar Kelimeler: Anksiyete Düzeyi, Depresyon, Ebru Sanatı, Fizyoterapi ve Rehabilitasyon Hastaları, Sanat Terapisi.

ABSTRACT

Arts-based therapies offer a means of articulating and expressing the feelings of helplessness and hopelessness that can pervade the lives of individuals. Through art, individuals can gain the skills to control and cope with these feelings. With art therapy, instead of an isolated life away from society, individuals unite with a common goal and emotion and gather to do various activities with group members. Several studies have demonstrated that art therapies facilitate the rapid identification of issues, accelerate the evaluation and intervention process, and, in this context, employ diverse artistic modalities in the treatment of various illnesses.

Considering the information above, the objective of this study is to examine the impact of art therapy utilizing marbling techniques on the levels of depression and anxiety experienced by patients and their relative's undergoing treatment at the Kırıkkale University Faculty of Medicine Physiotherapy and Rehabilitation Centre. Additionally, this study aims to ascertain the effects of the activities. It is intended that this will benefit the mental health and well-being of those taking part in the project. The aim is to help them to develop their social skills in a hospital setting, increase their socialization by strengthening their communication abilities, to alleviate their depression and anxiety, and equip them with effective coping strategies for managing stress

The study was conducted over 12 weeks, with one day a week dedicated to the program for 1.5 hours. The program comprised eight weeks of marbling activity and four weeks of training on depression, anxiety, stress, and coping strategies.

Upon analysis of the data obtained from the research, it was concluded that marbling art and the accompanying training had a positive impact on the treatment processes of the patients, guiding them in coping with the problems they experienced and ensuring social inclusion. Depression levels decreased, participants were able to express themselves more healthily, and their physical well-being, psychological well-being, and social well-being were significantly

enhanced. Considering these findings, it is recommended that social workers, who are the primary professionals responsible for the psychosocial well-being of applicants, integrate marbling art or various forms of art therapy into the planned intervention processes

Keywords: Anxiety Levels, Art Therapy, Depression, Physiotherapy and Rehabilitation Patients,

GİRİŞ

Sanat terapisi, fizyoterapi ve rehabilitasyon süreçlerinde hastaların iyileşme sürecine önemli katkılar sağlayan yenilikçi bir yaklaşımdır. Fiziksel tedavi yöntemlerinin yanı sıra, sanat terapisi hastaların duygusal ve psikolojik iyilik hallerini destekleyerek, genel iyileşme sürecini hızlandırabilir. Bu terapi yöntemi, hastaların kendilerini ifade etmelerine, stres ve kaygılarını azaltmalarına ve motivasyonlarını artırmalarına yardımcı olur. Sanat terapisi, bireylerin içsel dünyalarını keşfetmelerine olanak tanırken, aynı zamanda fiziksel rehabilitasyon süreçlerine de olumlu etkiler sağlar.

Bu çalışmada ebru sanatıyla uygulanan sanat terapisinin fizik tedavi ve rehabilitasyon merkezi yataklı servisinde tedavi gören hasta ve hasta yakınlarının psikososyal iyilik hali üzerindeki etkilerini saptamak ve bu çerçevede hastaların ve hasta yakınlarının hastane ortamında sosyal becerilerinin geliştirilmesi, sosyal içermenin sağlanması, iletişim becerilerinin kuvvetlendirilerek sosyalleşmenin artırılması, depresyon ve anksiyete düzeylerinin düşürülmesi ve stresle baş etme yöntemlerinin kazandırılması planlanmıştır ayrıca bu araştırmada ebru sanatının hasta ve hasta yakınlarının depresyon ve anksiyete düzeyleri üzerindeki etkisi incelenmesi amaçlanmıştır.

Fizyoterapi ve rehabilitasyon, çeşitli hastalıkların önlenmesi, tedavisi ve iyileştirilmesi için fiziksel yöntemler ve egzersizler kullanan bir sağlık bilim dalıdır. Fizyoterapi ve rehabilitasyon hastaları, kas-iskelet sistemi, kardiyovasküler sistem, solunum sistemi, sinir sistemi, lenfatik sistem gibi vücudun farklı sistemlerinde bozukluk veya yetersizlik yaşayan kişilerdir. Fizyoterapi ve rehabilitasyon hastalarının tedavi sürecinde fizyoterapistler önemli bir rol oynamaktadır. Bu meslek grubu, fizyoterapi ve rehabilitasyon hastalarının değerlendirilmesi, tanılanması, tedavi planlaması ve uygulaması, takibi ve eğitimi gibi aşamalarda görev alırlar. Fizyoterapistler, hastaların fonksiyonel kapasitelerini artırmak, ağrılarını azaltmak, yaşam kalitelerini yükseltmek ve bağımsızlıklarını sağlamak için çeşitli fizyoterapi yaklaşımları kullanırlar. Fizyoterapi yaklaşımları arasında manuel terapi, masaj, elektroterapi, termoterapi, hidroterapi, mekanoterapi, kinezyoterapi gibi yöntemler bulunmaktadır.

Fizyoterapi ve rehabilitasyon hastalarının tedavisinde fizyoterapistlerin yanı sıra diğer sağlık profesyonelleri de yer almaktadır. Örneğin; doktorlar, hemşireler, psikologlar, sosyal hizmet uzmanları, diyetisyenler gibi meslek grupları multidisipliner bir ekip oluşturarak hastaların ihtiyaçlarına göre hizmet vermektedir. Fizyoterapi ve rehabilitasyon hastalarının tedavisinde ekip çalışması çok önemlidir. Çünkü hastaların fiziksel, psikolojik ve sosyal boyutlarını

kapsayan bütüncül bir bakış açısı gerekmektedir. Bu anlamda hastaların hastane sürecinde fiziksel tedavilerinin yanı sıra ruhsal tedavileri de oldukça önemlidir. Bu noktada sanat terapisi oldukça önemli yer tutmaktadır.

Sanat Terapisi kavramı, Amerikan Sanat Terapisi Derneği (ATCB) tarafından kişinin fiziksel, zihinsel ve duygusal varlığını iyileştirmek ve geliştirmek amacıyla sanatın yaratıcı özelliklerinin kullanıldığı ruh sağlığı alanı şeklinde tanımlanmaktadır. Sanat terapisinde sanatın yaratım süreçleri ve sonuçları danışan üzerinde terapötik ve iyileştirici etki yaratmaktadır. Danışanlar duygularını keşfederek çatışmalarını ve davranışlarını yönetmekte, öz farkındalık sağlamakta ve sosyal becerilerini geliştirmektedir. Böylelikle kaygıları azalmakta, benlik saygıları artmakta ve gerçekliğe yönelimleri artarak iyileşmektedir. Sanat terapisi ruh sağlığı, rehabilitasyon, tıp ve eğitim alanlarındaki birey, çift, aile ve çeşitli gruplarda uygulanmakta; gelişimsel, tıbbi, eğitimsel, sosyal veya psikolojik bozukluk yaşayan kişilerde fayda sağlamaktadır. Sanat terapisinde temel amaç, danışanın işlevselliğini ve duygu durumunu iyileştirmek veya eski haline getirmektir (ATCB, 2022).

İnsanın ilk çağlarda mağara duvarlarına çizim yaparak, dans ederek başlattığı sanat kavramı zamanla kendi evrimsel süreciyle birlikte gelişmiş ve derinleşmiştir. Evrimleşen insan, yaşamın derinliklerini anlamaya çalışırken kendi derinliklerine de dalmış ve ruhsal yapısını keşfetmiştir. Bu keşif bazı hastalıkların ilaç ve cerrahi yöntem kullanmadan tedavi edilebileceğini göstermiş ve terapi kavramını yaratmıştır (Okçu, 2022). Günümüzde ise sanat terapisi birçok psikoterapi yaklaşımı içerisinde kullanılan bir disiplin olarak yerini almıştır. Sınırlı sayıda oturumla ruhsal tedaviyi sağlamaya duyulan ihtiyaç sonucunda, kısa süreli tedavi biçimleri ortaya çıkmıştır. Bu tedavi yöntemlerinden biri sanat terapisidir. Sanat terapistlerinin araştırmaları sonucunda sanat etkinliklerinin, bireylerin sorunlarını hızlı bir şekilde ortaya koymada yardımcı olduğu, değerlendirme ve müdahaleyi hızlandırdığı fark edilmiştir. Bu kapsamda hastalıkların iyileştirilmesinde sanatın kullanımı uzun zaman önceye dayanmaktadır.

Sanat terapisinde terapistin psikanalitik, bilişsel davranışçı yaklaşım veya varoluşçu yaklaşım gibi farklı yönelimleri olabilmektedir (Aydın 2012). Hastaların yaratıcı anlatımlarına dahi olmadan, grubun bir parçası olarak çalışan sanat terapistleri çoğunlukla hastanelerde ve zihinsel engeli olan bireylere yönelik kurumlarda görev alır. Sanat terapistleri hastalarda terapötik değişim sağlamak adına hastaların yaratıcılıklarını ortaya koyacak sanatsal araç ve gereçlerin kullanımına önem verir (Sharf, 2016). Bu psikoterapi yönteminde sanat, bir araç olarak kullanılmaktadır. Uygulama sonucunda elde edilen sanat ürünü estetik olsun veya olmasın, sanatsal eylemde bulunan kişinin iç ve dış dünyası arasında daha uyumlu bir ilişki kurmasına olanak sağlar (Güney, 2011). Sanat, kişilere özgür bir ortam oluşturarak hayatlarındaki kontrolü yeniden kazanmalarını kolaylaştırır. Aynı zamanda bireylerin kendilerini çeşitli yollarla ifade etmesiyle hayatlarına hâkim olan çaresizlik ve ümitsizlik duygularını ortaya çıkarmakta ve bireylere bu duyguları kontrol etme ve bunlarla baş etme becerileri kazandırmaktadır (Demir 2018).

Sanat terapisiyle bireyler toplumdaki uzak, yalıtılmış bir hayat yerine, ortak bir hedef ve duyguda birleşerek grup üyeleriyle birlikte çeşitli etkinlikler yapmak için toplanırlar. Psikoterapi sürecinde terapist ve hasta arasında sanatsal bir unsurun kullanımı ifade edilemeyen duygu ve düşüncelerin dışsallaştırılmasını sağlar. Bu yolla sanat terapisi kişilerin duygu dışavurumlarına destek sağlayarak duygularını tanımlayarak ifade etmelerine, böylece kişilerarası ilişki problemlerini çözmelerine yardımcı olmaktadır (Sarandöl ve ark. 2013).

Günümüzde sanat terapisi, psikodinamik psikoterapide faydalanılan bir araç olmaktan ziyade tek başına terapötik bir yaklaşım olarak kabul edilmektedir. Naumburg'un başlattığı Psikodinamik Yönelimli Sanat Terapisi yaklaşımı, psikoterapi üzerine yapılan araştırmaların artmasıyla daha da derinleşmiş ve çeşitlenmiştir. Bu yaklaşımda en sık kullanılan sanat dalları çizim, heykel ve görsel sanatlar olmakla birlikte farklı alanlardan da faydalanılmaktadır.

Türk kültürüne özgü el sanatlarından "ebru", Birleşmiş Milletler Eğitim, Bilim ve Kültür Örgütü'nün somut olmayan kültürel miras listesinde "Türk Kâğıt Süsleme Sanatı" olarak yer almaktadır. Ebru, suyun bazı maddelerle yoğunluğunun artırılarak üzerine fırça yardımıyla boya serpildikten sonra, görsel bir şölenle uyumu ve zarafeti sunan bir sanattır. Ebru sanatı, bireyleri bir araya getirir, paylaşılan bir ortam sağlar ve bu ortam içinde bireylere soyut kavramların ve hislerin ortaya çıkmasında bireysel deneyim kazandırır.

Ebru sanatı, yoğunlaştırılmış bir sıvı üzerine renklerin serbestçe yayılması, karışması ve dans etmesiyle oluşturulan bir kâğıt boyama sanatıdır. Ebru sanatının kökeni Orta Asya'ya dayanmakta olup, Türk kültürünün önemli bir parçasıdır. Ebru sanatı, tezhip ve hat gibi diğer süsleme sanatlarıyla birlikte kitap ciltleri, murakka kenarları ve yazı boşluklarında kullanılmıştır. Günümüzde ise ebru sanatı, kendine özgü estetiği ve terapötik etkisiyle bağımsız bir sanat dalı olarak kabul edilmekte ve sergilenmektedir. Ebru sanatının öğrenilmesi ve uygulanması disiplinli bir süreç gerektirmektedir. Ebru yapmak için özel malzeme ve teknikler kullanılmaktadır. Ebru teknesi, kitle, boya, fırça, tarak gibi araçlar ebru sanatının vazgeçilmez unsurlarıdır. Ebru yaparken renk seçimi, tekne başında kalma süresi, müzik ve ritim gibi faktörler de önemlidir. Ebru sanatı yapan kişi, renklerin dünyasına dalarken kendini daha özgür hissederek ve duygularını tekneye aktarır. Ebru sanatında her ürün eşsizdir. Aynı kişi, aynı tekne ve aynı boya ile bile aynı çalışmayı tekrarlasa da aynı sonucu elde edemez. Bu yönüyle ebru sanatı, bireyin özgünlüğünü ve öznelliğini vurgular.

Ebru sanatında kontrol etmek de önemli bir beceridir. Tekne içindeki sıvıyı ve renkleri istediği gibi yönlendirebilmek için ebru yapan kişinin sabır, dikkat ve deneyim sahibi olması gerekir. Suyun hareketliliği, teknenin boyayı emmesi ya da emmemesi, atölyenin sıcaklığı, havadaki toz oranı, zaman, boya ayarlarının değişkenliği gibi etkenler ebru yapmayı zorlaştırabilir. Bu yönüyle ebru sanatı bireyi seçimlerini ve sınırlarını gözden geçirmeye, kendi içine dönmeye, varoluşunun getirdiği olumlu ve olumsuz yönleriyle yüzleşmeye davet eder.

Ebru sanatı ile psikoterapi yapmak, bu sanatın kendine has malzeme ve tekniklerini terapötik bir amaçla kullanmayı gerektirir. Bu sanatın disiplinli bir hazırlık ve uygulama süreci vardır. Ebru sanatı ile psikoterapi yapanlar, renkleri ve tekne başında geçirecekleri zamanı kendileri

belirlerler. Bu sayede kendilerini daha serbest hissederler ve duygularını tekneye daha kolay yansıtabilirler. Ancak bazen tekneye aktarmak istedikleri şey ile ortaya çıkan şey arasında büyük farklar olduğunu görürler. Ebru sanatında her ürün eşsizdir. Aynı kişi, aynı tekne ve aynı boyalarla bile aynı çalışmayı tekrarlasa da aynı sonucu elde edemez. Bu sanat, bireyin özgünlüğüne ve öznel bakış açısına değer verir. Ebru sanatı ile psikoterapi yapanlar bazen tekne içindeki sıvıyı ve renkleri istedikleri gibi yönlendiremediklerini söylerler. Suyun fazla hareketliliği, teknenin boyayı emmesi ya da emmemesi gibi nedenlerle istedikleri ürünü elde etmekte güçlük çekebilirler. Atölyenin sıcaklığı, havadaki toz oranı, zaman, boya ayarlarının değişkenliği bu sanatın kontrol edilmesini zorlaştırır. Bu sanat, bireyin seçimlerini ve sınırlarını gözden geçirmesine, kendi iç dünyasına dönmesine, varoluşunun getirdiği olumlu ve olumsuz yönleriyle yüzleşmesine imkân sağlar. Atölye çalışmalarında, ebru yaparken ellerin kullanılmasıyla birlikte uygun müzik ve ritim eşliğinde beden de hareket etmesi sağlanır. Bu süreçte tekne başında el ve beden uyumunun arttığı, odaklanma ve doğaçlama yeteneklerinin geliştiği, malzemeye hakimiyet ve yaratıcı denemeler yapma cesaretinin özgüveni yükselttiği görülür.

Literatürde, tiyatro, plastik sanatlar, müzik, resim, cam boyama, boncuklarla takı yapma, kile şekil verme, ahşap boyama, maske yapımı, kolaj oluşturma, dans, hareket terapi, masaj terapi gibi sanat türleri ile kanser hastalarına sanat terapisi uygulandığı bildirilmiştir. Ancak ebru sanatı ile gerçekleştirilen sanat terapisinin Fizyoterapi ve Rehabilitasyon Hastanelerinin yataklı servisinde tedavi gören hastalar ve hasta yakınlarının psikososyal iyilik düzeyine etkisini araştıran bir çalışmaya rastlanmamıştır. Bu kapsamda, bu çalışma Fizyoterapi ve Rehabilitasyon Hastanelerinin yataklı servisinde tedavi gören hastalar ve hasta yakınlarının ebru sanatı terapisinin etkisini inceleyen ilk ve özgün bir çalışmadır.

Yukarıda verilen bilgiler ve yapılan araştırmaların sonucunda sanat terapisi ve sosyal hizmetin entegrasyonu müdahale sürecinde, müracaatçıya farklı bakış açıları kazandırabileceği ve sosyal hizmet uzmanının daha yetkin ve etkili çalışabileceği bilgilerine ulaşılmıştır. Bu çerçevede araştırmanın problemi; ebru sanatının yataklı serviste tedavi gören hasta ve hasta yakınlarının depresyon ve pozitif duyguları üzerindeki etkisinin incelenmesidir.

Yukarıdaki bilgilerden hareketle araştırmanın sorusu;

“Hasta ve hasta yakınlarının yaptıkları ebru çalışmalarına göre depresyon ve anksiyete düzeyleri değişmekte midir?” olarak belirlenmiştir.

Bu araştırmanın amacı ebru sanatıyla uygulanan sanat terapisinin fizik tedavi ve rehabilitasyon merkezi yataklı servisinde tedavi gören hasta ve hasta yakınlarının psikososyal iyilik hali üzerindeki etkilerini saptamak ve bu çerçevede hastaların ve hasta yakınlarının hastane ortamında sosyal becerilerinin geliştirilmesi, sosyal içermenin sağlanması, iletişim becerilerinin kuvvetlendirilerek sosyalleşmenin artırılması, depresyon ve anksiyete düzeylerinin düşürülmesi, stresle baş etme yöntemlerinin kazandırılması ve yaratıcılık ve hayal güçlerinin kuvvetlendirilmesi amaçlanmaktadır.

Araştırma sonucunda yatan hasta ve hasta yakınlarından elde edilen bulgular doğrultusunda bireylerin ne tür tıbbi sosyal hizmet müdahalelerine ihtiyaç duyduğu bilinmesi ve bu bilgiler neticesinde doğru müdahale edilmesi; hasta ve hasta yakınlarını psiko-sosyal yönden güçlendirmek hedeflenmektedir.

YÖNTEM

Çalışmada ebru sanatının fizik tedavi ve rehabilitasyon merkezi yataklı servisinde tedavi gören hasta ve hasta yakınlarının psikososyal iyilik hali anksiyete ve depresyon düzeylerinin azaltılması üzerindeki etkilerini ölçmek amacıyla nicel araştırma modelinin deneysel yöntemi kullanılmıştır.

Bu araştırmanın evren grubu Türkiye'deki Fizik Tedavi ve Rehabilitasyon Hastaneleri'nin yataklı servisinde tedavi gören hasta ve hasta yakınlarında oluşurken; örneklem grubumuz Kırıkkale Üniversitesi Tıp Fakültesi Hastanesi Fizik Tedavi ve Rehabilitasyon Anabilim Dalı yataklı servisinde tedavi gören hasta ve hastaların yakınlarından gönüllülük esasına dayanılarak amaca uygun olarak seçilen ve Nisan 2024- Temmuz 2024 tarihleri arasında fizik tedavi hastanesinde yatan hasta ve hastalara refakat eden toplam 20 kişiden oluşmaktadır.

Araştırmada örneklem seçiminde belirlenen ölçütler, çalışmanın yapıldığı dönemde katılımcının 18 yaş üzerinde olması; Kırıkkale Üniversitesi Tıp Fakültesi Hastanesi Fizik Tedavi ve Rehabilitasyon Anabilim Dalı yataklı servisinde tedavi gören bir hasta ve bir hastanın yakını olması şeklindedir.

Araştırma kapsamında katılımcılara ve kontrol grubuna ön test-son test uygulaması yapılmıştır.

İlk olarak hastalara ve yakınlarına Beck depresyon ölçeği, Beck anksiyete ölçeği uygulanmıştır.

Haftada 1 gün 1,5 saat olmak üzere 2 aylık toplam 8 oturum ebru etkinliği ve haftada 1 gün 1 saat olmak üzere toplam 4 oturum depresyon ve anksiyete hakkında seminerler gerçekleştirilmiştir.

Çalışmanın sonunda ön testte kullanılan ölçekler tekrar kullanılmış ve ebru etkinliğinin hastaların depresyon ve pozitif duyguları üzerindeki etkisi incelenmiştir.

Araştırmada elde edilen veriler için uygun olan istatistiksel hesaplamalar kullanılmaktadır. Bu çalışmada hastaların ve hasta yakınlarının psikososyal iyilik hali düzeylerinin ölçülebilmesi için Beck Depresyon Ölçeği, Beck Anksiyete Ölçeği'nden elde edilen cevapların frekans ve yüzdesi SPSS ve Araştırma verilerinin analizi bilgisayarda Statistical Pachege For Social Science (SPSS) 24.0 paket programında gerçekleştirilmiştir. Verilerin analizinde; normallik varsayımına bakılmış, gruplar arası farklılıkların olup olmadığını incelemek için bağımsız gruplar t-testi, tek yönlü varyans analizi, bağımlı ve bağımsız değişkenlerin birbiriyle olan ilişkisinin anlaşılması için korelasyon analizi teknikleri kullanılmıştır. İstatistiksel anlamlılık düzeyi olarak $p<0,05$ kabul edilmiştir.

ARAŞTIRMA BULGULAR VE TARTIŞMA

Ebru çalışmasına katılan hastaların depresyon ve anksiyete ölçeğinden aldıkları puanlara ilişkin sonuçlar tablo 1 de verilmiştir.

Tablo 1: Deney Grubuna Katılan Hastaların Beck Depresyon ve Beck Anksiyete Puanlarına İlişkin Bağımlı İlişkiler T Testi Sonucu

	x	sd	t	p
Depresyon ön test- son test	8,12	5,6	4,03	0,05*
Anksiyete ön test-son test	8,50	11,22	2,14	0,06

*p<0,05

Tablo 1’de incelenen deney grubundan elde edilen veriler Beck Depresyon Ölçeği Ön Test ve Beck Depresyon Ölçeği Son Test değerleri arasında istatistiksel olarak negatif yönlü anlamlı bir farklılık olduğu(p=0,05) sonucuna varılmıştır. Buna karşın Beck Anksiyete Ölçeği Ön Test ve Beck Anksiyete Ölçeği Son Test değerleri arasında istatistiksel olarak anlamlı bir farklılık olmadığı (p>0,05) sonucuna varılmıştır. Literatürdeki çalışmalara bakıldığında, hasta yakınlarının psikososyal iyilik düzeyleri ile ilgili çalışmaların yetersiz olduğu gözlemlenmiştir. Bununla birlikte sanat terapisi ve sosyal hizmet iş birliğini vurgulayacak ve bu yönde teşvik edici çalışmaların tıbbi sosyal hizmet alanında yok denecek kadar az olduğu görülmüştür. Sağlık alanında yapılan çalışmalarda ebru sanatının bireylerin fiziksel, zihinsel ve psikolojik olarak gelişimine faydaları olduğu sonucuna ulaşılmıştır. Bu doğrultuda ebru sanatının çocukların zihinsel, duygusal ve sosyal hayatları, kendini ifade edebilme becerileri (Aral vd., 2012, s. 299), kişisel gelişimleri, stres ve kaygıdan uzaklaşmaları, sabırlı olmayı öğrenmeleri üzerinde olumlu etkileri bulunmaktadır (Gür, 2012, s. 86).

Yapılan çalışmada ise eğitimler ile hastalara depresyon ve anksiyete ile ilgili farkındalık kazandırılmış ve bu doğrultuda yaptıkları ebru çalışmaları anlam kazanmıştır. Hastane yatışı boyunca monoton bir hal alan yaşamlarındaki duygusal değişimleri fark etseler dahi bu değişimleri adlandırmakta veya kabullenmekte zorluk yaşayan hastalar ve hasta yakınları ebru çalışmalarına daha istekli yaklaşım göstermiştir. Hastaların el kol koordinasyonlarını destekleyen ebru sanatı hem tedavi sürecinde destekleyici bir rol almış hem de bireylerin sosyalleşerek olumsuz duygular ile baş etmelerini sağlamıştır.

Tablo 2: Kontrol Grubuna Katılan Hastaların Beck Depresyon ve Beck Anksiyete Puanlarına İlişkin Bağımlı İlişkiler T Testi Sonucu

	x	sd	t	p
Depresyon ön test- son test	1,12	1,8	1,76	0,12
Anksiyete ön test-son test	0,25	0,7	1,00	0,35

Tablo 2’de incelenen kontrol grubundan elde edilen veriler sonucunda, Beck Depresyon Ölçeği Ön Test ve Beck Depresyon Ölçeği Son Test değerleri arasında istatistiksel olarak anlamlı bir farklılık olmadığı ($p>0,05$) sonucuna varılmıştır. Buna ek olarak, Beck Anksiyete Ölçeği Ön Test ve Beck Anksiyete Ölçeği Son Test değerleri arasında istatistiksel olarak anlamlı bir farklılık olmadığı ($p>0,05$) sonucuna varılmıştır.

Katılımcıların Nitel Araştırma Sonuçları

- Şırayı toprağa kardığınızda pekmez oluyor ve bu çok faydalı ve lezzetli bir besin haline geliyor, ebru sanatında kullanılan malzeme ve boyaların doğal ve toprak temelli olması bana hep bunu hatırlatıyor, faydasını görebilmek için de büyük bir heyecanla yapmak istiyorum ebruyu.
- İyi bir insan olmak istiyorum, hayal ettiğim hayatı yaşamak istiyorum. Kendimi geliştirmek ve gerçekleştirmek istiyorum.
- Sanat ile ilgili bir alana dahil olmak bana kendimi daha iyi ve özgür ifade edebilme fırsatı sundu.
- Ben ruhsal olarak kendimi iyileştirmesem çevreme ve özellikle çocuklarıma da bir fayda sağlayamam, uçakta maskeyi önce kendimize takmamız gibi bir şey bu. Ebru yapıyor olmak beni heyecanlandırdı ve iyi hissetmeme destek oldu.
- Hayata farklı çerçeveden bakmamı sağlayan insanlar beni çok etkiliyor, insanlarla bir araya gelmemi sağlayan bir hobi edinmek farklı fikirleri de beraberinde getiriyor, renkler ve şekiller konusunda yaptığımız fikir alışverişleri, kumaş seçimlerindeki diyaloglarımız bu sosyal ortama ayak uydurabilmeme sebep oldu.

Katılımcıların tedavisinde yer alan diğer meslek elemanlarının bu çalışma ile ilgili yorumları;

- Biz burada insanların fiziksel sağlığı ile ilgileniyoruz ama tam bir iyileşme olması için insanların psikolojik iyilik halinin de sağlanması gerekiyor bunu da gerçekleştirebilmek için hastaların bir arada bulunarak yaptıkları ebru çalışmaları ve verdiğiniz seminerlerin yansımalarını tedavi sürecinde görebiliyoruz.

- Bulduğumuz hastane itibariyle yapılan bu ebru çalışmaları elbette el kol becerilerinde de egzersiz olarak büyük yarar sağlıyor bu sayede hastalar hem fizyolojik hem de psikolojik olarak ilerleme kaydediyorlar.

SONUÇ

Pandemi, tıp eğitiminin taleplerini artırmış, tıp öğrencileri arasında depresif belirtilerin artmasına ve uyku düzenlerinin değişmesine yol açmıştır.

Hastalarla yapılan bireysel görüşmeler ve grup çalışmaları sırasındaki alınan geri dönüşlerde gözle görülür bir fark ortaya çıkmaktadır.

Hastane ortamında uzun bir süreç geçiren hastaların yaşamı bir süre sonra monotonlaşmaktadır bu sebeple anksiyete ya da depresyon düzeylerinde artışa sebep olmaktadır. Çalışma sonuçları bu monotonluğun önüne geçmek adına insanlarla bir arada bulunabilecekleri sanat terapisi temelli çalışmalar insan ilişkilerini ve iletişim becerilerini geliştireceğini göz önüne sermektedir. Bu sayede hastaların ve hasta yakınlarının psikososyal iyilik hallerinde iyileşmeler gözlenmektedir.

Uzun süreli tedavi verilen yatılı tedavi merkezlerinde sanat terapisi temelli çalışmaların artırılması ve bu çalışmalar ile verilecek olan seminerlerin de göz ardı edilmemesi hastaların tedavi sürecini olumlu etkilemektedir. Ayrıca hasta yakınlarının da yeni bir bakış açısı ve bir beceri kazanmalarını bu sayede ilerleyen yaşamlarında da bu becerilerini kullanarak kendileri için yeni faaliyet alanları oluşturmasını sağlamaktadır.

Bulgular, özellikle uzun süreli hastane yatışlarında hasta yakınlarının psikososyal iyilik hallerinin yükseltilmesinde sanat terapisi kullanımının yaygınlaştırılmasını; psikodinamik kuram çerçevesinde yapılan sosyal hizmet uygulamalarında sanat terapisinin etkililiği konusunda literatüre katkı sağlayacak ve tıbbi sosyal hizmet uzmanlarını da bu alanda yönlendirilmesini ve bilgilendirilmesini vurgulamaktadır. Özellikle bu gibi akut durumlarda tıbbi sosyal hizmet uzmanları hasta ve hasta yakınlarına destekleyici sanat terapileri, programlar, seminerler ve grup çalışmaları düzenleyerek hastane sürecinde yaşanan olumsuz duygu ve durumlarla baş etme becerileri kazandırmalıdır.

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**ÜLKER'İN SÜRDÜRÜLEBİLİRLİK ODAKLI KSS PROJELERİ: YÖNETİCİ
ALGISI ve STRATEJİK UYGULAMALAR**
ÜLKER'S SUSTAINABILITY-FOCUSED CSR PROJECTS: MANAGERIAL
PERCEPTION and STRATEGIC IMPLEMENTATIONS

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ÖZET

Halkla ilişkiler, kurumların iç ve dış hedef kitlelerle iletişimini yönetirken, kurumsal sosyal sorumluluk faaliyetleriyle topluma fayda sağlamaktadır. Markaların sosyal sorumluluk projelerine katılımı, uzun vadede karşılaşılabilecekleri riskleri minimize etmektedir. Günümüzde sürdürülebilirlik, üzerinde en çok durulması gereken konular arasında yer almaktadır. Sürdürülebilirlik, insanların tüketim alışkanlıklarına çözüm sunan bir kavram olup, Kurumsal Sosyal Sorumluluk (KSS) çalışmaları içerisinde önemli bir yer tutmaktadır. KSS çalışmaları, işletmelerin sürdürülebilirlik stratejileri doğrultusunda toplumsal beklentileri karşılmasını sağlamaktadır.

Araştırma kapsamında, Ülker markasının sürdürülebilirlik odaklı KSS projelerinin yöneticiler tarafından nasıl algılandığı, Ülker Sürdürülebilirlik, Çevre ve Enerji'den Sorumlu Yöneticisi ile yapılan bir derinlemesine görüşme aracılığıyla incelenmiştir. Elde edilen veriler, yöneticilerin benzer projelere yönelik tutumlarını, projelerin stratejik önemini, karşılaşılan zorlukları ve fırsatları ortaya koymaktadır. Ülker'in sürdürülebilirlik çabalarının, şirketin stratejik planlama ve kurumsal yönetim süreçlerine nasıl entegre edildiği de araştırma çerçevesinde ele alınmaktadır. Çalışma, yöneticinin perspektifinden sürdürülebilirlik odaklı yönetim pratiğine katkı sağlamayı amaçlamaktadır.

Araştırma sonucuna göre Ülker'in sürdürülebilirlik odaklı çalışmaları olumlu geri bildirimler almaktadır ve topluma, çevreye ve geleceğe odaklanarak sürdürülebilirlik hedeflerine katkıda bulunmaktadır. Ülker, on yıllık sürdürülebilirlik kalkınma hedefleri belirleyerek, çevre dostu üretim süreçleri ve geri dönüştürülebilir malzemeler kullanarak olumlu bir etki yaratmaktadır. Eğitim, sağlık ve sosyal yardım alanlarında birçok projeye destek veren Ülker, müşteri isteklerini analiz ederek sürdürülebilirlik projeleri geliştirmekte ve "Mutlu et, mutlu ol" mottosuyla sürdürülebilirlik faaliyetlerini yürütmektedir. Bu durum, çalışanlarının çevreye duyarlı davranışlarını ve şirket içindeki karbon ayak izinin azaltılmasını teşvik etmektedir. Türkiye'deki kurum ve kuruluşların sürdürülebilirlik alanındaki faaliyetleri hem topluma hem

de bu kurumların itibarına fayda sağlamaktadır. Ülker'in sürdürülebilirlik konusundaki çabaları ve aldığı ödüller ise bu alandaki başarısının bir göstergesidir.

Anahtar kelimeler: Halkla İlişkiler, Kurumsal Sosyal Sorumluluk, Sürdürülebilirlik, Sürdürülebilir İşletme, KSS, Stratejik Planlama.

ABSTRACT

Public relations manage communication between organizations and their internal and external target audiences while contributing to societal welfare through corporate social responsibility (CSR) activities. Participation in social responsibility projects helps brands minimize risks they may face in the long term. Today, sustainability is among the most critical issues to address. Sustainability, as a concept providing solutions to consumption habits, holds a significant place within CSR efforts. CSR activities enable businesses to meet societal expectations in line with their sustainability strategies.

Within the scope of the research, the perception of Ülker's sustainability-focused CSR projects by managers has been examined through an in-depth interview with Ülker's Manager responsible for Sustainability, Environment, and Energy. The data obtained reveal the managers' attitudes towards similar projects, the strategic importance of these projects, and the challenges and opportunities encountered. The integration of Ülker's sustainability efforts into the company's strategic planning and corporate governance processes is also addressed within the research framework. The study aims to contribute to sustainability-focused management practices from the perspective of the manager.

According to the research findings, Ülker's sustainability-focused efforts receive positive feedback and contribute to sustainability goals by focusing on society, the environment, and the future. Ülker creates a positive impact by setting ten-year sustainability development goals, employing eco-friendly production processes, and using recyclable materials. Additionally, Ülker supports numerous projects in the fields of education, health, and social assistance. By analyzing customer demands, Ülker develops sustainability projects and conducts its sustainability activities with the motto "Make happy, be happy." This approach promotes environmentally conscious behavior among its employees and aims to reduce the company's carbon footprint. The sustainability efforts of institutions and organizations in Turkey contribute to both society and their reputation. Ülker's sustainability initiatives and the awards it has received are indicators of its success in this field.

Keywords: Public Relations, Corporate Social Responsibility, Sustainability, Sustainable Business, CSR, Strategic Planning.

GİRİŞ

Günümüzde çevresel sorunlar, su ve hava kirliliği gibi konular ön plana çıkmakta ve bu durum, dünya üzerindeki tüm canlıların yaşamı için ciddi tehlikeler oluşturmaktadır. Markaların bu sorunların farkına vararak, bu konular üzerinde çalışmaları ve çözümler üretmeleri, çevreye duyarlı olmaları gerekmektedir. İşletmelerin, topluma fayda sağlayacak çalışmalar yapmasının amacı, hem sürdürülebilir bir dünya yaratma çabası hem de markanın kendi varlığını sürdürülebilirlik zorunluluğundan kaynaklanmaktadır. Kurumsal sürdürülebilirlik, toplumun refah seviyesini yükseltmek, ekonomik ve sosyal yaşam kalitesini artırmak açısından büyük önem taşır.

Kurumlar, sosyal sorumluluk çalışmaları yürüterek uzun vadeli ve olumlu sonuçlar elde etmekte, çevresel sürdürülebilirlik sorunlarına çözüm üretmektedir. Bursalı ve Şenocak'a (2018) göre, sürdürülebilirlik kavramı, işletmelerin üzerine yoğunlaşmaları gereken bir yükümlülüktür. İşletmeler, toplum içerisinde varlıklarını sürdürebilmek ve hedef kitleyi etkileyebilmek için çeşitli proje ve faaliyetler planlamaktadır. Bu sayede, kamuoyunun ilgisini çekmekte ve tüketicinin tepkisini ölçebilmektedirler. Halkla ilişkiler departmanlarının varlığı ve kurumun halkla ilişkiler yöneticilerinin misyonu, sürdürülebilirlik konusunu daha ileri noktalara taşımak açısından kritik öneme sahiptir. Bu bağlamda, kurumsal sosyal sorumluluk kavramı, kurumların sorumluluğunu yerine getirmesi gereken bir alan olarak daha büyük bir anlam kazanmaktadır.

İşletmeler, içerisinde buldukları çevrede yaşanabilirlik ve sürekliliği sağlamak amacıyla stratejilerini bu doğrultuda şekillendirmekte ve bu çalışmalara belirli bir bütçe ayırmaktadırlar. Kurumlar, ekolojik dengeye önem vermekte ve bu sayede topluma fayda sağlamak istemektedirler. Çevresine önem veren kurumlar, diğer kurumlara göre daha çok tercih edilmektedir.

Bu araştırmada Ülker markasının sürdürülebilirlik odaklı kurumsal sosyal sorumluluk (KSS) projelerinin yöneticiler tarafından nasıl algılandığını ve yöneticilerin sürdürülebilirlik perspektifinden bu projelerin stratejik önemini incelerken derinlemesine görüşme yöntemiyle elde edilen verilerin, Ülker'in sürdürülebilirlik odaklı KSS projelerinin yöneticilerin stratejik vizyonuna ve markanın kurumsal kimliğine nasıl entegre edildiğini ortaya koymaya çalışmaktadır.

HALKLA İLİŞKİLER ve KURUMSAL SOSYAL SORUMLULUK

Halkla ilişkiler kavramı, geçmişten günümüze kadar teknolojinin gelişmesiyle birlikte farklı tanımlarla zenginleşmiştir. Halkla ilişkiler, etik ilkelere uygun iletişim stratejilerini benimseyen benzersiz bir yönetim işlevidir (Sjöberg, 1998) ve işletme ile hedef kitlesi arasında karşılıklı etkileşim, kabul görme, iş birliği ve iletişimi düzenli bir şekilde sağlamayı amaçlayan bir yönetim fonksiyonudur. Bu fonksiyon, olası sorunların ve konuların anlayış içinde yönetilmesini sağlarken, yönetimi/yöneticileri halkın beklentileri konusunda sürekli bilgilendirir. Halkla ilişkiler, yönetimin toplum yararına hizmet etme sorumluluğunu tanımlar

ve vurgular. Aynı zamanda, potansiyel sorunları önceden saptayarak bir erken uyarı sistemi görevi görür ve yönetimin bu değişikliklere ayak uydurmasını sağlar. Böylece, yönetim bu değişikliklerden yararlanma imkânı elde eder.

Cutlip ve arkadaşları (1994:6) halkla ilişkileri, bir örgütün başarı ya da başarısızlığının kendilerine bağlı olduğu çeşitli kamuoyları ile örgüt arasında karşılıklı yarara dayanan ilişkileri kuran ve sürdüren bir yönetim fonksiyonu olarak tanımlar. Bu bağlamda, halkla ilişkiler yönetim fonksiyonunun üç temel unsuru ön plana çıkmaktadır:

İşletme: Kâr amacı güden ya da toplumsal yarar sağlama amacı taşıyan kurum ve kuruluşlardır. İşletmeler, çeşitli faaliyetlerini bir çatı altında gerçekleştirirler.

Hedef Kitle: İşletme ve marka ile doğrudan ilişkili olan, işletmenin başarısında etkili olabilen tüzel ya da özel kişilerden oluşur.

İletişim: Kaynaktan hedeflere, yani alıcılara mesaj aktarma sürecidir. İletişim, toplumun temelini oluşturan bir kavram olarak, kurum veya kuruluş yapılarında düzenli işlemeye yardımcı olan bir araçtır.

Bu unsurlar çerçevesinde, bir işletmenin hedef kitleleriyle arasında karşılıklı iletişimi sağlamak, bu iletişimi sürdürmek ve anlayış geliştirmek için halkla ilişkiler bir yönetim fonksiyonu olarak kritik bir rol oynar. Pohl (1995) bu durumu şu şekilde özetler: Halkla ilişkiler, örgütle ilgili kamuları, tüketicileri, programları ve planları uyumlu ve koordine bir şekilde yönlendirerek, ilgili hedef kitle ile istenilen ilişkileri kurmak ve sürdürmek amacıyla yönetimin bir aracı olarak hizmet eder. Halkla ilişkiler, bir kurumun hem iç hem de dış çevresiyle iyi ilişkiler geliştirmesi ve bu ilişkilerin yönetilmesini kapsar. Ayrıca, hedef kitleyi etkilemek için hazırlanan inandırıcı ve ikna edici çalışmalardan oluşur.

Peltekoğlu (2007:7), halkla ilişkileri, kurumun amaçları üzerine yapılandırılmış, öncelikleri değişkenlik gösteren hedef kitlelerle gerçekleştirilen stratejik bir iletişim yönetimi olarak tanımlar. Halkla ilişkiler, hedef kitleyle uzun vadeli ve sürdürülebilir bir iletişim kurmayı ve bu iletişimi güçlendirmeyi amaçlar. Kurum, hedef kitle ile karşılıklı çıkar ilişkisi kurar ve bu çıkarlar doğrultusunda bilgi ve düşünce paylaşımı gerçekleştirir. Halkla ilişkiler uzmanları, kurumun geleceği için stratejik çalışmalar yürütür ve bu çalışmalar bazen kâr amaçlı, bazen de toplumsal sorumluluk amacı güden etkinlikler olarak karşımıza çıkar.

Her kurumun temel hedefi topluma hizmet etmek ve toplumsal yarar sağlamak olmalıdır. Kurumsal sosyal sorumluluk (KSS) kavramı, kurumların insan haklarına, çevreye, eğitim alanlarına ve benzeri sosyal sorumluluk alanlarına duyarlı olmasını gerektiren gönüllülük esasına dayanan bir anlayışı ifade eder. KSS, kurumları değerli kılan unsurların yalnızca ürün üretmek veya hizmet sunmak olmadığını; aynı zamanda topluma yarar sağlayacak çalışmalar yürütmenin de önemli olduğunu vurgular. Bu bağlamda, KSS, kurumların topluma karşı olan ödev ve görevlerini yerine getirmeleri ile bu sorumlulukları dengeleme sürecidir. Kurumlar, toplumsal gelişime katkıda bulunma sorumluluğunu üstlenirler ve ekonomik sermayeyi etkili bir şekilde kullanarak sürdürülebilir kalkınmaya destek olurlar.

Eren (2000:99), sosyal sorumluluk kavramını, bir kurumun yasal ve ekonomik gerekliliklere, iş ahlakına saygı göstermesine ve kurumun hem çevresel hem de toplumsal beklentileri karşılamayı amaçlayan bir çalışma politikası olarak tanımlar. Bu çerçevede kurumsal sosyal sorumluluk, sadece kurumların yasal sorumluluklarını yerine getirmeleri değil, aynı zamanda toplumsal ve çevresel problemlerin çözümüne katkıda bulunmaları anlamına gelir. Kurumlar, çıkarlarını bir kenara bırakarak, sürdürülebilirlik ilkelerini benimserler ve bu ilkeler doğrultusunda kurumsal sosyal sorumluluk çalışmaları yürütürler.

Kurumsal sosyal sorumluluk, sürdürülebilir işletme ilkelerini uygulamak ve toplumla olan etkileşimlerini yönetmek için kullanılan stratejik bir araçtır. KSS sayesinde kurumlar toplumun gelişimi ve refahı için sorumluluk alır, çevresel sürdürülebilirlik sorunlarına yönelik çözümler geliştirir ve uzun vadeli sosyal sorumluluk projeleri ile bu katkılarını sürekli kılarlar.

SÜRDÜRÜLEBİLİRLİK KAVRAMI ve KURUMSAL UYGULAMALAR

Günümüzün en büyük küresel sorunlarından biri olan sürdürülebilirlik, modern yaşamın getirdiği çevresel ve sosyal zorluklarla başa çıkmak adına kritik bir kavram haline gelmiştir. Sürdürülebilirlik, yalnızca doğal kaynakların korunması ve çevre sorunlarının çözümüyle sınırlı kalmayıp, ekonomik büyüme, sosyal adalet ve kültürel gelişimi de kapsayan geniş bir çerçevede ele alınmaktadır. Kruse (2011:6), “sürdürülebilir kalkınma”yı, ekonomik, ekolojik, kültürel ve sosyal koşullar arasındaki karşılıklı bağımlılıkları göz önünde bulundurarak, çevre ve insan etkileşiminin sürekli olarak dönüşüm geçirmesi gereken bir süreç olarak tanımlar. Bu süreç hem ulusal hem de uluslararası düzeylerde, toplumsal aktörlerin küresel ölçekte uyum sağlamalarını gerektiren bir yaklaşımı ifade eder.

Henriques (2001:32) ise sürdürülebilirlik kavramını, bir kurumun faaliyetlerini sosyal, çevresel ve ekonomik sermaye üzerindeki etkilerini dikkate alarak uzun vadede sürdürülebilir bir şekilde yürütme yetisi olarak tanımlar. Sürdürülebilirlik çalışmaları, çevresel, ekonomik ve sosyal alanları kapsadığı için, kurumlar artık yalnızca kar elde etme amacını gütmekten öte, toplumsal çıkarları ön planda tutan kurumsal sürdürülebilirlik stratejilerini benimsemektedir.

Son yüzyılda, insan müdahalesi ile doğada meydana gelen değişiklikler (tüketim çılgınlığı, ekosistemin bozulması, çok fazla plastik kullanımı vb.), sürdürülebilir bir yaşamın ne denli önemli olduğunu bir kez daha gözler önüne sermektedir. Daha kaliteli yaşam adına yapılan yatırımlar, insan refahını artırma çabalarının bir parçası olmasına karşın bazen bireylerin iyi olma halini, yani yaşam memnuniyetini daha da azaltabilmektedir. Dolayısıyla, sürdürülebilir bir yaşam tarzını sürdürebilmenin, toplumsal refahı korumak açısından ne denli kritik olduğu açıkça ortaya çıkmaktadır.

Sürdürülebilirlik kavramı, yalnızca markaların halkla ilişkiler departmanlarını ilgilendiren bir konu olmaktan çok daha öteye geçmiştir. Bugün, sürdürülebilirlik, kurumların en üst yönetiminden en alt düzeydeki çalışanlarına kadar tüm paydaşları ilgilendiren bir yönetim anlayışını gerektirmektedir. Bu süreçte, markaların halkla ilişkiler departmanları ile sürdürülebilirlik faaliyetleri arasında kurulacak yakın ve etkili iletişim, sürdürülebilirlik

stratejilerinin başarısı için hayati önem taşımaktadır. Halkla ilişkiler departmanında görevli profesyoneller, sürdürülebilirlik projelerini tanıtmakla kalmayıp, aynı zamanda kamuoyundan gelen geri bildirimleri de toplamakta ve bu bilgileri sürdürülebilirlik stratejilerinin geliştirilmesinde kullanmaktadır.

SÜRDÜRÜLEBİLİR İŞLETME KAVRAMI ve HIZLI TÜKETİM SEKTÖRÜ MARKASI ÜLKER

Bir işletmenin hayata geçirilmesi uzun bir süreç gerektirir ve önemli miktarda emek ister. Sürdürülebilir bir işletme yapısının inşa edilmesi ise daha uzun bir zaman dilimi ve stratejik planlama gerektirir. İşletmelerin sürdürülebilirliğini sağlamak amacıyla yapılan çalışmalar, halkla ilişkiler departmanlarının kurumun tanıtımını sağlamak üzere gerçekleştirdiği etkinliklerle başlamaktadır. Sert (2016), işletmenin kar elde edebilmesinin büyük bir çaba ve yetenek gerektirdiğini vurgularken ayrıca işletme faaliyetlerinin sürdürülebilir olmasının da hayati bir öneme sahip olduğunu belirtir. Sert (2016), işletmenin kar elde edebilmesinin büyük bir çaba ve yetenek gerektirdiğini vurgularken, işletme faaliyetlerinin sürdürülebilir olmasının da hayati bir öneme sahip olduğunu belirtir. Tüketicinin sürekli artan talepleri ise kurumların sürdürülebilirlik hedefleri doğrultusunda daha ileriye gitme motivasyonunu artırmakta ve kurumların rekabet gücünü korumak ve geliştirmek için sürekli olarak kendilerini yenileme ve iyileştirme çabasına girmelerine neden olmaktadır.

Sürdürülebilir kalkınmanın önem kazandığı bir dönemde, küresel ölçekteki iş dünyası, sürdürülebilirlik ilkelerini benimseyerek toplumsal ve çevresel sorumluluklarını yerine getirmeye odaklanmıştır. Küresel İlkeler Sözleşmesi, 1999 yılında Birleşmiş Milletler (BM) Genel Sekreteri Kofi Annan'ın öncülüğünde hazırlanmış ve 2000 yılında BM Genel Merkezi'nde düzenlenen bir toplantıyla kabul edilmiştir. Kağnıcıoğlu'na (2007:191) göre, bağlayıcı olmayan bu sözleşme, gönüllülük esasına dayanmaktadır ve on ilkeyi içermektedir; bu ilkeler çevre, çalışma koşulları, insan hakları ve yolsuzlukla mücadele konularına odaklanmaktadır (United Nations Global Compact, 2011).

2010 yılında Birleşmiş Milletler tarafından düzenlenen Küresel İlkeler Sözleşmesi kapsamında farklı ülkelerden pek çok kurumun yöneticisiyle gerçekleştirilen araştırmanın sonuçlarına göre, kurumları sürdürülebilirlik konusunda özendiren başlıca sebepler şu şekilde sıralanmıştır (Kuşat, 2012):

- Artan marka değeri, güven ve itibar, kurumların karlılığını artırır.
- Personel motivasyonu yükselir, bu da kar marjlarını artırır.
- Kurumların itibarı arttıkça, kalifiye işgücünü çekmek daha kolaylaşır.
- İyi bir itibar, rekabet üstünlüğü sağlar.
- Uluslararası sorumlu yatırım şirketleri daha kolay finansal destek sağlayabilir.
- Bilinçli tüketicilerin talepleri değişir ve işletmeler bu taleplere uyum sağlamalıdır

Özetle sürdürülebilir işletme, doğal kaynakları verimli kullanma, çevreye duyarlılık, sosyal adalet ve ekonomik sürdürülebilirlik gibi faktörleri işletme stratejisine entegre etmeyi gerektirir.

Hızlı tüketim malları (HTM) perakendeciliği, yüksek raf devir hızına sahip, genellikle düşük fiyatlı ve satın alma kararları kısa sürede verilen, kısa süreli stoklanabilen ve sürekli olarak tüketilen gıda, içecek, kişisel bakım ürünleri, kozmetik ve temizlik ürünleri gibi ürünlerin son tüketicilere sunulması sürecini ifade eder (Rekabet Kurul Başkanlığı, 2009). Bu tür ürünler, tüm ülkelerdeki tüketici bütçelerinde önemli bir yer tutmakta olup, bu ürünlerin perakende ticareti, hanelere yüksek kalite ve düşük maliyetle düzenli olarak tedarik edilmesi açısından kritik öneme sahiptir (Çelen, Aydın, Erdoğan, Tarkan, Taymaz, Erol, 2007). Hızlı tüketim malları perakendeciliğinde lider marka Ülker, 1944 yılında Sabri Ülker ve Asım Ülker tarafından Ülker Bisküvi Sanayi A.Ş. adıyla kurulmuştur. Ülker, gıda üretiminde uzmanlaşmış ve farklı sektörlerde ürünlerini yüzün üzerinde ülkeye ihraç eden küresel bir marka haline gelmiştir. Şirket, gıda sektöründe geniş bir ürün yelpazesine sahip olup, farklı kategorilerde faaliyet göstermektedir. Ülker, sürdürülebilirliği, operasyonlarının temel bir bileşeni olarak görmekte ve tüm değer zincirinde paydaşlarıyla birlikte büyüme ve gelişmeyi hedeflemektedir.

Şirketin sürdürülebilirlik stratejisi, çevre, değer zinciri, çalışanlar, inovasyon, toplumsal sorumluluk ve liderlik gibi altı temel başlık altında şekillendirilmektedir. Ülker, 2024 yılı hedefleri doğrultusunda bu alanlarda geliştirdiği sürdürülebilirlik ilkelerini referans almakta olup, ulusal ve uluslararası gündemi, küresel trendleri yakından takip ederek Birleşmiş Milletler 2030 Sürdürülebilir Kalkınma Amaçlarına katkıda bulunmayı amaçlamaktadır. Şirket, sürdürülebilirlik çalışmalarının ancak tüm organizasyon ve çalışanlar tarafından içselleştirildiğinde başarılı olabileceğine inanmakta ve bu doğrultuda çaba sarf etmektedir (www.ulker.com.tr).

Bu bilgiler ışığında, Ülker'in sürdürülebilirlik yaklaşımı, yalnızca çevresel ve sosyal sorumlulukları yerine getirmekle kalmayıp, aynı zamanda sürdürülebilir işletme iş süreçlerinin her aşamasında yenilikçi çözümlerle desteklenen, uzun vadeli bir vizyonu yansıtmaktadır.

ARAŞTIRMA YÖNTEM ve BULGULARI

Bu araştırmada nitel araştırma yöntemi kullanılmış ve veri toplama aracı olarak derinlemesine görüşme tekniği tercih edilmiştir. Derinlemesine görüşme, katılımcıların deneyim ve düşüncelerini ayrıntılı olarak ortaya koymaya yönelik, açık uçlu soruların sorulduğu, esnek ve etkileşimli bir veri toplama sürecidir (Kümbetoğlu, 2008). Çalışmanın evrenini atıştırmalık (hızlı tüketim) sektörü oluşturmaktadır ve bu bağlamda Ülker markası, araştırmanın örneklemini olarak seçilmiştir. Araştırma, Ülker markasının atıştırmalık (hızlı tüketim) sektöründeki çevresel sürdürülebilirlik uygulamalarını ve sürecini yöneticilerin bakış açısıyla incelemeyi amaçlamakta ve çalışanların sürdürülebilirlik bilincinin oluşturulması ile bu bilincin toplumda iletişim çalışmaları ve çabalar aracılığıyla nasıl yaygınlaştırıldığını araştırmayı hedeflemektedir. Bu amaç ve hedeflerin test edilmesi, derinlemesine görüşmeden elde edilen veriler aracılığıyla gerçekleştirilmiştir. Görüşme soruları, Akbayır'ın (2019) "Halkla İlişkiler

Perspektifinden Kurumsal Sürdürülebilirlik İletişimi ve Bir Örnek Olay İncelemesi" çalışmasında yer alan sorulardan yola çıkılarak geliştirilmiştir. Bu sorular, Ülker'in sürdürülebilirlik stratejilerini ve iletişim faaliyetlerini detaylı bir şekilde değerlendirmek amacıyla yapılandırılmıştır.

Tablo 1. Ülker Markası Sürdürülebilirlik, Çevre ve Enerji'den Sorumlu Yöneticisi ile Gerçekleştirilen Derinlemesine Görüşme

** Sürdürülebilirlik stratejilerinin kurumsal yapılanma içinde yeri (departman/birim yapısı) ve kurumun sürdürülebilirlik yönetimine bakış açısı nasıldır/nasıl olmalıdır? Uzun vadeli büyüme stratejileri üzerindeki etkilerini nasıl değerlendiriyorsunuz?*

Ülker, 2014 yılında sürdürülebilirlik stratejisini oluşturmuş bir şirkettir. Bu strateji, çevresel, toplumsal ve ekonomik boyutlarda bir şirketin sürdürülebilirlik açısından neler yapabileceğine odaklanmaktadır. Şirket, bu stratejiyi altı ana başlık altında topladı: çevre, toplum, değer zinciri, inovasyon, çalışanlar ve liderlik. Her bir alanda uzun vadeli hedefler belirlenmiş ve bu hedefler 2014 yılı baz alınarak on yıllık bir sürdürülebilirlik kalkınma planı çerçevesinde oluşturulmuştur. O dönemde, Türkiye'de on yıllık hedefler belirleyen ilk şirketlerden biri olması, Ülker'in vizyoner bir yaklaşıma sahip olduğunu göstermektedir. Özellikle çevresel alanda belirlenen hedefler arasında karbon salımında artış olmadan büyüme, su kullanımını %30, enerji tüketimini %25 azaltma ve ambalaj kullanımını düşürme gibi somut hedefler yer almıştır. Ayrıca, çalışanlarla ilgili olarak çalışan bağlılığını artırma ve işten ayrılma oranını düşürme gibi hedefler de örnek olarak verilebilir.

Ülker, belirlenen bu hedeflere ne ölçüde ulaşıldığını değerlendirmek amacıyla her yıl sürdürülebilirlik raporları yayımlamaktadır. 2015 yılından itibaren her yıl sonunda yayımlanan bu raporlar, şirketin gerçekleştirdiği çalışmalar ve hayata geçirdiği projeler hakkında bilgi sağlamaktadır.

Stratejinin oluşturulmasının ardından, sürdürülebilirlik yönetimini koordine etmek üzere bir ekip kurulmuştur. Bu ekibin başında Sürdürülebilirlik, Çevre ve Enerji Müdürü ile Çevre ve Enerji Yöneticisi bulunmaktadır. Ayrıca, sürdürülebilirlikten, kaliteden, operasyonel mükemmellikten ve iş güvenliğinden sorumlu bir başkan yardımcısı da bu dört departmanın faaliyetlerini CEO'ya raporlamaktadır. Ülker gibi büyük şirketlerde, sürdürülebilirlik stratejilerinin üst düzeyde birim koordinasyonunda yönetilmesi kritik öneme sahiptir. Bu, tüm departmanlar ve iş birimleri arasında uyumun sağlanmasını ve hedeflerin eşit bir şekilde dağıtılmasını garanti eder. Böylece, her departman kendi yatırım ve bütçe planlamasını bu hedeflere uygun şekilde yapar. Ülker'de, bu yapının dışında bir Sürdürülebilirlik Komitesi de oluşturulmuştur. Bu komitede Ar-Ge, pazarlama, insan kaynakları, kurumsal iletişim, lojistik, operasyonel mükemmellik, kalite, iş sağlığı ve güvenliği, çevre ve idari işler gibi on farklı birimin liderleri yer almaktadır. Şirketin tüm fonksiyonları bu komitenin bir üyesi olarak kabul edilir. Komite, üç ayda bir toplanarak hedeflerin takibini yapar ve bu hedefler her yıl yenilenip geliştirilir. Komitenin faaliyetleri CEO'ya raporlanır ve CEO da bu raporları yönetim kuruluna sunar.

2024 yılına gelindiğinde, Ülker'in belirlediği on yıllık hedefler tamamlanmış olup, bu hedeflerin yenilenmesi gerekmektedir. Şirket, 2034 yılına yönelik sürdürülebilirlik hedeflerini belirlemektedir. Önceki altı ana başlık dört başlığa indirilmiştir: Dünya, toplum, değer zinciri ve çalışanlar. 2030 yılına kadar Ülker'in bu alanlarda neler yapacağı planlanmıştır ve tüm departmanların projeleri ile yatırım kalemleri kaba bir şekilde belirlenmiştir.

** Sürdürülebilirlik hedeflerinin gerçekleşmesinde, kurumun iletişime bakış açısı nasıldır/nasıl olmalıdır?*

Sürdürülebilirlik hedeflerinin gerçekleştirilmesinde iletişimin rolü kritik öneme sahiptir. Sürdürülebilirlik

Programının etkili bir şekilde yürütülmesi durumunda, bu programın müşterilere ve paydaşlara (sivil toplum örgütleri, kamu kuruluşları, özel sektör vb.) etkin bir şekilde aktarılması gerekmektedir. Yıllık performans raporları bu iletişimin temel araçlarından biridir ve bu raporlar standartlara uygun olarak, herkesin anlayabileceği şekilde hazırlanmalıdır. Türkçe ve İngilizce olarak yayımlanan raporlar, şirketin ekonomik ve çevresel performansını detaylandırır ve genellikle Ağustos-Eylül aylarında sunulur. Rapordaki bulgular, medya içerikleri ve basın bültenleri için bir temel teşkil eder. Ayrıca, sosyal medya platformlarında kurumsal ve müşteri odaklı paylaşımlar yapılır.

Önemli gün ve haftalarda, örneğin Dünya Su Günü (22 Mart), Dünya Çevre Günü (5 Haziran), Dünya Çiftçiler Günü ve Enerji Verimliliği Haftası gibi özel zamanlarda, Ülker raporların sonuçları doğrultusunda iletişim faaliyetlerinde bulunur. Bu faaliyetler bazen bir sosyal medya gönderisi şeklinde olabilirken, bazen de özel projelerle desteklenir. Örneğin, "Ali Ağa Buğdayı" projesi gibi projelerle basın davetleri düzenlenir ve bu projeler ilgili kitlelere sunulur. Sürdürülebilirlik veya inovasyonla ilgili projeler de bu kapsamda olabilir. Sürdürülebilirlik ekibi, elde edilen çıktılar kurumsal iletişim ekibiyle koordineli bir şekilde toparlar ve yıl içinde yürütülen tüm çalışmalarını kamuoyuna, paydaşlara ve çalışanlara duyurur. İletişim faaliyetleri profesyonel bir yaklaşımla yönetilmeli, çünkü iletişim kaynaklı krizler genellikle bu süreçlerde ortaya çıkmaktadır.

CEO ve üst düzey yöneticiler de kendi sosyal medya hesaplarında paylaşımlar yapabilir. Ayrıca, sivil toplum örgütleri tarafından düzenlenen etkinliklerde konuşmacı olarak davet edilip görüşlerini paylaşabilirler. Bu tür davetler bazen iş birliklerine de yol açabilir. Örneğin, TÜSİAD, MÜSİAD, TOBB, İstanbul Sanayi Odası gibi meslek örgütlerinin davetlerinde, iş dünyasına yönelik mesajlar verilebilir.

****Sürdürülebilirlik iletişiminde yararlanılan iletişim araç ve yöntemler hangileridir? Yararlanılan iletişim araç ve yöntemlerinin özellikleri nelerdir?***

Geleneksel medyada (televizyon, radyolar vb.) mecralarda görünürlük reklam ve haber içerikleriyle sağlanırken daha büyük bir kısmı dijital medyada yer almaktadır. İnstgram, Twitter, LinkedIn vb. gibi dijital mecralar yoğun olarak kullanılmaktadır.

Geleneksel medya, dijital platformların yaygınlaşmasına rağmen, hâlâ geniş bir kitleye ulaşabilen güçlü bir araç olarak varlığını sürdürmektedir. İnternet üzerinden gazetelerin ve diğer yayın organlarının takip edilebilir olması, bu mecraların etkisini artırmaktadır. Ülker'in sürdürülebilirlik ile ilgili yaptığı yatırımlar ve geleceğe yönelik hedeflerinin milyonlarca kişi tarafından takip edilen bu platformlarda da etkili bir şekilde açıklanması, şirketin sürdürülebilirlik stratejilerinin geniş kitlelere ulaşması açısından kritik öneme sahiptir.

****LinkedIn'in kullanılmasındaki amaç nedir?***

LinkedIn platformunda sürdürülebilirlik paylaşımlarının yapılmasının temel nedeni, bu mecranın iş dünyası odaklı bir platform olmasıdır. LinkedIn, tüm şirketlerin, çalışanların ve genç profesyonellerin bir arada bulunduğu bir ortam sunar ve özellikle "beyaz yaka" olarak adlandırılan iş gücüne hitap etmektedir. Hem şirketler arası hem de çalışanlarla doğrudan iletişimin kurulabildiği bu platform, Ülker'in sürdürülebilirlik alanında yarattığı etkiyi ve aldığı inisiyatifleri görünür kılmak açısından stratejik bir önem taşır. LinkedIn, Ülker'in iş dünyasını bu alanda etkileyebilmesini sağlayan güçlü bir araçtır. Bu platform üzerinden yapılan paylaşımlar, dünya ve toplum için pozitif etki yaratma potansiyelini artırır. Örneğin, Ülker'in sürdürülebilirlik ile ilgili bir paylaşımının ardından başka bir kurumun benzer bir girişimi duyurması, Ülker'in sektördeki rol model pozisyonunu pekiştirmektedir.

LinkedIn aynı zamanda üniversite öğrencileri ve yeni işe başlayan genç profesyoneller tarafından da takip edilmektedir. Bu kitleler, Ülker'in sürdürülebilirlik odaklı paylaşımlarını gördüklerinde, "Böyle bir şirkette çalışmak isterim." düşüncesini geliştirebilirler. Bu da Ülker için nitelikli ve dünya için olumlu katkılar yapmayı amaçlayan çalışanları hedefleme açısından önemli bir fırsat sunar. Sürdürülebilirlik bilincine sahip bu tür

yetenekli çalışanlar, şirket için büyük bir avantaj teşkil eder ve sürdürülebilirlik hedeflerine ulaşmada önemli katkılar sağlayabilir.

****Sürdürülebilirlik yönetiminin başarısında paydaş katılımının rolü, paydaş katılımını sağlamak için yararlanılan iletişim araç ve yöntemleri nelerdir?***

Paydaşların analizi, sürdürülebilirlik yönetiminin başarısında kritik bir rol oynamaktadır. Ülker, bu doğrultuda her iki yılda bir paydaş analizi çalışması gerçekleştirmektedir. Bu çalışmalar, danışmanlar aracılığıyla hazırlanan anketler yoluyla yürütülmektedir. Anketler, sivil toplum kuruluşları, üniversiteler, özel sektör temsilcileri, yatırımcılar, finans kuruluşları gibi geniş bir yelpazeye gönderilmektedir. Anketlerde, "Ülker'in sürdürülebilirlik anlamında öncelikleri ne olmalıdır?", "Ülker hangi alanlara yatırım yapmalıdır?", "Ülker'i nerelerde güçlü, nerelerde zayıf görüyorsunuz?" gibi sorular yer almaktadır. Bu süreçte yüzlerce paydaşın görüşleri toplanmakta ve değerlendirilmekte, toplumun Ülker'den beklentileri gözlemlenmektedir. Bu beklentilere göre yeni programlar geliştirilmekte ve mevcut stratejiler revize edilmektedir. Stratejide eksik kalan hedefler tamamlanmakta veya gerektiğinde yeni hedefler belirlenmektedir.

Sürdürülebilirlik stratejisi, her yıl yeniden belirlenen bir süreç değildir; stratejinin yenilenmesi bazen iki yılda bir gerçekleştirilmekte, bazen de aynı stratejiler devam ettirilmektedir. Bu, belirlenmiş stratejilerin güçlü ve uygun olduğunu göstermek açısından önemlidir.

Son yıllarda, iklim değişikliği gibi küresel konularda önemli gelişmeler yaşanmış ve tüm dünyada şirketler sürdürülebilirlik konusuna yatırım yapmaya başlamıştır. Bu durum, insanların beklentilerini de artırmıştır. Örneğin, "Ülker emisyonlarını nasıl yönetiyor?", "Çevre için ne yapıyor?" gibi sorular daha sık sorulmaya başlanmıştır. Ülker, bu artan beklentilere yanıt vermek ve sürdürülebilirlik hedeflerine ulaşmak amacıyla paydaşlarla düzenli olarak toplantılar düzenlemektedir. Bu toplantılarda, müşteri ve tedarikçilerle bir araya gelinerek, beklentiler ortaya çıkarılmakta ve iş birlikleri geliştirilmektedir. Örneğin, tedarikçilere ambalaj azaltımı veya kimyasal içeriği düşük, sürdürülebilir ürünler üretme önerileri sunulmaktadır. Bu tür iş birlikleri, tedarikçilerin kredibilitelerini artıran bir durum yaratmaktadır.

Çalışanların beklentilerini ve katılımını sağlamak amacıyla da çeşitli platformlar oluşturulmaktadır. Bu platformlarda tüm çalışanlar temsil edilmekte ve atık yönetimi, sosyal sorumluluk gibi konularda beklentilerini dile getirme fırsatı bulmaktadır. Çalışanlar, kendi bahçelerinde yaptıkları organik tarım, kompost uygulamaları gibi sürdürülebilirlik çalışmalarıyla ilgili deneyimlerini LinkedIn gibi platformlarda paylaşmaktadır. Ayrıca, "Akıl Küpü" uygulamasıyla çalışanlardan ve mavi yakalı işçilerden öneriler toplanmakta, uygulanabilir olanlar hayata geçirilmektedir. Her yıl 500'den fazla öneriyle karşılaşmakta ve bunların büyük bir kısmı sürdürülebilirlikle ilgilidir. Tüm bu süreçlerin, her yıl yayınlanan sürdürülebilirlik raporlarında ayrıntılı bir şekilde ortaya konduğu ve bu raporlar aracılığıyla sürdürülebilirlik çalışmalarının dikkat çektiği gözlemlenmektedir. Bu kapsamda, paydaş katılımı, sürdürülebilirlik yönetiminin başarısında kilit bir unsur olarak öne çıkmakta; iletişim araçları ve yöntemleri, bu katılımı sağlamak için etkin bir şekilde kullanılmaktadır.

****Ülker markasının sürdürülebilirlik odaklı KSS (Kurumsal Sosyal Sorumluluk) projelerinin şirket stratejisine nasıl entegre edilmektedir?***

Ülker, geçmişten beri "Mutlu et, mutlu ol" mottosunu benimseyen bir şirkettir. Bu mottomunun yanı sıra ikinci temel yaklaşımı "israfsız şirket modeli"dir. Bu model, suyu daha verimli kullanan, insan emeğini daha etkin değerlendiren ve üretim süreçlerinde israfı en aza indiren bir anlayışı temsil eder. Ülker'in sürdürülebilirlik stratejisi, bu iki mottoyu temel alır ve şirketin tüm faaliyetlerine bu perspektiften yaklaşır.

Örneğin, Ülker'in buğday projelerindeki amacı, çiftçilerin verimliliğini artırmak ve onları iklim değişikliğine karşı dirençli hale getirmektir. Fındık üretiminde karşılaşılan iklim değişikliği sorunlarına karşı, verimi artıracak programlar geliştirilmektedir. Benzer şekilde, Fildişi Sahili'ndeki kakao çiftçilerine ekonomik

destek sağlanmakta, sağlık hizmetlerine erişim kolaylaştırılmakta, okulları olmayan veya yetersiz durumda olan bölgelerde okullar inşa edilmekte ya da mevcut okullar iyileştirilmektedir.

Ülker, Türkiye Futbol Federasyonu ile iş birliği yaparak kız çocuklarına yönelik futbol projeleri geliştirmekte ve 23 Nisan gibi özel günlerde çocuklara yönelik sürdürülebilirlik temalı etkinlikler düzenlemektedir. Atıklardan kuş yuvaları yapma gibi projelerle, sürdürülebilirliği çocuklar ve gençler arasında yaygınlaştırmayı amaçlamaktadır. Bu tür projelerle, sürdürülebilirlik konusundaki kurumsal sosyal sorumluluk stratejisini tüm yaş gruplarına yönelik somut uygulamalarla hayata geçirmektedir. Ayrıca, fabrikaların ekonomik sürdürülebilirlik ve istihdam açısından önemini vurgulayan sosyal sorumluluk projeleri, Ülker'in genel stratejisiyle bütünleşmiş durumdadır.

****Sürdürülebilirlik odaklı KSS projeleri, Ülker'in kurumsal itibarı ve marka değeri üzerinde nasıl bir etkiye sahiptir? Sürdürülebilirlik odaklı projelerin nasıl finansal performans sağlamaktadır?***

Ülker'in sürdürülebilirlik programı, ulusal ve uluslararası platformlarda büyük takdir görmekte ve yüksek düzeyde bir başarı olarak değerlendirilmektedir. Bu başarıların tanındığı önemli kurum ve kuruluşlardan bazıları şunlardır:

- Standart & Poor's (Türkiye'de en yüksek sürdürülebilirlik performansı gösteren şirketlerin yer aldığı bir sıralamadır.) Türkiye'de en yüksek sürdürülebilirlik performansı gösteren şirketler arasında Ülker'i her zaman ilk sırada göstermektedir.
- CDP (Karbon Saydamlık Projesi) en yüksek puan alan şirket olarak yine Ülker'i önde göstermektedir (gıda sektöründe).
- Borsa İstanbul'da (yatırımcılar ve büyük şirketlerin yer aldığı) sürdürülebilirlik endeksi bulunmaktadır. Ülker, üç veya dört yıldır sürdürülebilirlik endeksinde en yüksek puan şirketlerin başında gelmektedir.

Ülker ve Pladis, en çok çalışılmak istenen, en iyi işveren ve marka olarak tanınmakta; sürdürülebilirlik çalışmaları ve sosyal sorumluluk projeleriyle müşterilerinin zihninde verimli ve faydalı bir şirket olarak yer edinmeyi hedeflemektedir. Şirket, çalışanlar, müşteriler, finansal kuruluşlar (örneğin, borsa) ve diğer uluslararası endüstriler ile enstitüler nezdinde güven kazanmıştır. Ülker hem çalışanlar hem de müşteriler arasında saygın bir konumda olup, genel kamuoyunda da olumlu bir algıya sahiptir ve bu algıyı güçlendirmeye devam etmektedir.

****Ülker'in sürdürülebilirlik odaklı KSS projelerinin, paydaş ilişkileri ve müşteri memnuniyeti üzerindeki etkilerini nasıl değerlendirirsiniz?***

Paydaşlarla yapılan görüşmeler sonucunda, onların beklentileri ve fikirleri doğrultusunda projeler hayata geçirilmiş ve elde edilen sonuçlar tekrar paydaşlarla paylaşılmıştır. Bu süreç, şirket içerisinde "mutluluk döngüsü" olarak adlandırılmaktadır. Bu döngüde, paydaşların beklentileri alınmış, bu beklentilere uygun çalışmalar gerçekleştirilmiş, sonuçlar uygulanmış ve memnuniyet sağlanmıştır. Sosyal sorumluluk projeleri, paydaşlarla yürütülen çalışmalar arasında önemli bir yer tutmakta olup, bu tür projelerin sayısını artırmak gerekmektedir.

Müşteri memnuniyet anketleri aracılığıyla elde edilen veriler, sürdürülebilirlik çalışmaları hakkındaki sorulara verilen yanıtlar, şirketin bu alandaki başarısını yansıtmaktadır. Anketlerde yer alan "Sürdürülebilirlik çalışmalarından memnun musunuz?" sorusunun yanıtları, Ülker'in bu alanda başarılı olarak değerlendirildiğini göstermektedir.

****Sürdürülebilirlik projelerinin iş süreçlerine ve operasyonlara entegrasyonu konusunda şirket içinde hangi tür zorluklarla karşılaşılıyor?***

Sürdürülebilirlik çalışmalarındaki zorluklar, özellikle bu yolculuğun başlangıç aşamasında, yani 2014 yılında, belirgin bir şekilde kendini göstermiştir. O dönemde sürdürülebilirlik kavramı yeni olduğu için çeşitli zorluklar ortaya çıkmıştır. Bu zorlukların en önemlisi, üst yönetimin ikna edilmesi aşamasıdır. Şirketin zaten var olan stratejisine sürdürülebilirlik konusunu entegre etmek, bu stratejiyi yeniden düzenlemek ve yeni programlar ile projeler geliştirmek oldukça zahmetli bir süreçtir.

İlk adım olarak bir boşluk analizi gerçekleştirilmiş; şirketin içindeki ve dünyadaki sürdürülebilirlik uygulamaları değerlendirilmeye başlanmıştır. En iyiye ulaşmak için gereken unsurlar belirlenmiş ve bu doğrultuda hangi projelerin ve etkinliklerin yapılması gerektiği detaylı bir şekilde planlanmıştır. Bu süreçte karşılaşılan en büyük zorluklardan biri de kaynak ihtiyacı, yani bütçe ve insan gücüdür. İlk kurulduğunda sadece iki kişiden oluşan sürdürülebilirlik ekibi, bugün dört kişiye ulaşmış ve insan kaynağı açısından önemli bir gelişim göstermiştir. Bu gelişim, yapılan işlerin kalitesini de artırmıştır. Başlangıçta daha küçük bütçelerle yürütülen projeler, zamanla artan kaynaklarla birlikte daha büyük ve etkili hale gelmiştir.

İkna süreci hem maddi hem de insan kaynağı sağlamak açısından en kritik aşama olarak öne çıkmıştır. Ancak elde edilen sonuçlar, bu yatırımların değerini ortaya koymuş ve üst yönetimin "Bu işi iyi ki yapmışız." demesini sağlamıştır. Bu da gelecekteki kaynak tahsislerini kolaylaştırmıştır. Sürdürülebilirlik, markaya itibar ve değer kazandırmakla kalmamış, müşterilerle, finans kuruluşlarıyla, sivil toplumla, üniversitelerle ve tedarikçilerle olan ilişkileri güçlendirmiştir.

Bir diğer zorluk ise sürdürülebilirlik konusunda yeterli bilgiye sahip olunmamasıydı. Başlangıçta farkındalık oldukça düşüktü. Bu nedenle, öncelikle mavi yakalı çalışanlara sürdürülebilirlik eğitimleri verilmiş, dışarıdan eğitimciler getirilmiş ve üniversitelerle iş birliği yapılarak çeşitli eğitim programları, sunumlar ve slaytlar hazırlanmıştır. Bu eğitimler sayesinde, toplumun ve çevrenin iyiliği için neler yapılabileceği anlatılmış ve çalışanların sürdürülebilirlik kavramına aşina olmaları sağlanmıştır. Ardından, beyaz yakalı çalışanlara da sürdürülebilirlik faaliyetlerinin nasıl yürütüleceği aktarılmış ve tüm çalışanlar yavaş yavaş bu süreçlerin içine dahil edilmiştir. Böylece, sürdürülebilirlik konusunda karşılaşılan zorluklar ve engeller aşılmıştır.

****Ülker'in sürdürülebilirlik odaklı olarak gelecekteki planları nelerdir? Ülker markasının çatısı altında bulunan çalışanlara sürdürülebilirlik hakkında bir eğitim ya da çalışanlarla ortak bir çalışma yapıyor mu?***

Ülker, iklim değişikliğinin giderek artan önemi doğrultusunda stratejik bir yaklaşım benimsemektedir. Kuraklık ve tarım gibi alanlarda karşılaşılan zorluklar, dünya nüfusunun artmasıyla birlikte daha da kritik hale gelmiştir. Bu durum, gelecekte gıda güvenliği açısından ciddi riskler taşımaktadır. Ülkelerin bu küresel soruna yönelik acil inisiyatifler alması gerekliliği vurgulanırken, emisyonların -özellikle karbondioksit ve sera gazı emisyonlarının- sıfırlanması gerekmektedir. Yenilenebilir enerji kaynaklarına geçiş, fosil yakıtların kullanımını bırakmak gibi adımlar bu sürecin ayrılmaz bir parçasıdır.

Ülker de bu doğrultuda kararlı adımlar atmaktadır. Türkiye'nin 2053 yılına kadar emisyonları sıfırlama taahhüdüne paralel olarak, Ülker de 2050 yılına kadar kendi emisyonlarını sıfırlamayı hedeflemektedir. Bu hedefe ulaşmak için, ara dönem hedefleri belirleyerek 2030 yılına kadar çeşitli sürdürülebilirlik projeleri planlamaktadır. Bu projeler arasında güneş enerjisine geçiş, su kullanımının azaltılması, atık suyun geri kazanımı, ambalajda plastik oranının azaltılması, geri dönüşüm malzemelerinin kullanımı ve toplumsal projelerde daha fazla yer almak gibi adımlar bulunmaktadır. Ayrıca, çalışanların sürdürülebilirlik konusunda daha fazla bilinçlendirilmesi hedeflenmektedir.

Ülker, bu sürdürülebilirlik çalışmaları ile gelecek yıllarda hem Türkiye'de hem de küresel arenada adından söz ettiren bir gıda şirketi olmayı ve sürdürülebilirlik konusunda öncü bir rol üstlenmeyi amaçlamaktadır.

Yukarıdaki tabloda, Ülker'in sürdürülebilirlik stratejileri ve uygulamalarıyla ilgili çeşitli veriler ve görüşler özetlenmiştir. Ülker'in Sürdürülebilirlik, Çevre ve Enerji'den Sorumlu Yöneticisi tarafından verilen yanıtlardan elde edilen bulgular, markanın sürdürülebilirlik alanında hem

yerel hem de küresel ölçekte etkin bir rol oynadığını ve bu konudaki stratejilerini sürekli olarak geliştirdiğini göstermektedir. Şirket, sürdürülebilirlik hedeflerini gerçekleştirmek için kapsamlı bir yaklaşım benimsemekte; paydaşlarla sürekli etkileşimde bulunarak geri bildirimleri değerlendirip stratejilerini bu doğrultuda şekillendirmektedir. Özellikle, emisyonların sıfırlanması, yenilenebilir enerjiye geçiş ve toplumsal projelerde daha fazla yer alma gibi hedefler, Ülker'in çevresel ve sosyal sorumluluklarını yerine getirme konusunda kararlı olduğunu ortaya koymaktadır.

TARTIŞMA ve SONUÇ

Halkla ilişkiler faaliyetlerinin önemli bir unsuru olarak sosyal sorumluluk kapsamında yer alan sürdürülebilirlik, günümüzde oldukça büyük bir öneme sahiptir. Bulgular doğrultusunda Ülker, sürdürülebilirlik kavramının ilk kez gündeme geldiği yıllarda, bu konuyu şirket politikasına entegre etmeye yönelik çabalar başlatmıştır. Ancak, bu sürecin başlangıcında çeşitli zorluklarla karşılaşmıştır. Sürdürülebilirlik stratejilerinin benimsenmesi, şirket içinde yaygınlaştırılması ve özellikle üst yönetimin ikna edilmesi aşamalarında önemli bir çaba sarf edilmiştir. Bu tür büyük ve küresel şirketlerde, üst yönetimin desteği ve onayı, sürdürülebilirlik gibi stratejik kararların şirket politikasında yer alabilmesi açısından kritik bir rol oynamaktadır. Ülker, bu doğrultuda, kurum içi çalışmalarını dünya, toplum ve çevre meselelerine odaklanarak genişletmiş ve bu alanlarda sorumluluklarını artırmayı hedeflemiştir.

Bu çalışma, Ülker'in sürdürülebilirlik stratejileri ve bu stratejilerin uygulama sürecindeki başarılarını incelemiştir. Ülker, 2014 yılında oluşturduğu sürdürülebilirlik stratejilerini çevre, toplum, çalışan, liderlik, inovasyon ve değer zinciri gibi altı ana başlık altında toplamış ve on yıllık sürdürülebilirlik kalkınma planı oluşturmuştur. Bu kapsamda karbon salınımı artışı yapmadan büyüme, su kullanımını %30 azaltma, enerji tüketimini %25 azaltma, ambalaj malzemelerini azaltma, çalışan bağlılığını artırma ve çalışan turnover oranlarını düşürme gibi spesifik hedefler belirlenmiştir. Her yıl yayınlanan sürdürülebilirlik raporları ile hedeflerin ne kadarına ulaşıldığı ve hangi projelerin hayata geçirildiği düzenli olarak değerlendirilmiştir.

2015 yılından itibaren tüm departmanlarına sürdürülebilirlik hedefleri koyan Ülker, bu hedefleri her yıl gözden geçirip geliştirmiş ve performans takibi yapmıştır. 2024 yılına gelindiğinde, Ülker belirlediği on yıllık hedeflerini tamamlamış ve 2022 yılından itibaren yeni hedefler belirlemeye başlamıştır. 2030 yılı sürdürülebilirlik hedefleri dünya, toplum, değer zinciri ve çalışanlar olarak dört ana başlık altında toplanmıştır.

Ülker, tüketicileri ve paydaşlarıyla iletişimde çeşitli yöntemler kullanmaktadır. Bu yöntemler arasında sürdürülebilirlik raporları, medya kullanımı, özel projeler, üst yöneticilerin sosyal medya hesapları, sivil toplum örgütleri ve kurumlarla iş birlikleri ve basılı medya yer almaktadır. LinkedIn gibi iş yaşamına ait platformları da etkin bir şekilde kullanarak gençlerin, çalışanların ve kurumların Ülker'in çalışmalarını takip etmeleri sağlamaktadır.

Ülker, iki yılda bir paydaş analizi çalışması yaparak, sivil toplum örgütleri, üniversiteler, özel sektör, yatırımcılar ve finans kuruluşları gibi farklı paydaşlardan geri bildirim almaktadır.

Anketler aracılığıyla Ülker'in sürdürülebilirlik öncelikleri, yatırım yapılması gereken alanlar ve güçlü/zayıf yönleri belirlenmektedir.

Ülker, "Mutlu Et, Mutlu Ol" mottosunu benimsemiş ve israf etmeden üretim yapmayı önemsemiştir. Standart & Poor's ve CDP gibi kurumlar tarafından takdir edilerek sürdürülebilirlik alanında birçok başarıya imza atmıştır. Borsa İstanbul'da sürdürülebilirlik endeksinde yer almakta ve en yüksek puan alan şirketlerin başında gelmektedir.

Müşteri memnuniyeti anketleriyle Ülker'in sürdürülebilirlik alanında başarısı takip edilmektedir. Ülker, iklim değişikliği, kuraklık, tarım, emisyonların sıfırlanması ve yenilenebilir enerji gibi konulara odaklanarak, 2050 yılına kadar emisyonları sıfırlama hedefine katkıda bulunmayı amaçlamaktadır. 2030 yılına kadar güneş enerjisine geçiş, su kullanımının azaltılması, atık suyun geri kazanılması, ambalajda plastik oranının azaltılması, geri dönüşüm malzemelerinin kullanılması, toplumsal projelerin desteklenmesi ve çalışanların sürdürülebilirlik konusunda eğitilmesi gibi ara dönem hedeflerine ulaşmak için çalışmalarını sürdürmektedir. Bu bulgular, Ülker'in sürdürülebilirlik konusunda gösterdiği kararlılığı ve elde ettiği başarıları ortaya koymakta, şirketin sürdürülebilirlik stratejilerinin etkinliğini ve paydaşlarına sağladığı olumlu etkileri göstermektedir.

Yöneticinin sürdürülebilirlik stratejileri hakkında verdiği bilgiler, bazı ticari sırlar ve hassas verilerin erişime kapalı olması nedeniyle, çalışmanın değerlendirilmesi ve sonuçların kapsamını sınırlayabilir. Ayrıca, bu bilgiler yöneticinin kendi perspektifi ve deneyimleriyle sınırlıdır ve bu da çalışmanın bir diğer sınırlılığını oluşturmaktadır. Görüşme süresinin kısıtlı olması da sürdürülebilirlik faaliyetlerinin ayrıntılı bir şekilde ele alınmasını zorlaştırabilir ve yalnızca belirli bir zaman dilimine odaklanarak, uzun vadeli etkilerin gözden kaçırılmasına neden olabilir. Gelecekte yapılacak olası çalışmalarda, sürdürülebilirlik stratejilerinin daha kapsamlı değerlendirmesini sağlamak amacıyla, farklı departmanlardan yöneticilerle yapılacak görüşmelerin yanı sıra, somut veri, rapor ve performans göstergelerinin analizi gerçekleştirilebilir. Ayrıca, sürdürülebilirlik çalışmalarının etkilerini uzun vadede değerlendirmek için süreklilik arz eden izleme ve raporlama mekanizmalarının kurulması önemlidir. Bu tür bir yaklaşım, yalnızca yöneticilerin değil, tüm paydaşların perspektiflerini içerecek şekilde daha geniş ve derinlemesine bir anlayış sağlayabilir.

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GEOPOLITICAL ACTIVITY OF THE EU IN THE SOUTH CAUCASUS AFTER THE END OF THE SECOND KARABAKH WAR (2020-2024)

İKINCI QARABAĞ MÜHARİBƏSİ BAŞA ÇATDIQDAN SONRA Aİ-NİN CƏNUBİ QAFQAZDA GEOSİYASI FƏALİYYƏTİ (2020-2024)

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ABSTRACT

For more than a quarter of a century, the South Caucasus has been the center of colliding and contradictory interests of major players, thereby turning the region into one of the most problematic and unstable points in the post-Soviet space. The unique geostrategic position of this region is critical to the evolution of world order in the twenty-first century. Although the primary geopolitical problem is the struggle for energy resources, competition for the right to have control and influence over the South Caucasus has become an ideological factor and has acquired the greatest strategic importance for both regional (Russia, Iran, Turkey, etc.) and global actors (USA, EU, China, etc.).

The resolution of the Armenian-Azerbaijani conflict was a historic event for the South Caucasus and opened up various opportunities that are designed to contribute to peace and stability in the South Caucasus. The moment has therefore come for the international community, including the European Union and the United States, to support efforts to promote peace and regional integration.

In general, the EU's revision of its policy towards Armenia and Azerbaijan, trying to establish a more balanced approach, will probably strengthen the institution's position in the post-war peace process and help Brussels play a more effective mediating role between the parties. If it turns out to be successful, it will have regional and possibly even permanent consequences for the South Caucasus. So, because the peace negotiations between Armenia and Azerbaijan were held mainly with the mediation of Russia.

Key words: EU, geopolitics, regional security, USA, Azerbaijan, Geoeconomic symbol of South Caucasus, Armenia, Georgia, integration processes.

XÜLASƏ

Əsrin dördüdə birindən artıqdır ki, Cənubi Qafqaz əsas oyunçuların toqquşan və ziddiyyətli maraqlarının mərkəzi olub və bununla da regionu postsovet məkanında ən problemlı və qeyri-sabit nöqtələrdən birinə çevirib. Bu regionun unikal geostrateji mövqeyi iyirmi birinci əsrdə dünya nizamının təkamülü üçün çox vacibdir. Əsas geosiyasi problem enerji resursları

uğrunda mübarizə olsa da, Cənubi Qafqaz üzərində nəzarət və təsir hüququ uğrunda rəqabət ideoloji amilə çevrilərək həm regional (Rusiya, İran, Türkiyə və s.), həm də global aktorlar üçün ən böyük strateji əhəmiyyət kəsb edir. (ABŞ, AB, Çin və s.).

Ermənistan-Azərbaycan münaqişəsinin həlli Cənubi Qafqaz üçün tarixi hadisə olub və Cənubi Qafqazda sülh və sabitliyə töhfə vermək üçün müxtəlif imkanlar açıb. Beləliklə, beynəlxalq ictimaiyyətin, o cümlədən Avropa İttifaqı və ABŞ-in sülhün və regional inteqrasiyanın təşviqi səylərini dəstəkləməsinin vaxtı çatıb.

Bütövlükdə, Aİ-nin Ermənistan və Azərbaycana qarşı siyasətini nəzərdən keçirməsi, daha balanslı yanaşma qurmağa çalışması, çox güman ki, təşkilatın müharibədən sonrakı sülh prosesində mövqeyini gücləndirəcək və Brüsselə tərəflər arasında daha effektiv vasitəçilik rolunu oynamağa kömək edəcək. Əgər bu uğurlu olarsa, bunun Cənubi Qafqaz üçün regional və bəlkə də qalıcı nəticələri olacaq. Çünki Ermənistanla Azərbaycan arasında sülh danışıqları əsasən Rusiyanın vasitəçiliyi ilə aparılıb.

Açar sözlər: Aİ, geosiyasət, regional təhlükəsizlik, ABŞ, Azərbaycan, Cənubi Qafqazın geoiqtisadi simvolu, Ermənistan, Gürcüstan, inteqrasiya prosesləri.

INTRODUCTION

The interests of Western Europe in the South Caucasus are quite extensive, and its desire to strengthen its position in the region is not accidental. The inability of Western European countries to reach consensus on many issues can be considered one of the main challenges for the European Union and its policy in the South Caucasus region. Moreover, the European Union in political terms turned out to be completely unprepared and insufficiently influential in solving emerging problems: the EU arsenal does not include legal instruments for resolving conflicts. Clearly we have returned to a status more like that of the Cold War, and the European Union is simply not prepared for great power struggle and competition – it was never intended to be a post-Cold War project. The world has undergone changes, the political situation in the world has changed, the balance of power has changed - it has been proven that the EU policy in the South Caucasus region is losing those initiatives that were put forward 20-25 years ago [1].

So we have a very fragmented, fragmented structure, unless it begins to take some very radical steps towards changing the way it implements the idea of unanimity. How then can the European Union mediate in resolving the conflict?

It does not matter whether we are talking about Azerbaijan and Armenia in the South Caucasus region, or in any other part of the world, if countries cannot reach consensus on solving any problem, the only question is how the EU, divided into contradictory camps can, act as a mediator? In any context of conflicts in the South Caucasus, especially in relation to Karabakh, it seems that the parties initially chose the wrong mediators. And if we talk about the post-war stage, the Brussels Platform may be a useful platform for bilateral meetings

between the leaders of Azerbaijan and Armenia, but a united Europe could not bring a real settlement of contradictions between the parties, due to the double standards of certain members of the Union. President I. Aliyev spoke about this in particular during his speech on July 21, 2023, at the Shusha Global Media Forum on the topic “New media in the era of the 4th Industrial Revolution”.

“The European Union, again, as I already said, is not a real mediator of the negotiation process. This is a certain factor that reduces tensions, or something, and allows the leaders of Armenia and Azerbaijan to talk and better understand each other”, said the head of the Azerbaijani state.

Essentially, the idea of going to Brussels to achieve anything other than a symbolic gesture is a dead end. In this case, you need to talk with Washington, Moscow, London, and Beijing - stable guarantors who actually have legislative power, and, moreover, are members of the UN Security Council, while the European Union does not. So, mentioning the use of the European Union as a means of solving or developing architecture for resolving conflicts in the South Caucasus is no longer relevant. It would be appropriate to note that the last scheduled meeting between Azerbaijan and Armenia in Granada, Spain did not take place due to the biased position of France.

Paris has a very long history of participation in the EU, but acts in its own interests. In the South Caucasus, France has been the only consistent European player to try to mediate, although it clearly has preconceived notions about who should benefit from any negotiated solution and why.

THE FACTOR OF THE ARMENIAN DIASPORA

What always needs to be taken into account (and this is something that Azerbaijan does not miss) is that France has one of the largest Armenian diasporas in the world. The Armenian diaspora in France has been formed for a long time: many Armenian Diasporas in the West have been part of political structures for many years, if it can be expressed in such specific terms, because many governments of different Western countries have representatives who are Armenians.

Azerbaijan at this stage does not have such an organized diaspora, so there are no voices that would speak out against playing “devil’s advocate” and contradict the narrative that the diaspora perpetuates; and this is a serious obstacle to reaching some kind of agreement or solution if you (in this case the French) only understand one side of the story. However, this is not the only factor in the failure of Western European policy in the South Caucasus.

It is known about the influence of the Armenian lobby in various countries of Europe and the West in general, including, of course, France and the United States of America, but the role of France’s colonial past and the high level of Islamophobia in Western Europe should also be mentioned here. France has a special relationship with its colonial past and is positioned as an empire, which is very different from Britain's imperial past. France never went through a

process of full decolonization. There was always something of an imbalance in their views on what their colonial possessions meant to French society; and if you look at their relationship with the colonial past, it still remains somehow incomplete and inconclusive (unresolved).

This is one of the reasons why there are now social problems with a part (10% to 15%) of the French population. First of all, we are talking about first generation Muslims, mainly from North Africa, but also from other parts of Africa, in whose circles the imperialist policies of France have led to very complex social dialogue and conflicts. Because during the French Empire, if they were part of the French Empire, then, in essence, they were a department of France. If said group lived in Paris, or at the very least in Algeria, this would be a kind of different interpretation of the Empire than, say, the British and their possessions in India or Africa. The above facts give the French (and also because they have a very large Armenian diaspora) a difficult or unfair approach to solving problems in the South Caucasus.

Moreover, the fact that they are in fact the only Western power that has done this for the last almost 30 years has kind of colored, or rather tarnished, their ability to truly be mediators.

In the 1990s, these were real gunpowder, petty and bloody wars, which in most cases still remain unresolved. As Nicholas Waller (CEO and Editor-in-Chief of international relations magazine NE Global Media), a conspiracy theorist, argues: *“This is really a result of the multi-generational nature of Armenian diaspora communities. A lot of time has passed since the first wave of immigrants poured in, for example, in California and Los Angeles (we are talking about people of Armenian descent who have lived there for more than 50 years, and in their case it is just a natural progression) - along with them and one-sided stories that are told again and again, over many generations”*.

“Therefore, they have always tried to be and make their propaganda “the fabric of society for a long time, and it has also been a relatively influential part of society”;- because they are part of the agricultural community, part of the small trade, and what ends up happening is that from generation to generation the stories are passed on to people who have nothing to do with the so-called (by Armenian immigrants) “land of the ancestral homeland of the Armenians”, but they have heard the stories, Therefore, they are of the opinion: “That must have been the case”,” he explained on the CBC broadcast.

This is not a conspiracy, it is simply generational information that has been passed down and then filtered down to the rest of society; and since the community of Azerbaijanis is microscopic, such a process is simply not observed. For this reason, when the “broadcast characters” of Armenian propaganda in the media meet, who find themselves on television, writing for the New York Times, or commenting as analysts, they have only heard one side of the story.

Ultimately, as we see, what happens is a biased (even if it may be unconsciously biased) views of events, the process of conflict resolution itself, and the development of public

perception. With all of the above, the main question arises - **where to move next and how to solve the problem?**

What are the main key elements of lasting peace in the South Caucasus region? Should such a West participate more in the processes taking place here?

For a very long time, the situation in the Caucasus has been the area of interest and specialization of many political experts and researchers. There were actually two short periods of time when the West was relatively involved in what was happening in the North and South Caucasus after the collapse of the Soviet Union. EU activity in the Caucasus before the Second Karabakh War can be divided into 2 stages:

1) indirect participation, or lack of activity as such, a widespread narrative about the “reluctance of the EU to be involved in wars”, which by its nature was counterintuitive to the foreign policy of individual Western European countries (the Second Chechen War dates back to this period of time);

2) in the early 2000s, another type of interaction occurred, first of all, the “pink revolution” in Georgia (2003) - one of the Western “color” revolutions, and then the “five-day war” (2008), accompanied by accusations by the H. Tagliavini commission, operating under the auspices of the EU, about “prolonged provocations in the conflict zone and numerous violations of international law” towards Russia [2].

At the moment when one would like to observe a fair position in promoting a sustainable future for all three countries in the South Caucasus, the demands of the EU, mainly France, the so-called “mediator” and member of the OSCE Minsk Group, were pro-Armenian one-sided in nature.

ANTI-AZERBAIJANI RHETORIC IN THE SOUTH CAUCASUS SEGMENT OF EU FOREIGN POLICY

Anti-Azerbaijani rhetoric in the South Caucasus segment of EU foreign policy is still observed today - one of the striking examples of this is the resolution adopted by the European Parliament on October 5, 2023, condemning Azerbaijan for a “planned and unjustified attack” (in reality, a counter-terrorism operation against Armenian separatism); measures taken on September 24, 2023 by the European Court of Human Rights (once again proving Europe’s bias in the Armenian-Azerbaijani issue), etc. Members of the European Parliament also made their contribution, calling on EU countries to impose sanctions against the oil and gas projects of the Azerbaijani government.

Rhetorical question: how reasonable is it to “throw away” Baku oil and gas, contrary to the commercial interests of Europe? Indeed, in terms of energy, the EU and Azerbaijan are interconnected.

And finally, on March 13, 2024 – there is another anti-Azerbaijani resolution. It is immediately worth noting that formally this act concerns Armenia, however, in the part that

relates to the peaceful settlement with Azerbaijan, European deputies tried to pour out all their irritation, bile and anger towards the country that defeated Armenian separatism. The resolution has the following title: *“On closer ties between the EU and Armenia and the need for a peace agreement between Azerbaijan and Armenia”*. 504 MEPs voted “for”, four “against”, 32 abstained, as follows from the information published on the website of the European Parliament [3]. A commentary by Azerbaijani Foreign Ministry spokesman Aykhan Hajizade published by the ministry said that the resolution served as “a striking example of the repeated approach of double standards in relation to Azerbaijan”. Stating that the resolution is supported by numerous groups in the European Parliament influenced by Armenia and the Armenian lobby, Hajizade said the resolution is part of a “smear campaign” against Baku.

Moreover, the resolution contains “ridiculous and offensive” statements that go “beyond the scope of political ethics and contradict the essence of international relations”, as well as statements that violate the territorial integrity and sovereignty of Azerbaijan. The resolution “condemns” what it calls “Azerbaijani military incursions into the internationally recognized territory of Armenia and asserts that Azerbaijan threatens the territorial integrity and sovereignty of Armenia.

There is no point in asking where the European deputies were while Armenia occupied the territories of Azerbaijan, carried out ethnic cleansing and destroyed the cultural, historical and religious heritage of the Azerbaijani people. The European Parliament was unable to preserve the only Natavan monument in France, which is a symbol of emancipation and enlightenment.

Perhaps the United Kingdom should be more actively involved in the affairs of the South Caucasus, at the time of membership in the EU, and be directly involved in mediating the Karabakh conflict resolution. In the long term, this would be an alternative model that offers a positive outcome for all parties.

THE ISLAMOPHOBIA FACTOR

In the 90s of the last century, French President Valéry Giscard d'Estaing said: *“The European Union is a Christian club”*. If there is a so-called “watershed”, then Azerbaijan really should not expect fundamental changes in principles, policies and concepts regarding the South Caucasus, different from those demonstrated by the heads of Western European countries during and after the Second Karabakh war, the war of liberation for Azerbaijan. It is possible that certain standards of EU policy in the South Caucasus coincide with the policy pursued before 2020; however, if we take the whole range of issues, again, leaving Azerbaijan aside, it was much more unfair than in relation to those states that have been accepted into the European Union.

Former Foreign Minister Alain Juppé believes that many Western European politicians themselves create an atmosphere of Islamophobia in countries such as France. *“They themselves make the French hate Muslims and Islam. Instead of allowing different religious*

communities to coexist peacefully, they are pitting Muslims and Christians against each other. Islamophobia is 99% the political phenomenon”, he says [4].

It should be noted that Azerbaijan has always been for cooperation, and continues its cooperation with Western European states, but, obviously, Azerbaijan needs to look for an alliance in its region, and therefore, on February 14, 2024, at the inauguration ceremony, Ilham Aliyev, spoke about strengthening membership in the Organization of Turkic States. And it is logical that Baku makes a choice to strengthen the UTC if other regional Alliances in which Azerbaijan will participate do not adhere to a fair policy towards Azerbaijan and the South Caucasus. Again, cooperation with Western countries is very important for Azerbaijan, from various points of view (both from the economic and from the point of view of the development of the education sector, etc.).

THERE ARE INTERESTING POINTS:

1) Now, due to the colonial policies of European states, over the past decades, many millions of Muslims and Arabs from Africa have moved to France and other states. There are about 10 million Turks living in Germany, and therefore there is an element of some kind of “war of civilizations” there, or maybe they are conducting some kind of “intercultural dialogue”, which leads to integration in the public life of European states. This is a big problem for them;

2) On the other hand, now there are 2 leaders in the European Union - France and industrial Germany (and before Brexit the leader was Great Britain). Both countries also form their policies outside the EU, trying to exert a strong influence on the South Caucasus region.

In the Parliamentary Assembly of the Council of Europe, where Azerbaijan froze its membership for 1 year, these states announced a so-called “boycott” of Azerbaijan, due to Baku’s refusal to invite European parliamentarians to evaluate the presidential elections held on February 7 and the denial of access to PACE speakers Lachin corridor in 2023.

However, obviously, this is just an excuse; the real reasons lie in Baku’s independent policy in resolving the Karabakh issue in September last year. It is difficult to predict whether the decision of the listed states will change next year. Countries trying to “isolate” Azerbaijan are not only Armenia and the Armenian lobby, there are also other countries, and taking this factor into account, Azerbaijan needs to carefully build its policy in the international arena and take into account the current realities.

GEOECONOMIC SYMBOL OF THE SOUTH CAUCASUS

It is no secret that one of the main factors in the development of the South Caucasus region is global communication projects. Geopolitical changes of the last two years have increased the importance of the Middle Corridor (Trans-Caspian International Transport Corridor), which runs through Central Asia and connects China with Europe.

As is known, since the beginning of the Houthi attacks on ships in the Red Sea, the volume of cargo transportation through the Suez Canal has decreased by 55%. The International

Maritime Organization (IMO) estimates that the Suez Canal has lost about two-thirds of its cargo due to tensions in the Red Sea, and that cargo is now being routed through southern Africa. And a number of shipping companies have decided to completely suspend transportation through the Red Sea [5]. Against the backdrop of this conflict, cargo carriers are choosing a longer roundabout route through the Cape of Good Hope, while at the same time in the EU, China, and the countries of Southeast Asia they are increasingly turning their attention to the Middle Corridor passing through the territory of the states of Central Asia and the South Caucasus - it is considered as optimal time and safety entry into the market of Turkey, the Middle East and Europe.

On January 29, 2024, the European Union authorized investments of 10 billion euros in the Middle Corridor - Vice-President of the European Commission Valdis Dombrovskis announced this at an investment forum in Brussels. In fact, there are not many projects that enjoy such interest and attention from the European Union, especially when it comes to projects that are not implemented within the EU. This means one thing - Europe realizes that it really needs routes for the delivery of goods, energy, carbon, and transit products from China, independent from Russia, and it would like to have a supply route independent from Russia.

This impressive investment is a reflection of the EU's real commitment to this project. Liabilities in the amount of 10 billion euros are current and planned investments, the European Commission clarified. It expects to mobilize this amount in the short term for sustainable transport development in Central Asia.

It is clear that in connection with geopolitical changes in Northern Eurasia (after Russia's full-scale invasion of Ukraine, the European Union is looking for alternative trade routes between Europe and Asia that do not pass through the territory of the Russian Federation), the countries of the South Caucasus region are acquiring critical strategic importance, both for Europe and for the countries of the Far East (primarily here we mean China, but, by the way, not only China).

Therefore, EU investments are "investments in itself", in its infrastructure, taking into account the interests of almost all players in the organization and systematization of this geo-economic and geopolitical space. Moreover, within the framework of the past 5th Balkan and Black Sea Forum, both China and the European Union expressed a common interest in the development of the Middle Corridor - to solve geopolitical problems and improve the security of supply chains.

In turn, the Trans-Caspian corridor is divided into Northern, Central and Southern routes - the latter runs, as already mentioned, from Turkmenistan to Iran. But according to the assessments of a special report, according to 5 criteria, the most effective and convenient is the Central Trans-Caspian Network - crossing the sea from southern Kazakhstan to Azerbaijan. *Research by the European Commission has shown that even without investment, the volume of standard transit containers could increase from 18,000 units in 2022 to 130,000*

in 2040. And if investment projects are implemented, the volume of containers through the Central Trans-Caspian Corridor in 2040 will increase to 865,000 units. That is, in less than 18 years, the volume of container traffic can be increased 48 times! [6]

What is clear is that, given the ongoing Russian-Ukrainian war, which has interrupted all logistics routes between the Russian Federation and the West, as well as the current escalation of conflicts in the Middle East, which has resulted in a virtual stop of normal shipping in the Red Sea and the Suez Canal, the role of the Middle Corridor as a safe route will only grow exponentially.

In the foreseeable future, that is, within 2-3 years, taking into account 1) Europe's needs for hydrocarbons; 2) China's need to transport its export goods; 3) economic growth of the Central Asian region; 4) the potential resumption of the Zangezur corridor, the scale of cargo transportation may exceed 10 million tons.

Although there are some limitations, the Middle Corridor has the potential to advance international transport links and contribute to stability and cooperation in the region, while recognizing that its viability will also depend on how the European Union responds to recent developments in regional connectivity. The Chinese economy is experiencing serious problems, in particular the Palestinian-Israeli war, which attracts many external players and stimulates the resumption of interaction with the South Caucasus, which is in the interests of the West and, most importantly, the countries of the South Caucasus.

IN CONCLUSION

The EU is an organization, like the UN, which has been experiencing great difficulties over the past 10 years; The Armenian lobby and general ignorance of the real situation in the South Caucasus, also played a role here. By placing a mission on the Armenian-Azerbaijani border, instead of reducing the intensity of conflict in the region, the European Union is increasing it.

The high level of Armenian lobbying in France, the leading player in the European Union, remains so, therefore there is no basis to regard French initiatives as some kind of "humanitarian impulse". The general consensus among experts is that while the EU has taken on a relatively biased mediation role in resolving disputes over South Ossetia and Abkhazia, with regard to the Second Karabakh War, the European Union has failed to take serious initiatives to deal with the situation.

A distinctive feature of the Brussels Platform is that it was initiated by the head of the EU, Charles Michel, and was largely based on his personal authority and was not a project coming from the Union itself.

It is also interesting that the EU has a common point of view, which encodes the South Caucasus within the framework of "energy security", that is, it considers what is happening in this region within the framework of the energy needs of the union. In this context, it is not surprising that the EU in 2020-2021. Pushed aside the regionalism he often voiced in the civilian sphere and replaced it with a bilateral relationship based on economics.

However, the resolution of the Armenian-Azerbaijani conflict was a historic step for the South Caucasus and opened up various opportunities that are designed to contribute to peace and stability in the South Caucasus.

When Armenia abandons the “soft protectorate” represented by the European Union and begins to conduct a constructive dialogue, to which Azerbaijan calls it, then there will be a chance to achieve lasting peace in the region. The sooner official Yerevan understands that “against Azerbaijan” in Western European circles does not always mean “for Armenia”, the faster Armenia will embark on the path of development.

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EVALUATION OF HALP SCORE IN DIFFERENT STAGES OF CHRONIC KIDNEY DISEASE

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ABSTRACT

Haemoglobin, Albumin, Lymphocyte, Platelet (HALP) score is a new prognostic biomarker that has been studied for about 10 years. It was initially shown to predict both prognosis and response to treatment in various cancer types. This score reflects the immunonutritional status. Among the components of this score, albumin reflects nutritional status and lymphocyte and platelet counts reflect immune status. Chronic kidney disease patients (CKD) are both immunosuppressed and catabolic patients. Therefore, we aimed to evaluate HALP score levels in different stages of CKD.

A total of 183 patients including 62 patients with stage 3 CKD, 63 patients with stage 4 CKD, 26 patients with stage 5 CKD and 32 controls were included in our study. Demographic data, haemogram and biochemical parameters of these groups were retrospectively recorded from the hospital database. HALP score was calculated for all groups with the formula $[\text{haemoglobin (g/L)} \times \text{albumin (g/L)} \times \text{lymphocyte (/L)}] / \text{platelet (/L)}$ count. One way ANOVA and chi-square analyses were used for comparisons.

In the CKD group, 54.3% (82) were male patients and 21.8% were diabetic. HALP score was 67.98 ± 19.76 in the control group, 52.34 ± 15.75 in the stage 3 CKD group, 39.82 ± 11.67 in the stage 4 CKD group, and 36.09 ± 10.87 in the stage 5 CKD group. HALP score decreased as the CKD stages progressed. The difference between the groups was found to be significant ($p < 0.001$). Similarly, haemoglobin ($p < 0.001$), albumin ($p < 0.001$) and lymphocyte ($p = 0.001$) values were significantly different between the groups. However, no significant difference was found between platelet values ($p = 0.406$).

HALP score is lower in CKD patients compared to healthy individuals and the decrease continues as the CKD stage progresses. Further studies are needed to investigate the relationship between HALP score, which is known to predict prognosis in patients with malignancy, and prognosis in CKD.

Keywords: Chronic Renal Failure; HALP score; Stage

ÖZET

Hemoglobin, Albümin, Lenfosit, Trombosit (HALP) skoru, yaklaşık 10 yıldır çalışılan yeni bir prognostik biyobelirteçtir. Başlangıçta çeşitli kanser türlerinde hem prognozu hem de tedaviye

yanıtı predikte ettiğine gösterilmiştir. Bu skor immünonütrisyonel durumu yansıtmaktadır. Bu skorun bileşenlerinden albumin beslenme durumunu, lenfosit ve trombosit sayısı da immun durumu yansıtmaktadır. Kronik böbrek yetmezliği hastaları (KBH) da hem immunsuprese ve hem de katabolik hastalardır. Biz de bu nedenle farklı kronik böbrek yetmezliği evrelerinde HALP skoru düzeylerini değerlendirmeyi amaçladık.

Çalışmamıza 62 evre 3 KBH, 63 evre 4 KBH ve 26 evre 5 KBH hastası ile 32 kontrol grubu olmak üzere toplam 183 hasta dahil edildi. Bu grupların demografik verileri, hemogram ve biyokimyasal parametreleri retrospektif olarak hastane veritabanından kaydedildi. Tüm hastalar için HALP skoru hesaplandı. Hemoglobün (g/L) × albümin (g/L) × lenfosit (/L)]/trombosit (/L) sayısı formülü ile tüm gruplar için HALP skoru hesaplandı. Karşılaştırmalarda One way ANOVA ve ki kare analizleri kullanıldı.

KBH grubunun %54.3'ü (82) erkek hastalardan oluşmaktaydı ve %21.8'i diyabetikti. HALP skoru kontrol grubunda 67.98±19.76, evre 3 KBH grubunda 52.34 ±15.75, evre 4 KBH grubunda 39.82±11.67, evre 5 KBH grubunda 36.09±10.87 olarak bulundu. KBH evreleri ilerledikçe HALP skorunun azaldığı görüldü. Gruplar arasındaki fark anlamlı bulundu (p<0.001). Benzer şekilde gruplar arasında hemoglobün (p<0.001), albümin (p<0.001) ve lenfosit (p=0.001) değerleri de anlamlı olarak farklıydı. Ancak trombosit değerleri arasında anlamlı fark bulunmadı (p=0.406).

HALP skoru sağlıklı bireylere göre KBH hastalarında düşüktür ve KBH evresi ilerledikçe düşüş devam etmektedir. Malignite hastaları için prognozu predikte ettiği bilinen HALP skorunun KBH için de prognoz ile ilişkisini araştırmak için ileri çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Kronik Böbrek Yetmezliği; HALP skoru; Evre

GİRİŞ

Kronik böbrek hastalığı (KBH), dünya genelinde genel nüfusun yaklaşık %15'ini etkileyen yaygın ve potansiyel olarak yıkıcı bir hastalıktır. Aynı zamanda önemli bir halk sağlığı sorunudur. Bu yıkıcı hastalıkta mortalite ve morbidite de yüksek seyretmektedir. Bu hastaların immünonütrisyonel durumlarının değerlendirilmesi için kullanılan prognostik beslenme indeksi gibi indekslerin hem diğer hastalıklarda hem de kronik böbrek yetmezliği hastalarında prognozla ilişkili olduğu gösterilmiştir (Zhang et al. 2023, Mureşan et al.2022) PNI, lenfosit ve albümin seviyelerine dayanan, bireylerin immünnütrisyonel durumunun güvenilir bir göstergesidir. Kronik böbrek hastalığı kohortunda da tüm nedenli mortalite ile bağımsız ilişkili olduğu bildirilmiştir.

HALP skoru son yıllarda ilgi gören ve hastaların immünnütrisyonel durumu hakkında ipucu verebilen bir indekstir. HALP skorunun bileşenlerinde albümin ve lenfosit yanında hemoglobün ve trombosit değerleri de hesaba dahil edilmektedir. Kronik böbrek hastalığı seyrinde sıklıkla anemi görülür ve hastanın yaşam kalitesinin azaltır, morbidite ve mortaliteyi artırır. KBH'li hastalar sıklıkla altta yatan faktörlerle ilişkili kronik bir inflamatuvar durumdan muzdariptir. Bu

kalıcı inflamasyonun Hb seviyelerindeki deęişkenliğe ve KBH hastalarında sıklıkla görülen eritropoietin uyarıcı ajanlara karşı yanıtızsızlığa katkıda bulunabileceęi de bilinmektedir (Gluba-Brzóka, et al 2020). Albümin, karacięerin negatif akut faz reaktan proteindir ve hipoalbuminemi inflamatuvar bir durumu yansıtır. Ayrıca, albümin bir beslenme belirteci olarak da kullanılmıştır. Diyabetik nefropatili hastalarda hipoalbuminemi ile renal prognoz arasında bağımsız ilişki olduęu da bilinmektedir (Zhang et al 2019). Lenfositler ve trombositlere bakacak olursak, düşük lenfosit ve yüksek trombosit seviyelerinin bozulmuş baęışıklığı ve artan enfeksiyon riskini gösterdięi bilinmektedir. Sistemik inflamasyon, lenfosit apoptozunda artışlarla, enfeksiyon riskinde artışla ve olumsuz kardiyovasküler olaylarla ilişkilendirilmiştir. Trombositler, hemostaz görevlerine ek olarak, inflamasyon sürecinde ve immünolojik tepkilerde önemli bir rol oynar (Mureşan et al 2022).

Kronik böbrek yetmezliği hastaları (KBH) da hem immunsuprese ve hem de katabolik hastalardır. Biz de bu nedenle farklı kronik böbrek yetmezliği evrelerinde HALP skoru düzeylerini deęerlendirmeyi amaçladık

MATERYAL VE METOD

Bu çalışma 151 orta-ileri evre kronik böbrek hastası ile 32 kontrol olmak üzere toplam 183 katılımcı ile gerçekleştirildi. Selçuk Üniversitesi Tıp Fakültesi elektronik kayıt sisteminden 3 aylık sürede nefroloji polikliniğine başvuran hastalar tarandı. Malignitesi olan hastalar ve herhangi bir hematolojik hastalığı olan kişiler çalışma dışında tutuldu. Evre1 ve 2 KBH da çalışmaya dahil edilmedi. Hastaların demografik verileri, hemogram, üre, kreatinin, sodyum, potasyum, kalsiyum, fosfor, parathormon, albümin, lipid profili düzeyleri elektronik kayıt sisteminden kaydedildi. Hastaların tahmini glomeruler filtrasyon hızı CKD-EPI formülü ile hesaplandı. Hemoglobün (g/L) × albümin (g/L) × lenfosit (/L)]/trombosit (/L) sayısı formülü ile HALP skoru hesaplandı.

Kronik böbrek hastaları evre 3, evre4 ve evre 5 olmak üzere üç gruba ayrıldı. İstatistiksel analiz SPSS paket programı ile yapıldı (SPSS for Windows, Version 22.0, SPSS Inc., USA). Kolmogorov Smirnov testi ile verilerin normal dağılıma uygunluğu deęerlendirildikten sonra gruplar arasındaki karşılaştırma için ikiden fazla grupta ANOVA, iki grup arası ise independent sample t testi yapıldı. Normal dağılıma uymayan gruplar arası farklılıkların analizinde Mann Whitney U testi uygulandı. Parametreler arasındaki ilişkiler Pearson korelasyon analizi ile deęerlendirildi. Kategorik ölçümler sayı ve yüzde olarak, sürekli ölçümler de ortalama±standart sapma (gerekli yerlerde ortanca ve minimum-maksimum) olarak gösterildi. Kategorik ölçümlerin karşılaştırması ise Ki-kare testi ile yapıldı. Tüm testlerde istatistiksel önem düzeyi p<0,05 olarak alındı.

BULGULAR VE TARTIŞMA

Çalışmamıza dahil edilen kontrol grubu ile kronik böbrek hastaları arasında yaş ve cinsiyet açısından anlamlı fark yoktu. HALP skoru kontrol grubuna göre, kronik böbrek hastalarında daha düşüktü. KBH evresi ilerledikçe de HALP skorları azalıyordu. HALP skoru bileşenlerini

oluşturan albümin ve hemoglobin seviyelerinin de KBH evresi ilerledikçe anlamlı şekilde azaldığı görüldü. Platelet seviyelerinde gruplar arasında anlamlı fark görülmedi. Bulgular tablo 1’de gösterilmiştir.

Tablo1 Kronik böbrek hastalığı evreleri ile kontrol grubunun demografik ve laboratuvar verileri

	Kontrol	Evre 3 KBH	Evre 4 KBH	Evre 5 KBH	p
	n:32	n:62	n:63	n:26	
Yaş	48.6±7.1	48.3±8.8	47.2±10.5	49.5±7.4	0.283
Cinsiyet (E/K)	19/11	40/22	31/33	12/14	0.173
Üre	26.8±6	63.6±20	88.9±36.6	128.6±29.8	<0.001
Kreatinin	0.8±0.16	1.7±0.34	2.7±0.65	4.5±0.74	<0.001
eGFR	114±14.7	40.2±7.9	22.1±4.4	12±1.29	<0.001
Glukoz	98±11.3	113.1±55.9	109.6±46	114.6±38.4	0.032
Albumin	4.7±0.3	4.0±0.31	4.01±0.3	3.6±0.63	<0.001
Hemoglobin	14.8±1.5	13.9±1.8	12.6±1.7	11.7±1.6	<0.001
Nötrofil	4143±1318	4459±1608	5018±2312	6201±3180	0.001
Lenfosit	2418±606	2197±693	1843±567	1978±710	<0.001
Platelet	253.5±51.6	240.2±67.7	242.7±72.3	267.2±106.9	0.406
HALP skoru	67.9±19.7	52.3±20.7	39.8±16.6	33.6±15.9	<0.001

Kronik böbrek hastalarında cinsiyetlerarasında HALP skoru farklılığı olup olmadığını araştırdık. 151 KBH hastasını analiz ettik ve sonuçları tablo 2’de gösterdik. Üre, kreatinin, ürik asit, sodyum, potasyum, kalsiyum, albümin, glukoz, trigliserid, nötrofil ve lenfosit değerleri açısından kadın ve erkeklerde anlamlı fark yoktu. Trombosit, total kolestrol, HDL kolesterol, LDL kolesterol, fosfor ve PTH kadınlarda erkeklere göre anlamlı olarak yüksekti. Hemoglobin değeri ise beklendiği şekilde erkeklede kadınlara göre yüksekti. HALP skoru ise erkeklerde kadınlara göre anlamlı olarak yüksek bulundu ($p<0.001$).

Diyabeti olan ve olmayan KBH hastalarını HALP skorları açısından karşılaştırdığımızda ise anlamlı fark bulunmadı ($p=0.338$). Diyabetik hastaların HALP skoru 42.7 ± 20.5 ve diyabetik olmayan hastaların HALP skoru 46.6 ± 20.3 idi.

Pearson korelasyon yapıldığında HALP skoru yaşla anlamlı negatif korele ($r=-0.206$, $p=0.005$) idi. Aynı analizle HALP skoru eGFR ile anlamlı şekilde pozitif korele bulundu ($r=-0.460$, $p<0.001$)

Tablo 2 Kronik böbrek hastalarının cinsiyete göre laboratuvar bulguları

Parametreler	Kadın	Erkek	p değeri
Üre	82.8±30.3	85.6±43.7	0.660
Kreatinin	2.43±0.97	2.8±1.23	0.070
Ürik asit	6.81±1.74	7.34±1.85	0.071
Sodyum	136.9±2.37	137.1±2.9	0.615
Potasyum	4.6±0.48	4.6±0.97	0.926
Kalsiyum	8.9±0.87	9.0±0.67	0.592
Fosfor	3.8±1.4	3.4±0.7	0.022
Albumin	3.97±0.47	3.96±0.38	0.895
PTH	203±102.4	149.6±77.4	0.031
Glukoz	108.8±41.3	114.6±54.7	0.476
Total kolesterol	224.8±49.1	196.9±54.2	0.001
HDL kolesterol	46.9±12.9	37.7±9.4	<0.001
LDL kolesterol	143.9±38.4	123.7±41	0.003
Trigliserid	165 (52-591)	171 (42-481)	0.689
Hemoglobin	12±1.5	13.8±1.9	<0.001
Nötrofil	4.96±2.5	5.02±2.1	0.861
Lenfosit	1.99±0.69	2.02±0.69	0.748
Trombosit	268.8±82.7	227.0±68.1	0.001
HALP puanı	38.6±17.6	51.6±20.6	<0.001

Çalışmamızın ana bulgusu kronik böbrek hastalarında kontrol grubuna göre HALP skorlarının düşük olması ve KBH evresi ilerledikçe HALP skorlarının düşmesi idi. Ayrıca KBH hastalarında, erkeklerde bu skor kadınlara göre daha yüksekti. HALP skoru daha çok malignite hastalarında çalışılmıştır ve böbrek yetmezliği hastalarında sınırlı sayıda çalışma vardır.

Giderek daha sık araştırılan bu skor için standart bir eşik yoktur. ABDde erişkin popülasyondan 8245 bireyin dahil edildiği bir çalışmada median HALP puanı 49 olarak bulundu. Bu popülasyonda erkeklerde median HALP skoru 55.8 ve kadınlarda 43.8 olarak bildirildi. Hiçbir komorbiditesi olmayan katılımcıların median HALP skoru 51.0'dı. Komorbiditesi olmayan erkeklerde ortanca HALP puanı 59,1 ve kadınlarda 44,1'di. Kadınlarda hemogloblin düzeylerindeki erkeklere göre düşüklük HALP skorunu da aynı yönde etkilemiş görünüyordu. Bu çalışmada HALP skoru ile yaş arasında ters bir ilişki olduğu gösterilmiştir. Antar ve arkadaşlarının çalışmasında böbrek yetmezliği olan katılımcıların HALP puanı (41.6), böbrek yetmezliği olmayan katılımcılara (49.2) kıyasla anlamlı derecede daha düşüktü ($p < 0,001$). Ayrıca, son 12 ayda diyalize giren katılımcıların medyan HALP puanı (33.5), diyaliz tedavisi görmeyen katılımcılara kıyasla (43,3) anlamlı olarak düşüktü ($p=0.012$). Bizim bulgularımız da bu çalışmanın bulgularıyla uyumludur (Antar, 2023).

Böbrek hastalarında HALP skorunu araştıran bir diğer çalışma IgA nefropatili hastalarda yakın zamanda bildirilmiştir. 895 biyopsi ile doğrulanmış IgAN hastasını kaydeden retrospektif tek merkezli bu çalışmada hastalar ortalama 23 ay takip edildi. HALP puanına göre hastalar 3 gruba ayrıldı. En düşük HALP skoruna sahip grupta böbrek yetmezliği geliştirme riski diğer gruplara göre daha yüksekti. En yüksek HALP skoruna sahip grubun ortalama renal sağkalım süreleri (46.0 ay,) diğer iki gruba göre (44.8 ve 42.5 ay) anlamlı derecede daha yüksekti. Bu çalışma sonuçlarına göre başlangıç HALP düzeyi böbrek sonuçlarını etkili bir şekilde değerlendirebilir (Yuan, 2024).

Başka bir çalışmada kontrast ilişkili akut böbrek hasarı gelişimi ile HALP skoru arasındaki ilişki incelenmiştir. Endovasküler abdominal aort anevrizması onarımı yapılan 125 hastanın dahil edildiği bu çalışmada kontrast ilişkili akut böbrek hasarı (ABH) gelişen hastaların HALP düzeyleri (26.1) ABH gelişmeyenlere göre (40.5) anlamlı olarak yüksek bulunmuştur. Düşük HALP skorunun kontrast ilişkili ABH gelişiminin hem bağımlı hem de bağımsız bir öngörücüsü ortaya koyulmuştur. Aynı çalışmada ayrıca HALP skorunun mortalite ile ilişkisi de incelenmiş ve HALP skorunun ayrıca mortal seyreden grupta (28.9) sağ kalanlara (40.8) kıyasla daha düşük olduğu bulunmuştur ($p=0.004$). (Özderya, 2024)

SONUÇ

HALP skoru sağlıklı bireylere göre KBH hastalarında düşüktür ve KBH evresi ilerledikçe düşüş devam etmektedir. HALP skoru bu hasta grubunda erkeklerde anlamlı olarak yüksektir. Malignite hastaları için prognozu predikte ettiği bilinen HALP skorunun KBH için de prognoz ile ilişkisini araştırmak için ileri çalışmalara ihtiyaç vardır.

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**COVID-19’LU GEBE HASTALARIN PLASENTALARINDA ORTAYA ÇIKAN
HİSTOPATOLOJİK YAPILARIN İNCELENMESİ**
EXAMINATION OF HISTOPATHOLOGIC STRUCTURES IN PLACENTAS OF
PREGNANT PATIENTS WITH COVID-19

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ÖZET

Çalışmamızın amacı COVID-19 olan gebe hastaların plasentalarında gelişen plasental histopatolojik yapıları incelemektir. Çalışmamızda Dicle Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve Doğum kliniğine yatan ve COVID-19 tanısı alan 20 gebe hastanın plasentalarından histolojik takip için küçük parçalar alındı. 18 yaşından küçük ve 49 yaşından büyük kadınlar, ikincil hastalığı veya kronik hastalığı olan hastalar (örn. Herhangi bir solunum yolu hastalığı, herhangi bir gebelik komplikasyonu veya herhangi bir diğer sistemik bozuklukları) çalışmaya dahil edilmedi. Öksürük, boğaz ağrısı, nefes güçlüğü semptomlarının yanında PCR testi COVID-19 virüsü için pozitif olan hastalar kabul edildi. Placenta örnekleri Hematoksilen&Eozin (H&E) ile boyanarak ışık mikroskobu altında incelendi. COVID-19 grubuna ait hastaların placenta örneklerinin longitudinal kesitinde; kan damarlarının etrafında bazal membran yapısının belirgin olarak bozulduğu ve desidua hücrelerinin apoptotik görünümde olduğu izlendi. Ayrıca bu hastaların plasentaları serbest halde dağılmış olup, koryonik villusların özellikle bağlantı bölgeleri olan sinsityal köprülerde incelemeler olduğu ve inflamatuvar hücre infiltrasyonunun agregat oluşturması dikkat çekiciydi. COVID-19’lu

annelerin plasental yapılarında COVID-19'a bağlı olduğu düşünölen histopatolojik deęişikliklerin meydana geldięi izlendi.

Anahtar kelimeler: COVID-19, Plasenta, Histopatoloji.

ABSTRACT

The aim of our study was to investigate the placental histopathologic structures in the placentas of pregnant patients with COVID-19. In our study, small pieces of placentas of 20 pregnant patients who were hospitalized in Dicle University Faculty of Medicine, Department of Obstetrics and Gynecology and diagnosed with COVID-19 were obtained for histologic follow-up. Women younger than 18 years and older than 49 years, patients with secondary disease or chronic disease (e.g. any respiratory disease, any pregnancy complications or any other systemic disorders) were excluded. Patients with symptoms of cough, sore throat, difficulty breathing and a positive PCR test for COVID-19 virus were accepted. Placenta samples were stained with Hematoxylin & Eosin (H&E) and examined under light microscope. In the longitudinal section of the placenta samples of the patients belonging to the COVID-19 group; it was observed that the basement membrane structure around the blood vessels was significantly disrupted and the decidua cells had an apoptotic appearance. In addition, the placentas of these patients were scattered freely and it was noteworthy that the chorionic villi were thinned, especially in the syncytial bridges, which are the connecting regions, and inflammatory cell infiltration formed aggregates. It was observed that histopathologic changes thought to be related to COVID-19 occurred in the placental structures of mothers with COVID-19.

Keywords: COVID-19, Placenta, Histopathology.

GİRİŞ

Gebelik, solunum yolu viral enfeksiyonundan kaynaklanan olumsuz obstetrik ve neonatal sonuç riskini artırır. Fetüsün reddini önlemek ve fetal gelişime yardımcı olmak için gebelikte maternal bağışıklık sistemi deęişir. Bazı viral enfeksiyonlar, hamile kadınlarda daha şiddetli veya uzun süreli bir hastalığa neden olabilir. SARS ile ilişkili koronavirüsün yüksek oranda anne ölümü, düşük ve erken doğum ile sonuçlandığı bilinmektedir. İnfluenza ile yapılan çalışmalar hastalığın, hamile olan ile hamile olmayan kadınlarla karşılaştırıldığında hamile olan kadınların anne morbiditesi ve mortalite riskini arttığını göstermiştir (Golden ve Simmons, 2020; Baergen ve Heller, 2020). Her iki durumda da ciddi doğum kusurları veya gebelik kaybı gelişebilir.

Gebelik, bağışıklık sistemini kısmen baskılayarak gebe kişiyi viral enfeksiyonlara karşı savunmasız hale getirebilen bir süreçtir (Longman ve Johnson, 2007). Gebelik sırasında başta akciğerler etkilenmek üzere solunum fonksiyonlarında meydana gelen deęişiklikler gebenin hipoksiye karşı toleransını azaltmaktadır. Ayrıca vazodilatasyona bağlı olarak gelişen ve

genellikle üst yollarında izlenen mukozal ödem, gebeleri solunum yolu enfeksiyonlarına karşı daha duyarlı hale getirebilmektedir (Stephansson ve ark., 2022). Bir diğer risk grubu arasında görülen hipoksi, inflamatuvar aktivasyon ve şiddetli akut solunum sendromu koronavirüs-2 (SARS-CoV-2) virüsünün neden olduğu Coronavirus hastalığı-2019 (COVID-19), olumsuz gebelik seyrine neden olarak plasental patolojik değişikliklere yol açabilmektedir (Schett ve ark., 2020; Tang ve ark., 2020). Gebeler, COVID-19'un hem prenatal hem de postnatal dönemde görülen olumsuz etkileri dolayısıyla yüksek riskli grup arasında yer almaktadır. SARS-CoV-2'nin vertikal geçişe sebep olduğu birçok çalışmada bildirildiğinden plasental patoloji temel ilgi alanı olmuştur (Zaigham ve ark., 2021). Ayrıca konjenital bulaşma nadiren görüldüğünden virüs ile enfekte olmuş gebelerde COVID-19'a bağlı fetal tehlike olasılığı hala bilinmemektedir.

COVID-19, 2019 yılının Kasım ayında Çin'in Wuhan kentinde başlayan ve bütün dünyaya yayılarak Dünya Sağlık Örgütü (DSÖ) tarafından pandemi olarak edilen, bulaşıcılığı yüksek viral bir enfeksiyondur (Kumar ve ark., 2021). COVID-19'un hamile kadınlar üzerindeki etkisine ilişkin sınırlı sayıda çalışmalar vardır (Juan ve ark. 2020). Zaigham ve Andersson çalışmalarında SARS-CoV-2 enfeksiyonuna bağlı maternal morbidite ile mortalite olasılığının artabileceğini bildirmişlerdir (Zaigham ve Andersson, 2020). SARS-CoV-2 enfeksiyonuna sahip gebelerde, sağlıklı olanlara kıyasla daha yüksek erken doğum geliştiği görülmüştür (Chinn ve ark., 2021). Benzer şekilde İsveç'te yapılan bir çalışmada SARS-CoV-2 enfeksiyonunun erken doğum riskini arttığı ancak, ölü doğum oranında herhangi bir değişikliğe yol açmadığı bildirilmiştir. (Stephansson ve ark., 2022).

Çalışmamızda PCR testi COVID-19 virüsü için pozitif olan hastaların plasentalarında gelişen histopatolojik yapılar incelenecektir. Bu çalışma sayesinde COVID-19 hastalığının plasenta üzerindeki etkileri yapısal olarak kısmen ortaya çıkarılacaktır.

YÖNTEM

Plasentaların Elde Edilmesi ve Dokuların Takibi

Çalışmamızda Dicle Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve Doğum kliniğine yatırılan ve COVID-19 tanısı alan 20 gebe kadın hastanın plasentalarından alınan örneklerle gerçekleştirildi. 18 yaşından küçük ve 49 yaşından büyük kadınlar, ikincil hastalığı veya kronik hastalığı olan hastalar (örn. Herhangi bir solunum yolu hastalığı, herhangi bir gebelik komplikasyonu veya herhangi bir diğer sistemik bozuklukları) çalışmaya dahil edilmedi. Öksürük, boğaz ağrısı, nefes güçlüğü semptomlarının yanında PCR testi COVID-19 virüsü için pozitif olan hastalar kabul edildi. Çalışmamızın etik kurul izni "Dicle Üniversitesi Tıp Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan" alındı.

Plasentalarından alınan örnekler histolojik takip için küçük parçalara ayrıldı. Tüm dokular rutin histolojik doku takibine alındı. %10 Formaldehit içerisinde 24 saat fikse edildikten sonra 2 gece çeşme suyu ile yıkamada bekletilip, artan alkol serilerinden (%50, %70, %80, %90, %96) geçirildi. Şeffaflaştırma için Kksilende 3x30 dakika bekletilerek ardından 58°C' de

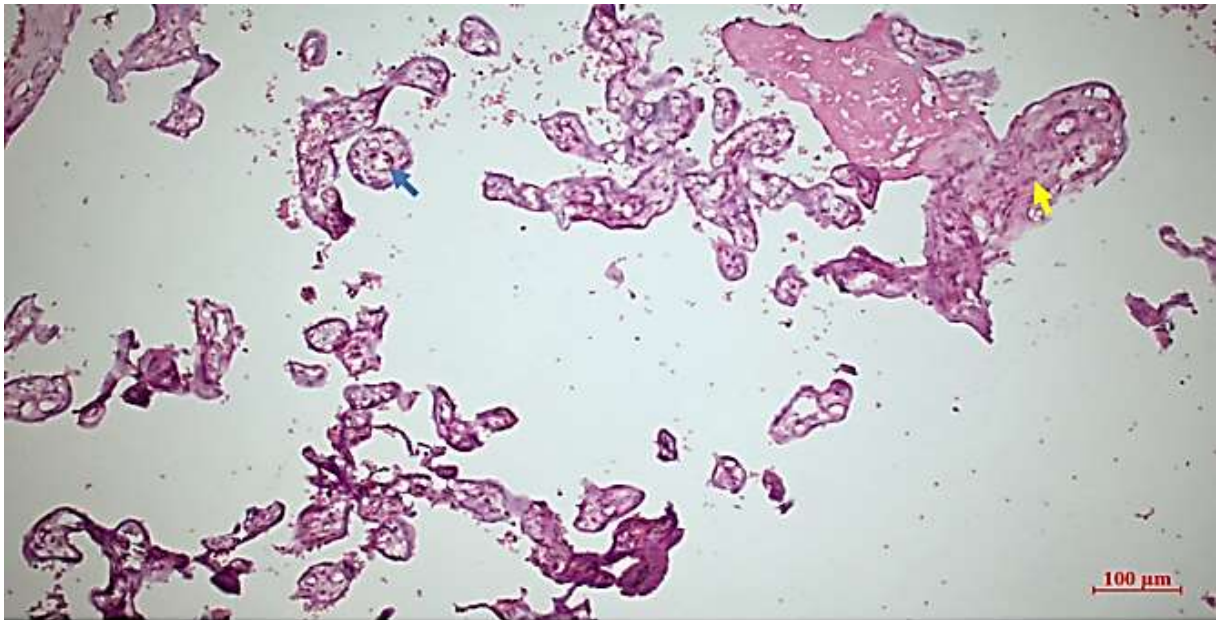
parafin infiltrasyonuna alındı. Daha sonra dokular parafin bloklara gömülerek ve mikrotom (katalog no: Leica RM2265, Wetzlar, Germany) yardımıyla oluşan bloklardan 4-6 µm kalınlığında kesitler alındı ve Hematoksilen&Eozin (H&E) ile boyandı.

Hematoksilen-Eozin (H&E) Boyama İşlemi

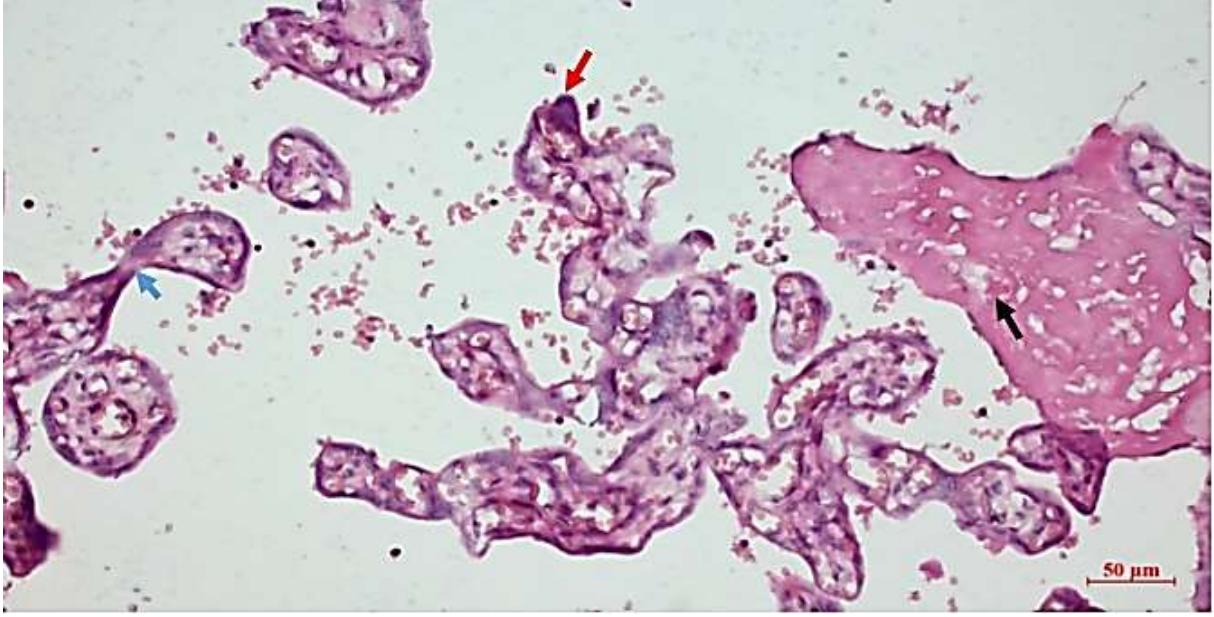
Parafin bloklardan alınan plasental doku kesitleri 37°C'ye ayarlanmış benmariye alınarak, lam üzerindeki fazla parafin eritildi. Parafini eritmek için kesitler 58-62°C etüvde 6 saat boyunca bekletildi. Kesitler 3x15 dakika ksilende deparafinize edildikten sonra azalan alkol serilerinden (%100, %96, %90, %70, %50 etil alkol) 10'ar dakika geçirilerek, distile suya getirildi ve 5 dakika bekletildi. Kesitlere hematoksilen eozin boyama protokolü uygulandı. Boya aşamasından sonra kesitler artan alkol serilerine (%80, %90, %96 etil alkol serilerinden geçirilerek) hızlıca daldırılarak absolü alkolde 2 dakika bekletildi. Son olarak kesitler 3x15 dakika ksilende bekletilip, doku üzerilerine Entellan damlatılarak lamelle kapatıldı.

ARAŞTIRMA BULGULARI VE TARTIŞMA

Covid-19 grubu plasentaların longitudinal kesitlerinde; kan damarlarının etrafında bazal membran yapısının belirgin olarak bozulduğu (mavi ok), çevrede hiyelanize alanlara inflamatuvar alanların eşlik ettiği ve desidua hücrelerinin apoptotik görünümde olduğu izlendi (Şekil 1). Ayrıca bir başka spesimde serbest halde dağılmış koryonik villusların özellikle bağlantı bölgeleri olan sinsityal köprülerde incelmeler (mavi ok), koryonik villüslarda genişleyen sinsityal düğümler (kırmızı ok), inflamatuvar hücre infiltrasyonunun agregat oluşturması (siyah ok) izlenmekteydi (Şekil 2).



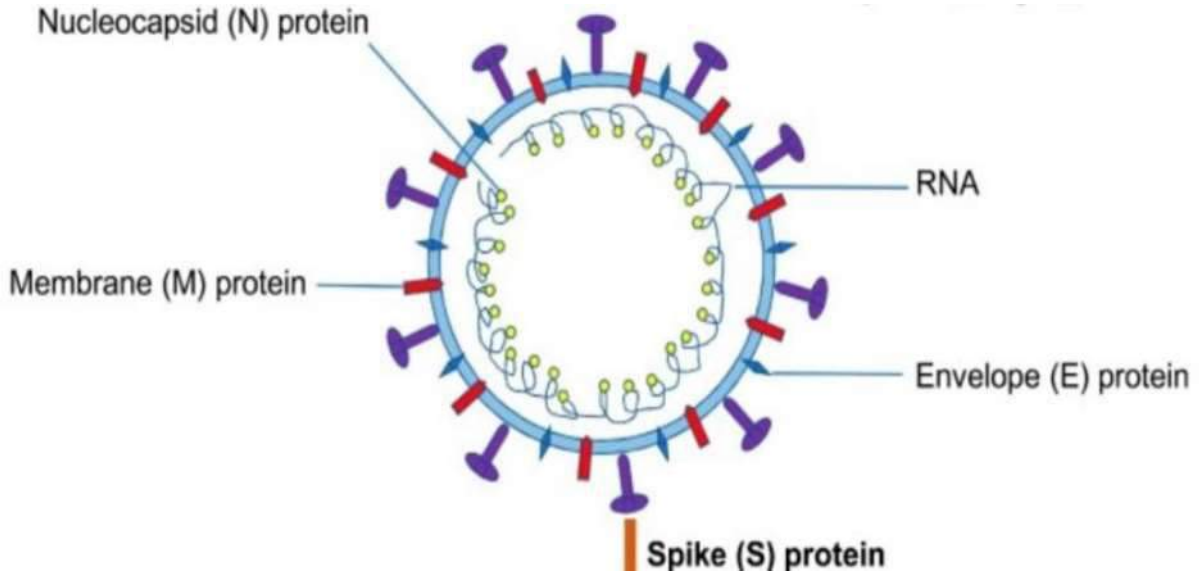
Şekil 1. Covid grubu placentanın kök villüsünün longitudinal kesitinde kan damarlarının etrafında bazal membran yapısının belirgin olarak bozulduğu (mavi ok) etrafta hiyelanize alanlarla birlikte inflamatuvar alanlar ve desidua hücrelerinin apoptotik görünümü (sarı ok) dikkat çekiciydi.



Şekil 2. Covid grubu plasenta serbest halde dağılmış koryonik villusların özellikle bağlantı bölgeleri olan sinsityal köprülerde incelmeler (mavi ok), koryonik villüslarda genişleyen sinsityal düğümler (kırmızı ok), inflamatuvar hücre infiltrasyonunun agregat oluşturması (siyah ok) dikkat çekiciydi.

Koronavirüsler, tek zincirli, pozitif polariteli, zarflı RNA virüsleri olarak bilinmektedir. Pozitif polariteli olduklarından RNA'ya bağımlı RNA polimeraz enzimi içermezler. Zarf üzerinde sivri uçlu glikoproteinlerin barındırıklarından elektron mikroskobu altında incelendiklerinde Latince'de taç anlamına gelen "corona" terimi kullanılıp Coronavirus (taçlı virüs) adı verilmiştir. Koronavirüsler;

- ✓ Spike (S),
- ✓ zarf (E proteini),
- ✓ membrane (M) ve
- ✓ nukleokapsid (N) olmak dört yapısal proteinden meydana gelir (Şekil 3).



Şekil 3. Koronavirüslerin şematik olarak yapısı (Zhou ve ark., 2019).

SARS-CoV-2, yaklaşık 2019 yılının sonlarına doğru ortaya çıkıp, kendini COVID-19 olarak gösteren etyolojik ajandır. SARS-CoV-2 oldukça patojenik olup, asemptomatik, hafif-ağır pnömoni ve akut solunum sıkıntısı sendromu (ARDS) gibi kendini gösteren solunum yolu hastalığıyla ilişkilidir. İlerleyen pandemi süreciyle COVID-19'un sadece bir solunum yolu hastalığı olmadığı, plasenta dahil birçok organ sistemini etkileyebileceği ve hatta ölüme sonuçlandığı görülmüştür (Zhu ve ark., 2020). Gebelik, genel olarak gebe olmayanlara göre solunum yolu enfeksiyonlarında daha yüksek morbidite ve mortalite riskiyle ilişkilendirilmiştir. COVID-19'lu gebelerle ilgili sistematik incelemede, şiddetli pnömonili annelerin bazılarının yoğun bakıma ihtiyaç duyduğu, yine aynı çalışmada abort, anne ölümü, intrauterin ve neonatal fetal ölüm gibi vakaların olduğu bildirilmiştir (Juan ve ark., 2020).

Plasenta, fetüsün maternal enfeksiyonlara maruz kalmasına izin vermeyen koruyucu bir bariyer oluşturmaktadır. İnsan plasentası, trofoblast adı verilen ve üç ana türü olan bir dizi spesifik fetal türevli hücreden oluşur. Bunlar, anne kanı ile doğrudan temas halinde olan ve villus ağacını hizalayan terminal olarak farklılaşmış multinükleer sinsityotrofoblast hücreleri, sinsityotrofoblastın altında yer alan progenitor villöz sitotrofoblast hücreleri ve koryon villuslarını uterusu bağlayan invaziv ekstravillus trofoblast (EVT) hücrelerini içermektedir. Bununla birlikte, kanıtlar, patojenlerin bu engeli aşabileceğini, bazen gelişmekte olan gebelik üzerinde yıkıcı etkileri olduğunu ve fetüsü etkileyip yenidoğanlarda mikrosefali, oküler anormallikler gibi ciddi komplikasyonlara neden olabileceğini düşündürmektedir (Coyne ve Lazear, 2016).

SARS-CoV-2'nin hamilelik sırasında anneden fetüse bulaşma olasılığı öne sürülse de plasentanın virüs bulaşmasındaki rolü henüz tam olarak anlaşılamamıştır. Sinsityotrofoblastlarda SARS-CoV-2 mRNA veya viryonların varlığını doğrulayan son bulgular, SARS-CoV-2'nin neden olduğu transplasental enfeksiyonu güçlü bir şekilde düşündürmüştür (Algarroba ve ark., 2020; Patané ve ark., 2020). SARS-CoV-2 pozitif annelerin

plasentasında yapılan bir vaka kontrol çalışmasında ise fibrin birikimi, mikrokalsifikasyonlar, sinsityal düğümler, küçük fibrotik villus ve villöz aglütinasyon insidansında artış olduğu görülmüştür (Baergen ve Heller, 2020). Baergen ve Heller doğum sırasında (32 ila 40 haftalık gebelik) rutin testlerde SARS-CoV-2 için pozitif bulunan 20 kadından alınan plasenta üzerinde yaptıkları çalışmada, 10 plasentada olası fetal vasküler malperfüzyon veya fetal vasküler tromboz belirtileri izlenmiştir (Baergen ve Heller, 2020). Ancak karşılaştırma için kontrol grubu olmaması bulguların yorumlanmasını zorlaştırmıştır. Bulguların çoğunlukla düşük derecede ve diğer etiyolojilerle ilişkili olabileceği de düşünülmektedir. Bertero ve ark. (Bertero ve ark., 2020) tarafından COVID-19'lu 5 kadın tarafından doğurtulan ardışık 6 plasenta serisi araştırılmıştır. Vakaların tümünde plasental sürüntü negatifken, bir vakada ise fetal nasofarengial sürüntü pozitif bulunmuştur. Altı plasentadan üçü kronik villit ile uyumlu değişiklikler gösterirken, bir vakada ise kronik histiyositik intervillozit belirtileri izlenmiştir. Kronik villitli üç olguda intervillöz trombohemorajik alanlarda fibrin laminer birikimi görülürken desidual ve villöz/intervillöz lenfositik (CD8-pozitif) infiltrasyon olduğu bildirilmiştir.

Çalışmamızda maternal bölgeden alınan Covid 19 plasenta kesiti incelendiğinde serbest halde dağılmış koryonik villusların özellikle bağlantı bölgeleri olan sinsityal köprülerde incelmeler olduğu, inflamatuvar hücre infiltrasyonunun geliştiği, kan damarlarının etrafında bazal membran yapısının belirgin olarak bozulduğu ve desidua hücrelerinin apoptotik görünümleri izlenmekteydi.

SONUÇ

Gebelikte bulaşan SARS-CoV-2 enfeksiyonunun plasenta dokularında COVID-19'a bağlı olduğu düşünülen histopatolojik değişikliklerin meydana geldiği izlenmiştir.

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THE ROLE OF EMOTIONAL INTELLIGENCE IN LEADERSHIP: IMPACT ON TEAM PERFORMANCE AND JOB SATISFACTION

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ABSTRACT

In this paper, are explored the impact of Emotional Intelligence (EI) on leadership and its effects on team performance and job satisfaction. Through an analysis of existing literature and an empirical study, this paper aims to demonstrate how EI helps leaders better manage their teams and improve organizational outcomes. This study seeks to explore the role of Emotional Intelligence (EI) in leadership and its influence on team performance and job satisfaction. Emotional Intelligence encompasses the ability to recognize, understand, and manage one's own emotions and those of others. It is considered a critical element for effective leadership, affecting leaders' ability to create a positive work environment, motivate teams, and manage conflicts constructively. Hypothesis: The results are expected to show a positive correlation between leaders' levels of Emotional Intelligence and team performance, as well as a significant impact on employee satisfaction. These findings may underscore the importance of developing Emotional Intelligence skills for leaders to enhance not only organizational outcomes but also employee well-being. The study contributes to existing literature by offering a deeper understanding of how Emotional Intelligence influences leadership and which aspects are most crucial for enhancing performance and job satisfaction. Furthermore, these results can be utilized by organizations to design training and development programs for their leaders, focusing on improving Emotional Intelligence skills to achieve more effective leadership and a more satisfying and productive work culture. This study holds value in Albania since Emotional Intelligence (EI) has limited theoretical foundations and the concept is not widely recognized or studied. The study aims to shift focus towards broader culture, extending beyond the target group of social science and psychological researchers, as a concept that aids, shapes, and develops individuals and their worldview, particularly influencing the organizational culture of various entities overall.

Keywords: Leadership, Emotional Intelligence, emotional impact, self-awareness, performance, organizational culture.

INTRODUCTION

For more than 50 years, Albania was a closed country under a communist regime. The brutal communist regime lasted for most of the 20th century, and the country was completely isolated from the world until the regime began to waver with the fall of the Berlin Wall. Under this regime, the emotional aspects of individuals were dictated by the state. Emotional intelligence

was not recognized, and the concept of direction was exclusively through authoritarian leadership. Since authoritarianism was a system characterized by strong, imposed, and unquestionable rules, the aspects of implementing and valuing emotional intelligence made sense only through clear regulations and the subjugation of others. This subjugation was realized through a deviated approach from the elements of emotional intelligence recognized today and was accompanied by a lack of tolerance for diversity, dissenting opinions, a need for strict discipline, and a tendency to impose beliefs on others. Viewed in the historical context of Albania, individuals who possessed high emotional intelligence had the ability to use it to create a shield against the authoritarian behaviors of the system. This phenomenon continues today for those individuals who are part of organizations with centralized authoritarian policies. In that social reality, emotional intelligence is significant from two perspectives: that of the leader, who, through psychological influence, imposes a certain form of belief on the masses, and that of the passive masses, determine that those who have control over their own feelings and emotional management skills are less likely to seek control over others to regulate their own self-confidence. The importance lies in the fact that, in the development of humanity and the evolution of the state and its democratization, emotional intelligence can help reduce authoritarian tendencies. However, it is not the only guarantee for achieving this, as it also involves factors such as culture, technical skills, individual will, and so on. Emotions spread like viruses with the same ease. A study at Yale University found that among work groups, joy and warmth spread quickly, while irritation was less contagious, and depression spread with more difficulty. This assessment of mood spread influences how effectively people can work and how good humor can enhance cooperation, fairness, and overall business or organizational performance (Daniel Goleman, Boyatzis, R. E., & Annie McKee, A. (2013). This study highlights the importance of emotional intelligence in leadership and management, emphasizing that leadership is not only a matter of technical and intellectual skills but also emotional skills. (Goleman, 1998). Management and Leadership of an entity require the integration of several elements, but since the emotional aspect is linked to individual well-being, emotional intelligence takes precedence in leadership and in building relationships with people. According to (S. Freud, 1923) human personality is composed of the Id, Ego, and Superego, where the Id represents primitive impulses, the Ego mediates between reality and the needs of the Id, while the Superego encompasses moral norms and ethics. Freud does not directly mention the concept of emotional intelligence, but he implies that effective management of these personality structures is beneficial for emotional and psychological well-being. The correlation between the Ego and knowledge appears to be inversely related. (Einstein, A, as cited in Calaprice, 2010) emphasizes that the greater the knowledge, the smaller the ego. Based on this inverse correlation between the human ego and knowledge, we analyze the impact of the ego on emotional intelligence. A high ego struggles to maintain emotional balance in challenging situations. Anger blocks reason, thus increasing the probability of failure in managing challenging situations. A high ego elevates self-esteem and reduces humility, impeding emotional self-awareness. This state obstructs the possibility of reflection, and the

individual loses the opportunity for self-improvement. According to (Holiday, 2016) a high ego can be an obstacle to personal and professional growth, affecting aspects of emotional intelligence. (Holiday, 2016) emphasizes modesty and humility by reducing the impact of the ego in relationships with others. Self-awareness and self-reflection, as elements of emotional intelligence, influence the effective management of internal emotions by recognizing weaknesses and striving for their improvement. Another mentioned element is commitment to learning and personal development, as the ego hinders deep thinking and exploration to understand the world and learn from others, or otherwise known as social learning from constructive social interaction. High emotional intelligence requires resilience to both praise and criticism to stay focused on one's goals. Both praise and criticism should serve to reinforce the objective of leading others: motivation from praise and improvement from criticism. That's why (Holiday, 2016) emphasizes the importance of humility and self-awareness. (Goleman, 2005) explains that emotions are a human impulse for action. The term comes from the Latin root "emotio," which means "to move out" or "to move," indicating that an emotion is always present. There are other authors who seem to legitimize this reaction even when the approaches do not present an entirely positive situation. (Nietzsche, 1887) describes the continuous efforts to find the origin of justice as a form of "resentment" explaining that this term can be misused to "sanctify" the desire for revenge. He argues that justice, in most cases, is used to "legitimize" individuals' vindictive emotional responses, translating it into a form of equilibrium or social response. (Nietzsche, 1887, p. 48) suggests that it originates from a deep sense of personal or social injustice, and through it, a new kind of equilibrium emerges, implying a norm for accepting emotions such as hatred and revenge. The connection between justice according to Nietzsche and emotional intelligence is presented as a narrow concept from a biological perspective and suggests a critical skepticism towards the traditional concept of justice as an objective equilibrium. (Nietzsche, 1887) highlights the role of emotions and personal perceptions in the conceptualization and application of justice in society. According to (Goleman, 2005) the cost-effectiveness of emotional intelligence is a relatively new concept in business, which some managers may find difficult to accept for their teams. Maccoby's study (as cited in Goleman, 2005, p. 173) revealed that most executives felt their jobs required "their head, but not their heart." This study emphasizes that many leaders feel disconnected from the emotional aspects of their work, focusing primarily on intellectual and technical aspects. Many of them express concerns and fears that feelings of empathy or focus on those they work with would hinder their ability to achieve their organizational objectives and that it would be nearly impossible for them to remain objective in making difficult decisions. This study was conducted in the 1970s, a time when the business environment was very different from today. My argument is that such attitudes are outdated; a new competitive reality is placing emotional empathy at the forefront in the workplace and market. As (Goleman, 2005) highlights, referencing Shoshana Zuboff, a psychologist at Harvard Business School, corporations have undergone a radical revolution this century, which has come with a corresponding transformation of the emotional landscape. (Goleman, 2005) explain that for a long period,

there was a dominance of managerial hierarchy in the corporate world, where only the “jungle fighters” were rewarded. Rigid corporate hierarchies began to change in the 1980s due to the influences of globalization and advancements in information technology. While in the past the “jungle warrior” model symbolized success in the corporate world, today the “interpersonal skills” represents the future of management in companies. According to (Goleman; 1998) self-awareness is a key component of emotional intelligence, which involves a deep understanding of one’s feelings, strengths, weaknesses, and personal needs. Emotional intelligence significantly impacts job satisfaction by enhancing relationships and communication among colleagues. Employees with high emotional intelligence are better equipped to manage pressure, challenges, and conflicts, and as a result, help in avoiding problems and tensions within the organization. This contributes to creating a more harmonious and productive environment, improving collaboration, and increasing job satisfaction.

MATERIALS AND METHOD

For this topic, a mixed-methods research approach was utilized, incorporating both quantitative and qualitative methods to comprehensively assess emotional intelligence and leadership effectiveness. Questionnaires and rating scales were used to measure emotional intelligence and leadership effectiveness. Specifically, the Emotional Quotient Inventory (EQ-i) was utilized to evaluate various dimensions of emotional intelligence, including emotional self-awareness, self-management, self-motivation, empathy, and social skills. The data was gathered through an electronic survey conducted using Google Forms. Participants were asked to rate their perceptions on a scale from 1 (very low) to 5 (very high). This approach allowed for the collection of structured data, facilitating the analysis of correlations and causal relationships. Observational techniques were employed to assess leaders behaviors and interactions in their work environments. This qualitative data provided insights into how emotional intelligence impacts leadership effectiveness and employee satisfaction. Observations were compared with theoretical concepts and existing literature to enhance the understanding of the studied phenomena. The sample for this study consisted of employees from Iceberg Communication Agency, a private successful agency specializing in communication, advertising, event management and innovation. The selection criteria included, Participants: A total of 20 team members from the agency were included in the sample. Sampling Method: Convenience sampling was used, with participants selected based on their availability and willingness to participate. Survey Administration: The survey was conducted in June 2024, and participants were invited to complete the questionnaire electronically via Google Forms. Ethical Considerations, Confidentiality and Anonymity: The study ensured the confidentiality and anonymity of all participants. Personal identifiers were not collected, and responses were aggregated for analysis. Informed Consent: Prior to participation, all individuals provided informed consent, acknowledging their understanding of the study’s purpose and their right to withdraw at any time. Quantitative Analysis: Statistical analyses were conducted to identify correlations and causal relationships between emotional intelligence and leadership effectiveness, as well as motivation and job satisfaction. Results were summarized in Table 1.

Qualitative Analysis: Observational data were analyzed to understand the impact of emotional intelligence on leadership and employee dynamics, integrating insights with theoretical frameworks. This methodological approach allowed for a comprehensive evaluation of the research questions, providing both numerical data and contextual understanding of emotional intelligence in the workplace.

RESULTS AND DISCUSSION

In this study, analyses were conducted to evaluate the impact of emotional intelligence and its components. The objective was to perform a thematic analysis of the data from the questionnaires to identify behavioral patterns among the team members of the agency and their perceptions of the leader. Additionally, the study aimed to assess the relationship between the leader's emotional intelligence and the motivation and job satisfaction of the staff members. The data are presented in Table 1.

Table 1. Referring to questionnaires completed at Iceberg Communication Agency

	1	2	3	4	5
Question 1	5.3%	10.5%	31.8%	36.8%	15.8 %
Question 2	10.5%	15.8%	21.1%	15.8%	36.8%
Question 3	0%	27.8%	33.3%	27.8%	11.1%
Question 4	5.6%	27.08%	5.6%	38.9%	22.2%
Question 5	0%	26.3%	15.8%	31.6%	26.3%
Question 6	0%	26.3%	10.5%	47.4%	15.8%
Question 7	0%	26.3%	31.6%	21.1%	21.1%
Question 7.2	0%	26.3%	36.8%	26.3%	10.5%
Question 8	5.3%	26.3%	36.8%	21.1%	10.5%
Question 8.2	0%	11.1%	0%	11.1%	77.8

For Question 1 and 2, which refer to elements of Self-Awareness and Self-Management of the leader, it was found that 36.8% dhe 15.8% (total 52.6%), members rated these elements at levels (4) “high” and (5) “very high”. The majority of the interviewed staff members rate their leader as having high self-awareness and very high self-management skills in difficult and stressful situations. Additionally, 36.8% of staff members, in relation to Question 7.2, perceive a level (3) of satisfaction with the work environment. Furthermore, 36.8% feel moderately motivated at work. The analyses determine a link between high levels of self-awareness, self-management skills, and a generally positive perception of the work environment among team members and

their perception of job motivation. Data analyses revealed that the team at the agency is led by leaders with generally high emotional intelligence, as the highest percentage of team members perceive their leader's emotional intelligence skills at above average (3) or high (4) levels. 77.8% of team members report performing better and having increased productivity and quality in completing their tasks, which indicates a correlation between the leader's emotional intelligence and staff satisfaction and motivation. The results indicate that leaders with high levels of emotional intelligence are more successful in creating a healthy and productive organizational environment. Empathy (Question 4): 38.9% and 22.2% of team members rated their leader empathy skills as high (4) and very high (5), respectively. This suggests that their leader is very effective in understanding and providing support for both professional and personal needs of employees, which has contributed to increased motivation and engagement of the team in performing tasks with high quality, thereby reflecting positively on the overall performance of the organization. This finding supports (Goleman's, 1998) theory, which emphasizes that supported employees feel valued and are more likely to remain engaged in their roles, enhancing their performance individually and the organization's performance. Although the study has identified a positive correlation between leaders emotional intelligence, team performance, and job satisfaction, thus supporting the study's initial hypothesis, several limitations should be considered. A significant limitation is that the study utilized a limited and specific sample. Additionally, the study was conducted at a particular point in time and within a specific business context, which may not be applicable to different organizational cultures, such as manufacturing enterprises where the primary focus is on production (quantity) rather than communication or interactive behaviors oriented towards social interactions. In some large corporations, these findings may be partially applicable only to a specific target group with a certain social status and educational levels. Research conducted in contexts with a broader range of individuals might reveal influences related to other characteristics of leadership, including the nature and type of work, organizational context, organizational culture, national value systems, and the political and socio-economic conditions of a country, among other factors.

CONCLUSION

Table 1 shows that the highest percentage of team members perceive emotional intelligence as average (3), high (4), and very high (5). This is reflected in the high levels of motivation and job satisfaction reported in questions 7 and 8. The data analysis suggests a positive correlation between the perception of high emotional intelligence in leaders and the motivation of team members. These results support the initial hypothesis, as the high percentages of team members indicate a positive perception. Additionally, the results are consistent across different questions. This outcome is relatively aligned with the initial hypothesis, supporting a positive relationship between leaders' emotional intelligence and the motivation and performance of the team, as well as a significant impact on team members' satisfaction. On the other hand, it is a well-known fact that the agency is successful in the labor market and highly active in its activities, including local and international partners. Unlike the studies conducted in the 1970s, such as Maccoby's (cited in Goleman, 2005, p. 173), where the business environment was significantly

different from today, organizations now view emotional intelligence as a crucial element for achieving effective management. Significant impacts include globalization, advancements in information technology, the rise of democratic spirit and recognition, and the establishment of balances in realizing fundamental human rights, encompassing professional personality, freedom of speech, social and emotional well-being, among others. In this context, Nietzsche's theory (1887), which legitimizes anger by naturally accepting these emotions as part of individuals' emotional reality, should be viewed and conceptualized with its limitations today. The goal is to achieve an optimal level of well-being by aiming for objectivity, eliminating "negative" emotions, and promoting "positive" emotions among team members both vertically and horizontally within the organization. Additionally, achieving this well-being requires responsibility, self-actualization, and knowledge.

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Annex

1. Emotional Self-Awareness of the Leader

How well does your leader manage their own self-awareness and the impact of their emotions on their decisions and actions in various situations?

2. Self-Management of the Leader

Is my leader capable of managing their emotions, maintaining calm and control, and sustaining a positive attitude in stressful and challenging situations?

3. Self-Motivation of the Leader

My leader sets clear and achievable goals for the team, is motivated to achieve success despite obstacles, and uses positive emotions to drive the team's performance.

4. Empathy of the Leader

My leader can feel and understand the emotions of team members, puts themselves in their position to understand their perspectives, and recognizes emotional cues even without words.

5. Social Skills of the Leader

My leader is capable of building positive and constructive relationships with the team, communicates effectively and efficiently with the team and collaborators, and manages conflicts within the team constructively.

6. Leadership Effectiveness

Our team meets its objectives, is engaged and motivated due to our leader's leadership style, and members feel supported and valued by them.

7. Job Satisfaction

7.1. I am satisfied with the performance of my leader.

7.2. Our team expresses high satisfaction with the work environment created by our leader.

8. Work Motivation

8.1. I feel motivated at work.

8.2. When I am motivated, I perform better and have increased productivity and quality in task execution.

SHIFTING PARADIGMS TO BUILD A FAIRER DISABILITY ASSESSMENT SYSTEM IN ALBANIA

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ABSTRACT

Disability assessment approach has evolved significantly across the globe, shifting from the traditional medical model to the bio-psycho-social model, which emphasizes a more holistic approach to health and disability. Until 2019, disability assessment in Albania was based on the traditional medical model, with a limited focus on biological impairments. In order to support Albania`s commitment to disability issues, State Social Service with the support of World Bank, began implementing the bio-psycho-social model of disability assessment in Tirana in November 2019, which later extended to all districts by the end of 2022. Through a literature review, this article aims to explore the rationale behind the establishment of the new bio-psycho-social model in Albania. The previous *-medical model-* was found to be ineffective, fragmented, highly abusive, bureaucratic, and non-collaborative with other important social protection systems. The previous approach of disability assessment failed to consider the potential of people with disability to live independently, treating them as dependent on passive cash payment programs. The Convention on the Rights of Persons with Disabilities, which poses a new concept of disability as an interaction between biological and environmental factors, was ratified by Albania in 2012, consequently placing Albania in a position to develop a new system that reflects accurately this concept. The bio-psycho-social model assumes that people with disabilities will receive both cash payments and services, and will be integrated into society. The implementation of the bio-psycho-social model of disability assessment in Albania has become reality, however, understanding how this model is working to achieve its goal of overcoming the shortcomings of the previous model remains an issue that requires attention and promptly response.

Key words: disability, disability models, bio-psycho-social, people with disabilities

INTRODUCTION

Bio-Psycho-Social Model of Disability Assessment in Albania

Disability assessment approach has evolved significantly across the globe, shifting from the traditional medical model to the bio-psycho-social model, which emphasizes a more holistic approach to health and disability. While the traditional medical model links inevitably disability to biological factors (Hogan, 2019; Suleiman et al., 2021), the bio-psycho-social model expands the notion of disability by assessing the impact of biological factors in continuous interaction with psycho-social and contextual factors, such as environmental and personal factors (WHO, 2001). In the recent years the bio-psycho-social model of disability assessment has also begun to be implemented in Albania, entering in an era where the disability assessment captures the “big picture” of a PwD’s life by taking into consideration every influencing factor that goes beyond biological conditions and has the potential to affect their full participation into society.

Referring to June 2024 statistics from State Social Service, approximately 73,643 people were reported as beneficiaries from disability programs, categorized as “blind”, “para-tetraplegia” and “PwDs with mental and physical disabilities”. Among them, 52.114 has been assessed through the new bio-psycho-social-model of disability assessment (SHSSH, 2024). A brief review of statistical data from State Social Service reveals that the number of beneficiaries from disability programs in Albania is continually fluctuating.

Prior to November 2019, the disability assessment model in Albania has been the traditional medical model (MSHMS, 2019), a model which considers disability as a condition produced by a biological condition (Petasis, 2019, Bernard, 2021). The bio-psycho-social model of disability assessment in Albania was established as part of a broader policy reform, the reform referred to as “Modernization of Social Assistance System in Albania”. This reform encompasses 3 pillars of social protection- *economic assistance, disability benefits and social services*. This project aimed to support Albania for the implementation of reforms to improve the equality and efficiency of social assistance programs (World Bank, 2012; Byrne et al., 2021).

The piloting process in Albania was initiated in Tirana, where the disabled citizens of administrative units no. 6 and no. 7 followed for the first time a new procedure of disability assessment conducted by a multi-disciplinary team of doctors and social workers (MSHMS, 2019). With the support of the World Bank was conducted an in-depth analysis of the disability model, highlighting its limitations on the approach toward people with disabilities and their opportunities to get integrated into society. The piloting process aimed to test and adapt the bio-psycho-social model to the specific conditions on Albanian context. Officially, the bio-psycho-social model of disability assessment was adopted in November 2019, when the model began to be implemented in all administrative units of Tirana (MSHMS, 2019). After the district of Tirana, in the fall of 2021, the bio-psycho-social model was successfully extended to the districts of Durrës and Elbasan (SHSSH, 2022). On December 2022, the reform was extended to the remaining nine districts (SHSSH, 2023).

The need to change the existing disability assessment model in Albania came along with the growing recognition of the shortcomings of the traditional medical model. Through a literature review, this article aims to explore the rationale behind the establishment of the new bio-psycho-social model in Albania.

Factors driving the adoption of the bio-psycho-social approach in Albania

Disability assessment model in Albania has undergone significant transformation to align with the United Nations Convention on the Rights of Persons with Disabilities (2006), reflecting comprehensive understanding of disability as an interaction of biological, psycho-social and contextual factors. Albanian government ratified the United Nations Convention on the Rights of Persons with Disabilities on February 11, 2012, thus beginning the commitment to promote, protect and ensure equal rights for people with disability in society, a responsibility of all states that ratify the Convention (UN, 2006).

The ratification of United Nations Convention on the Rights of Persons with Disabilities marks the beginning of policy and legal framework harmonization. Changes in legal, regulatory and existing policy practices aimed at ensuring equality, non-discrimination, accessibility, independent living in community setting, opportunities for education, vocational trainings or employment, access on social and health services, fully participation on social-economic and cultural life, all these under a common denominator: *integration and poverty alleviation*. Within the context of the ratified United Nations Convention on the Rights of Persons with Disabilities, several strategic documents were formulated such as: National Social Protection Strategy 2020-2023 and 2024-2023, National Plan for PwDs 2016-2020 and 2021-2025, Employment and Skills Strategy 2019-2022 and 2023-2030. Collectively, these strategic documents were designed to improve the quality of life of people with disability.

In addition to the ratification of United Nations Convention on the Rights of Persons with Disabilities, the transformation of disability assessment model in Albania was also driven by the Stabilization and Association Agreement (2006) signed between Albania and EU member states. The reform of disability assessment model relates to the chapter “Social Inclusion and Protection”, which focuses on the overall assessment of poverty and inequality in the country, strategies for poverty reduction and social inclusion, the digital system for providing social assistance, cooperation between social services and employment services, the availability of services for individuals in need, and the deinstitutionalization of services, moving towards community-based services. Within the framework of the Stabilization and Association Agreement between Albania and the EU member states, changes have been made throughout the Social Assistance System, building an accurate and transparent model of disability assessment that targets effectively the needs of people with disabilities in Albania.

The traditional disability assessment model - *medical model* - implemented since 1993 in Albania resulted to be a fragmented model because of its narrow focus on assessing loss of work capability rather than assessing the level of functioning to perform daily life activities (UNDP, 2014). To simplify, this approach provided only cash benefits to people with

disabilities, moreover the payments had several debated issues. Analysing the Decision of Minister no. 618, dated 07.09.2006 “On the determination of criteria, documentation, and the amount of payment for persons with disabilities,” it is concluded that all people with disabilities within the Social Protection Program were treated with the same amount of cash benefit regardless of the level of their impairment and their ability to engage in society. Similarly, regardless of age *-being child or adult-* the treatment with cash benefits for disability was the same (MSHMS, 2019). The purpose of this model seems not to be the integration of people with disabilities into society, as long as it is based only on the provision of cash benefits and does not interact with other systems such as: education, vocational training or employment mediation services, pillars which guarantee full participation in society.

Referring to MoHSP data, the existing disability assessment model had high levels of abuse. In the “Policy Document for Reforming the Disability Assessment Scheme” was emphasized that despite several controls, the level of abuse remained excessive. Data from a control group established to detect abusive cases revealed that that out of 14,431 cases reviewed, 1,250 were found to be abusive (ibid).

The traditional disability assessment model was overly bureaucratic. The assessment procedure was lengthy, complicated, and sometimes impossible for citizens to follow (UNDP, 2014; MSHMS, 2019). An evaluation report on the disability assessment system in Albania, conducted by the Albanian Diabetes Association, showed that the medical model was excessively bureaucratic due to a long procedure that often made impossible for disabled citizens to receive all the benefits they are entitled to under the legislation (Albanian Diabetes Association, 2022).

Under the medical model, people with disabilities in Albania were required to complete medical documentation after being admitted to the tertiary health system (excluding blindness). This documentation, which includes referral forms for examinations, epicrisis and medical checks, must be submitted to the social administrator’s office within their administrative unit. The administrative unit then sends it to the Regional Directorate of Social State Services, where it is reviewed by the disability assessment commission. Once a decision was made, the documentation is returned to the Regional Directorate of Social Services, which then forwards it to the local unit for processing. UNDP (2014) found this process not only lengthy but also complicated, due to the inadequate number of disability assessment offices and the challenging geographic distances for people with disabilities.

Existing assessment criteria were solely medical, which contradicts the WHO (2001) concept of disability as a condition produced by the interaction between medical, psycho-social, and environmental factors, as well as the provisions made in the Convention on the Rights of People with Disabilities (2006), which Albania ratified in 2012 with Law No. 108/2012 “On the Ratification of the International Convention on the Rights of People with Disabilities.” Moreover, medical criteria did not distinguish between adults and children, leading to equal assessments of children and adults despite the different impact of disability on them (UNDP,

2014; MSHMS, 2019). As a result, the assessments were often incomplete, leading to fragmented and sometimes inequitable support for those in need.

The promised effectiveness of the bio-psycho-social approach in Albania

Given the ineffective, abusive, inefficient, bureaucratic and passive nature of the existing assessment system, there was a strong demand to take action towards changing the assessment model. The bio-psycho-social model of disability assessment in Albania brings a new approach to people with disabilities. This new approach brings innovation in the way the assessment is carried out, the procedure that is followed, the benefits that can be obtained from this assessment and the possibilities of integration.

The bio-psycho-social model introduces for the first time the concept of multi-disciplinary teams. In contrast to the medical model of disability assessment where the team is compounded of doctors solely, the bio-psycho-social model is based on multi-disciplinary teams of doctors and social workers (MSHMS, 2019; National Strategy for PWD 2021-2025; ILO, 2021; Otte et al., 2022). Thus, the bio-psycho-social model takes the responsibility to ensure a holistic and comprehensive assessment that includes the overall life situation of people with disabilities, meeting their needs accordingly.

With the introduction of the bio-psycho-social model, the documentation required for the application has been simplified. In accordance with the legislation, the citizen who wants to benefit from disability programs should start the procedure from the general doctor (named family doctor in Albania), then to the specialist doctor in accordance to their diagnosis. These doctors will complete the forms of disability assessment where they describe the medical information about the patient, medication, and suggest a level of limitations in activities and participation. These forms, along with the medical examinations, are submitted by the citizen to the Disability Assessment Office that covers his area of residence. Hospitalisation in tertiary structures is no longer required to apply for disability benefits.

With the adoption of the bio-psycho-social model, disability assessment procedure is simply and fast. Within 30 days from the submission day, the multi-disciplinary team conducts the interview with the disabled person. The interview explores deeply the level of functioning of the disabled person in different aspects such as: selfcare, domestic life, mobility, general activities, engagement in social life, relationships, education or work integration etc. Based on the medical examinations and the conducted interview, the multi-disciplinary team determines the level of limitation of the disabled person to carry out activities of daily life in accordance to their age (SHSSH, 2019).

Following the adoption of the bio-psycho-social model, fragmentation is no longer an issue. Cash benefits are distributed in a fairer way, reflecting the level of limitations in performing daily activities for each person with disabilities. The cash benefits levels decreased for those who do not have high limitations and increased for those whose limitations strongly affect their quality of life. Moreover, the bio-psycho-social model of disability assessment is interested in

the integration of people with disability into society. The multi-disciplinary team, along with cash benefits, recommends integrated services such as assistive teachers, daily or residential social services, employment services, vocational trainings services, assistive tools, physiotherapy, psychotherapy, etc.

In the light of the bio-psycho-social model, children and adults are treated differently. There is a broad acceptance that children and adults are not affected in the same way from disability. The bio-psycho-social model of disability assessment overcomes this shortcoming. For instance, cash benefits for children are set at 75% of those for adults, reflecting the fact that parents are responsible for their upbringing (MSHMS, 2019).

CONCLUSIONS

Some factors collectively compelled Albanian Government to shift toward a new model of disability assessment that ensures a holistic, comprehensive, efficient and effective assessment.

Alignment to EU standards and Eu integration requirements: Within the framework of the United Nations Convention on the Rights of Persons with Disabilities, ratified in 2012, Albanian government had to take actions to ensure the rights of people with disabilities in the light of the interaction between bio-psycho-social and contextual factors. On the other side, EU integration poses the need to reform the social inclusion and protection programs, toward more accurate and transparent models.

Fragmentation and lack of integration with other systems: The medical model was an isolated model, that provided cash benefits solely for people with disabilities, lacking collaboration with other integration schemes such as education, employment, vocational training etc. which are pivotal for an effective societal participation. The traditional model focused solely on biological impairments, neglecting the psycho-social and environmental factors crucial for a comprehensive understanding of disability, thus failing to support the integration of people with disabilities into society, treating them as dependent on passive cash benefits rather than promoting their potential for independent living.

The Red Tape: The process under the medical model was lengthy, complicated and often inaccessible, particularly for those living in remote areas, leading to delays and sometimes preventing individuals from receiving the benefits they were entitled to by legislation.

Prone to high abuse: The traditional system was vulnerable to abuse, with significant numbers of cases being found fraudulent despite multiple controls. The existing model seemed to be fairness and ineffective.

The “one size fits all” approach: Children and adult were treated with the same cash benefits, failing to consider needs in accordance with age and the life demands.

The implementation of the bio-psycho-social model marks a positive step toward a fairer and more effective disability assessment system in Albania. However, ongoing monitoring and

evaluation are essential to ensure that the new system continues to meet its goals and adapt to the needs of people with disabilities in Albania.

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THERE IS VIRTUAL MONEY, VIRTUAL ECONOMY, VIRTUAL SOCIETY, AND VIRTUAL HUMANS. WHAT'S NEXT IN THE DIGITAL ERA?

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ABSTRACT

We are currently living in a digital era that is rapidly transitioning to a more and more virtualized ecosystem. Disruptive digital technologies, such as digital payment systems, artificial intelligence (AI), machine learning, big data and analytics, augmented reality (AR) or virtual reality (VR), the metaverse, blockchain, IoT, 5G, or cybersecurity, are driving this shift, creating a 'virtual bubble' that increasingly shapes daily life. This paper aims to clearly define the concepts of virtual money, virtual economy, and the newly emerging virtual society in this current stage of materialization. We also explore the concept of 'virtual humans' from multiple perspectives. We ground our approach in a systematic literature review, utilizing the Scopus scientific database to analyze current research trends. Our contribution is to synthesize these definitions, providing a comprehensive overview of the terms and their interrelationships, as well as assessing their dependence on the real world. Additionally, we offer our own insights and suggestions on how the 'virtual' world can enhance the 'real' realm. We propose that further research is essential to deepen the understanding of these concepts and their implications.

Keywords: virtual economy, virtuality, digital transformation, metaverse, blockchain.

JEL: O11, O32, O33, O35, O36

INTRODUCTION

In contemporary discourse, the terms "digital" and "virtual" are frequently used interchangeably, yet they represent distinct concepts that carry significant implications across various applications. For example, Reshko (2023) states that digital cards are tangible entities encoded with electronic data, whereas virtual cards exist only in a non-physical, online environment.

Similarly, in healthcare, digital tools might include electronic health records or digital monitoring devices, while virtual care involves entirely online consultations and interactions

(DoseSpot, 2024). This distinction highlights the growing importance of accurately defining and understanding the term "virtual" in today's digital landscape.

The growing significance of virtual entities—such as virtual money, virtual economy, virtual society, and virtual humans—necessitates a clearer and more precise understanding of their definitions and interrelationships as for the present. As these entities increasingly influence both digital and physical realms, it becomes crucial to examine their implications for society, economics, and human interaction.

The objective of this study is to explore and define these virtual entities, analyze their interconnections, and assess their implications within the current digital landscape. This leads to the research question of the paper, meaning “What are the definitions, interrelationships, and implications of virtual money, virtual economy, virtual society, and virtual humans in the current digital landscape?”

We will first delve into the historical context of the term "virtual," tracing its evolution and its divergence from the term "digital." Following this, we will explore the concepts of virtual money, virtual economy, virtual society, and virtual humans, focusing on systematic literature reviews as the main research methodology and, subsequently, concept studies, analyzing their significance and the complex relationships among them. We will then proceed to a section dedicated to the Results and Discussions, which will conclude with the Conclusions.

THE HISTORY OF THE TERM “VIRTUAL”

Originating from the Latin word “*virtus*”, which means "excellence" or "potency," the term "virtual" has been used historically in philosophy and science to refer to something that has the characteristics or effects of another item without actually being there ("Virtuality (philosophy)," 2024). Hollandbeck (2020) highlights how the meanings of these words have diverged yet remain linked through their shared origin in the concept of inherent power or effectiveness. This etymological journey from *virtus* to "virtual" highlights the deep linguistic connection between these concepts, showing how the original meaning of strength and excellence transformed into the modern understanding of virtuality as something effective yet physically intangible (Ryan, 2019).

In the Middle Ages, the term "virtual" was frequently used to describe ideas such as an optical "virtual image," which appears in a place but does not actually exist there (Heim, 1993). According to Aristotle's theory of *dunamis*, or potentiality, something might exist in potential before becoming actualized, just like an acorn is essentially an oak tree (Aristotle, 1984).

This suggests that the term "virtual" was philosophically associated with concepts of "excellence" and "potentiality" (*potentia*). Thomas Aquinas (1947) elaborated on this by use the term "virtual" to explain how causes might have unrealized potential effects. For example, Aquinas discussed how a seed contains within it the virtual power to become a plant. This notion was tied to the Aristotelian concept of *dunamis* (potentiality) versus *energeia* (actuality),

where something exists in potential before it is fully actualized. In this context, the "virtual" refers to the inherent capacity or potency within an entity that can lead to its future actualization.

This idea is a key element in the understanding of causality and potentiality in medieval thought, illustrating how entities can contain within themselves the virtual (potential) reality of what they will become, such as a seed containing the potential to become a plant. Later, Leibniz (1686) used the term "virtual" to talk about the power that monads, the basic units of reality, had by nature.

"Virtual" referred to entities in medieval and Renaissance philosophy that had potential or real effects, even if they were not fully realized. This was especially important in the field of optics, since a "virtual image" is an image that seems to exist wherever it doesn't actually exist (Smith, 2006). Virtuality was examined in the context of causality by Aquinas and Renaissance thinkers such as Francisco Suárez, who recognized the significance of possible consequences inside causes (Suárez, 1597).

Since the introduction of digital computers in the mid-1900s, the term "virtual" has been closely associated with technology. In a pre-internet era, Howard Rheingold (1991) acted as a crucial connector in the early VR research community. By traveling to various labs and sharing insights from different places, he helped researchers who were otherwise isolated learn about each other's work, fostering collaboration and the spread of knowledge. So, the particularly true of the term "virtual reality" was first used to refer to immersive computer-generated worlds in the 1980s (Lanier, 1989). This was a big change because "virtual" still meant something being "real in effect" but without a physical presence; it now also included digital places with real-world effects (Heim, 1993).

The term "virtual" in its technological context began to gain prominence in the mid-20th century, particularly in the realm of computing. Initially, "virtual" referred to things like "virtual memory," a concept that allowed computers to simulate more memory than was physically available by using disk storage (Heim, 1993). This idea of something existing in effect but not in physical form set the stage for the broader use of "virtual" in technology.

In the 1980s, the concept of "virtuality" expanded significantly with the advent of virtual reality (VR). Jaron Lanier (1989), a key figure in the development of VR, coined the term "virtual reality" to describe immersive, computer-generated environments that allow users to interact as if they were physically present in those spaces. This marked a major shift in the use of "virtual," as it now described entire environments that were experienced through technology, rather than merely simulated components like memory.

By the 1990s, the term "virtual" had broadened further to include online and digital spaces, often referred to as "cyberspace" or "virtual worlds." These virtual spaces, such as early online communities, allowed people to interact in ways that mimicked real-life social interactions but within a digital environment (Rheingold, 1991). The notion of "virtual" thus came to encompass any digitally-mediated experience that replicates aspects of physical reality.

Today, "virtual" is a versatile term used to describe a wide range of digital experiences, from virtual meetings and online classrooms to virtual reality games. The evolution of the term reflects its roots in simulating or representing reality through technology, while maintaining a strong connection to its original sense of something being effective or real in essence, if not in physical form.

VIRTUAL MONEY

The first paper about virtual money was written by Mackenzie (1998). In 1998, the concept of virtual money began to challenge the long-standing dominance of material money, such as coins and banknotes, which had been the foundation of economic systems for centuries. Virtual money, in this context, referred to electronic forms of value transfer, where transactions could be conducted without any physical exchange of currency. This shift represented a significant transformation in how society understood and managed money.

The dematerialization of money—its transition from a tangible object to an electronic form—posed considerable challenges for existing legal frameworks, which were designed to regulate physical currency. As Mackenzie highlighted, the law's reliance on outdated notions of money's materiality risked making it ineffective in addressing the realities of modern financial practices and the emerging threats of financial crimes enabled by these new forms of currency.

While cryptocurrencies had not yet emerged in 1998, the foundational issues around virtual money were already apparent. The ongoing evolution of money towards increasingly abstract forms calls for legal and regulatory adaptations to ensure that the benefits of virtual money can be realized while maintaining financial stability and security.

We applied a systematic approach on the scientific literature indexed by the Scopus database, as depicted in Table 1 (research date 25th of August 2024). After applying the above filters we carefully analysed 10 relevant scientific literature papers on this subject.

Table 1. "Virtual money" systematic literature review stages (PRISMA flow)

No.	PRISMA STAGES	SCOPUS
1	TITLE-ABS-KEY ("virrtual money") AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all"))	
2	Initial results (period 1998-2024)	189
3	Rule no. 1: document type (no books, chapters, reviews, editorials)	-33
4	Results no. 1: articles and conference papers	156
5	Rule no. 2: publication stage (no press articles)	-2
6	Rezults no. 2: final articles only	154
7	Rule no. 3: source type	-12
8	Results no. 3: journals and conference proceedings	142

9	Rule no. 4: language limitation	-14
10	Results no. 4: only English papers	128
11	Rule no. 5: access type	-102
10	Results no. 5: only open access	26
11	Rule no. 7: PDF type files	-13
12	Results no. 7: only PDF files with no password	13
13	Rule no. 8: manual check (relevance to the topic domain)	-3
14	Results no 8: relevant papers	10
15	Final results	10

**Reference: (Page et al., 2021)*

A short bibliometric analysis shows also the dynamics of the scientific papers on this topic with the increasing trend since 1998 and the disrupted evolution of the term in 2008, when “cryptocurrencies” gave rise to a new meaning to the virtual currency.

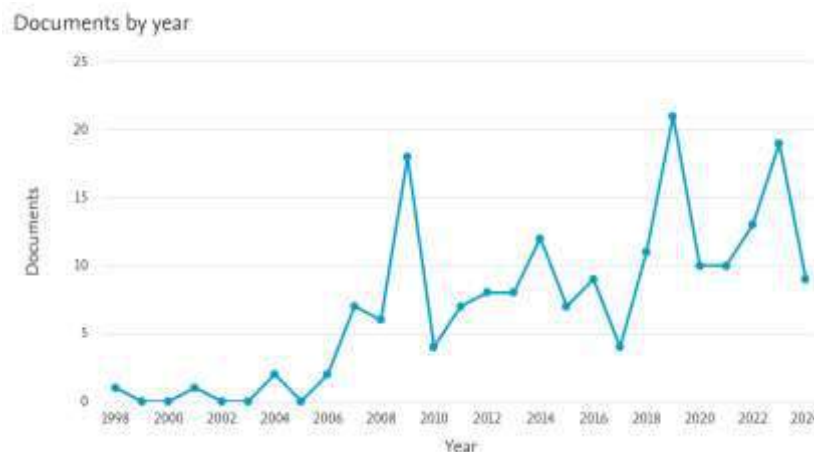


Figure 1. Documents by year of publication for “virtual money” (Source: Scopus)

As for these scientific papers, virtual money can be described as a digital representation of value that can be exchanged or traded electronically. Unlike traditional currencies, which exist in physical forms such as coins and banknotes, virtual money exists solely in digital form. Cryptocurrencies, a subset of virtual money, are digital or virtual currencies that use cryptographic methods to secure transactions and control the creation of new units. These currencies are typically decentralized, meaning they are not governed by any central authority, unlike traditional fiat currencies such as the USD, EURO, and other national currencies (Ya’acob et al., 2019).

One of the key interrelationships within the realm of virtual money is the connection between cryptocurrencies and blockchain technology. Cryptocurrencies like Bitcoin and Ethereum operate on blockchain technology, which ensures the security and transparency of transactions without the need for a central authority (Bitto et al., 2022). Blockchain technology underpins cryptocurrencies by providing a decentralized ledger that records all transactions across a

network of computers. Gurrib (2020) states that this decentralized nature offers users a high degree of autonomy and security, reducing the risk of centralized control and manipulation.

The rise of virtual money has profound implications for both the economy (Davis & Rosner, 2021) and regulatory frameworks (Jan & Ali, 2021). Economically, virtual money, particularly cryptocurrencies, challenges traditional financial systems by offering lower transaction costs, faster transfer speeds, and enhanced privacy (Bitto et al., 2022). Cryptocurrencies have the potential to increase financial inclusion, especially for unbanked populations in developing countries (Aliyu & Mohammed, 2021). However, Ya'acob et al. (2019) focus on significant challenges of, such as volatility, which can lead to financial instability, and the potential for facilitating illegal activities due to the anonymity they provide

Regulatory challenges are another critical concern. Governments and financial institutions are grappling with how to effectively regulate virtual money to prevent its misuse while allowing for innovation and growth in the digital economy. The lack of a unified regulatory framework across different jurisdictions further complicates this issue, leading to a fragmented approach to regulation that can hinder the development of a global standard for virtual currencies (Bitto et al., 2022; Jan & Ali, 2021).

The market for virtual money has seen rapid growth, with significant increases in both the number and market capitalization of cryptocurrencies. Bitcoin remains the most widely recognized and valued cryptocurrency, but others like Ethereum, Litecoin, and Tether have also gained substantial market share. The value of these cryptocurrencies is highly volatile, influenced by market demand, technological advancements, and regulatory news (Bitto et al., 2022; Nguyen & Tran, 2021).

Machine learning techniques have been employed to predict cryptocurrency prices, with autoregressive models (AR) showing high accuracy in forecasting future values. These predictive models are crucial for investors who seek to understand market trends and make informed decisions, highlighting the importance of technology in managing the inherent risks associated with virtual money (Bitto et al., 2022; Smirnova & Ryabov, 2022).

As already mentioned before virtual money presents several challenges. The volatility of cryptocurrencies remains a significant concern, as prices can fluctuate wildly within short periods, leading to potential financial losses for investors (Domoracki et al., 2023). The anonymity provided by virtual currencies also facilitates illegal activities, making regulatory oversight difficult (Nguyen & Tran, 2021). Additionally, the decentralized nature of cryptocurrencies limits the ability of central banks to control the money supply and implement effective monetary policy (Ya'acob et al., 2019).

Future research is likely to focus on improving the stability of cryptocurrencies, integrating digital payment systems into existing financial infrastructures, and addressing the ethical and regulatory challenges posed by these technologies (Bitto et al., 2022). As virtual money continues to evolve, its impact on the global financial system will become increasingly

significant, potentially disrupting traditional banking and financial services (Hassan et al., 2022).

In conclusion, virtual money represents a significant shift in the financial landscape, characterized by its digital nature, decentralization, and reliance on blockchain technology. While it offers numerous benefits, including increased financial inclusion and lower transaction costs, it also presents significant challenges, particularly in terms of volatility and regulation. As the digital economy continues to grow, finding a balance between innovation and regulation will be crucial to ensuring the sustainable development of virtual currencies.

VIRTUAL ECONOMY

The virtual economy has emerged as a significant aspect of the digital landscape, encompassing a wide range of economic activities within digital environments. This concept has evolved alongside advancements in information and communication technologies (ICT), influencing various sectors from online gaming to virtual tourism. This essay explores the definition, interrelationships, and implications of the virtual economy, highlighting its characteristics, the technologies that support it, and the challenges it faces in the modern digital era.

The term "virtual economy" first appeared in the scientific literature in 1998 in a paper by Louis A. Lefebvre and Elizabeth Lefebvre, presented at the 31st International Conference on System Sciences (HICSS). They introduced the concept as an emerging paradigm where economic activities occur within digital environments (Lefebvre & Lefebvre, 1998).

A World Bank report, "Knowledge Map of the Virtual Economy: Converting the Virtual Economy into Development Potential" (infoDev/World Bank, 2011), highlights that the scarcity of digital goods in virtual economies drives demand and creates opportunities for various services, similar to how scarcity functions in the physical economy. Information and communication technologies (ICT) power these virtual economies by enabling the production and exchange of these unique digital goods, forming a computer-mediated economy.

The systematic study of scientific literature based on the Scopus search engine presents the following peculiarities (research date 25th of August 2024). In this way, I have narrowed down the research scope by applying PRISMA filters as in Table 2.

Table 2. "Virtual economy" systematic literature review stages (PRISMA flow)

No.	PRISMA STAGES	SCOPUS
1	TITLE-ABS-KEY ("virttual economy") AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all"))	
2	Initial results (period 1998-2024)	299
3	Rule no. 1: document type (no books, chapters, reviews, editorials)	-45
4	Results no. 1: articles and conference papers	254

5	Rule no. 2: publication stage (no press articles)	-3
6	Results no. 2: final articles only	251
7	Rule no. 3: source type	-20
8	Results no. 3: journals and conference proceedings	231
9	Rule no. 4: language limitation	-10
10	Results no. 4: only English papers	221
11	Rule no. 5: access type	-149
10	Results no. 5: only open access	72
11	Rule no. 6: period limitation (2020-2024)	-32
12	Results no. 6: papers between 2020 and 2024	40
13	Rule no. 7: PDF type files	-12
14	Results no. 7: only PDF files with no password	28
15	Rule no. 8: manual check (relevance to the topic domain)	-11
16	Results no 8: relevant papers	17
17	Final results	17

**Reference: (Page et al., 2021)*

Figure 2 shows the dynamics of the scholarly literature on this subject, showing an upward tendency since 1998. The first ones come from 1998 since the 1994 paper does not address the "virtual economy" topic that we are researching here.

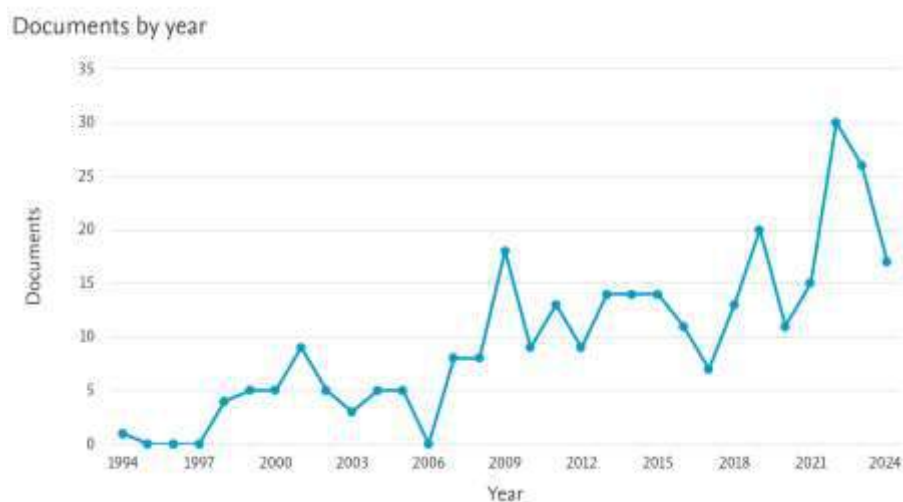


Figure 2. Documents by year of publication for “virtual economy” (Source: Scopus)

Virtual economies are distinct from traditional economies in that they operate within virtual environments such as online platforms, gaming worlds, and augmented or virtual realities (VR/AR). The scarcity of virtual goods and services, similar to physical goods in the real economy, creates demand, generating opportunities for various economic activities (Vyshnevskiy, 2019; Woo et al., 2011). These economies also include transactions involving virtual assets, digital currencies, and services that facilitate user interactions within these digital spaces (Zhang et al., 2021).

The virtual economy is closely intertwined with several emerging technologies that enhance user interactions and economic transactions within digital environments. Technologies such as blockchain, deep learning algorithms (Ji and Su, 2023), and geospatial mapping play crucial roles in the development and functioning of virtual economies. Blockchain, in particular, provides a decentralized, secure framework for transactions, ensuring trust and transparency in virtual environments (Aldweesh et al., 2023; Juan et al., 2023).

The integration of VR and AR technologies further enriches the virtual economy by offering immersive experiences that drive consumer engagement and spending. For instance, emotional marketing in virtual tourism, where VR is used to enhance consumer experiences, has been shown to positively impact consumer spending (Zhang et al., 2021). Additionally, the metaverse (Abramov et al., 2024), as an extension of the virtual economy, incorporates these technologies to create more interconnected and immersive digital environments (Li, Chen, & Liu, 2024).

The virtual economy's implications are profound, influencing both economic activities and social interactions (Fuchs & Thurner, 2014). Economically, the virtual economy has led to the development of new business models (Fang, et al., 2022), such as play- to-earn (P2E) games, which provide financial incentives to players, thereby increasing participation in virtual worlds (Chen, Xu, & Zhang, 2023; Zhang & Bi, 2024). Chun et al. (2018) examine how virtual economies in MMORPGs replicate real-world economic systems, highlighting how in-game economic activities influence social structures and player interactions. These models highlight the importance of integrated and secure economic systems within virtual environments.

Socially, the virtual economy has raised concerns about economic inequality and the accumulation of wealth within digital environments. Research has shown that network positions and social behaviors significantly influence wealth distribution in virtual economies, similar to real-world economic structures (Fuchs & Thurner, 2014). Additionally, the emergence of virtual economies has led to new forms of labor and employment, such as in-game farming, where individuals earn real income by trading virtual goods (Novikov et al., 2015).

Despite its potential, the virtual economy faces several challenges. Scalability and security remain major concerns, particularly in blockchain applications within virtual worlds. The complexity of integrating different virtual worlds (metaverses) with varied rules and technologies makes asset exchange between them difficult (Aldweesh et al., 2023). Moreover, issues related to cyberattacks, fraud, and the need for robust reward systems to ensure active participation are pervasive challenges (Ying et al., 2023).

Economic inequality within virtual environments also poses significant challenges, as wealth accumulation is often influenced by factors such as network positions and social behaviors, mirroring real-world economic disparities (Fuchs & Thurner, 2014). Addressing these challenges requires strategic management and the development of regulatory frameworks to balance economic activities and maintain stability within the virtual economy (Shkurkin et al., 2015).

The future of the virtual economy is expected to deepen its integration with other digital economies, such as the AI and blockchain economies, to create new market opportunities and stimulate economic growth and innovation (Vyshnevskiy, 2019). However, achieving sustainable development will require overcoming challenges related to scalability, security, and regulation (Limano, 2023).

In conclusion, the virtual economy represents a complex and interconnected digital marketplace driven by emerging technologies and characterized by the exchange of virtual goods and services with real-world economic value. The interrelationships between the virtual economy and technologies such as blockchain and VR/AR play a crucial role in shaping its development and impact. While the virtual economy offers numerous opportunities for economic growth and innovation, it also presents significant challenges that must be addressed to ensure its sustainable development.

VIRTUAL SOCIETY

Ikeda from the University of Tokyo, Jaoan (1994) mentions for the 1st time the term “virtual society” in his paper “Social psychological approach to 'networked' reality”. According to this work originated in the psychological area, social reality changes within virtual societies, where traditional social structures are weakened. Users in these digital environments develop new communication styles, leading to different communication cultures within various forums. This adaptation challenges the idea that universal communication rules apply across all virtual settings.

A systematic literature review using the Scopus database shows that the term "virtual society" is prevalent in fields like computer science (30.2%), engineering (15.7%), and social sciences (15.2%). It also appears in business, economics, medicine, arts, and environmental sciences. The PRISMA process started with 253 results, and 10 key papers were selected for detailed analysis as of August 25, 2024.

Table 3. “Virtual society” systematic literature review stages (PRISMA flow)

No.	PRISMA STAGES	SCOPUS
1	TITLE-ABS-KEY ("virrtual society") AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all"))	
2	Initial results (period 1994-2024)	253
3	Rule no. 1: document type (no books, chapters, reviews, editorials)	-44
4	Results no. 1: articles and conference papers	209
5	Rule no. 2: publication stage (no press articles)	-1
6	Rezults no. 2: final articles only	208

7	Rule no. 3: source type	-25
8	Results no. 3: journals and conference proceedings	183
9	Rule no. 4: language limitation	-13
10	Results no. 4: only English papers	170
11	Rule no. 5: access type	-128
10	Results no. 5: only open access	42
11	Rule no. 6: period limitation (2020-2024)	-23
12	Results no. 6: papers between 2020 and 2024	19
13	Rule no. 7: PDF type files	-12
14	Results no. 7: only PDF files with no password	28
15	Rule no. 8: manual check (relevance to the topic domain)	-11
16	Results no 8: relevant papers	17
17	Final results	17

**Reference: (Page et al., 2021)*

Figure 3 also illustrates the dynamics of scientific works on the topic of "virtual society," showing an increasing trend starting from 1994. It is evident that all the 4 virtual entities were monetized in the early '90s.

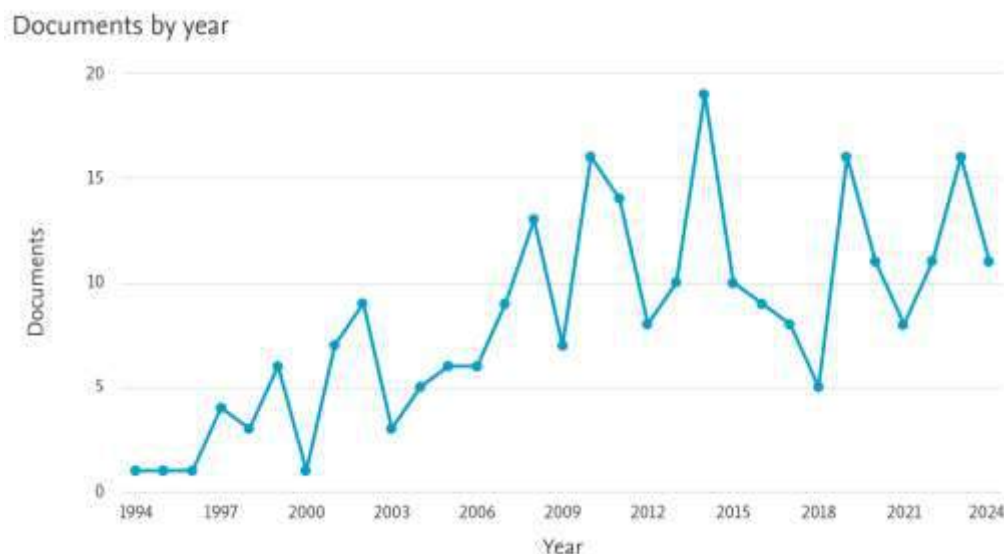


Figure 3. Documents by year of publication for “virtual society” (Source: Scopus)

These scientific papers can be summarized like this. In the digital age, the concept of a "virtual society" has emerged as a significant topic of discussion, shaped by the proliferation of online communities, social networks, and sophisticated virtual interactions. Virtual societies are not mere digital replicas of physical communities but dynamic ecosystems that influence and reshape social norms, behaviors, and cultural identities. Understanding virtual societies involves exploring their definitions, their internal dynamics, and their broader implications in today's world.

A virtual society can be defined as a digital ecosystem where individuals connect, communicate, and collaborate through technology, transcending geographical and physical boundaries. Unlike physical societies rooted in tangible, face-to-face interactions, virtual societies exist entirely online, facilitated by platforms such as social networks and online forums. These platforms allow users to share experiences, form relationships, and build collective identities, often around shared interests or causes (Tucker & Lorig, 2024).

Virtual societies are characterized by their fluidity and adaptability. Members can easily join or leave communities, and interactions are often more dynamic and fast-paced compared to traditional physical communities. This fluid nature allows virtual societies to evolve rapidly, responding to the changing needs and behaviors of their members (Smith & Jones, 2023).

Virtual societies are not isolated entities; they are deeply interconnected within the broader digital landscape. The interactions within these societies are often shaped by the platforms on which they operate, such as Facebook and WhatsApp, which facilitate continuous engagement and the formation of social capital. Social capital in this context refers to the networks of relationships that facilitate cooperation, trust, and reciprocity among members. These networks are crucial for the functioning of virtual societies, as they often complement or even replace traditional face-to-face interactions (Tucker & Lorig, 2024).

The rise of virtual societies has profound implications for social interaction, cultural norms, and individual behavior (Arrieta-López & Carrasquilla-Díaz, 2021). One of the most significant impacts is the way virtual societies shape societal norms. In these digital spaces, the constant exchange of ideas, opinions, and content influences public perceptions and behaviors. Social networks, in particular, have become powerful platforms for shaping public discourse, sometimes even more so than traditional media (Rastogi & Bansal, 2022). However, this also introduces challenges, such as the rapid spread of misinformation, which can distort societal norms and undermine trust within these digital communities (Wu & Liu, 2021).

Another critical implication of virtual societies is the democratization of information. Virtual societies provide platforms where marginalized voices can be heard, enabling more inclusive public discourse. However, they also present challenges related to privacy, digital inequality, and the potential for social fragmentation. Ensuring equitable access to digital technologies and protecting users' privacy are crucial for the sustainable development of virtual societies (Song, Qian, & Pickard, 2021).

In terms of practical applications, virtual societies have become increasingly integrated into various domains, such as education, healthcare, and entertainment. The COVID-19 pandemic accelerated the adoption of virtual societies, as many activities shifted online. Virtual classrooms and remote healthcare consultations are now commonplace, demonstrating the utility and potential of virtual societies in addressing contemporary challenges (Sun et al., 2022). Additionally, the advancement of technologies such as augmented reality (AR) and artificial intelligence (AI) will likely further integrate virtual societies with physical reality, enhancing their effectiveness in these domains (Rapuano et al., 2023; Aref & Omar, 2020).

VIRTUAL HUMANS

The Scopus scientific database reveals that the "virtual human" concept, similar to the previous virtual entity, also saw monetization in 1994. Table 4 narrows down a systematic literature review to the 25th of August 2024.

Table 4. "Virtual humans" PRISMA flow (Source: Scopus)

No.	PRISMA STAGES	SCOPUS
1	TITLE-ABS-KEY ("virrtual humans") AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j") OR LIMIT-TO (SRCTYPE , "p")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all"))	
2	Initial results (period 1994-2024)	3.804
3	Rule no. 1: document type (no books, chapters, reviews, editorials)	-307
4	Results no. 1: articles and conference papers	3.407
5	Rule no. 2: publication stage (no press articles)	-13
6	Rezults no. 2: final articles only	3.394
7	Rule no. 3: source type	-501
8	Results no. 3: journals and conference proceedings	2.893
9	Rule no. 4: language limitation	-221
10	Results no. 4: only English papers	2.672
11	Rule no. 5: access type	-1935
10	Results no. 5: only open access	737
11	Rule no. 6: period limitation (2024)	-689
12	Results no. 6: papers published in 2024 only	48
13	Rule no. 7: PDF type files	-33
14	Results no. 7: only PDF files with no password	15
15	Rule no. 8: manual check (relevance to the topic domain)	-9
16	Results no 8: relevant papers	6
17	Final results	6

**Reference: (Page et al., 2021)*

Furthermore, Figure 4 illustrates the dynamics of scientific research on "virtual humans," showing an increasing trend starting in 1994, with a first peak in 2009, after the appearance of cryptocurrencies.

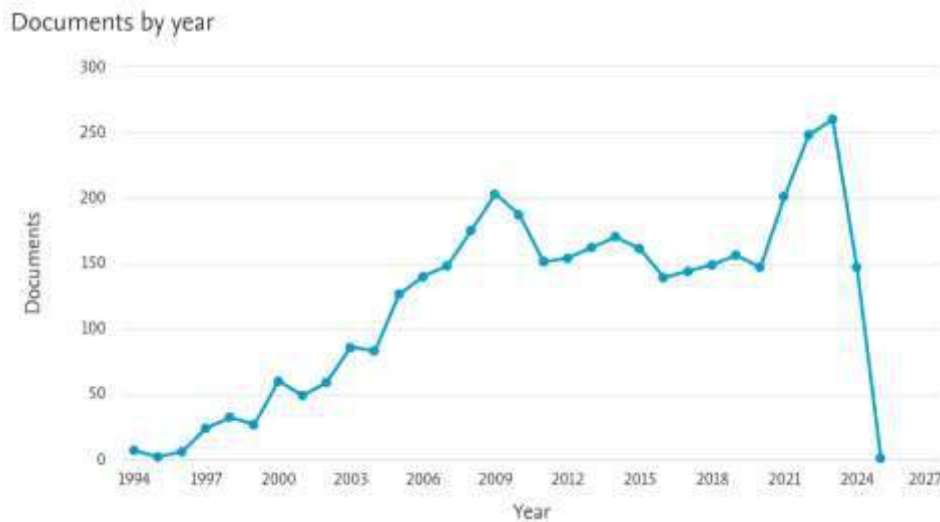


Figure 4. Documents by year of publication for “virtual humans” (Source: Scopus)

Virtual humans (VHs) are becoming an integral part of digital interactions, spanning various fields such as entertainment, education, healthcare, and customer service. These digital entities, which often possess human-like characteristics, are designed to interact with real humans in a multitude of contexts. The concept of virtual humans covers a broad range, from AI-driven avatars to digital representations in virtual and augmented reality (VR/AR) environments and interactive agents in simulations. Their growing integration into society raises significant questions regarding their definitions, roles in social interactions, and the ethical implications of their deployment.

Virtual humans can be defined as digital entities that simulate human appearance and behavior to interact with users in a realistic manner. Typically powered by artificial intelligence, these entities respond to user inputs through human-like speech, gestures, and facial expressions. VHs can manifest as avatars in VR environments, conversational agents on digital platforms, or digital assistants embedded in devices 1(Kum, Jung, & Lee, 2024). Each of these manifestations serves unique roles in enhancing user interaction and engagement.

The roles of virtual humans in society are diverse, extending from practical assistance to social interaction. For instance, in healthcare, virtual humans are used as therapeutic tools, providing controlled environments where patients can interact safely, aiding in mental health treatment (Kum, Jung, & Lee, 2024). In customer service, they improve user experience by offering personalized assistance and reducing the burden on human staff 2(Smith & Jones, 2023). Educational settings have also begun to incorporate VHs as tutors or trainers, delivering interactive learning experiences tailored to individual needs 3(Rapuano et al., 2023).

The integration of virtual humans into society presents both benefits and challenges. On the positive side, they enhance accessibility by providing services to individuals who may face barriers in interacting with others in person, such as those with disabilities (Smith & Jones, 2023). However, the use of VHs also raises ethical concerns, particularly in relation to privacy, the potential for manipulation, and the blurring of lines between reality and simulation 4(Ali, Wang, Hussain, & Li, 2023).

As technology continues to advance, virtual humans are expected to become more deeply integrated into daily life. Future applications may include expanded roles in law enforcement, corporate training, and global collaboration platforms (Smith & Jones, 2023). In healthcare, VHS are likely to play a growing role in providing mental health support and patient education, offering personalized care in virtual settings (Kum, Jung, & Lee, 2024). Moreover, in the cultural sector, virtual humans could be employed to recreate historical figures or provide interactive tours in virtual museums, thereby enhancing user engagement and learning experiences (Cannavo et al., 2024).

In summary, virtual humans are becoming crucial components of digital society, offering numerous benefits but also presenting challenges that require careful consideration. As technology continues to evolve, the role of virtual humans is likely to expand, making it essential to address the ethical and societal implications of their integration into everyday life.

RESULTS AND DISCUSSIONS

The research question posed in the introduction, "What are the definitions, interrelationships, and implications of virtual money, virtual economy, virtual society, and virtual humans in the current digital landscape?" is addressed systematically in the results and discussion sections. Each virtual entity is analyzed for its definition, interrelationships, and implications within the broader context of the digital landscape.

Virtual money is defined as a digital representation of value, primarily characterized by decentralization, cryptographic security, and reliance on blockchain technology. It is interrelated with advancements in blockchain technology, which underpins its secure and decentralized nature. The implications of virtual money include opportunities such as financial inclusion and reduced transaction costs, along with challenges like market volatility and regulatory complexities.

The virtual economy is an economic system within digital environments, characterized by the exchange of virtual goods and services with real-world economic value. It is closely intertwined with emerging technologies like blockchain, VR, and AR, which enhance user interactions and economic transactions. The implications of the virtual economy include new business models, economic inequality, and challenges related to scalability and security.

A virtual society is defined as a dynamic digital ecosystem where people connect, communicate, and collaborate, often transcending physical boundaries. These societies are interconnected within the broader digital landscape, with implications for social norms, behavior, and public discourse. Virtual societies democratize information but also face challenges such as misinformation, privacy concerns, and digital inequality.

Virtual humans are digital entities designed to simulate human appearance and behavior, interacting with users in realistic and context-specific ways. They play a significant role in various sectors, including healthcare, education, customer service, and entertainment. The interrelationship between virtual humans and society is profound, as these entities assist in practical tasks while also influencing social interactions and potentially reshaping societal norms.

The interconnectedness of virtual money, virtual economy, virtual society, and virtual humans creates a complex digital ecosystem that is continuously evolving. Virtual money supports the virtual economy, which in turn underpins virtual societies. Within these societies, virtual humans play crucial roles, facilitating interactions and enhancing user experiences.

The implications of these virtual entities are significant for the digital age. While they offer numerous opportunities, such as improved financial inclusion, new economic models, and enhanced social interactions, they also present challenges. These include regulatory hurdles, ethical concerns, and the risk of exacerbating digital divides. The rapid pace of technological advancement means that these challenges must be addressed proactively to ensure the sustainable development of virtual entities. The relationships among these virtual entities are highly interconnected. Virtual money underpins the virtual economy, which in turn supports and sustains virtual societies. Within these societies, virtual humans play critical roles in facilitating interactions and enhancing user experiences.

The evolution of virtual money, virtual economy, virtual society, and virtual humans reflects a broader shift towards a more interconnected and immersive digital world. These entities redefine traditional concepts and introduce new challenges and opportunities that are essential for understanding the implications of the digital age. As these virtual entities continue to integrate with the physical world, they will likely lead to more sophisticated and immersive environments, transforming economic and social interactions and raising new questions about regulation, ethics, and governance.

CONCLUSIONS

This study has explored the definitions, interrelationships, and implications of virtual money, virtual economy, virtual society, and virtual humans in the current digital landscape. The analysis has shown that these virtual entities, though distinct, are deeply interconnected and collectively influence both digital and physical realms. Virtual money, exemplified by cryptocurrencies, challenges traditional financial systems by offering decentralized and secure transaction methods. The virtual economy, driven by digital platforms, creates new market opportunities but also presents challenges such as scalability and security. Virtual societies, as digital ecosystems, reshape social norms and interactions, raising concerns about misinformation and privacy. Finally, virtual humans, which simulate human interactions, bring both opportunities for enhanced user experiences and ethical concerns regarding privacy and social isolation.

The broader implications of these virtual entities for society and the digital era are profound. As virtual entities continue to integrate with real-world systems, they will likely lead to the creation of more sophisticated and immersive virtual environments. This integration will not only transform economic and social interactions but also raise new challenges related to regulation, ethics, and technological governance. The potential for virtual entities to disrupt traditional industries and societal norms suggests that careful management and strategic planning will be essential to harness their benefits while mitigating risks.

Future research should focus on several key areas to deepen the understanding of virtual entities. First, there is a need for more interdisciplinary studies that examine the legal, ethical, and social implications of virtual entities, particularly as they become more embedded in daily life. Second, research should explore the potential for virtual entities to exacerbate digital divides and economic inequalities, and propose solutions to ensure equitable access and participation. Finally, as virtual entities become more sophisticated, studies should investigate the long-term psychological and societal impacts of virtual interactions, including the effects on identity, social behavior, and mental health.

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TOWARDS A UNIFIED DIGITAL EUROPE: COMPARATIVE ANALYSIS AND STRATEGIC INSIGHTS FROM GLOBAL DIGITALIZATION PRACTICES IN PUBLIC ADMINISTRATION

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ABSTRACT

This working paper explores the current state of digitalization within European countries, both EU and non-EU, and examines the key factors influencing the heterogeneity of digital public services across the continent. One of the primary objectives is to analyze how the evolution of digitalization in European public administration compares to similar processes in other important regions of the world, identifying both similarities and differences. Through a comprehensive analysis of regional disparities, regulatory frameworks, and infrastructural differences, the paper identifies the primary challenges to achieving a more homogeneous and transnational digital environment in Europe. The research highlights global best practices, particularly from North America, Asia-Pacific, Australia and Latin America, and discusses how European countries can benefit from these examples to enhance their own digital transformation efforts. The findings emphasize the importance of interoperability, technological adoption, and digital inclusivity, offering actionable recommendations to accelerate digitalization in a way that benefits the entire European region. This work aims to inform policymakers and stakeholders on strategies to create a more integrated and efficient digital ecosystem across geographical and geopolitical boundaries.

Keywords: Digitalization, Public Administration, Europe, Global Comparison, E-Government.

JEL: K00, K33, K40, N10, N40, O33, O38, O43, O50, P51

INTRODUCTION

Digital transformation in public administration has emerged as a pivotal concern for governments globally, driven by the imperative to enhance efficiency, accessibility, and transparency in public services. In Europe, the pursuit of a unified digital ecosystem becomes particularly significant due to the existing diversity in digitalization levels across the continent. Although substantial progress has been made, significant disparities persist, not only between EU and non-EU countries but also within the EU itself. These disparities underscore the need for a coherent strategy aimed at advancing digital public services across all European nations.

The broader context of digitalization extends beyond mere technological adoption; it involves navigating complex regulatory landscapes, addressing infrastructural disparities, and overcoming political and institutional resistance. Understanding Europe's digitalization journey requires considering the global context. By comparing Europe's efforts with those of regions like North America, Asia-Pacific, Australia, and Latin America, this study aims to provide a richer perspective on the dynamics shaping digitalization within Europe.

Since 2006, Dunleavy et al. emphasizes the importance of digital integration in public administration and proposes a shift from "New Public Management" (NPM) to "Digital-Era Governance" (DEG). NPM, focused on disaggregation, competition, and incentives, has led to increased complexity and challenges for citizens, causing its influence to wane in advanced countries. In contrast, DEG emphasizes reintegrating government functions, adopting holistic, needs-based approaches, and advancing digitalization. So, DEG could drive sustainable change through technology and integration, although its success and widespread adoption remain uncertain at that time of digitalization. Bannister and Connolly (2014) emphasize the importance of understanding the relationship between ICT and public values in the context of government transformation.

This paper, therefore, seeks to contribute to this discourse by analyzing the current state of digitalization in European public administration, comparing it with global practices, and identifying the main challenges and opportunities for achieving a more unified digital ecosystem in Europe. The central question guiding this study is: "What are the key factors and best practices that can drive a more unified and effective digital transformation in European public administration?"

METHODOLOGY

To explore these question, this study employs a comprehensive literature review, drawing on existing studies, governmental reports, and policy documents. This methodological approach allows for a detailed comparison of the regulatory frameworks, infrastructural setups, and political dynamics that shape digitalization in Europe and beyond.

A key component of this analysis is the comparative regulatory analysis, which systematically examines the regulatory frameworks governing digitalization across various regions, including Europe, North America, Asia-Pacific, Australia, and Latin America (Coglianese, 2012; Mahoney & Thelen, 2010). By analyzing legal structures, policy frameworks, and institutional arrangements, this method helps identify best practices and potential areas for reform that could be applied in the European context.

Additionally, concept analysis is utilized to clarify and define critical terms such as digital interoperability, inclusivity, and technological adoption. This ensures a clear and consistent understanding of these complex terms, which is particularly important in qualitative research within fields like public policy and information systems (Walker & Avant, 2011).

The data collection process involved gathering information from governmental reports, academic publications, legal texts, and policy documents. The analysis focuses on identifying trends, disparities, and best practices in digitalization, with special attention to the regulatory and infrastructural factors that contribute to these outcomes.

RESULTS

The analysis reveals significant disparities in digitalization among European countries. Generally, EU member states possess more advanced digital infrastructures and regulatory frameworks compared to non-EU countries. However, the disparities are not limited to the EU/non-EU divide; there are also considerable differences within the EU itself. For instance, Northern and Western European countries typically exhibit more advanced digitalization efforts than those in Southern and Eastern Europe (European Commission, 2021). These findings highlight the uneven landscape of digitalization across Europe, which poses challenges for creating a unified digital environment.

Several key factors influence the success of digitalization in public administration across Europe. Among these, regulatory frameworks stand out as a crucial determinant. Countries with comprehensive, forward-looking regulations, such as Estonia and Denmark, have achieved significant progress in digitalizing public services. These frameworks often incorporate robust data protection laws, digital identity systems, and e-government strategies that emphasize user-centric service delivery.

For example, the EU's General Data Protection Regulation (GDPR) and Estonia's e-Residency program serve as prime examples of legal frameworks that support digital transformation (Regulation (EU) 2016/679; Republic of Estonia, 2014).

The quality and availability of digital infrastructure, including broadband access and cloud computing capabilities, are also pivotal for the success of digitalization initiatives. Countries with well-developed digital infrastructures are better equipped to implement advanced e-government services and integrate new technologies such as AI and big data analytics. The EU's Digital Agenda and the Connecting Europe Facility illustrate efforts aimed at enhancing digital infrastructure across Europe (European Commission, 2010; Regulation (EU) No 1316/2013).

Another critical factor is the degree of political commitment to digital transformation, which varies widely across Europe. In some countries, digitalization is a top government priority, supported by strong leadership and governance structures. Conversely, in others, progress is hampered by a lack of political will, fragmented governance, or resistance to change. These variations in political dynamics significantly impact the overall digitalization landscape in Europe (Fountain, 2001; Egeberg & Trondal, 2018).

To succinctly answer the research question, we are here to say that the key factors that can drive a more unified and effective digital transformation in European public administration include harmonizing regulatory frameworks, investing in robust digital infrastructure, fostering political will, and learning from global best practices. These elements are critical to addressing

the existing disparities and creating a more cohesive and integrated digital environment across Europe.

DISCUSSION

To provide a comprehensive understanding of digitalization in public administration, it is essential to examine successful strategies implemented in various global regions. North America, particularly the United States and Canada, offers robust examples of digitalization frameworks characterized by strong regulatory support, extensive digital infrastructure, and a focus on innovation. The U.S. federal government's Digital Services Playbook, for example, provides a detailed guide for designing and delivering digital services that are user-centered and responsive to citizen needs (U.S. Digital Service, 2014). Legislation such as the E-Government Act of 2002 further underscores the commitment to leveraging digital technologies for improving government efficiency and service delivery (Public Law 107-347).

In the Asia-Pacific region, South Korea and Singapore have emerged as global leaders in digital public administration. Both countries have invested heavily in digital infrastructure and implemented policies that promote technological adoption and digital inclusivity. South Korea's Digital Government Master Plan and Singapore's Smart Nation initiative are exemplary strategies that prioritize interoperability and citizen engagement (Kim, 2014; Singapore Government, 2021). The regulatory framework in South Korea, including the Act on Promotion of Information and Communications Network Utilization, provides a solid legal foundation for these initiatives (Act No. 6360).

Australia's approach to digital transformation is driven by a focus on user-centric service delivery and the integration of digital technologies across all levels of government. The Australian Government's Digital Transformation Strategy highlights the importance of digital inclusion and accessibility, ensuring that all citizens benefit from digital public services. Australia's Digital Transformation Agency operates under the Digital Transformation Agenda, supported by legislation such as the Privacy Act 1988 and the Digital Economy Strategy (Australian Government, 2018; Australian Government, 2021).

In Latin America, despite facing infrastructural and governance challenges, countries like Brazil and Chile have made significant strides in digitalizing public administration. Brazil's e-Government Strategy and Chile's Digital Agenda 2020 emphasize the importance of collaboration between government, industry, and civil society in driving digital transformation (Cepik & Canabarro, 2015; UN ECLAC, 2018). The legal framework provided by Brazil's Marco Civil da Internet (Law No. 12.965/2014) is particularly noteworthy for guaranteeing internet rights and supporting digital government initiatives.

Coming back to Europe we found out that achieving a unified digital environment across the continent is fraught with challenges. These challenges are multifaceted, encompassing regulatory, infrastructural, and political dimensions. Understanding these obstacles is crucial

for devising strategies that can overcome them and move towards a more integrated digital Europe.

One of the most significant barriers to digital integration in Europe is regulatory fragmentation. The lack of harmonization in regulatory frameworks across European countries complicates cross-border collaboration and the development of transnational digital services. Different legal requirements and standards for digital services across countries create obstacles that hinder seamless digital integration (Kraemer & King, 2006). The EU's eIDAS Regulation is a step toward addressing these issues by providing a standardized legal framework for electronic identification and trust services (Regulation (EU) No 910/2014).

Another major challenge is the digital divide within Europe. While some countries boast advanced digital infrastructures and high levels of digital literacy, others lag behind, particularly in rural and economically disadvantaged areas. The EU's Cohesion Policy and the Rural Development Programme aim to reduce these disparities by funding projects that improve digital access in less developed regions (European Commission, 2020; Regulation (EU) No 1303/2013).

Interoperability, or the lack thereof, is a significant challenge for digital integration across Europe. Differences in data standards, technical specifications, and administrative processes create barriers that prevent the seamless delivery of transnational digital services. The EU's Interoperability Framework (EIF) provides guidelines and standards to improve interoperability between public administrations, but more work is needed to fully address this issue (Cordella & Bonina, 2012; European Commission, 2017).

Additionally, resistance to digital transformation within certain political and institutional contexts can slow progress significantly. This resistance often arises from concerns about data privacy, cybersecurity, or the potential impact of digitalization on employment and social equity. Addressing these concerns is critical for advancing digitalization efforts in a manner that is inclusive and equitable (Fountain, 2001; Mergel et al., 2019). The EU's Cybersecurity Act is an example of an initiative aimed at alleviating such concerns by establishing a framework for cybersecurity certification (Regulation (EU) 2019/881).

In light of the challenges identified, this study suggests several strategic recommendations aimed at accelerating digitalization across Europe. There is a pressing need for greater harmonization of regulatory frameworks across Europe to facilitate cross-border digital services. The EU should work towards establishing common standards and legal requirements for digital services, ensuring that all member states adhere to the same principles of data protection, digital identity, and e-government service delivery (Kraemer & King, 2006; Misuraca, 2013). The eIDAS Regulation and GDPR lay the groundwork for such harmonization.

Moreover, investment in digital infrastructure remains crucial for bridging the digital divide in Europe. This includes expanding broadband access to rural and underserved areas, upgrading

cloud computing capabilities, and supporting the development of emerging technologies such as 5G and AI (Baller et al., 2016; McKinsey Global Institute, 2018). The Connecting Europe Facility plays a key role in supporting these investments (Regulation (EU) No 1316/2013).

To promote the seamless delivery of transnational digital services, the EU should prioritize the development of interoperable digital systems and platforms. This involves adopting common data standards, technical specifications, and administrative processes, as well as establishing cross-border digital services that cater to all European citizens (Cordella & Bonina, 2012; OECD, 2020). The EIF and eIDAS Regulation are central to these efforts.

Strong political will and leadership are indispensable for driving digital transformation in Europe. Governments need to prioritize digitalization as a key policy area and invest in the necessary governance structures to support this transformation. This includes establishing dedicated digital agencies, appointing digital leaders, and fostering collaboration between different levels of government and the private sector (Fountain, 2001; Egeberg & Trondal, 2018). The Digital Europe Programme supports these initiatives by funding projects that promote digital skills and leadership.

Europe stands to gain valuable insights by learning from *global best practices*. For instance, the user-centered design approach adopted in North America, the emphasis on digital inclusivity in Asia-Pacific, and the focus on accessibility and service delivery in Australia can serve as models for European countries. By adopting these best practices, Europe can enhance its own digital transformation efforts and work towards creating a more integrated and efficient digital ecosystem (Australian Government, 2018; Kim, 2014; U.S. Digital Service, 2014).

CONCLUSION

This study has highlighted significant disparities in digitalization within European public administration and identified the key factors influencing these differences. Through a comparative analysis with global practices, the research has underscored the importance of harmonizing regulatory frameworks, investing in digital infrastructure, promoting interoperability, and fostering political will to achieve a more unified digital Europe.

The findings offer valuable insights and recommendations for policymakers and stakeholders as they work towards creating a more integrated and efficient digital ecosystem across the continent. Addressing the challenges identified in this study, while drawing on global best practices, will be crucial for advancing Europe's digital transformation efforts.

Achieving the vision of a unified digital Europe is a complex and challenging endeavor. However, with the right strategies and commitments, it is an achievable goal that can bring significant benefits to the entire region. Europe must continue to build on its strengths, address its weaknesses, and leverage the lessons learned from global leaders in digitalization to ensure that all citizens can benefit from the opportunities offered by digitalization.

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HUMAN RESOURCES- CHALLENGES FACING THE TOURISM SECTOR IN ALBANIA

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ABSTRACT

The article underscores the significance development of the tourism sector in recent years in Albania, which has highlighted the need to increase the capacity of human resources, especially for young people educated or trained in this field. Despite media calls regarding this issue and continuous announcements from businesses themselves, as well as the increasing number of accommodation structures including international brands, this will be the biggest problem that will accompany tourism.

The pandemic period and the phenomenon that accompanied it, created a reflection for workers to reassess their careers and move to other industries. On the other hand, accommodation industries began to review current career paths and evaluate what they should bring new in the eyes of employees entering this sector. High housing rents and rising apartment prices made it very difficult for young people to stay under current payment conditions. Employers must engage in developing new and innovative strategies to ensure they have a talented and capable workforce to face economic challenges and risks. Caring for employee well-being, offering flexible working conditions, and creating a productive and encouraging work environment can help increase employee productivity and engagement.

To effectively address these challenges, it is important to develop sustainable and appropriate strategies to improve the tourism sector in Albania. This includes investments in education and training for the workforce, promoting diversity in the workplace, incorporating motivation as a crucial process in retaining employees, and fostering close cooperation between the private sector, government, and non-governmental organizations to find innovative and sustainable solutions for future challenges. In this way, we can ensure sustainable and advanced development for the proper functioning of the tourism sector as a primary source of the economy.

Keywords: Human Resources, Tourism, Emigration, Government. Unemployment.

INTRODUCTION

Albania, despite its relatively small size, has a rich natural and cultural heritage, ancient and full of history, with biodiversity concentrated in all its protected areas. Its geographical position in the western part of the Balkan Peninsula has made Albania a crossroads for various routes

and cultures from antiquity to the present day. This heritage has sparked the interest of foreign tourists in visiting Albania across all its natural and cultural tourist destinations. These include the Theth National Park with its enchanting nature, the Valbona Valley, which is traversed by a crystal-clear river bearing the same name and surrounded by the Albanian Alps, the Kune-Vain Lagoon, rich in biodiversity with a magnificent landscape, and the Vjosa River National Park, the last wild river in Europe, which, in addition to its unique tourist values, is also home to rare species that are the subject of study for scientists and researchers. On the other hand, in terms of tangible cultural heritage, notable sites including the UNESCO-listed cities of Berat and Gjirokastra, Ohrid Lake, Gashi River, Rrajca etc, which have consistently been the focus of foreign visitors attention. Foreign tourists have consistently shown the greatest interest in Albanian culture and therefore in cultural heritage sites.

The tourism sector in Albania is facing a series of challenges. The significant growth this sector has experienced in recent years, especially after the COVID-19 pandemic in 2020, which has led to a substantial increase in the number of foreign tourists visiting Albania. Consequently, this growth has been accompanied by an increase in the number of accommodation facilities and other business units to cater to both domestic and international tourists from various parts of the world.

The rising number of businesses operating in the tourism sector has created a demand for more employees, who are required to be qualified in areas such as services, management, hospitality, and catering. However, many young people, upon completing high school or university, have chosen to emigrate due to the low wages offered in Albania. This has left the tourism industry not only dealing with other challenges (inherited by the past), that have since been addressed but also facing a major issue: securing a qualified workforce.

According to a report from the United Nations Development Program, one in five jobs in Albania, or approximately 250,000 employees, are in the tourism industry, travel and related sectors. However, the Institute of Statistics in Albania reported that in 2022, around 46,000 residents left the country, most of whom were young people.

According to official data, since 2011, an average of around 42,000 people have left Albania each year, with 70 percent of them being young people. The majority of young people emigrate primarily in search of better job opportunities, education, and healthcare.

The question arises whether these human resources can be sourced from local youth, or if it is necessary to attract workers from other countries interested in working in Albania?

This decision will have significant implications for the future of the tourism sector, as well as for the broader economic and social landscape of the country.

OBJECTIVES

The primary objective of this paper is to underscore the imperative and significance of raising awareness among young people in Albania regarding the existence of this future challenge. Combined with increased investment from state institutions in the future, this awareness

campaign can significantly impact the prosperity of these areas, the development of tourism and the ways to keep the young generation attracted to work in the Tourism Industry by using methods to make them eager to work here.

1. The initiation of methods from state institutions together with the businesses working in these fields would facilitate advancements in research and shed light on new data, which could hold significant importance for the entire country economy.
2. These investments would create employment opportunities for many young people which is the biggest concern now and for the future. Furthermore, the unveiling of new data would enhance media and social network promotion, further piquing the interest of various demographic groups, including local and foreign tourists encouraging visits to the area. These increasing number of tourists are going to help the Tourism Industry to raise the wages of service staff which would be an important step to keep these young people staying in the country.
3. The increasing number of tourists and visitors would stimulate the establishment of new businesses, accommodation structures, and employment opportunities for local youth and residents. Education Institutions are going to be an important step for having a qualified young generation that would be the solution for the economy growth.

OVERVIEW

Before the pandemic,

Albania's tourism industry faced labor shortages, especially during peak seasons. Many businesses struggled to find skilled workers for positions such as hospitality management, tour guides, chefs, and service staff. A significant portion of Albania's workforce, particularly young and skilled individuals, has emigrated in search of better opportunities abroad. This brain drain has left the tourism sector with a reduced pool of qualified candidates.

During the pandemic,

Many tourism-related businesses were forced to close temporarily or permanently, leading to widespread job losses. As a result, many workers left the industry or the country altogether. Some tourism professionals' workers transitioned to other sectors during the pandemic, and not all returned to tourism as the industry began to recover.

A NEW ERA IN THE TOURISM INDUSTRY IN ALBANIA AFTER 2020

Post-pandemic

With the easing of travel restrictions, Albania saw a significant increase in both domestic and international tourists. However, the sudden increasing number of visitors exposed the gaps in staffing, with many businesses struggling to meet the demands.

The rapid growth of tourism has outpaced the development of human resources. There has been a lack of systematic training programs to equip workers with the necessary skills to provide high-quality services.

Tourism jobs in Albania are often associated with low wages, seasonal employment, and job insecurity. This makes it difficult to attract and retain qualified staff.

The significant growth of the tourism sector in Albania in recent years has emphasized the need to increase the capacity of human resources, especially for young people educated or trained in this field. Despite calls in the media regarding this issue, ongoing announcements from businesses, and the growing number of accommodation facilities, including international brands, this will remain the biggest challenge for the tourism sector this season (alongside the issues of unorganized and still primitive transportation systems).

Workers are now seeking jobs that offer higher pay, more flexible hours, and opportunities for continuous growth within an organization.

Retaining talent should indeed be a priority, as high employee turnover can be costly and disruptive to business operations. By offering competitive salaries, creating a supportive work environment, and prioritizing employee development, businesses can not only attract but also retain the right talent, ensuring long-term success in a competitive market.

Employers need to engage in developing and innovative strategies to ensure they have secured a talented and capable workforce to address economic challenges and risks.

A BRIEF STORY

Albania has been a member of UNESCO (the United Nations Educational, Scientific and Cultural Organization), one of the specialized agencies of the UN, since 1958. Under the communist regime, no sites were listed until 1992, when Butrint was included for the first time as part of the World Heritage List due to its unique and irreplaceable value as a city where different civilizations coexisted. Since then, Albania has had additional registrations on the World Heritage List, which have played an extraordinary role in recognizing the country on the international stage positively, thus also influencing the increase in tourist numbers. Nowadays there are 9 sites (including Natural, Cultural and Spiritual ones, like: Berat, Gjirokastra, Lumi i Gashit, Rrajca, Iso Polifonike, Liqeni i Pogradecit, 2 Kodiket e Beratit etc), registered on the World Heritage List, which is significant for a small country like Albania in terms of both size and population.

After the 1990s, unfortunately, Albania has not developed any other sectors to boost the country's economy, such as agriculture, due to the mass emigration of young people and the lack of modern technological equipment that would facilitate increased productivity and the use of products not only for domestic market needs but also for the export. Similarly, livestock farming continues with few exceptions to be developed for personal use, and neither the heavy

industry nor the extraction of mineral resources has provided benefits to the state due to concessions.

In recent years, the entire Albanian economy and government policies have been focused on the assistance and development of tourism.

Albania is a new tourist destination. Thanks to its stunning nature, diverse landscapes, and a variety of attractions with historical and cultural values, the country offers opportunities for different types of tourism, including cultural and natural tourism, rural tourism, sports and adventure tourism, culinary tourism, health tourism, and coastal tourism. Existing tourist offers, packages, or itineraries often need significant improvement. They should be diversified to manage the challenges of seasonality, attract tourists during different times of the year, and encourage longer stays in these destinations.

TOURISM JOBS IN ALBANIA OFTEN FACE CHALLENGES TO SEVERAL FACTORS:

1. The tourism industry in Albania is highly seasonal, with most activity concentrated during the summer months. This seasonality leads to short-term contracts and limited opportunities for year-round employment, making the jobs less attractive to those seeking stable, long-term careers.
2. Due to the high competition among businesses in the tourism sector, especially small and medium-sized enterprises, there is pressure to keep costs low. This often results in lower wages for employees, making it difficult to attract and retain qualified and experienced staff.
3. The seasonal nature of tourism also contributes to job insecurity. Workers often face uncertainty about whether they will have employment from year to year, which discourages long-term commitment to the industry.
4. In many cases, tourism jobs do not offer clear paths for career advancement, making them less appealing to individuals looking for long-term growth and development.
5. Many qualified young people in Albania emigrate in search of better job opportunities abroad, further depleting the pool of skilled workers available for the tourism industry.

These factors combined create a challenging environment for attracting and retaining qualified staff in the tourism sector. The qualification of human resources in the tourism industry is one of the main challenges facing this sector.

INTERVIEW WITH STUDENTS FROM AGE 18-25 YEARS OLD IN ALBANIA.

In a course with my students nearing the completion of their studies, they confidently stated that in today's conditions, with rising expenses, they would not accept a job with a salary lower than 650 euro per month. Despite many of them lacking experience, the reasons they provided were justified by the increasing price of the house rent and other facilities. On the other hand, higher wages would consequently mean higher prices. The employer mindset of the past 30

years had changed; previously, the approach was to replace any employee asking for a raise, as there were plenty of others waiting to be hired. Most young people in recent years have found themselves emigrating, and many continue to seek better living conditions abroad.

1. According to your opinion, what is the reason for the emigration of young people from Albania?

I would like to stay here, in my country but I don't see perspectives. After the graduation I am thinking to move in another EU country. The reason is the low wages, the owners don't treat well the staff, seasonal employment, no motivations used to keep the staff after many years working in the same business, and moreover job insecurity. This makes it difficult for us to stay here losing many years working just to survive as our parent did.

2. How to retain and attract the younger generation to work in Albania's tourism sector?

* Increase Wages: Offer competitive salaries that reflect the cost of living, particularly in areas with high rental prices.

* Provide additional benefits such as housing allowances, health insurance, and performance bonuses to make the job packages more appealing.

* Training and Education: Invest in vocational training programs, internships, with educational institutions to provide young workers with the skills and qualifications needed in the tourism sector.

* Safe and Supportive Work Environment: Ensure that workplaces are safe, inclusive, and supportive, with a focus on employee well-being and mental health.

* Leverage Technology: Utilize digital platforms for training, recruitment, and operations to attract tech-savvy young professionals who are looking for innovative and modern workplaces.

3. Would you stay in Albania if these conditions were met?

Definitely, Yes!

Indeed, by investing in education, training, and personal development, the younger generation can play a crucial role in enhancing the tourism sector in Albania. This approach will not only support the growth and success of the industry but also help address the challenges faced by businesses in tourism. Albania's diverse landscapes and rich cultural heritage offer a wealth of opportunities for tourism to drive economic development and create new job opportunities, which can contribute to revitalizing areas affected by emigration. This strategic focus can position Albania as a competitive player in the global tourism market and foster long-term growth in the sector.

Efforts to raise wages in the tourism sector and improve working conditions are essential for increasing motivation among young people to choose careers in this field and for making Albania more attractive to tourists. Competitive salaries and good working conditions are crucial factors influencing the sustainability and competitiveness of the tourism sector.

In this regard, modernizing management and providing good working conditions for staff are important steps. Effective management of tourism businesses, along with opportunities for professional development and career advancement, will help increase the workforce and attract new talent to the tourism sector. These measures will contribute to improving services for tourists and enhancing Albania's appeal as a tourist destination.

CONCLUSION

Most businesses are coming to understand the importance of human capital, which is why they are seeking to improve wages. Significantly raising wages above 1,000 euros could potentially reduce youth emigration. By raising salaries, they aim to attract and retain skilled workers, addressing the ongoing labor shortages and supporting the sector's growth.

Government support, such as tax incentives and subsidies for training, can help reduce financial burdens on businesses. Improving working conditions and offering better benefits can make the sector more appealing. Expanding recruitment efforts and advocating for policy adjustments can also help address the shortage. Promoting the tourism sector as a viable career option can further attract new talent.

Investing in the education and training of local youth could be a sustainable solution, potentially reducing emigration and ensuring that the workforce is well-adapted to the specific needs of the Albanian tourism market. On the other hand, attracting foreign workers might provide a quicker fix to the labor shortage, but it could also bring challenges related to integration, language barriers, and the need for additional resources to support these workers. The right approach may involve a combination of both strategies, balancing immediate needs with long-term goals for the sector's development.

Developing specialized training programs and partnerships with educational institutions could help build a more skilled workforce. Vocational training and continuous professional development are essential.

A collaborative effort between the government and the private sector is needed to address these challenges. This could include incentives for businesses to invest in their employees and initiatives to attract young professionals to the industry. Utilizing technology for staff training and management could help bridge the skills gap and improve efficiency in operations..

Albania needs to ensure that these young individuals remain and develop their careers domestically to effectively manage the increasing number of tourists. The shortage of workforce will have a significant and direct impact, particularly this year and in the coming years, as the number of tourists continues to grow.

To address this challenge, it is essential for Albania to create conditions that retain talent and provide career opportunities in the country, ensuring that the tourism sector can handle the rising demand and continue to contribute to economic growth.

Specifically, they suggest exempting salaries up to 1000 euro from taxation and providing tax breaks for training programs aimed at developing the skills of new employees. This advice comes as businesses struggle with rising energy, fuel, and gas costs, as well as a significant decline in consumer spending.

Due to the severe shortage of labor, many sectors, especially bars and restaurants during the tourist season, have had to increase wages, that is expected to lead to higher prices and potentially the closure of some businesses, particularly in the hospitality sector, where price hikes are already being anticipated.

In light of these challenges, there is growing speculation about the future role of robotics in the workforce. Robotics could potentially address some of these issues by reducing labor costs, improving service efficiency, and compensating for the lack of available human labor. However, the initial investment in robotic technology can be substantial, and the replacement of human touch in customer service might not always be well received. As such, while robotics could play a role in the future of work, its adoption needs to be carefully balanced with other strategies to ensure it complements rather than entirely replaces the human workforce.

"In this situation, the government needs to support manufacturing businesses in minimizing the risk of workforce shortages. Companies hiring new employees should be incentivized through fiscal benefits, as their professional retraining represents an additional cost for the business. For this category of new employees with no professional experience, the state should ease the burden on employers by exempting them from income tax for a specified period.

The demand for waiters, cooks, and kitchen assistants is high both in Albania and Europe. The labor shortage, worsened by the pandemic, affects both skilled and unskilled workers, with many young Albanians migrating abroad.

By focusing on investment in education and training, promoting diversity in the workplace, enhancing employee motivation, and fostering strong collaboration between the private sector, government, and non-governmental organizations, Albania can build a resilient and skilled workforce. These steps are crucial for sustaining the growth of the tourism industry and ensuring its role as a vital component of the national economy. Through these efforts, Albania can enhance its attractiveness as a tourist destination and achieve long-term economic development.

The crisis is not expected to be resolved soon. The initial strategy of hiring workers from Asian countries has largely failed. Many businesses have found that these foreign workers often use their time in Albania as a stepping stone to migrate to Europe, rather than staying and contributing to the local workforce. This issue is particularly severe for large accommodation facilities in Albania that have hired 40 to 50 workers, only to see them leave shortly after.

Most of these workers arrive with dual passports and leave after only ten days or a month, despite the investments made by businesses, including employment contracts and tax payments.

The Albanian government has not intervened to address these issues, leaving the resolution to the private sector.

Since the significant wage increases for local employees, investments in technology to replace human labor in certain industries, and the opening of new production lines in rural areas, these are some of the measures that Albanian entrepreneurs are taking to address the labor shortage.

THE MAIN ACTORS WHO SHOULD INVEST IN THESE HUMAN RESOURCES ARE:

1. Ministry of Tourism, Culture, Youth, and Sports.
2. Ministerial bodies responsible for tourism.
3. Ministry of Environment.
4. Ministry of Agriculture and Food.
5. Local Government Authorities and Communities.
6. Private tourism associations (Chamber of Commerce, Hotelier Association, Restaurant Association, Travel Agency Association) and similar organizations at the national and local levels.
7. NGOs involved in the tourism sector.
8. Educational institutions (vocational, higher education, master's, doctoral, etc.).
9. Service providers.
10. Private businesses in the tourism sector.

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LINGUISTIC DURABILITY: THE FATE OF NEOLOGISMS IN CROATIAN MEDICAL LITERATURE¹

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ABSTRACT

The creation of neologisms in the standard Croatian language is governed by its word formation rules, leveraging its lexical bounty. Neologisms are created in line with the usual word formation processes, and if the neologisms are well-formed, if they are needed in the vocabulary of the Croatian standard language, and if they are accepted by its speakers, they are no longer considered neologisms, and instead become active components of the general lexis.

This paper uses the philological method to describe neologisms in Croatian medical literature occurring some 20 years ago, and seeks to determine if they have become a part of the contemporary lexis and come into general use. A description of the neologisms in the context of the application of terminological principles is a vital component of the paper as well.

Keywords: neologisms, formation rules, Croatian medical literature, terminological principles

INTRODUCTION

The lexis of the standard Croatian language can be classified into two groups: general use lexis and limited use lexis.

The general lexis is known to the majority of Croatian language speakers, whereas limited use lexis is often known only to narrow professional communities, as it is mostly composed of professional and scientific terms – professionalisms used in particular professions and sciences.

There is one important similarity between the general state of the Croatian lexis in various historical periods and the contemporary general Croatian lexis: in all periods, there were lexemes that were frequent and common in everyday communication, and there were rare and less common lexemes that were often completely unknown to the average speaker.

For this reason, two distinct layers are differentiated in the general lexis: the active lexeme layer and the passive lexeme layer.

The line between the active and the passive layer of the general lexis is not firm, because lexemes can move from active to passive lexis and vice versa. There is a transitional layer

¹ Scientific paper

between the two lexes, comprising several groups of lexemes that do not fully belong to the active or to the passive lexis at a given time. This lexis is called transitional (Samardžija 1998: 31). In addition to passive, active and transitional lexis, contemporary reference works increasingly often discuss deviations in dictionary definitions of medical terms in this regard, especially with respect to different fields of science that a given medical term belongs to. For instance, Zibar, Nedić and Baraban (2022: 69–86) explored the different semantic fields of the lexeme *eutanzija* [euthanasia] and discrepancies between law and medicine.

Transitional lexis is composed of archaisms, buzzwords (which appear suddenly and spread quickly, but go out of date equally quickly), revived words, and neologisms.

The need to express a new concept or name a new object is the principal reason for the formation of neologisms. Unlike its phonetical and grammatical structure, the lexis of a language is an open system, comprising an unlimited number of units, and capable of easily accepting new ones. The number of new words that can be accepted is unlimited, but their acceptance is still subject to phonetic, formational, and morphological restrictions. In the Croatian language, the formation of neologisms complies with its word formation rules, leveraging its lexical bounty.

Neologisms are formed in line with the usual word formation processes, and if they are well-formed, if they are needed in the vocabulary of the Croatian standard language, and if they are accepted by its speakers, they are no longer considered neologisms, and instead become active components of the general lexis.

However, most of the neologisms discovered by the exploration of sources for this paper were unknown.

“Not all new words appearing in a language can be accepted. Neologisms must follow the spirit of the spoken language, and no grammatical rules or dictionary entries must be infringed on during their formation. Sometimes neologisms are poorly coined, not respecting the grammatical rules governing compounds, or not fitting into the spirit of the language” (Melvinger 1984: 70).

This paper focuses on the study of lexemes found in a selection of Croatian medical literature originating from the early 21st century, as well as in medical journals and several chapters of textbooks used in medical studies from the same period. Examples are presented in the paper in an effort to illustrate the extent to which neologisms enrich the lexical and formational structure of the Croatian language, but also to show that the reasons for the formation of neologisms are not always only what linguists make them out to be. On the contrary, some neologisms are truly unnecessary in the standard language, because they have synonyms that are widely accepted in the general use lexis. An effort will also be made to identify, among the found neologisms, those that became a part of the general use lexis twenty years later.

Marko Samardžija (1998: 31) specifies two reasons for the formation of neologisms:

- extralinguistic or social reasons occur when new technical and scientific achievements, inventions, products, and so on need to be given a name;
- puritanical reasons occur when a Croatian word is invented to replace a loanword from a foreign language.

L. Hudeček, M. Mihaljević and J. Pilić (2001) argue that the need to express a new concept or name a new object is the reason for the creation of neologisms.

Hrvatski jezični savjetnik [Croatian Language Handbook] by a group of authors (1999) also mentions extralinguistic reasons (political and social), while not defining linguistic reasons.

An article by Vesna Muhvić-Dimanovski in *Filologija* [Philology] magazine (1998: 495-499) offers the most appropriate classification of neologisms, which was used in this paper with the addition of two new criteria: neologisms that already have synonyms in the standard language, and neologisms that were formed under the influence of language economy.

Some of the examples that were originally thought to be neologisms were later found in *Hrvatsko-talijanski rječnik* [Croatian-Italian Dictionary] by Dragutin Parčić or in *Rječnik hrvatskoga jezika* [Croatian Language Dictionary] published by the Miroslav Krleža Institute of Lexicography and *Školska knjiga* (“Šonje’s dictionary”), and some were found in both. Rather than classify them as neologisms, these examples were discussed in a separate group.

The examples found were classified into two groups:

a) neologisms

b) lexemes that were registered in dictionaries, but either never became a part of the general use lexis, or took a long time to be included in it.

1) Medical neologisms

Examples that were neologisms at the time when they were found in sources (the first five years of the 21st century) are discussed and described below, identifying the lexemes that have become a part of the general use lexis.

a) neologisms formed out of necessity to name new concepts originating from foreign sources:

– *bioterrorizam* [bioterrorism], *teleedukacija* [tele-education], *pedometer* [pedometer], *alkoholtester (alkotest)* [breathalyser]

- *bioterrorizam* [bioterrorism] (*Liječničke novine* no. 18: 27) – a noun formed by blending, which refers to terrorism that uses biological agents (such as *Bacillus anthracis*); (*bio* + *terrorizam*). The first part of the compound has lexical meaning, but cannot be used as a word on its own. This is a prefixoid, a bound lexical morpheme.

- *teleedukacija* [tele-education] (*Liječničke novine* no. 18: 66) – a noun formed by blending, which refers to various forms of education delivered through various forms of media, remote learning (*tele* + *edukacija*).
- *pedometar* [pedometer] (*Doktor u kući*, no. 84: 3) – a noun formed by compounding (*ped* + *o* + *metar*), which refers to a measuring device used when walking and running.
- *alkoholtester* [breathalyser] (*Doktor u kući*, no. 84: 3) – a noun formed by blending. *Alkotest* (*alkoholtest*) [breathalyser test] differs semantically from *alkotester* (*alkoholtester*) [breathalyser]: the former refers to the result of the action of measuring a person's blood alcohol content, and the latter to the device that is used to measure it. The two terms are used interchangeably today, even though the tokens *alkotest*, *alkoholtest*, *alkotester* are found in the available sources. *Hrvatska enciklopedija* [Croatian Encyclopaedia] (online edition, 2024) defines *alkotest* as a test checking for the presence of alcohol in expired air using a special handheld device.

The above lexemes were accepted in the Croatian language in the period in question, becoming a part of the general use lexis. They were created by word-formation processes consistent with the Croatian grammatical structure, and were taken over from foreign sources.

b) words derived from Croatian components according to a foreign model, which are categorised as loan translations in the broadest sense (replacing a loanword with a Croatian word). The loan translations in question were formed by calquing. (Melvinger 1984: 54):

– *visokotlakaš* (*hipertenzičar*, *hipertoničar*) [person suffering from high blood pressure], *svjetloplahost* (*fotofobija*) [photophobia], *krvotočni urušaj* (*hemodinamički šok*) [hemodynamic shock], *DNA mikropostroji* (*DNA čipovi*) [DNA microarrays]

- *visokotlakaš* (*Doktor u kući*, no. 84: 10) – a noun formed by compounding and suffixation from an adjective and a noun (*visok* + *o* + *tlak* + *aš*), which refers to a person suffering from high blood pressure. In Croatian, nouns ending in *-ač* and *-aš* in most cases refer to an agent, but in this example the suffix *-aš* refers to the holder of an attribute. In line with terminological principles, the use of the Croatian lexeme is preferable.
- *svjetloplahost* [photophobia] (*Vaše zdravlje*, no. 36: 14) – a noun formed by blending (*svjetlo* + *plahost*), which means 'photophobia'.
- *krvotočni urušaj* (Gamulin, Marušić, Kovač et al, *Patofiziologija* [Pathophysiology], Medicinska naklada, 2002: 521) – the syntagm refers to hemodynamic shock (syndrome involving the reduction of the difference in arterial and venous pressure, which causes multiple organ failure), the noun *urušaj* having been formed from the verb *urušiti* [collapse] by adding the suffix *-aj*, which is used to form nouns from verbs using the present stem.

- *DNA mikropostroji* [DNA microarrays] (Gamulin, Marušić, Kovač et al., *Patofiziologija*, Medicinska naklada, 2002: 95) – this syntagm is a translation of the anglicism ‘DNA microarray’, in which only the second part was translated, while the first part remained in English (DNA = deoxyribonucleic acid).

c) Croatian words coined to name new concepts:

– *uzorkivač* [sampling device], *uživala* [opiates], *zastopalna kost* [talus bone]

- *uzorkivač* (*Liječničke novine*, no. 18: 29) – a noun that means ‘sampling device’. Since the verbs *uzorkivati* and *uzorkovati* [to sample] do not exist in Šonje’s dictionary, the noun *uzorkivač* was formed from the noun *uzorak* [sample].
- *uživala* [opiates] (*Liječničke novine*, no. 18: 17) – a noun referring to various opiates, tobacco, alcohol and narcotics, which was formed by suffixation by adding the suffix *-lo* to the infinitive stem of the imperfective verb *uživati*. In *Tvorba riječi* [Word Formation] (2002), Stjepan Babić classifies *-lo* as an unproductive suffix, which explains why it has not been registered in dictionaries.
- *zastopalna kost* [talus bone] (*Doktor u kući*, no. 85: 48) – the name for a bone in the foot that did not exist in modern lexicography at the time when it appeared in the referenced source. The noun is no longer a neologism, as confirmed by the *Struna* (Croatian scientific terms) database, which mentions it in the description of the talus bone: “the talus bone meets the tibia on its upper end, the navicular bone at the front, and the heel bone at the back” (<http://struna.ihjj.hr/naziv/glezanjska-kost/26400/>, date not specified). The adjective was formed by prefixation and suffixation.

In addition to the three criteria presented in the aforementioned article by Vesna Muhvić-Dimanovski, the study and the description of examples leads to the conclusion that, as far as lexemes in medical literature are concerned, the classification of neologisms should be expanded by two additional groups:

d) words coined under the influence of language economy:

– *sporocijeleće rane* [slow-healing wounds], *epi-napad* [epileptic seizure], *poštednija operacija* [minimally invasive surgery], *poštedno šepanje* [compensatory limp], *sukretnja* [synkinesis], *šokna pluća* [shock lungs], *multiinfarktna demencija* [multi-infarct dementia], *psihofarmak* [psychopharmaceutical]

- *sporocijeleće rane* [slow-healing wounds] (*Liječničke novine*, no. 29: 51) – the term refers to wounds that heal slowly, and the lexeme in question was formed by blending an adverb (*sporo*) and a present verbal adverb (*cijeleći*), which took on the role of a qualitative adjective in this compound (*sporo* + *cijeleće*). Nominalisation is evident in this example: *rane koje sporo zacjeljuju* [wound that heal slowly] → *sporocijeleće rane* [slow-healing wounds].

- *epi-napad* [epileptic seizure] (*Vaše zdravlje*, no. 36: 16) – semi-compound referring to epileptic seizure, formed by abbreviating the adjective *epileptičan* [epileptic] without completely losing the connection between the abbreviated form and the full dictionary entry *epileptički*. Such semi-compounds are acceptable because they are understandable in the context they are found in.
- *poštednija operacija* [minimally invasive surgery], *poštedno šepanje* [compensatory limp] (*Doktor u kući*, no. 85: 31, 49) – in the first example, the adjective *poštedan* describes how surgery is performed (in a minimally invasive way), and in the second example, it describes a limp that develops to compensate for pain. Interestingly, the first example was formed from the comparative form of the adjective *pošted* + *na*, which was itself a neologism at one time, but is now registered in contemporary dictionaries. In both examples, the adjective is derived from the perfective verb *poštedjeti* [to spare].
- *sukretnja* [synkinesis] (*Doktor u kući*, no. 85: 40) – the noun refers to two or more movements happening at the same time, as indicated by the prefix *su-*. The noun was formed by prefixation (*su* + *kretnja*). It appears in *Medicinski leksikon* [Medical Lexicon] in the entries describing Bell’s phenomenon, Wartenberg’s sign, and new discoveries about Parkinson’s disease. (<https://medicinski.lzmk.hr/clanak/1606>, date not specified)
- *šokna pluća* [shock lungs] (Gamulin, Marušić, Kovač et al, *Patofiziologija*, Medicinska naklada, 2002: 532) – this condition would ordinarily be called *pluća pod šokom*, but, under the influence of language economy, the noun *šok* assumed adjective function, resulting in the neologism *šokan,-a,-o*, an adjective formed by adding the suffix *-an* to the noun *šok*. Šonje’s *Rječnik hrvatskoga jezika* lists the adjective *šokantan* [shocking], but its meaning makes it unsuitable for use in the above syntagm. The term *šokna pluća* appears on the official *Medicinski leksikon* website, in the entry explaining the foreign word *alveolitis* (<https://medicinski.lzmk.hr/clanak/alveolitis>).
- *multiinfarktna demencija* [multi-infarct dementia] (*Vaše zdravlje*, no. 35: 7) – According to *Hrvatski jezični savjetnik* (1999), the prefix *multi-* means ‘several, multiple, manifold’. This syntagm stands for the loss of intellectual capacity due to multiple infarcts. The adjective was formed by prefixation and suffixation by adding the Latin prefix *multi-* to the internationalism (Latinism) *infarkt*. The use of the Croatian prefix *više-* might be preferable to *multi-*: *višeinfarktna demencija* (*više* + *infarkt* + *na*).
- *psihofarmak* [psychopharmaceutical] (*Vaše zdravlje*, no. 36: 17) – the noun refers to a drug, in a broader sense, which has a positive or negative impact on the central nervous system. It was formed by compounding (compounding and suffixation, *psiho* + *farm* + *ak*) by abbreviating the adjective *psihološki*

[psychological] to *psiho* and adding the neologism *farmak* to it. The second part of the compound is a Graecism. “Regarding the formation of derivatives by adding the suffix *-ak* to nouns, it is important to note that this is a unproductive suffix. No new derivatives containing this suffix were registered after 1860, and many of the confirmed derivatives are infrequently used or have become archaisms” (Babić 2002: 16). In spite of Babić’s argument, the suffix *-ak* cannot be declared completely unproductive, since the above example shows that it is used in medical language.

e) words that have adequate synonyms or near synonyms (single words or syntagms) that are widely accepted in the standard language:

– *nezgodacija* (*nezgoda*) [accident], *sitnožilje* (*kapilare*) [capillaries], *ugroza zdravlja* (*ugroženost zdravlja*) [health threat], *krvnožilni sustav* (*krvožilni sustav*) [cardiovascular system], *ožiljne promjene* (*promjene ožiljaka*) [scarring], *antiviralni lijekovi* (*protuvirusni lijekovi*) [antiviral medications], *obrisak tkiva* (*bris, uzorak tkiva*) [swab], *cirkulatorni stimulans* (*cirkulacijski stimulans*) [circulatory stimulant], *zakrečenje* (*kalCIFikacija, ovapnjenje*) [calcification]

- *nezgodacija* [accident] (*Doktor u kući*, no. 84: 32) –*a* (*nezgoda*) would be the correct suffix to use in this word, because *Tvorba riječi* characterises the noun *nezgodacija* solely as a colloquialism that is sometimes used in the publicist style (Babić, 2002: 221).
- *sitnožilje* [capillaries] (Gamulin, Marušić, Kovač et al., *Patofiziologija*, Medicinska naklada, 2002: 530) – a collective noun that means ‘capillaries’. *Sitnožilje* stands little chance of becoming a part of the general use lexis, since replacing the lexeme *kapilare* with *sitnožilje* would expand its meaning: capillaries are indeed the smallest blood vessels [literal translation of *sitnožilje* is ‘small vessels’], but venules and arterioles are small vessels as well. This noun was formed by blending the adjective *sitno* and the collective noun *žilje*.
- *ugroza zdravlja* [health threat] (*Liječničke novine*, no. 29: 7) – the noun *ugroza* is a synonym of *ugrožavanje*, which is already widely accepted in the Croatian language. The lexeme is derived from the verb *ugroziti* [to threaten] by adding the suffix *-a*. This noun was potentially also influenced by language economy and could therefore be included in the d) category.
- *krvnožilni sustav* [cardiovascular system] (*Liječničke novine*, no. 32: 43) – even though the adjective *krvožilan* exists and is registered both in Šonje’s dictionary and in *Hrvatski čestotni rječnik* [Croatian Frequency Dictionary] (ranked as the 566th by use value), the compound that includes the full form of the adjective *krvni* cannot be considered unnecessary, because its full form is aligned with the grammatical structure of the Croatian language. The difference between the two examples is that *krvožilni* is formed by compounding from the noun *krv* [blood], while *krvnožilni* is formed from

the adjective *krvni* [relating to blood]. Since the product of transformation of this syntagm is *sustav krvnih žila*, where we clearly see that the adjective form *krvni* is used, the use of the neologism could be preferable.

- *ožiljne promjene* [scarring] (*Liječničke novine*, no. 32: 41) – the noun refers to changes resulting from the process of scarring (scar formation), and it is therefore obvious that the verbal noun in the instrumental case was replaced by an adjective in the syntagm (*promjene ožiljkavanjem* > *ožiljne promjene*). The adjective in question was formed by suffixation. Since the adjective obscures the meaning, it would be better to instead use the syntagm: *nastajanje ožiljaka* [scar formation].
- *antiviralni lijekovi* [antiviral medications] (*Liječničke novine*, no. 18: 27) – qualitative (relative) adjective *viralan* is not a part of the standard Croatian language, in which its meaning is conveyed by the adjective *virusni*. The above adjective was formed by prefixation, adding the prefix *anti-*, originating from Latin, whose Croatian counterpart is *protu-*. *Viralan* is often considered a synonym of *virusni*, as both adjectives are derived from Latin *viralis*, ‘relating to virus(es)’ (Loknar, 2003), but the connotation of fast spreading is their only common denominator in the contemporary context. The adjective *viralan* is associated with (fast-spreading) videos or information, whereas the adjective *virusni* is used to describe viral diseases, and *protuvirusni* to describe antiviral medications.
- *obrisak tkiva* [tissue swab] (*Doktor u kući*, no. 84: 40) – refers to a tissue sample taken by a swab in order to make a diagnosis. The noun was formed by prefixation and suffixation (*o* + *bris* + *ak*), where the prefix and the suffix are both redundant.
- *cirkulatorni stimulans* [circulatory stimulant] (*Doktor u kući*, no. 85: 27) – the suffix *-an* is used incorrectly in this syntagm. Transformation of this syntagm by replacing the adjective *cirkulatorni* with a noun in the singular genitive case results in the form *stimulans cirkulatora* [stimulant of the circulator], which is not the correct meaning. The suffix *-ski* should have been used instead, which means that the correct adjective for use in this syntagm is *cirkulacijski*. The same transformation would in this case result in the form *stimulans cirkulacije* [stimulant of circulation], which is the correct meaning. The original word was used incorrectly: “*Korijen đumbira – snažan je cirkulatorni stimulans, važan kod reumatskih artritičnih poremećaja.*” [Ginger root is a powerful circulatory stimulant whose use is important in rheumatoid arthritis conditions.]
- *zakrečenje žila* [vascular calcification] (*Doktor u kući*, no. 85: 50) – the use of the verbal noun *kalcifikacija*, originating from a foreign language and derived from the verb *kalcificirati*, whose meaning is completely identical to the noun in the example,

would be expected in this syntagm. In addition to *zakrečenje*, the term *ovapnjenje* is also used for vascular calcification in medical literature.

2) Lexemes registered in dictionaries that are not a part of the general use lexis

The lexemes in this group were found in 1901 Parčić's dictionary and 2000 Šonje's dictionary and are therefore not neologisms, even though an average Croatian speaker might perceive them as such. Since these words are featured in dictionaries, they exist in the standard Croatian language, but are very seldom encountered in general use, as confirmed by *Hrvatski čestotni rječnik*.

Also, several examples have been used in the wrong meaning, even though the form that was used to present them also exists in dictionaries.

Examples:

- *želatinozna tvar* [gelatinous substance] (*Doktor u kući*, no. 84: 35) / *želatinsta masa* [gelatinous mass] (*Doktor u kući*, no. 85: 26) – the adjective *želatinozna* may seem unusual, but it is featured in the dictionary published by the Institute of Lexicography, which gives its meaning as 'resembling gelatine', while the adjective *želatinsta* is not featured. In *Tvorba riječi* by Stjepan Babić, the suffix *-oz(a)n* denotes the state of being supplied with what the adjective refers to (which is contrary to the explanation given in the dictionary issued by the Institute of Lexicography), and is not very productive. In contrast, the suffix *-ast* denotes similarity, and should therefore have been used in the above example.
- *oparci cvjetova* [flower infusions] (*Doktor u kući*, no. 85: 27) – the noun *oparak* is a pharmaceutical name for a herbal infusion. This example is included here because the lexeme *oparak* is ranked as the 568th among a total of 569 in *Hrvatski čestotni rječnik*. Considering its very infrequent use, this word could be construed to mean 'the result of *paranje* [ripping]' (the verb *parati* [to rip] is ranked the 557th). As a result, speakers would be more likely to associate this word with the verb *párati* [to rip] than with the verb *pariti* [to steam].
- *mozgovne* (*Doktor u kući*, no. 85: 60) / *moždane stanice* [brain cells] – both adjectives refer to the noun *mozak* [brain], but there is a difference in meaning between them. The adjective *mozgovni* means 'mental, intellectual', while the adjective *moždani* means 'of or relating to the brain'. The use of the adjective *mozgovni* in the syntagm *mozgovne stanice* is therefore incorrect (Šonje's dictionary).
- *sastojine* (*LN*, no. 18: 49) / *sastojci prehrambenih proizvoda* [food ingredients] – the noun *sastojine* does not appear in the dictionary issued by the Institute of Lexicography, but it does appear in Dragutin Parčić's dictionary. For this reason, *sastojine* can be considered a revived word that belongs to the transitional lexis and is therefore not included in Šonje's dictionary. The argument that the lexeme *sastojina* is

a revived word is confirmed by the frequency of its use among Croatian language speakers, as it is ranked as the 566th in *Hrvatski čestotni rječnik*.

- *ponuditelj* [offering party] (*Liječničke novine*, no. 32: 18) / *ponuđač* [tenderer] – the lexemes *ponuditelj* and *ponuđač* are not synonymous in spite of the assumption that the suffix *-telj* is interchangeable with the suffix *-ač*. *Ponuditelj* means a person who makes an offer, or a sole proprietor or entrepreneur who has submitted an offer to perform construction works (used in the construction industry). *Ponuđač* means a person submitting a tender in a public call for tenders or a seller (Šonje's dictionary, 2000).
- *grljak* (Vladimir Presečki et al., *Virologija* [Virology], 39) / *grlič maternice* [cervix] – in Šonje's dictionary, *grljak* is defined primarily as 'bottleneck', but its anatomic meaning 'cervix' is also mentioned. *Hrvatski čestotni rječnik*, on the other hand, does not mention this example at all. The word *grlič*, which has no anatomic meaning in Šonje's dictionary, and is only defined as 'bottleneck', is ranked as the 569th in *Hrvatski čestotni rječnik*. In conclusion, the anatomic meaning of the noun *grljak* is less frequent in the standard Croatian language. This role has been taken over by the noun *grlič*, whose dictionary meaning is used only rarely or not at all.
- *zaduha* [dyspnoea] (*Vaše zdravlje*, no. 35: 37) / *astma* [asthma] – the noun *zaduha* is featured here because its meaning is also unknown to the average speaker of the Croatian language. Still, it appears in Šonje's dictionary, where *zaduha* and *astma* are listed as synonyms, but the former has a broader meaning (dyspnoea, breathlessness, shortness of breath, asthma). The noun *astma* is ranked as the 567th in *Hrvatski čestotni rječnik*, while the noun *zaduha* is ranked as the 569th, which indicates that asthma is more common in the general use lexis.
- *radba* / *rad* –Ø [work] (Gamulin, Marušić, Kovač et al., *Patofiziologija*, Medicinska naklada, 2002: 532) – this verbal noun is formed using the suffix *-ba*, which is described as mostly unproductive in Babić's *Tvorba riječi*, while *Hrvatski jezični savjetnik* (Barić: 1999) describes it as productive. In the spoken language, the suffix *-Ø* is more commonly used in the formation of this verbal noun, as indicated by its rank in *Hrvatski čestotni rječnik*, in which it is ranked as the 65th, whereas the noun *radba* is not even included in this dictionary.
- *liječnička obradba* [medical treatment] (Gamulin, Marušić, Kovač et al., *Patofiziologija*, Medicinska naklada, 2002: 532) – this verbal noun, formed by a combination of prefixation and suffixation, exists in Šonje's dictionary, but is used less frequently than the noun formed by adding the highly productive suffix *-a* (*obrada*). *Obrada* is ranked as the 450th in *Hrvatski čestotni rječnik*, while *obradba* is only ranked as the 559th.

- *beznadežno* (*Doktor u kući*, no. 84: 66) / *beznadno* [hopeless] – the adjective *beznadežan* is included in Šonje's dictionary, with a reference to the adjective *beznadan*, since *beznadežan* originates from Russian. The suffix *-ežan* does not exist in *Hrvatski jezični savjetnik* or *Tvorba riječi*, and the adjective is not included in Parčić's dictionary, which indicates that the suffix *-ežan* had probably not existed in Croatian morphology at the time, nor does it exist today. *Hrvatski čestotni rječnik* also does not mention this example.
- *dogotovljen* [completed] (*Liječničke novine*, no. 18: 47) – the adjective *dogotovljen* means 'completed, finished, ended'. There is an entry for *dogotovljen* in Šonje's dictionary, and an entry for the verb *dogotoviti* in Parčić's dictionary. This adjective was formed by a combination of prefixation and suffixation (*do* + *gotov* + *(l)jen*).

3) CONCLUSION

Our analysis of a selection of medical lexemes led us to the conclusion that the need to name new objects, concepts or phenomena is not the only reason for the formation of neologisms in Croatian medical literature. Examples (which do not constitute a representative sample in any way) indicate that the majority of the neologisms in the selection were formed under the influence of language economy or by replacing words registered in dictionaries that the speakers of the Croatian language use as such.

Neologisms are most frequently formed by suffixation and blending. Some of the discussed lexemes cannot be classified as neologisms, because they have been found in dictionaries, but these lexemes for the most part do not belong to the general use lexis. The examples in question were formed by suffixation, or a combination of prefixation and suffixation. In the contemporary context, most of the lexemes found in sources originating from the early 21st century, which were mostly neologisms at the time, have become a part of the contemporary lexis.

The study of medical lexemes is crucial because it provides deeper understanding of the terms used in the medical profession, which is important for accurate and clear communication between medical professionals, as well as between medical professionals and their patients. Medical lexemes often comprise complex terminology units endowed with specific meanings, the knowledge of which helps avoid misunderstandings in diagnostics and treatment. On the other hand, word formation is increasingly influenced by word economy due to the need for simpler, shorter and more efficient forms of expression, which is of particular importance in the modern society, given its striving for fast and clear communication, both in everyday language and in scientific terminology. The use of shorter word forms, which facilitates quick exchange of information, drives linguists to monitor and understand the changes taking place in the language.

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SUGAR MILLS ROUTE & TOURISM DEVELOPMENT IN JORDAN VALLEY - SOUTHERN LEVANT

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ABSTRACT

The results of field studies through archaeological excavations in the Jordan Valley region confirmed the establishment of dozens of sugar mills in the valley, especially during the end of the Byzantine era and the beginning of the Islamic eras, specifically during the Ayyubid-Mamluk period. Among the most prominent of these recent discoveries are factories, workshops and products Sugar in the Jordan Valley, where 32 factories, mills and pottery workshops were revealed in the Jordan Valley, especially in the northern Jordan Valley, down to Ghor Al-Safi, where the largest sugar factory was revealed there. The Jordan Valley was world famous for growing sugar cane and then grinding it in mills managed by the power of water propulsion, whose remains are still standing. The product is then processed according to the various stages of manufacturing that the inhabitants of the Jordan Valley excelled in during the Islamic eras, equivalent to the twelfth century to the fourteenth century, and many researchers considered that the Jordan Valley was among the earliest centers of the world's civilizations in the manufacture and export of sugar especially Jordanian sugar, which is known for its international quality (Montreal sugar), and the export of Montreal Sugar reached Africa, especially Egypt, when sugar industry experts moved to Egypt during the Ayyubid-Mamluk Era and established cane farms and mills there, and from Egypt the industry spread to the rest of Africa.

It is worth noting the spread of Jordanian sugar through trade to distant regions in Europe and others, as Montreal's Jordanian sugar reached Cyprus, Sicily, and from there to France, Italy, and especially the city of Florence, where the demand for Jordanian sugar in Europe was great for its high quality. It is obvious that the Crusaders returning from the Levant brought with them farmers from Jordan who are experts in cultivation of sugar can .

Keywords: Archaeology, History, Trade, Sugar, south Levant.

Introduction

Sugar cane appeared in the Levant in a number of countries, including Iran-Khuzestan and Mesopotamia-Iraq, where it was cultivated in Basra and Sinjar; Al-Qalqashandi referred to its presence in Tigris-Ahwaz.

Sugar was also mentioned in ancient sources, especially the Hellenistic period, as it referred to cane; and the use of sugar liquid in the manufacture of medicines. The Arabs also practised the cultivation and manufacture of sugar, and used it in the manufacture of medicines and medical

drugs, and the manuscript 'The Guide to the Jewels of Foods and the Power of Vocabulary in Medicines' confirmed the importance of sugar in medical treatments in the Fatimid era. The Arabs are considered the first to use sugar in medicines and the first to teach Europeans to make and extract it from the cane.

According to Latin sources, the Orient was more advanced than Europe in the use of water power in industry, which helped the development of the sugar industry. Cane cultivation and sugar production reached its peak in Jordan during the Ayyubid and Mamluk eras, so sugar mills or sugar mills were built near sources of flowing water, especially those that are always flowing and flowing with the power to move the butterflies and grind the cane.

One of the most prominent archaeological sites associated with the sugar industry in Jordan is the Tell al-Sukkar site in the southern Jordan Valley, near the Dead Sea. At this site, the remains of structures that were used to produce sugar from sugar cane have been found. These facilities include mills, presses, and special ovens that were used to convert sugarcane juice into sugar.

These archaeological mills are part of Jordan's industrial heritage and reflect the level of technological advancement reached by the region's inhabitants at the time. Evidence has been found to suggest that sugar was an important product that was exported to different parts of the world.

Previous Studies

The archaeological mills associated with the sugar industry in Jordan represent an important part of the region's economic and industrial history. The sugar industry was thriving in the Middle Ages, especially during the Mamluk period, where advanced techniques were developed to produce sugar from sugar cane, which was heavily cultivated in the Jordan Valley. There are many studies that dealt with the history of sugar cultivation and the development of the sugar industry in Jordan; the following are the most important studies on this topic:

- 1- Dr Saleh Al-Hamarneh presented a study titled 'The cultivation of sugar cane and its industry among the Muslim Arabs'; he dealt with the places where sugar was cultivated in the Islamic period, and the methods of manufacturing it. (**Hamarnah, 1978**)
- 2- The researcher Ruba Ahmed Abudloo referred to the importance of sugar mills and their history in the Jordan Valley, through the study she submitted for a master's degree, under the title (Sugar mills in the Jordan Valley in the twelfth and fourteenth centuries AD in the light of historical sources and archaeological finds)(**Abu Dalu : 1991**)
- 3- The book (Studies in the History of the Levant 'Jordan' - Volume I) by Prof. Dr Mohammed Adnan Al-Bakhit Al-Abadi mentions that Arab encyclopaedists, especially in the Mamluk era, referred to the spread of sugarcane cultivation in the Jordan Valley region).
- 4- Dino also published a number of articles and a book about the results of archaeological excavations in Ghor al-Safi.(**politos :1986**)



Figure 1: Sugar Can as the major source from Jordan Valley .

Phases of Sugar Manufacturing

The stages of sugar manufacturing are as follows:

First: Grinding the sugar cane to extract the sugar sap

Second: The sugar sap is placed in special copper pots called ‘copper dasut’ and heated to the boiling point, in order to separate the water from the sugar by evaporating the water and obtaining concentrated juice .

Third: The concentrated juice is then transferred to small chambers and poured into conical clay moulds and left until it crystallises into cones of sugar

IV: The sugar is extracted from the pots, thus completing the sugar manufacturing cycle and making it ready for sale.

One of these pots and boiling pots was found in Ghor al-Safi during excavations

Assessment Study

A field assessment of several sugar mills in the Jordan Valley was conducted starting in 1995 in order to know the current reality of the mills and how to restore and develop them and benefit from them in the economic and social situation. By examining the architectural remains of a group of mills in each of the Tall al Suker, Dhar and Ghor Al-Safi, it was found that sugar mills were built on the sides of the ever-flowing valleys throughout the year or near abundant springs because this industry needs water to irrigate the cane crops and also for the need to move the wheels of the mills. More than 34 mills have been counted in the sugar mills, but the real number of mills is still in need of further studies and field research

Based on the previous studies, there is a change not for the better in these mills for several reasons, the most important of which are: Fig:1 .

Firstly: no maintenance and restoration work has been done on the mills.

Secondly: There is a lack of a database of sugar mills in Jordan, showing architectural details, strengths, weaknesses, risks and opportunities.

Thirdly: There is a lack of local awareness of the importance of sugar mills and their role in revitalizing the tourism movement and tourism economics

Fourthly: the reports of archaeological surveys mention the presence of more than one press in several sites, without specifying the number of them, such as Tell Abu al-Qus and site No. 32 in Wadi al-Yabas (Marby and Palumbo 1988: 95).

Fifth: the mentioned several sites where sugar pots were found without the presence of architectural remains on the site, such as Deir Alla, Tell al-Shuna al-Shamaliya, Tell Fandi, Tell al-Arbaeen, and Tell Abu Sarbut.

Sixth: agricultural dredging, opening roads, and modern construction have destroyed many of these mills.

Seventh: the reconstruction of some of these mills for other uses, such as grain milling.

Although these factors make it difficult to determine the number of mills, Hamarneh mentioned 32, while Khouri identified at least 20 (Khouri 1981)

Sugar Manufacturing

Through the architectural remains that have been studied in Tell Sukkar, Dharar, and Karima, and based on the historical sources and the few archaeological finds, it is clear that sugar mills were built on the banks of rivers or next to springs because this industry needs water to irrigate the cane and move the wheels. Therefore, along the Jordan Valley, we find 34 sites where sugar mills were found, but the exact number of sugar mills remains unknown, for the following reasons:

- The reports of archaeological surveys mention the presence of more than one press in a number of sites, without specifying the number of them, such as Tell Abu al-Qus and Site 32 in Wadi al-Yabas (**Marby and Palumbo 1988: 95**).
- Mentioning several sites where sugar pots were found without the presence of architectural remains on the site, such as Deir Alla, Tal al-Shuna al-Shamaliya, Tal Fandi, Tal al-Arbaeen, and Tal Abu Sarbut.
- Agricultural dredging, the opening of roads, and modern construction have destroyed many of these mills.
- Reconstruction of some of these mills for other uses, such as grain milling.
- Although these factors make it difficult to determine the number of mills, Hamarneh mentioned 32, while Khouri identified at least 20 (**Khouri 1981**)

Tell el-Suker

An archaeological site located in the southern Jordan Valley near the Dead Sea. The site dates back to the Mamluk period and is believed to have been a major center for the sugar industry in the region. Archaeological remains: At Tell al-Sukkar, remains of industrial facilities have been found, including mills, ovens, and tools that were used to convert sugar cane juice into sugar. These facilities reflect the level of technological advancement of the period. Reservoirs were also found to collect water, which was essential to the production process.fig:2 .

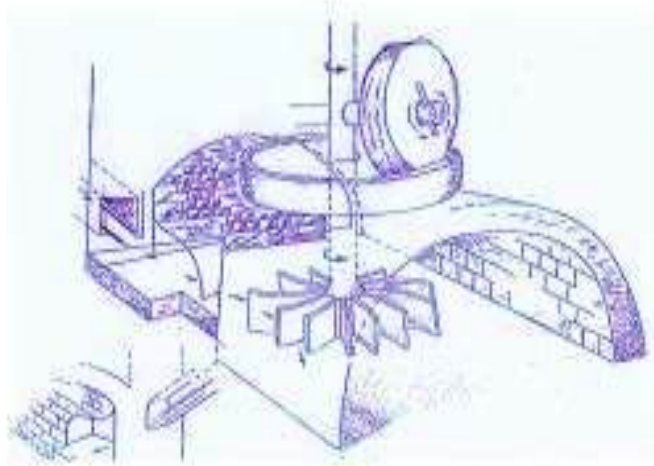


Figure 2: Tell el- Suker mill after Abu Dalu 1991 .

Pella

One of the most important centers for the manufacture of sugar, where the vessels used for manufacturing purposes were found during the dredging operations in the centre of the hill. The agricultural village became established in the center of the hill in the Mamluk period, as the area was supplied with sugar cane from nearby agricultural areas in the Jordan Valley, and recent excavations in the center of the hill, the mosque

area, have indicated the presence of an early Mamluk village based on coins, in addition to the presence of large numbers of sugar vessels that have not yet been studied. Fig:3.

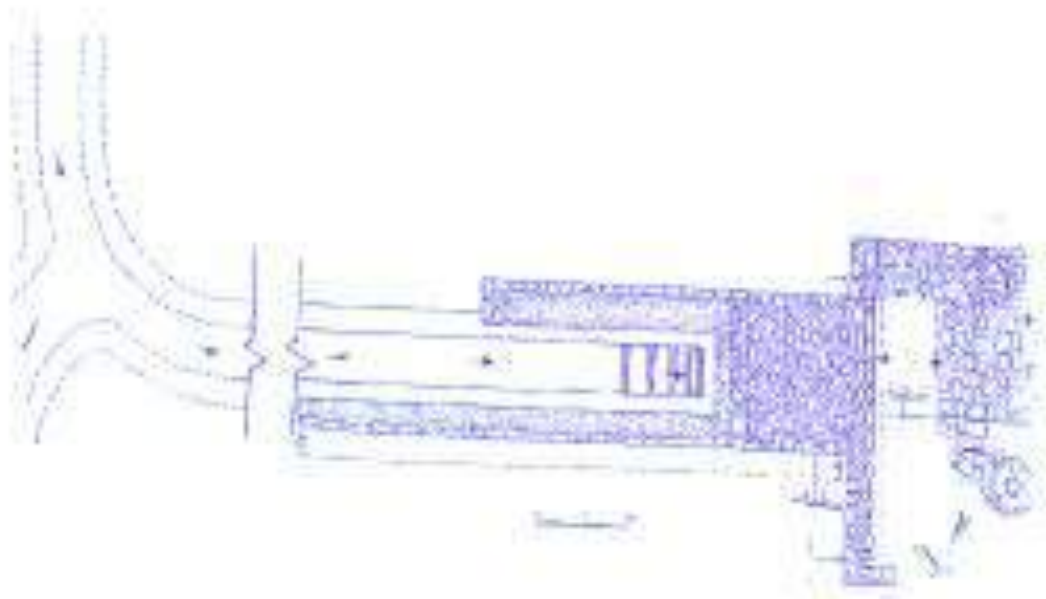


Figure 3: Plan of Pella sugar Mill

Sarbut:

The excavations of the Tell Abu Sarbut site, located to the west of Deir Alla, revealed human settlement from the Byzantine period to the Umayyad period, a gap in settlement in the Abbasid period, and intensive settlement in the Ayyubid-Mamluk period. Large quantities of pottery dating from this period were found in various forms and materials, including sugar, which was found in large quantities.

In the 1990 excavation season, large quantities of pottery were found, including a significant number of vessels used in the sugar industry, five of which were found in addition to the two previously found.

South Karima

The city of Karima is located on the main road that runs along the eastern bank of the Jordan Valley, about 3 km north of the shrine of the Companion Abu Ubaydah, and the Kafranja Valley is located to the north of South Karima, with mountains in the east and flat fields in the west, and water from the Kafranja Valley is fed by canals to the north

The site has a canal on the north-eastern side and part of it is located on Wadi Kafranja and consists of a stone building with arches in addition to a press on the northern side built with stones that appear trimmed at the bottom with trimmed stones and were later restored with cement in an attempt to repair what was destroyed or build what is necessary from The indiscriminate cement construction distorted the character of the building and obliterated its features. The only thing that remains visible are the water channels, which continue to the east on the southern side of Wadi Kafranja, but their traces are not clear due to the modern construction in the area, which covered most of their traces, so it was difficult to trace them to know their length Fig:4.



Figure 4: The grinding stone for crushing the sugar cane

How sugar mills work in the light of archaeological excavations

The working principle of sugar factories depends on water that moves the horizontal or vertical wheels to operate the millstone or juice installed in them, either directly or through the gears, and this is determined by the force and speed of the water; the millstone or juice is moved by a water wheel made of hard wood and iron, which in turn is moved by the water that reaches it in three ways:

.1 Water flowing from the mouth of a high horizontal channel, the height of which varies according to the level of the water level that comes from the spring or valley. The force of the flowing water falls directly on the grinding or pressing stone, and the height of the water level is directly proportional to the momentum of the water.

.2 Water flowing from a high altitude to pass through a suspended channel to descend from the channel nozzle directly over a vertically mounted water wheel.

.3 Water flowing with high force in a river or valley from the bottom of a pole-mounted water wheel

The force of the water flowing in the second or third case is an indirect force, where the water moves the vertical wheel, which in turn moves the squeezing stone through the sprockets, and the speed of the squeezing stone depends on the amount of water, its momentum and speed, the water wheel and its type, and the weight of the squeezing stone, and the squeezing stone is a stone A circular stone of basalt or carved rock, installed either horizontally where the two stones are placed on top of each other so that the lower stone remains stationary while the upper stone moves, and reed sticks are inserted between the two stones, and the amount of pressure on the sticks varies according to the degree of proximity of these two stones to each other. Sometimes the top stone is placed vertically, so that the bottom stone is horizontal and stationary while the top stone, which is in a vertical position, moves. Often, two vertical stones are placed instead of one.(**Forbes :157**) Fig :5.

The juice from this process is received in dedicated vessels and then transferred in one of the two ways mentioned above to another section of the factory, where it is cooked and boiled and finally poured into conical molds in the form of sugar cones.

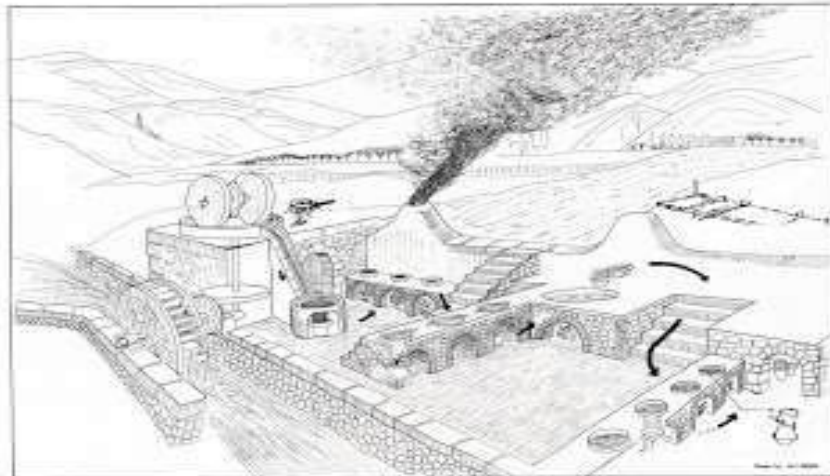


Fig :5 General View of the sugar factory elements

Jordanian sugar and foreign trade relations

Jordan had close trade relations with Egypt, Syria, Palestine and the Hijaz. It also had trade relations with Baghdad in the seventh century AH, and this indicates that Amman was an important trade centre during the Ayyubid period.

The sources mentioned the existence of (Dar al-Ta'am) in the city of Ajloun prepared for foreign merchants, and this house is similar to it in the city of Damascus and performs the same work as the agency in the Egyptian diaspora, and combines in its function between housing foreign merchants and storing their goods, and some European documents indicate the presence of sugarcane and shubaki, which the region is famous for, in the markets of Florence between 1310 AD and 1340 AD.(Muhesein :1987)

The commercial treaty concluded by the Abbasid Sultan al-Muayyad Saif al-Din Sheikh with Venice stipulated that the following should abide by its provisions: The deputy of Alexandria, Karak, Safed, Hama and Tripoli, so he issued his order in 1412 AD regarding foreign trade, and this treaty is considered one of the important documents about the mechanism of exporting sugar manufactured in Al-Asar, which was mentioned earlier.

This is evidence that the Jordanian cities had commercial relations with Venice before the conclusion of this treaty, as the people of Shobak were known for their commercial activity in the sugar industry and earning through trade with European cities, otherwise this sultanic order would not have been issued to them, and the same thing was repeated during the period when the Mamluk Sultan, King Al-Nasser Muhammad bin Qalawun, revolted in Karak in his third sultanate and left it to take control of Damascus.

The gains of this region under study from this active commercial movement were not limited to the mere material profit returned to its inhabitants, but the follow-up of these caravans and transit trade was a fertile field for cultural and civilisational encounters, as trade routes are vital routes for the transmission of civilisation and culture between peoples, through which news and new doctrines and opinions are transmitted, and the markets where they land across Jordan were a field for the exchange of thought and knowledge.

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Industry in the Southern Jordan Valley: An Interim Report on the Pilot Season of

Excavations, Geophysical and Geological Surveys

THE ROLE OF MEDICINE IN THE ECONOMY OF A COUNTRY

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ABSTRACT

Medicine holds a crucial position in the global landscape, significantly influencing both the health and economic stability of nations. Its contributions to public health are immense, as it plays a vital role in reducing mortality rates, increasing life expectancy, and improving the overall quality of life. Healthy populations are essential for sustaining economic productivity, as they experience fewer healthcare costs and participate more actively in the workforce, which drives economic growth. The healthcare industry, encompassing pharmaceuticals, medical devices, and services, constitutes a substantial portion of national expenditures and acts as a major economic engine.

Investment in healthcare infrastructure and innovation not only stimulates job creation and entrepreneurship but also enhances a nation's competitiveness in the global market. Medicine also serves as a catalyst for innovation, leading to the development of new treatments, therapies, and medical devices, thereby improving healthcare outcomes and fostering economic growth through the generation of intellectual property. Furthermore, the sector drives significant research and development (R&D) efforts, attracting investments that not only advance medical knowledge but also generate spillover effects across other industries, boosting productivity and competitiveness. Despite these positive impacts, the economic influence of medicine is accompanied by challenges such as rising healthcare costs, access disparities, poor health literacy, and the burden of chronic diseases, which necessitate effective policy interventions to ensure equitable healthcare access and cost containment. Understanding the intricate relationship between medicine and the economy is vital for policymakers, healthcare professionals, and stakeholders to craft strategies that promote sustainable development and equitable healthcare access.

In this scientific article, we will discuss the costs associated with translators' medical campaigns, the economic impact of poor health literacy, the challenges posed by large families,

and the importance of medication compliance in minimizing diseases and improving health outcomes.

Keywords: Economy, Medicine, Medical knowledge, Sustainable Development.

The Economic Impact of Healthcare Systems

Healthcare systems are among the largest sectors in any economy, often representing a significant portion of national expenditure. In many developed countries, healthcare spending accounts for more than 10% of Gross Domestic Product (GDP), and this figure is rising as populations age and as demand for more sophisticated medical treatments increases. This substantial investment in healthcare is not just a cost but also a critical driver of economic activity. The healthcare sector generates millions of jobs, from healthcare providers to support staff, and also stimulates demand for pharmaceuticals, medical devices, and related services. Moreover, the sector's extensive supply chains create ripple effects across the economy, supporting industries such as manufacturing, technology, and research.

However, the economic impact of healthcare systems is not solely positive. Rising healthcare costs pose significant challenges for both individuals and governments. High costs can lead to disparities in access to care, with economically disadvantaged populations often facing barriers to obtaining necessary medical services. This in turn can exacerbate health inequities, leading to poorer health outcomes and increased long-term healthcare costs. For governments, escalating healthcare expenditures can strain public finances, limiting resources available for other critical areas such as education, infrastructure, and social services. Thus, managing healthcare costs while ensuring equitable access to high-quality care is a central challenge for policymakers.

The Importance and Relationship Between Economics and Medicine: The interplay between economics and medicine is a crucial area of study that illuminates how healthcare systems, medical innovation, and public health policies can shape the economic health of nations. This relationship is characterized by a complex, bidirectional influence where economic forces drive medical advancements and healthcare delivery, while medical progress, in turn, stimulates economic growth and development. Understanding this intricate relationship is essential for policymakers, healthcare professionals, and economists to create sustainable healthcare systems that not only improve health outcomes but also contribute to broader economic prosperity.

Medicine as an Engine of Economic Growth

Medicine plays a pivotal role in driving economic growth through its contributions to workforce productivity, innovation, and technological advancement. Healthy populations are more productive, as they are less likely to miss work due to illness and more likely to engage fully in their professional and personal lives. This, in turn, contributes to higher levels of economic output and growth. Additionally, investments in public health and preventative medicine can

reduce the incidence of chronic diseases and other health conditions that often lead to significant economic burdens. By improving population health, countries can achieve more sustainable economic growth and reduce the long-term costs associated with healthcare.

Moreover, the field of medicine is a significant driver of innovation. The development of new treatments, drugs, and medical technologies not only improves health outcomes but also stimulates economic activity. Pharmaceutical companies, medical device manufacturers, and biotech firms invest heavily in research and development (R&D), leading to the creation of new products and services that can be exported globally. This innovation creates high-paying jobs, generates intellectual property, and fosters the growth of new industries. Additionally, the commercialization of medical innovations often leads to the formation of spin-off companies and new business ventures, further contributing to economic dynamism.

The Role of Health Literacy in Economic and Health Outcomes

Health literacy, or the ability of individuals to understand and use health information to make informed decisions about their health, is a critical factor that influences both health and economic outcomes. Poor health literacy is associated with higher rates of hospitalization, greater use of emergency services, and lower levels of preventive care, all of which contribute to higher healthcare costs. Individuals with low health literacy are also less likely to adhere to prescribed treatments and more likely to experience poor health outcomes, which can further strain healthcare systems and reduce workforce productivity.

The economic costs of poor health literacy are substantial. For individuals, it can lead to increased out-of-pocket expenses for healthcare, lost income due to illness, and diminished quality of life. For society, poor health literacy can result in higher public health expenditures, reduced economic productivity, and increased social welfare costs. Addressing health literacy through education and public health initiatives is therefore essential not only for improving individual health outcomes but also for enhancing the overall economic well-being of communities.

The Economic Implications of Medication Compliance: Medication compliance, or the extent to which patients follow their prescribed treatment regimens, is another critical factor that has significant economic implications. Non-compliance with medication regimens can lead to poorer health outcomes, including increased morbidity and mortality, which in turn can result in higher healthcare costs. For example, patients who do not take their medications, for a multitude of reasons, as prescribed may experience complications that require hospitalization or additional medical interventions, leading to increased costs for both individuals and healthcare systems.

The economic impact of non-compliance is not limited to direct healthcare costs. It also affects productivity, as patients who manage their health conditions effectively are more likely to miss work or perform poorly while at work. This can lead to lost income for individuals and reduced economic output for businesses and society as a whole. Furthermore, non-compliance can have

broader social and economic effects, such as increasing the burden on caregivers, reducing the quality of life for patients and their families, and straining public health resources.

Improving medication compliance is therefore an important goal for both healthcare providers and policymakers. Strategies to enhance compliance include both patient and medical professional education, simplified treatment regimens, and the use of technology to monitor and support adherence. By improving compliance, healthcare systems can reduce costs, minimise the deterioration of patients, improve health outcomes, and enhance the overall economic well-being of society.

The Challenges of Large Families and Healthcare Economics : The size of families also has significant implications for healthcare economics. Large families, particularly in low-income settings, can face numerous health challenges, including limited access to healthcare services, inadequate nutrition, and higher rates of maternal and child mortality. These challenges are compounded by the economic pressures associated with supporting a large number of dependents on limited resources.

For healthcare systems, large families can increase demand for services, particularly maternal and child health services, which can strain public health resources. In many low- and middle-income countries, the high fertility rates associated with large families can lead to overburdened healthcare systems, making it difficult to provide adequate care for all individuals. This can result in poorer health outcomes and higher long-term healthcare costs, as untreated or poorly managed health conditions become more severe.

From an economic perspective, large families can also impact educational attainment and workforce participation. Children from large families may have fewer opportunities for education and may enter the workforce earlier, often in lower-paying jobs. This can perpetuate cycles of poverty and limit economic mobility, further exacerbating the economic challenges associated with large families.

Addressing the healthcare and economic challenges associated with large families requires comprehensive strategies that include access to family planning services, education, and economic support. By reducing the health and economic burdens of large families, countries can improve health outcomes, enhance economic productivity, and promote sustainable development.

As a result, The relationship between economics and medicine is multifaceted and deeply intertwined, with significant implications for both health and economic outcomes. Healthcare systems are major economic drivers, contributing to job creation, innovation, and economic growth, but they also pose challenges in terms of rising costs and access disparities. Medicine plays a critical role in improving population health, which is essential for sustained economic productivity and growth. However, issues such as poor health literacy, medication non-compliance, and the challenges of large families highlight the complexities and challenges that must be addressed to fully realize the economic benefits of medical advancements.

Understanding the importance of the relationship between economics and medicine is crucial for policymakers, healthcare professionals, and economists. By developing strategies that promote equitable access to healthcare, improve health literacy, and support medication compliance, countries can enhance both health outcomes and economic prosperity. Ultimately, the goal is to create healthcare systems that not only save lives but also contribute to the broader economic and social well-being of nations.

Challenges Caused by Large Families in a Country's Economy and Medicine

Large families present unique challenges to both the economy and healthcare systems, particularly in low- and middle-income countries where resources are often limited. These challenges are multifaceted and can have long-lasting impacts on both individual family members and the broader society.

Economically, large families often face significant financial strain, as resources must be divided among more dependents. This can result in lower per capita income, reduced access to education and healthcare, and higher rates of poverty. Children from large families are more likely to enter the workforce at a younger age, often in lower-paying jobs, which limits their economic mobility and perpetuates cycles of poverty. This can have a ripple effect on the economy, as lower educational attainment and workforce participation reduce overall economic productivity and growth.

In terms of healthcare, large families can increase the demand for medical services, particularly maternal and child health services. This can strain public health resources, especially in countries with high fertility rates and limited healthcare infrastructure. In many cases, healthcare systems may be unable to provide adequate care for all family members, leading to higher rates of maternal and child mortality, malnutrition, and communicable diseases. These health challenges can further exacerbate the economic burdens faced by large families, as poor health outcomes often result in higher medical costs and reduced income-earning potential.

Moreover, large families can create challenges for healthcare delivery by increasing the demand for services beyond the capacity of healthcare systems. For example, in areas with high fertility rates, healthcare facilities may be overwhelmed by the number of patients, leading to longer wait times, reduced quality of care, and greater difficulty in managing public health initiatives. This can result in poorer health outcomes for all individuals in the community, not just those from large families.

From a policy perspective, addressing the challenges posed by large families requires a multifaceted approach. Family planning services are essential for helping families manage their size and spacing of children, which can improve health outcomes and reduce economic burdens. In addition, education and economic support programs can help large families achieve better health and economic outcomes by increasing access to healthcare and improving educational opportunities for children. By addressing these challenges, countries can improve both health outcomes and economic productivity, contributing to more sustainable development.

Costs Associated with Translators' Medical Campaigns

Translators' medical campaigns, particularly in multilingual or multicultural settings, are crucial for bridging communication gaps between healthcare providers and patients. These campaigns are essential in ensuring that individuals who do not speak the dominant language of a region can still access and benefit from healthcare services. However, the implementation of these campaigns incurs significant costs that can impact healthcare budgets and resource allocation.

The costs associated with translators' medical campaigns are multifaceted, involving direct expenses such as hiring and training professional medical translators, producing multilingual educational materials, and investing in translation technologies. Hiring professional translators, who have language skills and medical knowledge, is expensive but necessary to ensure accurate and effective communication in healthcare settings. Inaccurate translations can lead to misdiagnoses, incorrect treatments, and ultimately poorer health outcomes, which may increase healthcare costs in the long run.

In addition to direct costs, there are also indirect costs associated with translators' medical campaigns. These include the time and resources required to integrate translation services into existing healthcare frameworks. For example, healthcare facilities may need to adjust their workflows to accommodate the time needed for translations during patient consultations, which can reduce the number of patients seen in a day and thereby lower the overall efficiency of healthcare delivery.

Moreover, the costs of translators' medical campaigns can vary significantly depending on the region's linguistic diversity and the healthcare system's existing infrastructure. In areas with high linguistic diversity, the demand for translation services is greater, leading to higher costs. Conversely, in regions with less diversity or where there is a more homogeneous population, these costs may be lower but still present challenges in ensuring that minority language speakers receive equitable care.

Despite these costs, the benefits of translators' medical campaigns are substantial. By improving communication between healthcare providers and patients, these campaigns can lead to better health outcomes, increased patient satisfaction, and more efficient use of healthcare resources. Ultimately, the investment in translators' medical campaigns can be justified by the long-term savings associated with improved health outcomes and reduced need for costly interventions due to miscommunication.

Economic Impact of Poor Health Literacy

Health literacy, defined as the capacity to obtain, process, and understand basic health information and services to make appropriate health decisions, is a critical determinant of health outcomes and healthcare costs. Poor health literacy is a widespread issue that poses significant economic challenges for both individuals and healthcare systems.

Individuals with poor health literacy are more likely to experience difficulties in navigating the healthcare system, understanding medical instructions, and managing chronic conditions. This

often results in higher rates of hospitalization, increased use of emergency services, and lower uptake of preventive care. These factors contribute to increased healthcare costs, both for individuals and for the broader healthcare system.

For individuals, the economic impact of poor health literacy is reflected in higher out-of-pocket healthcare expenses, lost income due to illness, and reduced quality of life. For instance, individuals with low health literacy may not fully understand their insurance benefits, leading to inadequate coverage and higher personal expenses. They are also more likely to miss work or be less productive due to poorly managed health conditions, which further exacerbates their economic burden.

From a broader perspective, poor health literacy can strain public health resources and increase national healthcare expenditures. According to research, the additional costs associated with low health literacy in the United States alone are estimated to be in the range of hundreds of billions of dollars annually. These costs are attributed to the increased need for medical interventions, longer hospital stays, and the greater use of emergency services that could otherwise be avoided with better health literacy.

Moreover, poor health literacy can hinder the effectiveness of public health initiatives, such as vaccination campaigns and chronic disease management programs. If individuals do not understand the importance of these initiatives or how to participate in them, their impact is diminished, leading to higher healthcare costs and poorer population health outcomes. This, in turn, affects the economy by reducing workforce productivity and increasing social welfare costs.

Addressing poor health literacy requires targeted interventions, including education campaigns, simplified health communication strategies, and the use of technology to improve access to health information. By improving health literacy, healthcare systems can reduce costs, improve health outcomes, and enhance overall economic productivity.

The Importance of Medication Adherence in Minimizing Disease and Improving Health Outcomes

Medication adherence, or the extent to which patients take their medications as prescribed, is a critical factor in managing chronic diseases and improving overall health outcomes. Non-adherence to medication regimens is a widespread issue that can have serious consequences for both individual patients and healthcare systems.

For individual patients, non-adherence can lead to poorer health outcomes, including increased disease progression, higher rates of hospitalization, and greater risk of complications. For example, patients with chronic conditions such as diabetes or hypertension who do not adhere to their medication regimens are more likely to experience severe complications, such as heart attacks or strokes, which can result in long-term disability or death. These poor health outcomes not only affect patients' quality of life but also increase their healthcare costs, as more intensive medical interventions are often required to manage complications.

Non-adherence to medication regimens also has significant economic implications for healthcare systems. It is estimated that in the United States, the cost of non-adherence to medications is over \$100 billion annually, primarily due to increased hospitalizations, additional doctor visits, and the need for more expensive treatments. This economic burden is not limited to the United States; non-adherence is a global issue that affects healthcare systems worldwide.

Several factors contribute to non-adherence, including the complexity of medication regimens, side effects, lack of understanding of the importance of the medication, and financial barriers. Addressing these factors requires a comprehensive approach that includes patient education, simplified treatment regimens, and support systems to help patients manage their medications effectively.

One effective strategy for improving medication adherence is the use of technology, such as electronic reminders, apps, and automated refill systems, to help patients remember to take their medications. Additionally, involving patients in decision-making about their treatment plans can increase their understanding of the importance of adherence and improve their motivation to stick to their regimens. Healthcare providers can also play a critical role by regularly reviewing patients' medications, using appropriate language when explaining treatments, and addressing any concerns or barriers to adherence.

Improving medication adherence is essential for minimizing disease progression, reducing healthcare costs, and improving overall health outcomes. By focusing on strategies to enhance adherence, healthcare systems can achieve better patient outcomes, reduce the economic burden of chronic diseases, and improve the efficiency of healthcare delivery.

Conclusion: The interplay between economics and medicine is a complex and multifaceted relationship that has profound implications for individuals, healthcare systems, and societies. Translators' medical campaigns, health literacy, large families, and medication adherence are just a few examples of the many factors that influence both health outcomes and economic productivity. Understanding these relationships is essential for developing policies and strategies that promote equitable access to healthcare, improve health outcomes, and enhance economic prosperity. By addressing the challenges associated with these factors, countries can build more sustainable healthcare systems that not only save lives but also contribute to broader economic and social well-being.

The interdependence between economics and medicine is a fundamental aspect of national development, where each plays a pivotal role in shaping the other. The economic underpinnings of medicine are evident in the significant investments required to build robust healthcare systems, drive medical research, and ensure the equitable distribution of healthcare services. These investments, while substantial, yield profound returns by fostering healthier populations, which in turn enhance workforce productivity, reduce long-term healthcare costs, and stimulate overall economic growth. The role of economics in medicine is thus essential in determining

the allocation of resources, prioritizing healthcare initiatives, and ensuring that advancements in medical science translate into tangible health outcomes for the population.

Conversely, the importance of medicine in economics cannot be overstated. Medicine contributes directly to economic stability and growth by ensuring that populations are healthy enough to participate actively in the labor market. Healthy individuals are more likely to contribute effectively to economic activities, leading to increased productivity and innovation. As the world's population ages, it is imperative to sustain and nurture the relationship between the economy and medicine, as healthier individuals contribute to a happier and more productive workforce, and the medical sector itself remains a significant economic driver that must be continuously supported and developed.

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ACCOUNTABILITY AND PERFORMANCE AS SOCIAL RESPONSIBILITY OF THE PUBLIC ADMINISTRATION: A PROPOSAL FOR CAPACITY BUILDING

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ABSTRACT

The present paper provides a critical analysis of the correlation between accountability and the performance of the public administration. The current work establishes a theoretical framework for understanding the link between building the right capacities for accountability and performance within the context of the principal-agent dynamic, emphasizing the necessity for performance to be subject to a transparent system of accountability between the public administration and the citizen, who is the recipient of public services. Following the identification of this theoretical framework, the discourse delves into the concept of performance, initially aiming to elucidate its broad and varied implications through a comprehensive analysis of secondary data. Results revealed that performance metrics, rather than being unequivocal and objective, frequently lack precision, necessitating a meticulous and expert evaluation process. Subsequently, the paper highlights service quality as a crucial aspect of performance that is most conducive to forming the basis of the accountability relationship between the agent (public administration) and the principal (citizen/user). The development of a Citizen's Rights Charter in the National Policies emerges as the tool capable of translating the theoretical proposition into practical reality. The contribution concludes with a series of practical recommendations underscoring the significance of the role played by the creation of the Independent Performance Evaluation Body in fostering participatory approaches to fully realizing the principle of transparency.

Keywords: accountability, performance, Citizens' Rights Charter, Independent Performance Evaluation Body, public administration

Introduction

Accountability in public service was introduced a very long time ago when famous Greek philosophers such as Aristotle, Plato, and Zeno first discussed accountability in the context of judgment, punishment, and social control (McGrawth & Whitty,2018). In modern times, accountability has been the subject of discussion for many disciplines including economics, law, politics, healthcare, and psychology as well as behavior. organizational behavior (Gray et al.,2015; Scholte,2004). Accountability means the nature or sense of responsibility towards a person or something for the actions or decisions that have been made and the willingness to provide the necessary explanation. Kearns (1996) defines accountability as a mechanism for individuals holding the highest level of authority within an organization to oversee and ensure

optimal job performance by directing employees. The significance of accountability lies in guaranteeing that tasks are executed to meet predetermined objectives while minimizing resource wastage. The principle of accountability stands as a crucial component within the realm of public administration, serving as a safeguard for civil servants against involvement in behaviors that run counter to the ethical standards expected of them. Adhering to accountability practices in work execution is key to ensuring that the allocation of resources to Government agencies for program, activity, or project development aligns with plans and maximizes returns on investment. Failure to uphold accountability principles within public administration can lead to detrimental consequences (McGavey,2001). Governmental bodies are consistently confronted with various internal and external threats that have the potential to impact performance, productivity, and organizational longevity (Bovens,2010). In this context, the Albanian government has instituted enforcement laws aimed at cultivating a culture of accountability among civil servants, like Law 38/2016 for the Integrity of Civil Servants (see Law 38/2016). Creating a Governmental accountability system will enhance the caliber of work performed by government officials and guarantee the effective and systematic allocation of public funds, while also aligning with existing laws, protocols, and guidelines. The current paper aims to provide a thorough examination of the accountability, performance, and social responsibility of public administration servants in Albania. The rationale for selecting this focus is rooted in the country's efforts to become a member of the European Community. One of the predominant issues highlighted in various scientific studies and reports from EU institutions regards the pervasive corruption and accountability challenges within the realm of Public Administration.

LITERATURE REVIEW

The concept of public accountability specifically refers to the assertion that the public possesses a "right to information" or the entitlement to access trustworthy data from the government (Zakaaria et al.,2013; Pablos et al., 2002). This accountability concept materializes when one entity is tasked with disclosing decisions and activities to another entity (Hasan et al.,2022). Hence, accountability is established when the agent is entrusted with resources and duties by the principal (Hasan et al.,2022; Kluvers & Tippett, 2010). The accountability dynamic in the public domain has indirectly positioned the public as beneficiaries of the information and services provided by the government (Binkerhoff,2017). Therefore, the public holds the privilege of being informed about the utilization and administration of these financial resources by the government (Perez et al., 2005). The public is keen on acquiring information that facilitates their evaluation of the current performance and financial status of the government. Therefore, the government must enhance transparency in providing necessary information to the public (Perez et al.,2005). This obligation is crucial to uphold, serving as a fundamental aspect in demonstrating their answerability to the governance of society. The concept of accountability encompasses a wide array of meanings that vary depending on the specific circumstances and contexts. In the traditional sense, accountability is commonly understood as an inherent connection between the entities involved in conducting and receiving a particular

operation (Roberts and Scapens,2005). From an organizational viewpoint, Shahul (2000) contends that organizational accountability transcends mere adherence to the effective, efficient, and economical (3E) utilization of resources, extending to the avoidance of any form of resource misuse. Consequently, the individuals responsible must be prepared to elucidate their actions to those entitled to such information. Moreover, accountability is intricately linked with power dynamics, as power can be delegated while responsibility remains non-transferable. Hence, managers are liable for the decisions and behaviors of their subordinates. Accountability is intricately linked to the principle of individual responsibility. Within the broader scope of accountability, a sense of responsibility must be present and instilled in all individuals entrusted with carrying out tasks (Gray et al.,2015). Tasks must be executed flawlessly and ethically, devoid of any forms of deceit, corruption, unfairness, betrayal, and the like. Should any negative aspects arise during task execution, even if the outcome is deemed satisfactory, there will be no personal gain. Instead, repercussions corresponding to the wrongful actions committed will ensue. In the field of public administration, accountability entails the duty of officials to elucidate their decisions and actions to those entitled to receive such clarifications. Accountability can be categorized as vertical, requiring civil servants to answer both their superiors and the government. Nevertheless, contemporary interpretations of accountability extend this obligation to encompass responsibilities beyond traditional boundaries while discharging duties. Hence, accountability within any public sector organization stipulates that officials demonstrate unwavering commitment and responsibility by ethical values, prevailing laws, and regulations. This is also supported by Jones and Pendlebury (2000), advocating for effective, efficient, and economical management of public resources (3E). The British Account Ability 1000 model is among the most well-established models in the literature. Introduced by the Institute of Social and Ethical Accountability (ISEA) in 1999, this model is recognized as a foundational standard providing guidelines for social and ethical accounting, auditing, and reporting (Beckett & Jonker,2002). The principles and phases outlined in the model are influenced by the establishment and cultivation of relationships with stakeholders. Rather than being viewed as a static goal, the standard marks the initiation of a process that evolves dynamically in response to the changing dynamics of companies and their operating environment. It is designed as a framework for continuous enhancement focused on engaging stakeholders across various types of organizations, including public, private for-profit, and non-profit entities. The Account Ability 1000 model includes the foundation standard which outlines the essential principles and phases of the social reporting process, along with guidelines covering auditing and quality assurance, stakeholder engagement, and accountability assessment. Additionally, it specifies the requirements for obtaining the necessary "professional qualifications" to ensure competence and ethical conduct in accounting, reporting, and auditing practices. The model delineates distinct phases based on a set of core principles to uphold the quality and ethical standards throughout the accounting, reporting, and auditing procedures. The table below provides a summary of the key elements.

Table 1. Key components of the Account Ability framework.

STEPS OF THE PROCESS	PRINCIPLES
<ul style="list-style-type: none"> • Planning • Accounting • Auditing and reporting • Embedding (internalization of the process in the company system) • Stakeholder engagement (involvement of stakeholders in the reporting process with a view to continuous improvement). 	<ul style="list-style-type: none"> • Accountability (the basic principle from which all the following derive) • Inclusiveness • Completeness • Comparability • Quality of information • Regularity and timeliness • Communication • External verification • Integration into management systems • Continuous improvement

Source: Author elaboration

Public Sector Management

Public sector administration is frequently linked with the state or government due to the public sector being the segment of a nation's economy that is state-owned or controlled (Binkerhoff,2017). Public entities focus on executing governmental tasks and overseeing the public's affairs. A crucial defining aspect of the public sector is the inherent "publicness" of its operations, with the term "public" being associated with general society. Government activities and the services it delivers unequivocally fall within the public sphere, making public service synonymous with the public sector. This sector encompasses governmental bodies entrusted with managing any government-related operations, intricately tied to the administration of state or governmental matters (Kluvers& Tippett,2010). Management, in this context, regards the efficient allocation of resources (human, financial, material) to achieve predetermined objectives. Public sector management involves endeavors aimed at fulfilling public interests rather than individual ones. Operating as an entity of the state or government, the public sector invariably functions within a political framework. Managing public administration involves implementing optimal techniques, principles, and methodologies commonly utilized in the business sector. Public administration, being a vast entity, requires a systematic approach to function effectively. By incorporating successful management principles from the private sector into public organizations, there is a chance to enhance their efficiency, effectiveness, and accountability, mirroring the traits of private enterprises. This integration can bolster the administrative capabilities, ensure better adherence to legal regulations, and elevate the standard of public service delivery.

The significance of public administration in government

Governance is based on a social contract with individuals to protect their rights (Pattaro et al.,2022). To fulfill this contract, it focuses on public administration, which is described as "*the body authorized by law to implement governmental policies and duties in the public sphere*". The concept of public administration emphasizes "*the structure and operation of public bureaucracies and organizations, including financial management, personnel administration, and internal formal and informal oversight mechanisms. Initially (and notably influenced by Prussian academics), public administration was seen as a subset of administrative law*" (Demmke and Moilanen, 2012). Public administration encompasses the organizational structure of government, including the institutions and interactions that support the work of public servants. Despite the common perception of public administration as synonymous with bureaucracy, it is important to recognize the unique nature of bureaucracy as a distinct organizational form that is not only confined to the governmental sphere. Selepe et al. (2023) argued that although public administration should be separate from politics, with decision-making authority and policy formulation being the primary focus, they are often interrelated and complement each other. In the context of contemporary Albanian administration, maintaining administrative autonomy from political interference is crucial. Even though the Albanian public context is influenced by politics, public administration necessitates its integration into the political landscape, distinguishing it from private or business administration.

Measuring the performance of public service and administration

The effectiveness of public administration services is contingent upon the sector operating at an optimal level. Various factors influence the quality of performance within public institutions, including individual performance, the implementation of public policies, adherence to human rights, compliance with legal frameworks, and cost-effectiveness. Institutional performance is deemed satisfactory when public funds are utilized efficiently (Van Dooren et al.,2012; Rosenbloom,1983). Individual performance is crucial in ensuring that services are delivered effectively to citizens. Professionalism and skills exhibited by employees directly impact the quality of service provided. Motivating employees through confidence, job security, competitive wages, and opportunities for career advancement is essential for achieving high-performance levels (Cuccurullo et al.2016). Performance evaluation serves as a mechanism to assess the quality of work carried out by employees. Gao (2015) suggests that performance appraisal should recognize employees' contributions toward achieving set objectives. Establishing performance standards collaboratively between employees and supervisors is also recommended. Performance efficiency is enhanced through consistent and periodic measurement rather than over long periods (Gao,2015; Askim,2009). Regular measurement allows for the identification and correction of employee mistakes, leading to improved work quality. Performance measurement is crucial in identifying individual priorities, weaknesses, and areas for improvement (Gao,2015). The public sector in the early 1990s saw a growing

emphasis on performance evaluation in Albania. Governments in developed countries began prioritizing performance measurement as a key aspect of public management reform. In Albania, individual work assessment and performance measurement in the public sector were introduced following the approval of civil servant status in 1999. The law mandated the development of sub-legal acts for evaluating individual work results in all public administration institutions. Since 2014, civil servant performance assessments have been conducted biannually, allowing for prompt feedback to address poor performance. However, individual performance growth is not solely achieved by the employee, as organizational support is essential. High individual performance is linked to task and objective fulfillment, which are aligned with organizational goals. The authors such as Gao (2015) and Baimyrzaeva (2011) emphasize the importance of the organization's support in public administration success.

Social responsibility of the public administration

The recognition of the necessity for public administration social responsibility, along with the discussions it has sparked across various levels, has displayed a notable evolution over the years (Dhameja,2016). Bowen (1953) is widely acknowledged as the pioneering work of social responsibility, emphasizing the dual significance of firms' economic objectives and their associated social repercussions. The term Corporate Social Responsibility (CSR) carries an abstract nature that varies depending on factors such as the historical context, relevant theories, disciplinary backgrounds of the authors, internal or external perspectives considered, specific attributes of adopting companies, and the socio-economic environment of the country in which it is implemented. The processes, rationales, and principles of social disclosure are distinctive for each corporation; however, commonalities can be discerned among them concerning comparable categories of corporations. Public institutions possess a high level of intricacy due to numerous factors. They aim to fulfill the requirements of the community, interpreted both collectively (common needs) and from the perspective of individual citizens (individual needs) (Ali et al.,2017; Dhameja,2016; Dahlsrud,2008; Jamail,2007). This objective embodies a general significance that requires translation into specific goals, and the alignment of these objectives with the activities executed by the institution is the responsibility of those tasked with governing the organization and all individuals engaged in various roles. The economic identity of a public institution is public and is represented by management, politicians, and citizens in three roles: as funders (via the tax system), as service users/recipients, and as individuals with voting rights (Ali et al.,2017). Management is responsible for steering the public institution by the values and objectives articulated in the mission, striving to maintain a continuous equilibrium with the expectations articulated at the political level and the demands of citizens. It is evident that diverse needs are not always aligned, making it challenging to correlate the processes and services provided with the established goals to harmonize the various interests, especially in developing countries (Dahlsrud,2008). Citizens are provided with the opportunity to articulate their unfavorable views regarding the institution's performance, either directly through tools for measuring customer satisfaction or through methods such as protests, petitions, and demonstrations in serious matters. The concept of

consensus wields significant influence over political decisions and the management of public entities, all while aiming to promote collective well-being (Ali et al.,2017; Dahlsrud,2008). A variety of other parties are involved in public institutions, including but not limited to human resources, suppliers, client organizations, beneficiaries of public institution activities, creditors, other national or supranational entities, and the environment. The intricate nature of the products and services provided, characterized by a strong social component, the complexities of production and supply processes, and the multi-faceted nature of outcomes, as well as the challenges in assessing the efficiency, effectiveness, and cost-effectiveness of public institutions, all contribute to the intricacy of the reporting process (Sánchez-Torné et al.,2020; Buertly et al.,2019; Javed et al.,2019; Boccia& Sarnacchiaro,2017). This in turn leads to an escalating demand for social reporting, enabling diverse stakeholders to comprehend the accomplishments made, compare them against the established objectives, and make informed judgments.

The current study

Methodology

Purpose

This paper seeks to assess the viewpoints of government officials in the public sector of Albania regarding the factors that impact their efficiency within the organization.

Hypothesis

The following hypotheses were raised in assessing the relationship between experience and performance and training and performance of the civil servants in Albania.

H₁: There is a relationship between the work experience of the civil servant and his performance.

H₂: There is a relationship between training programs and the degree of efficiency in civil servants.

Instrument

The examination will be conducted utilizing empirical data gathered from a survey involving civil servants in seven different line ministries. The data acquired consist of self-assessment tools, designed to assess the perceptions of civil servants regarding the indicators outlined in the questionnaire, aiding in addressing the research question: *What impact do, work experience, training, and performance evaluations have on the performance of civil servants?* The analysis focuses on the civil servant and the variables influencing their performance. It entails statistical description and the identification of relationships between variables. The questionnaire, comprising twenty-four questions, was developed by the author based on literature related to public administration and management in Albania. Instead of opting for a pre-existing questionnaire from the literature, a tailored questionnaire was deemed more suitable, considering the specifics of the Albanian context. The processing of the questionnaires yielded

three hundred data points. The questionnaire consists of seven questions collecting general survey data and data relevant to the study's focus. It includes fourteen closed questions and ten semi-open questions. Five questions prompt respondents to provide details for their responses; three questions require explanations for the answers provided; and two questions offer an "Other" option for alternative responses. Additionally, a Likert scale with five points is utilized in three questions. The questionnaire underwent testing in December 2024 with a pilot-participation of twenty civil servants. Enhancements to the questions were made based on feedback from the administrative staff and participants. Adjustments were focused on the fundamental data concerning civil servant status and inquiries related to training. The author supervised the distribution and collection of the questionnaires. The analysis time covers the administrative year 2023-2024, encompassing the distribution and retrieval of questionnaires throughout 2023.

Sample

The examination focuses on civil servants within the central administration system. Specifically, the actual civil servants in a total of 1,658 civil servants within the facility, comprising 574 open positions and 1,084 active civil servants were utilized. Across the seven ministries, there were 104 open positions (16%) and 156 civil servants on probation (29%). The Ministry of Education and Sport (MAS) had the highest vacancy rate at 22%. The absence of civil servants within the structure is perceived by management as a hindrance to achieving goals and enhancing institutional performance. The sample selection process was stratified based on gender (male/female) and employment status (active civil servant/probationary civil servant). Sample size determination was conducted with a confidence level of 95% and a margin of error of 5%, where $e = 5\% = 0.05$. A total of three hundred civilian employees and probationary civilian workers were included in the sample for analysis.

Results

a. Descriptive analysis of demographic variables

From a demographic standpoint, 68% of individuals employed in civil service are female. The age group ranging from 41 to 50 years old constitutes the highest proportion of civil servants at 35%. Furthermore, it is noted that 78% occupy positions as executive specialists. Additionally, 74% of civil servants have attained confirmed status within their roles. A fraction of 24% has been employed at the institution for less than a year, while 16% have had less than a year of experience specifically in civil service. Examination of the data reveals that a quarter of the civil servants included in the survey are currently undergoing a testing phase, aligning with having less than a year of experience in the civil service domain. Interestingly, the disparity between tenure at the institution and in civil service is minimal, indicating that most of these individuals have not undergone turnover, transfer, or movement from one organization to another. The data further illustrates that the largest percentage of civil servants, amounting to 28.8%, possess work experience ranging from 1 to 5 years.

b. Statistical analysis

Table 2. Pearson Correlations for Pre-Training Meetings and Training Efficiency

		Do you have a meeting with your managers to discuss your training needs?	How effective was your training in your professional development?
Do you have a meeting with your managers to discuss your training needs?	Pearson Correlation	1	.220**
	Sig. (2-tailed)		.000
	N	300	300
How effective was your training in your professional development?	Pearson Correlations	.220**	1
	Sig (2-tailed)	.000	
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Pearson correlations $r = .220$. The two-way statistical significance is $.000 < 0.01$. The correlation between the development of civil servants' meetings with direct superiors and the effectiveness of the training is poorly positive, but statistically significant at a level of 0.01. The determining coefficient $r^2 = .049$ indicates that 4.9% of the effectiveness variations of training are explained by the variation of the development of meetings with superiors directly before any training. The contingency coefficient shows that 95.3% are other factors that affect the effectiveness of training for civil servants.

Table 3. Pearson Correlations for Training Programs and Effectiveness

		What is your opinion on these programs?	How effective was your training in your professional development?
What is your opinion on these programs?	Pearson Correlation	1	.620**
	Sig. (2-tailed)		.000
	N	300	300

How effective was your training in your professional development?	Pearson Correlations	.620**	1
	Sig (2-tailed)	.000	
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Pearson correlations of Table 3 reveal a value of $r = .620$ with a two-way statistical significance $= .000 < 0.01$. The correlation between programs and training effectiveness is moderately positive and statistically significant at a level of 0.01. The determining coefficient $r^2 = 0.357$ (.620) indicates that 35.7% of the effectiveness variations of training are explained by program variation. The contingency coefficient decreases, and it indicates that 64.3% are other factors that affect the effectiveness of training for civil servants.

Conclusive remarks

The current paper aims to give a comprehensive view of the public administration, resources, and factors that influence its development. Albania in the early 1990s inherited a centralized system where state control prevailed and institutional autonomy was lacking. This situation led to uncertainties regarding the new roles that the state and public institutions should assume in the nation's progress. The reform of public administration commenced with its adjustment to the evolving political, economic, and social landscape. This transformation unfolded along three main avenues: (i) the reorganization of public entities based on their functions; (ii) the redefinition of the public servant role to align with the country's new circumstances; (iii) the enactment of legislation to facilitate the updated functions of public administration. Despite efforts towards Reforming Public Administration (RAP), both theoretical and empirical assessments revealed that public institutions have yet to achieve the desired standards. The execution of public policies remains incomplete, deviating from projections, while the performance of civil servants necessitates enhancement in various aspects: Although the formal education level of civil servants is high according to available data, their qualifications in public administration are inadequate. Moreover, experience has little impact on the professional growth and efficiency of civil servants in the field of Information and Communication Technology (ICT), as a quarter of them have less than a year of service, and another quarter possess 1-5 years of experience in civil service. The relationship with superiors is crucial for identifying training needs and conducting objective performance evaluations, emphasizing the importance of adhering to meritocracy in recruitment, career progression, performance-related rewards, and disciplinary actions (such as dismissal) by the law. It is also essential to provide relevant training and conduct performance assessments based on professional criteria, free from biases. While the system allows for diverse individuals to join civil service, considering it a profession suggests the necessity of making medium to long-term investments in public administration to cultivate skilled and competent civil servants who can meet the demands of the market. This process should begin by investing in universities, fostering the development

of students studying public administration, and integrating them into the long-term vision for public administration reform. The choice of specialization at the educational level marks the initial phase of the career trajectory, encompassing meticulous planning for an empowered employee of the future.

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INNOVATION AND CREATIVITY AS ANTECEDENTS DENOMINATIVES OF THE ORGANIZATIONAL DEVELOPMENT

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ABSTRACT

In recent years, the idea that innovation and creativity are decisive factors for the effectiveness and survival of organizations has been strengthened. In response to the increasing emphasis on creativity and innovation, the interest of economic, psychological, and social disciplines in the study of innovation has grown enormously in recent years at the level of scientific research, and the range of studies on innovation processes and the implementation of ideas has continued to progressively increase. Since these premises, the present research has analyzed through a mixed methodology the relationships between some antecedents of innovation identified in the literature and innovative behavior, aiming to address at least some of the above-mentioned aspects. Results of the literature review revealed that in fact, the three phases of innovative behaviors (generation, promotion, and implementation of ideas) have distinctive characteristics and for this reason it is plausible to assume that the factors and/or the weight of the factors change according to the phase considered. In particular, the idea generation stage is the most creative stage and in it the individual components of innovative behavior are predominant, while the other two phases, the promotion and implementation of ideas, constitute the implementation component of innovative behavior and in them the relational and organizational aspects of innovative behavior are predominant. When studying the role of motivation at work in innovative behavior, the intent to deepen the knowledge of the economic processes underlying the relationship between antecedents and innovative behavior is revealed. As a conclusive finding, literature review revealed that influenced by the individual's inclination to resist change, particularly through established routines, while situational factors like relationship conflicts and performance play a crucial role in the other phases of innovative behavior. An intriguing finding is also that the level of resistance to change can moderate the connection between innovation orientation and actual innovative actions. Research findings also revealed that the applicability of Self-Determination, the relationship between precursors and innovative behavior are contingent upon the specific stage of innovative behavior being examined.

Keywords: Innovation, Creativity, Idea Generation Stage, Promotion, Implementation Of Ideas

Introduction

Literature broadly recognizes that companies must prioritize creativity and innovation due to their significant contributions to business growth, brand empowerment, and market expansion (Mumford & Todd,2019). Scholars such as Zhan et al. (2022), Juliana et al. (2021), Mazla et al., (2020), Chang & Chen (2020), and Ballor et al. (2019) acknowledge that creativity and innovation play a crucial role in enhancing business outcomes by reducing costs, ensuring customer satisfaction, and gaining a competitive edge. Consequently, this analytical-descriptive paper aims to evaluate the influence of creativity and innovation on business advancement. Organizations and managers who have yet to integrate these elements into their strategic plans can benefit from the theoretical and practical insights provided in this work. The article seeks to chronicle the progress in creativity and innovation and their impact on business development over time, drawing from a range of sources including advancements, challenges, trends, and viewpoints within the financial sector. Insights from various scholars and experts underscore the essential nature of creativity and innovation in driving business growth within the context of global markets, intense competition, and dynamic financial landscapes. Scholars like Dasgupta (2023), Mazlar et al. (2022), Dani & Gandhi (2021), and Anderson et al., (2014), emphasize how creativity and innovation serve as key drivers for the organization's advancement, fostering productivity and competitiveness through innovative problem-solving approaches across production, logistics, finance, and market challenges. Similarly, the works of authors like Gelaidan et al. (2022), Baccarella et al. (2021), Becker et al. (2011), and Eppler et al. (2011) argue that the integration of creativity and innovation should be intrinsic to the organizational core of all enterprises, irrespective of the nature of their offerings. These strategies facilitate adaptation to the various challenges, competencies, crises, and transformations that firms encounter throughout their establishment, growth, and market positioning. Distinguishing between creativity and innovation lies in the ability to actualize visions, dreams, ideals, utopias, myths, and fantasies. While creativity dwells with imagination, innovation involves the development of changes, dreams, and novel ideals (Mumford & Todd,2019). Transforming dreams into tangible outcomes necessitates the translation of ideas into actionable plans. Innovation entails the creation of novel entities with distinct and unique attributes. The achievement of innovation demands a systematic process rooted in environmental observation, analysis, and the application of creativity to generate fresh ideas. Individuals and organizations engaged in innovation must allocate time, effort, and resources to achieve desired outcomes in various areas such as designs, products, services, or ideologies (Mumford & Todd,2019; Simontov,2000). The process starts with a willingness for change followed by practical implementation within the organizational framework. This intricate procedure involves a cycle of renewal, encompassing both destruction and creation, akin to the cycles observed in individuals' lives. The timing for innovation within organizations is contingent upon the historical development of the company, its contextual positioning, and strategic objectives. Contemporary businesses are compelled to innovate to maintain a competitive edge, emphasizing that innovation should not be pursued merely for the sake of it.

The essence lies in devising distinct ideas, strategies, products, or services that set them apart through originality and forward-thinking. Fear often impedes companies from embracing innovation, with questions arising about the efficacy of current practices. Innovation signifies progress by enhancing value in alignment with cost-benefit considerations. While the innovation journey may be daunting, the primary goal is not to shock or surprise but to foster progress. Organizational readiness and conducive environments play a vital role in fostering a culture that recognizes the necessity for innovation (Simontov,2000). Creativity and innovation are intertwined components, with one relying on the other for optimal outcomes. Effective innovation emerges when creativity is harnessed, and creative ideas push the boundaries of conventional thinking. Furthermore, a propensity for innovation distinguishes visionary leaders and enterprises willing to take calculated risks and prioritize future-oriented strategies. These leaders meticulously evaluate risks to minimize potential errors, harboring a forward-thinking approach that transcends traditional business paradigms. They chart unexplored paths, leaving a legacy that inspires companies seeking success through innovative practices. Essentially, by incorporating creativity and innovation, businesses can implement new production, advertising, and marketing strategies, thereby promoting their development (Gelaidin et al.,2022; Chang & Chen (2020); Acar et al.,2018). To substantiate these claims, the current paper aims to address the fundamental question: *Why are creativity and innovation crucial for business advancement?* This involves examining the underlying factors that support the notion of creativity and innovation as drivers of corporate progress through an analysis of various academic and scientific publications.

Literature review

Creativity

Henri Poincaré Method of Creativity

The stages involved in the process of creativity include (Dei,2022; Miller,1997):

- *The preparation stage* involves the careful selection and identification of the problem, along with the gathering of relevant information.
- The next step involves *working on the collected ideas*, where all materials are processed and refined mentally, akin to a cognitive digestion process.
- Subsequently, during the *Incubation stage*, unconscious processes emerge, leading to solutions in an unpredictable manner. It is crucial to embrace mental relaxation during this phase, allowing for a reduction in rational thinking and fostering creative distractions like music or theater. This facilitates the subconscious digestion of the problem while taking a break.
- *Illumination or inspiration* marks the moment when ideas surface unexpectedly. Ideas manifest when least anticipated, typically after a period of relaxation and diversion following active problem-solving attempts.

- The *verification stage* entails the verification and organization of the creation systematically, shaping the idea for practical implementation. The creator evaluates the creation against logical principles to ensure its coherence and alignment with established objectives. Feedback and criticism from knowledgeable individuals in the field are essential to validate the idea. The product may prove valid or reveal itself as incomplete, potentially requiring further incubation and integration into the creative process (Dei,2022). Dei (2022) also proposes a final stage involving the dissemination and socialization of the creation.

Conditions of creativity

The incorporation of conditions into creative development techniques could enhance the efficiency of these techniques. They include a) *Creativity as a creation of problems*, b) *Creativity as an integrating event*, c) *Creativity as a multiple phenomenon*, and d) *Creativity as a learning event*. Creativity is a variable that can be identified as a process, a product, or a personality characteristic based on tools, techniques, or strategies (Mumford & Todd,2019). However, it is not possible to find in the everyday environment elements related to creativity that are the product of the procedures that claim to increase it, that is, products that are effects of the explicit use of techniques. It is true that from immediate experience the validity of such procedures cannot be denied and that, on the contrary, there is evidence that demonstrates the veracity of the statements. The questioning does not focus on the validity of the above, but on the conditions that can facilitate the impact of creativity development techniques. ***First condition:*** Generating problems is essential for fostering creativity. The capacity to identify, propose, or pose problems is a fundamental prerequisite for creativity. Most existing tools aimed at enhancing creativity do not explicitly address this aspect. Instead, these tools concentrate on offering strategies for solving problems rather than formulating them. Creativity is manifested in the solutions provided, not in their initial origins. The essence of creativity lies in raising original questions that challenge the status quo. Some questions may not be novel, yet they can lead to innovative answers. ***Second condition:*** Creativity is a multifaceted concept encompassing processes, personality traits, and outcomes. Organizations that produce creative works follow specific procedures and exhibit distinct characteristics within their organizations. One challenge is the lack of universal attributes among all creative individuals. Nonetheless, certain factors like intelligence and the emotional intelligence of the staff are commonly associated with creativity. Exceptional intelligence within a particular domain is essential for fostering creativity in that area. Creativity also thrives on qualities such as persistence and determination (Dwivedi et al.,2021). These elements can be equated to motivation, representing a constant driving force towards achieving a goal. Additionally, fluidity, flexibility, elaboration, and originality are crucial components of creativity. Processes like incubation, illumination, and evaluation further contribute to the creative process. To effectively enhance creativity, techniques should comprehensively address all these elements. Therefore, any endeavor to cultivate creativity must consider it as a complex interplay of habits, beliefs, skills, and social influences. Each task aimed at nurturing creativity should target specific habits, skills,

approaches, or ways of concluding tasks. **The third condition** employs multiple creativity. Creativity is manifested in varying forms depending on the staff's capacity. While straightforward, this concept is often overlooked or inadequately addressed. Diverse methods of directing attention exist, with the primary aim being to underscore the necessity of tailoring creativity enhancement strategies to accommodate individual disparities and personal requirements. An essential component involves highlighting the staff's strengths and innate talents and integrating procedures into the strategies that amplify these skills through an understanding of the underlying regulatory processes. **The fourth condition** involves successive approximations. Organisms tend to reinforce behaviors while avoiding those that do not yield incentives and engaging in behaviors to evade pain. By integrating this principle into a program aimed at fostering creativity, the approach would involve adopting a series of incremental steps, where progress is achieved gradually, and each step is reinforced to prevent premature advancement without consistent success in the preceding stage. While these conditions alone may not suffice, they are indispensable and warrant greater emphasis on strategies designed to nurture creativity (Dwivedi et al.,2021). While the efficacy of conventional techniques remains undeniable, there is room for enhancing their effectiveness.

Table 1. Distinctions between innovation and creativity

Innovation	Creativity
<i>Innovation changes reality</i>	<i>Creativity changes perception</i>
<i>Innovation requires action</i>	<i>The creativity of thinking</i>
<i>It is a team challenge</i>	<i>It is an individual challenge</i>
<i>It is a continuous process</i>	<i>E.g., a discontinuous process</i>
<i>It takes a long time</i>	<i>Take a moment</i>
<i>Deliver something new to the system</i>	<i>Imagine a new system</i>
<i>Its effect can be measured</i>	<i>Its effect cannot be measured</i>
<i>Require project management</i>	<i>Require ideas</i>

Source: Author's own elaboration

The human capital within an organization plays a crucial role in advancing technical excellence. To foster quality, an effective approach is to initiate an escalation in creative endeavors, as these serve as the foundational source of all innovative individual undertakings. Discrepancies often emerge in organizations between the potential capabilities of individuals and their actual performance. While it is essential to strive for

extensive commercial reach, especially in fiercely competitive environments, it is equally important to infuse management practices with an innovative approach. The objective is to strike a balance between commercial viability and efficiency. Creativity serves as a valuable tool in addressing organizational or team-related challenges by offering fresh perspectives for problem analysis and generating a diverse array of solutions. The connection between creativity and innovation lies in the fact that within an organizational context, creativity gains significance only when it is translated into practical applications, thus culminating in innovation (Al-Askari,2012). The two concepts share a close correlation with the decision-making procedure. In the initial stages, where the divergent procedure is highly crucial, emphasis is placed on creativity; subsequently, during the execution stage, innovation takes precedence. Within organizations, there exist individuals who are creative and others who are innovative, typically being distinct people. As per Peter Drucker (2012), "*systematic innovation involves the methodical quest for modifications with a particular aim, along with an evaluation of the possibilities they may present for societal or economic innovation.*" The structured pursuit of innovations is intricately linked to the decision-making process. Within this context, two aspects stand out wherein innovation assumes a significant role: 1) In *problem-solving*, characterized by its definition as "the exploitation of opportunities." This category of issues frequently emerges from a novel concept evolving into a fresh objective. 2) In *decision-making*, where the generation of alternative courses of action becomes imperative. Here, innovation manifests through the injection of creativity into the process and the execution of non-traditional courses of action. By virtue of the transformation instigated in the process, a distinction can be drawn between *Incremental innovation*: minor adjustments targeted at enhancing the company's functionality and performance, with the potential to collectively form a substantial foundation for advancement. *Radical innovation*: represents a departure from established norms, introducing new products or processes that defy categorization as a natural progression of existing ones. Discussion of innovation commonly aligns with technological aspects; nonetheless, its scope extends beyond technology to encompass organizational domains (management modifications), commercial, financial, productive realms, among others. The process of innovation is a multifaceted endeavor that encompasses a variety of interconnected activities. A prominent theory in innovation, put forth by Clayton Christensen in 2004, is the concept of "*disruptive innovation*". According to this theory, new market entrants armed with straightforward solutions have the potential to displace established industry players. Christensen posits that existing market leaders typically excel in the realm of incremental innovation, catering to the needs of their primary customer base. Conversely, newcomers often find success through disruptive innovation, offering simple, cost-effective solutions that appeal to underserved customer segments (.....). The innovative process exerts a positive impact on organizations characterized by lower labor specialization and a more decentralized structure, allowing for enhanced flexibility and adaptability. Effective communication within this process serves to remove barriers

between different departments within the company. Both the entrepreneur and the businessman are individuals who continually engage in imaginative endeavors, whether internally or externally, to drive their projects forward. The educational institution and the labor organization are both focused on assessing the objectives of establishments, along with their standards, frameworks, roles, and procedures. Their concerns extend to aspects like leadership, communication, and conflict resolution. The performance of an organization is a consequence of the three categories of innovations, occurring in sequence together, rather than each innovation type independently. Likewise, various combinations of innovation types, leading to enhanced performance within a specific setting, should be addressed. It is vital to highlight that organizational performance results from innovation in a broad sense, rather than just the adoption of administrative or technological innovation separately. Groups and teams hold significant importance as platforms for fostering creativity, as they create micro-cultures within organizations, where a multitude of stimuli and obstacles come into play as innovative ideas and actions are put forth. Four key points that are often least comprehended during the assessment of teamwork can be identified: 1) The crucial role of the team as the catalyst for the creative process. 2) The existence of multidisciplinary teams within organizations. 3) The distinction between a mere group of individuals and a team in terms of creative output. 4) The significance of time in the development of teams for achieving high levels of creativity. The significance of the team as a facilitator of the creative process: The motivating force of an effective team is an invaluable asset. The outcomes produced by a competent team can possess remarkably high creative value. Even from an individual perspective in terms of uniqueness, quality of solutions, adaptability, etc., the team fosters excitement, transformation, and ignites a creative drive that no other stimulus can replicate. A proficient team initiates projects, some of which are so ambitious that they would never have been pursued by individuals working alone.

Organizational and innovation models

Two widely used innovation models can be defined in the organizational system, such as the linear model and the chain link model. Research suggests that the same work and development process can give rise to a multitude of subsequent innovation processes, in many cases, over extended periods of time. Some of them may be successful and some may not (Tecee,2010). The linear model does not imply that the innovative process necessarily derives from a directly linked R+D activity and models (Raymond et al.,2015). In many cases, innovations of a continuity, non-radical nature may arise from an observation of improvement or from market analysis without there being any technological development activity. In industrial society, innovation, including the improvement of products and processes, has been of central importance, indicating that the transformation of new knowledge into practical and productive knowledge has always been a crucial aspect. However, recent changes in economic processes - increased speed of communications and greater availability of information - have made knowledge management even more important and central to business success. The generation

of an innovation and its implementation requires the integration of the two cycles — the research and the production — into a network. By being able to create something that no one else can copy or do in a better way, a company can create a powerful competitive advantage. Many organizations overlook the competitive advantage that can result from the manufacturing function.

This consideration has led to the conclusion that it is better to talk about company innovation systems and to start research specifically on companies by differentiating between the internal R+D structure of the company and its external structure.

In the linear model, there are certain shortcomings, such as:

- The innovation process is a succession of different stages.
- It gives too much importance to R+D as a trigger for the process.
- It does not represent economic reality, since some countries that allocate few resources to R+D have increased their participation in the exchange of manufactured products through an appropriate appropriation of the results of the R+D carried out by others.

In the same way, many companies innovate successfully with few resources for R+D, although well integrated into the business strategy (Raymond et al.,2015). Innovation in the R+D model is considered as a set of interrelated activities whose results are often uncertain. Because of this uncertainty, there is no linear progression between the activities of the process. Therefore, R+D is not a source of inventions but a tool that is used to solve problems that arise at any stage of the process. Research focused on this model addresses problems that cannot be solved by existing knowledge. The company has a knowledge base to which it turns to solve the problems that arise when innovating. This model promotes a culture of innovation throughout the company. Incentives for staff are also based on their creativity and their ability to learn new things (Raymond et al.,2015).

METHODOLOGY

The current paper was conducted within the framework of qualitative, analytical, and descriptive bibliometric research. The process involved the collection, research, analysis, and discussion of chosen bibliographic materials, consisting of four main stages: information focusing from various sources such as journals, articles, books, theses, and academic works, selection of these sources, analysis of academic literature, and interpretation of the information contained. According to Öztürk et al. (2024) this methodology eases the analysis, recording, retrieval, and selection of knowledge, viewpoints, and perspectives presented by other scholars. Various academic resources like 1) Scielo, 2) Google Scholar, 3) Academica.edu and 4) ResearchGate were consulted. To ensure impartiality and rigor, searches were also conducted on Scopus and the Web of Science. Two descriptors, creativity, and organization innovation, as well as creativity and innovation as drivers of business growth, were utilized in the information search. Subsequently, a content analysis was performed on the identified works, with a focus on selecting those most relevant to the review's objectives despite the ample international

literature available on the topic. The materials were selected based on the authors' judgment to systematize, summarize, retrieve, and describe each work analyzed. The compilation process involved the use of several tools such as worksheets, detailed readings, preliminary notes, and content sheet preparation. In the final stage, the key contributions of the authors were synthesized, deduced, and discussed to present the findings and conclusions. The article preparation process included defining the topic, assessing its viability, and outlining objectives, initiating the search for theoretical materials, evaluating them based on prior readings, creating summary sheets, organizing, analyzing, evaluating, and discussing the information, and commencing the article construction. Throughout the process, we benefitted from the assistance of online resources, Office 2010, and tools for data collection and analysis.

RESULTS AND DISCUSSION

The literature review focused on exploring the progress in creativity and innovation as drivers of business growth uncovers various trends discussed in the consulted sources. Initially, it is emphasized that creativity and innovation should not only be constant elements within organizations but also be approached comprehensively. Researchers support this notion for several reasons, such as the interdependence between innovation and creativity, highlighting how they contribute to the efficiency and effectiveness crucial for a company's success (Gelaidan et al.,2022; Chousa-Pinero et al.,2020; Mazla et al.,2020; Oguz et al.,2019; Danish et al.,2019). Creativity enables the exploration of novel solutions to the challenges and conflicts faced by businesses. These perspectives are in alignment with the views of Dei (2022), Juliana et al. (2021), Chang and Chen (2020), Danish et al. (2019), Ballor (2019) and Sham et al. (2018). Conversely, innovation plays a vital role in transforming plans, concepts, and growth opportunities into tangible outcomes. Essentially, innovation brings ideas to fruition in the form of concrete products, strategies, and initiatives. Additionally, the theoretical analysis underscores the significance of creativity and innovation as essential drivers of economic, productive, and competitive progress in the contemporary business landscape. These elements provide a range of tools and avenues for organizations to implement innovative practices necessary to adapt to financial and competitive shifts and remain viable in the market. It is widely acknowledged that fostering creativity and innovation contributes to local, national, and international economic advancement by devising strategic, commercial, and productive strategies that attract customer interest, thereby bolstering organizational productivity, competitiveness, commercial viability, and economic resilience. These components facilitate the production of cost-effective, high-quality, groundbreaking products that are economically viable in various contexts and appeal to the attention of consumers. Essentially, the amalgamation of creativity and innovation enables the development of genuine, inventive, and significant products that are perceived favorably by consumers, thereby ensuring their sustained presence in the marketplace (Chang and Chen,2020). Considering this viewpoint and the examination of the data, it is evident that creativity and innovation are fundamental elements that should be seamlessly integrated into all facets and divisions of organizations without exception. These mechanisms streamline the generation of competitive, efficient, and

commercial benefits that bolster both the internal and external frameworks of enterprises, as they explore fresh avenues to allocate their resources, remain at the forefront of emerging market innovations, and confront commercial challenges. Creativity and innovation play a crucial role in enhancing processes of continuous change within corporations, leading to their constant renewal. This, in turn, aids in identifying operational dynamics capable of discerning both current and future commercial needs, as well as assessing emerging trends in various contexts where businesses operate. Scholars such as Zhan et al. (2022), Mazla et al. (2020), Piñeiro-Chousa et al. (2020) emphasize that creativity and innovation are fundamental components for the productivity, competitiveness, and economic advancement of any given company. Consequently, these elements contribute significantly to shaping and enhancing the range of products and services offered, thereby enabling companies that embrace such strategies to develop innovative goods and services, thereby fostering effective competition within the market. Furthermore, heightened productivity and competitiveness among companies often result in product quality enhancement, cost reduction, market expansion, increased sales, and ultimately improved profitability, leading to substantial economic growth. The critical analysis indicates that business owners and managers must prioritize creativity and innovation as pivotal factors that underpin the success of their enterprises through process enhancement, strategic design, and product optimization to meet societal needs. Noteworthy advantages include minimizing commercial failures through continuous ingenuity, bolstering organizational business management through adaptability and the generation of novel ideas, exploring new applications for existing products or services, formulating policies to address challenges or crises, and enhancing overall efficiency and effectiveness.

Following are the results of the bibliometric review of the current review:

Table 2. Bibliometric review

Authors	Title	Journal Name	Year of Publication	Publisher
Oguz A. Acar, Murat Tarakci, Daan van Knippenberg	Creativity and innovation under constraints: A cross-disciplinary integrative review	Journal of Management	2019	Sagepub
J Piñeiro Chousa, M ^Á López-Cabarcos, Juan Piñeiro Chousa, M. Ángeles López Cabarcos, Noelia María Romero, Castro Ada María Pérez Pico	Innovation, entrepreneurship, and knowledge in the business scientific field: Mapping the research front	Journal of Business Research	2020	Elsevier
H Sham, H Akib, AA Patonangi, Muhammad Guntur	Principal entrepreneurism competence based on creativity and innovation in the context of learning organizations in Indonesia	Journal of Entrepreneurship Education	2018	Eprints
Rizwan Qaiser Danish, Javeria Asghar, Zeeshan	Factors affecting “entrepreneurial al	Journal of Innovation and Entrepreneur sip	2019	Springer open

Ahmad & Hafiz Fawad Ali	culture”: the mediating role of creativity			
YY Chang, MH Chen	Creative entrepreneurs' creativity, opportunity recognition, and career success: Is resource availability a double-edged sword?	European Management Journal	2020	Elseiver
Temoor Anjum Muhammad Farrukh, Petra Heidler, Julián Andres Díaz Tautiva	Entrepreneurial I intention: Creativity, entrepreneurship, and university support	Journal of Open Innovation	2020	MPDI
AND Héraud	A new approach to innovation: from the knowledge economy to the theory of creativity applied to territorial development	Journal of the Knowledge Economy	2021	Springer
JJ Ballor, VV Claar	Creativity, innovation, and the historicity of entrepreneurship.	Journal of Entrepreneurship and Public Policy	2019	Emerald

Source: Author elaboration on bibliometric data

Table 2 presents the top eight cited researchers who exhibit a strong interest in investigating innovation and creativity within entrepreneurship. The table also includes the title of the most impactful article shaping research development in this area. Citation analysis was conducted utilizing PoP software, followed by the storage of results in Excel format and the correction of incomplete articles. The findings reveal eight studies with the highest citation numbers, indicating significant contributions to innovation and creativity in entrepreneurship. Among these, Danish et al., 2019; Piñeiro-Chousa, et al., 2020 and Acar et al., 2019) hold the top three positions. Following closely is the work of (Pinero-Chousa et al.,2020) in the second position, examining how established firms and shared workspaces impact job satisfaction, innovation, and entrepreneurial outcomes. Securing the third spot is the study by (Sham et al.,2018), utilizing bibliometric approaches to explore entrepreneurial innovation trends and provide insights for future investigations. These results aim to benefit academics and serve as valuable references for educational purposes. Notably, one article authored by Indonesian researchers secured the fourth position in the citation analysis, highlighting substantial contributions that could guide local researchers in exploring related topics. An interesting discovery by the review lies in the observation that the extent of resistance to change may influence the relationship between innovation orientation and tangible innovative behaviors. Furthermore, the selected studies have indicated that the relevance of Self-Determination, along with the association between antecedents and innovative conduct, depends on innovative behavior and creativity. In the contemporary business landscape, sustained market dominance is predicated not only on temporary market control but also on a culture of creativity and ongoing innovation, ensuring continual evolution, progress, and survival in a volatile market characterized by financial uncertainties and intense competition. Consequently, it is imperative for commercial entities to recognize and integrate creativity and innovation into their operational, organizational, logistical, marketing, and competitive strategies. Any business entity or department that neglects to incorporate creativity and innovation jeopardizes its prospects for success.

Conclusive remarks

For a considerable period, the notion of teamwork's ability to yield significant advantages during task execution has been prevalent. The adage "two heads are better than one" serves as a common expression of this concept; however, the meticulous examination of team formation or work groups within the business realm is seldom undertaken. Simultaneously, creativity is confined to domains more closely associated with the arts, with only a select few in the business sphere being granted the authority to implement it. Nevertheless, an understanding emerges that creativity is not a sporadic outcome but rather an integral part of the daily collaborative process, one that should not be viewed as an exceptional asset. To achieve genuinely innovative outcomes, the team must embrace it as a fundamental "philosophy of life." Creativity entails the generation of novel ideas; innovation involves the actualization of these ideas. Ideas, if left unutilized, hold no value. Their worth is solely validated through implementation. Where there is discord, an opportunity invariably presents itself. Conventional thinking propels us to enhance existing concepts, although there are numerous instances where discarding prior

notions is imperative to birth entirely novel creations. The innovation journey progresses from accessible information to business rivalry, adhering to a consistent framework throughout history. However, contemporary times witness the instantaneous availability of information at a minimal cost to individuals capable of acquiring, evaluating, comprehending, and leveraging it to enhance their products, processes, or services. Consequently, the pace of transformation accelerates, emblematic of the distinctive landscape we inhabit – the information and knowledge society. This nascent phase of the process signifies merely the outset. Through a synthesis of research findings, it is affirmed that owing to their manifold positive impacts, creativity and innovation emerge as pivotal facets of corporate advancement at a productive and competitive echelon, fostering favorable outcomes on the economic, commercial, and strategic facets of an enterprise's empowerment.

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REDUCING UNEMPLOYMENT IN SMALL VILLAGES IN HUNGARY

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ABSTRACT

No significant and lasting solution is expected from economic agents to reduce unemployment. Employment opportunities in the for-profit sector are not infinite and are concentrated in large cities. There are few opportunities for the disadvantaged, mostly low-educated, inhabitants of rural areas. Public employment, often used as an active employment policy instrument, is an appropriate option in municipalities where job opportunities are limited or non-existent. The search for possible ways to move on from public employment should be kept in mind. The way forward is to move from public employment to solidarity. The author sees the solution to the unemployment problems in Hungary not in public employment, but in the solidarity economy. The basic value of the solidarity economy is that it does not act in the interests of the individual, but in the interests of the community, and seeks to promote the development of communities organised on a territorial basis or along the lines of common interests. Individuals in a solidarity economy work together for the common good. The methodology used is field research, during which the author visited several municipalities and interviewed mayors about the results of the public employment programme in their municipalities.

Keywords: unemployment, small vilages, rural development

INTRODUCTION

The growing imbalances in the labour market that go hand in hand with the expansion of globalisation have not only called for a rethinking of the concept of work, but also for a local search for solutions. Unemployment, as a consequence of the labour market imbalances that naturally develop in a capitalist society, was revealed by Keynes' theory. Keynes also raised the idea of the need for state intervention in the maintenance of production and employment. The New Deal in the US and the welfare states that developed in the West after the Second World War were based on the acceptance of the need for state intervention and the commitment to guarantee social rights. In the welfare states, unemployment was seen as an inevitable, but temporary, phenomenon that went hand in hand with the functioning of the economy and could be dealt with by social policy (Pigou, 1968).

The persistence of unemployment is therefore clearly not just an economic problem. The role of work in human societies has put at risk our fundamental social values and the foundations of our social organisation. Since in existing social structures individuals are valued according to their work and their position in the division of labour, work is the basis of social redistribution and, according to our generally accepted norms, work is not only a duty but also the main means of self-fulfilment (Dahrendorf, 1988). The loss of work thus puts the individual at risk not only financially, but also mentally and morally. His social relations may be loosened, transformed and he may fall out of his former networks (Castel, 1996). This may be accompanied by a mental and moral decline.

Together, the symptoms can trigger a process of social exclusion. When this phenomenon affects individuals on a massive scale, it is a serious social crisis. It is in the interest of society as a whole to avoid a complete polarisation and disintegration of society and the resulting crisis symptoms, such as an increase in social deviance (divorce, addiction, crime, suicide) and the increased burden this place on the economy (Neamtan, 2002). At a time when the vision of an 80-20 society is widespread among experts, i.e. when we have to expect 20% of society to sustain the other 80% over the long term, no one can think of staying out of the problems (Martin and Schumann, 1996). The existential, mental and moral traumas affecting 80% of the population are a burden and a direct threat to the remaining 20%. Consequently, the understanding of wage labour = work in modern societies needs to be changed.

By the 1990s, it had become clear that a social policy approach to employment problems was not a real solution. Aid is a good short-term solution if it can provide a very heavy financial burden. Financial assistance for those who lose their jobs can only compensate for a small part of the disadvantages caused by job loss. Only job security in its complexity can provide a real solution. The main objective of employment policy and the increasingly closely intertwined social policy is to (re-)integrate people into work.

Public employment was originally intended to replace the costs of public and private tasks and developments in the interest of the community with work. It became more prominent in periods when previous forms of economic and employment were in transition, and the labour market supply-demand imbalance that emerged during the transition and the resulting income shortage forced the intervention of central power (Csoba, 2010). Its operation as a permanent form of employment may be constrained by public budget constraints. Public employment, despite its undeniable role in reducing the income loss of labour market dropouts and stabilising the distribution of wealth in labour-centred societies, has always been heavily criticised and its dead-end - going nowhere - nature has been increasingly confirmed. Public employment has been criticised for (1) being temporary, (2) not leading back to the primary labour market, (3) not improving employability, (4) distorting competition and potentially squeezing out sustainable employment opportunities, (5) turning social causes of poverty into individual causes (Csoba, 2010). Together with this, public employment can be beneficial for both the individual and the community. On the one hand, if well organised, it can beautify,

build, improve the health and livability of the community, and keep work and thus community morale stable. On the other hand, employees benefit from receiving a higher wage than the benefits they receive for the work they do, they gain work experience that increases their chances of re-entering the primary labour market, they set an example for their children, they feel useful members of society, and their self-esteem and the esteem of the individual in the eyes of society increases.

SOCIAL COOPERATIVES AS NEW FORMS OF PUBLIC EMPLOYMENT

Social cooperatives can be established in Hungary under the new rule since 2006. Prior to that, it was still possible to set up such enterprises in the form of cooperatives before the change of regime, which had a completely different content (Finta and Póla, 2020).

The establishment and operation of the social cooperative must involve the participation of a municipality which is a public employer under the legislation on public employment, and its founders must include a person who is in a public employment relationship with the municipality or who has been in a public employment relationship with the municipality within one year prior to the date of its membership (G. Fekete, 2014).

In the course of the operation of the social cooperative, it shall be ensured that the cooperative has a member who is employed in the public sector or, failing this, a member who, at the time of the establishment of the membership, is a jobseeker under the Act on the Promotion of Employment and Unemployment Benefits, provided that the period between the termination of the membership of such person and the establishment of the membership of a new member meeting the conditions under discussion shall not exceed three months. Social cooperatives registered or in the process of registration at the time of the entry into force of the new rules and meeting the above conditions must comply with the new provision by 31 December 2019 at the latest. On the basis of the required amendment to the articles of association, the application for registration of the change may be submitted to the Court of Registration without payment of the fee and publication costs, provided that the amendment to the articles of association contains only the amendments necessary to comply with the provisions just discussed. If the social cooperative also notifies changes to other company details, only the fee and publication costs otherwise payable in respect of the change to those details will be payable.

The designation of social cooperatives established on the basis of public employment as a separate type of cooperative is justified by the fact that they are a distinct group of social cooperatives from a regulatory point of view (Finta and Póla, 2020). The function of these social cooperatives is to continue the relationship established between the public employment authority and its employees on the basis of the public employment relationship, whether still in existence or previously, so that the formerly employed persons can be employed within the social cooperative representing the next step towards market employment, but still with the assistance of the (former) public employment authority. A common feature of these social cooperatives is therefore that the (former) public employment municipality and one or more

persons currently or previously in public employment with the municipality are involved in their establishment and operation.

The social cooperative's activities are characterised by a concern to improve the situation of the most disadvantaged sections of society, but this does not mean that it can only have members who are seeking employment or are otherwise disadvantaged, or that it can only provide social services. A social cooperative is a community enterprise. What distinguishes it from a normal non-profit enterprise is that the profits generated can be divided among the members in proportion to their shares, but part of the profits is set aside in a community fund, the percentage of which is decided by the general assembly. This money is used to finance the cultural, social and other needs of members.

MATERIALS AND METHODES

I used the interview methodology to assess the situation in the municipality of Trizs and the circumstances of the creation of the social cooperative. In the autumn of 2023, I interviewed the mayor of the municipality and the head of the social cooperative.

RESULTS AND DISCUSSION

Trizs is a small village in Borsod-Abaúj-Zemplén county, the Northern part of Hungary. Hundreds of years ago, it was a royal estate inhabited by the royal guards and was completely deserted during the Turkish occupation. Because of its location, there was no chance for agriculture, so the inhabitants were mainly engaged in animal husbandry. The local traditional way of life and housing culture can be found in the House of Traditions, which hosts craft activities, small community events and gastronomic demonstrations based on traditions, where visitors can also taste local products. For a long time, the inhabitants of Trizs have been a closed community, which has helped to preserve local treasures. Their popular products are still made using traditional methods, using locally grown plants, fruits and herbs from the fruit processing factory.

Figure 1 shows the evolution of the population of the municipality from 2012 to 2022, broken down by year. In 2012, the population was 208 inhabitants, last year it was only 168. The population increased from 2012 to 2014, and then decreased by 4 inhabitants in 2015 compared to the previous year. The highest population was in 2016 with 219 inhabitants, but from that year onwards, the number of inhabitants in the municipality has been decreasing every year compared to the previous year, except in 2020. I cannot give you an exact figure for 2023, but my interview with the Mayoress shows that the official population is currently 191, but there are not physically that many inhabitants in the municipality of Trizs.

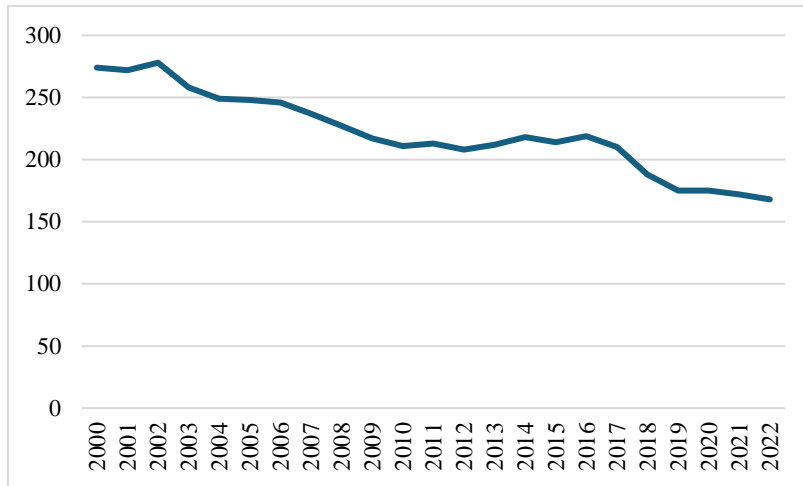


Figure 1. Resident population at the end of the year in the municipality of Trizis.

Figure 2. shows the number of live births and deaths over the same period. Between 2012 and 2016, at least one person was born every year, but more people died. The biggest difference between live births and deaths was in 2016, when 5 more people died than were born. While in 2017 6 people died and no one was born, in 2019 no one died in the municipality and two were born. The year 2020 is the only year in which more people were born than died, but in the following two years no one was born in the municipality.

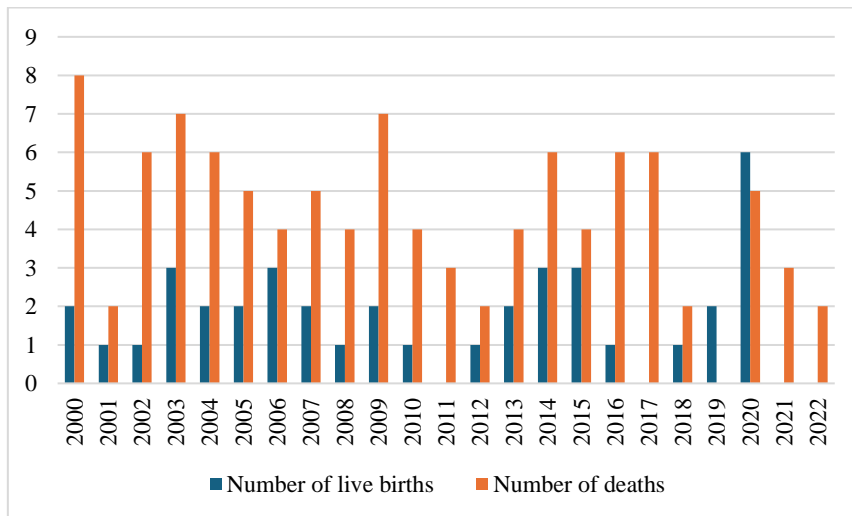


Figure 2. Number of live births and deaths of Trizis.

In terms of the number of registered jobseekers (Figure 3.), men outnumber women in every year, except in 2022, when the number of women jobseekers was 8 compared to 3 men. In 2015, the number of men registered as jobseekers was 5 and the number of women registered as jobseekers was 0 in the same year. The largest difference between the number of men and women looking for work was in 2017, when there were 7 more men unemployed than women.

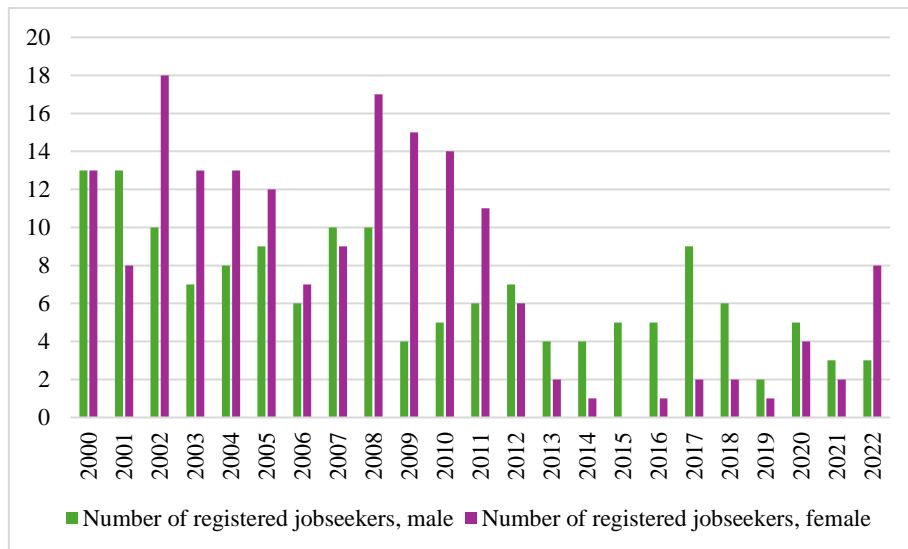


Figure 3. Trends in the number of registered jobseekers of Trizis.

The Trizsi Ízek Start Agricultural and Service Social Cooperative was founded in 2015 and currently has one location. Its main activity is the processing and preservation of other fruits and vegetables. Their products are made from fruits and herbs harvested in the area, as well as from raw materials bought from local producers, using traditional methods and the careful hands of local women. They produce sugar-free and preservative-free jams and syrups, which are available in a variety of flavours in addition to the usual ones. These products have won numerous awards and national recognition, such as the National Product Award and the Excellent Regional Product mark. Its inhabitants are very proud that Wild Ace Rosehip Jam of Trizs won the title of Best Jam at the 2022 Nók Lapja Food Awards. The secret of their success lies in their multi-generational life experience, conscientious and careful work. They put their hearts and souls into making jams and syrups, and the result is a product they would recommend to anyone. Their shops can be found in several municipalities.

At the time the social cooperative was set up, there were 40 people working in the public employment programme, and they were trying to give them something meaningful to do. First they planted orchards, herb gardens, and they processed the things they produced, and then it seemed to be more and more successful, more and more things were processed and in larger and larger quantities. Then the need arose to provide a regulated framework and the social cooperative was established. The social cooperative was a very new thing, a very untrodden path at that time, the mayor heard that the Ministry of the Interior considered it as a step up from public employment. It wasn't easy to set up, but it was finally established in 2015, but it wasn't until the end of 2017 that this cooperative really started to operate. Today, unemployment is no longer significant in the municipality. Residents are trying to find work in the primary labour market or in the cooperative and only 5 people are currently in public employment.

A social cooperative could be set up with 7 people under the rules of the time. The condition was that the municipality itself had to be a member, and the people who were involved in this

activity in public employment and in its management were included, so that the members of the cooperative were chosen from among them. Now there are more than 20 members in the cooperative. It is mainly women who work in the cooperative, as the production of syrups and jams is a female activity.

The biggest problem is market acquisition and market retention, which is very difficult in today's environment. As the mayor puts it, "we had a difficult start, and just when we had learned to produce under factory conditions and were about to hit the market with a bang, COVID-19 pandemic came along and put us back on the starting line (Lipták and Musinszki, 2022). When we survived that, the energy crisis came and there was a significant wage increase in the meantime." Wages are a cost that has to be given to people, because everyone lives on money, says the mayor. They have their own shop, they have retailers, they have online wholesalers, they have a web shop, so they have several legs, but it's not enough. On the one hand, the market is saturated, there are a lot of handicraft products. When they started, local products were a rarity, but by the time the factory was built, many people had caught up, and it's not easy in today's world to produce and sell quality products when people's wallets are getting thinner. They have many expenses and jam, and syrup may not be what they need every day.

There is one factory in the municipality, a small fruit processing factory employing 6-7 people is not common in a municipality of 200 inhabitants. Now the biggest employer is no longer the municipality, but the social cooperative, which can provide work locally.

CONCLUSION

The Trizsi Ízek Start Agricultural and Service Social Cooperative is a cooperative founded in 2015, which is active in the processing and preservation of fruit and vegetables. The cooperative started its real operations in 2017. They sell their products through several platforms, including their shop, web shop and resellers. The aim of its creation was to give the 40 people who were then employed in the public sector an activity that would not only help them to earn a living but also contribute to the development of the municipality. Over the past 6 years, they have faced many challenges, including a period of a coronavirus epidemic and an energy crisis. Despite the difficulties, they have won a number of awards and accolades, including the Home Produce Award, the Distinguished Landscape Product Mark and the Tradition and Innovation in Agribusiness Award at the National Agriculture and Food Exhibition and Fair last month.

The people of Trizs are a very close-knit community, and they value the various community programmes that are organised to ensure that everyone, regardless of age, can enjoy themselves. The benefits of the social cooperative are numerous in the municipality.

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EXAMINING THE RELATIONSHIP BETWEEN E-GOVERNMENT AND GOOD GOVERNANCE, IN ALBANIA

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ABSTRACT

E-government is widely accepted as an effective means of providing public services and affects good governance in developing countries. The use of technology and digital platforms in the provision of public services, during these years, has had an increasing trend at the national and global level. E-government is related to the use of Information and Communications Technology (ICT), which serves as an important instrument in the transformation of the traditional government services delivery channels to be more effective, efficient and accessible to citizens. In Albania during the last years, providing digital public services has been a challenge for the government, with the objective to improve the performance of public service delivery, for citizens and society as a whole. E-government is considered a powerful tool in the hands of the government to improve the quality of public service delivery, increase transparency and accountability, reduce corruption and increase citizen satisfaction. E-government promotes good governance in these directions; by increasing transparency, information and accountability to citizens; by encouraging citizen participation in decision-making processes and by improving the quality of public services. Good governance in developing countries is an important instrument to achieve better performance, as well as to promote an effective and sustainable development. After the 1990s, our country has undertaken and implemented a series of structural and institutional reforms in the direction of good governance. These reforms have aimed at increasing the effectiveness of the government, the performance of the public administration, and the best functioning of the public institutions. Good governance has considerable potential for the modernization of public administration, the improvement of public service delivery, sustainable development and the well-being of citizens. The purpose of this paper is to examine and evaluate the relationship between e-government and good government in Albania, based on the analysis of e-public services provided by the government platform (e-Albania) and Worldwide Governance Indicators (WGI).

Keywords: e-Government, performance, good governance, relationship, digital public service.

INTRODUCTION

E-government is related to the use of Information and Communications Technology (ICT), which serves as an important instrument in the transformation of the traditional government services delivery channels to be more effective, efficient and accessible to citizens. In this regard, information and communication technologies (ICT) to support good governance remain an important driving force, especially in developing countries. It presents incredible opportunities to innovate, strengthen and improve the ways and processes of working in the public administration. Digital platforms and devices serve to collect, store, analyze and share information accurately and rapidly. Tangible benefits for citizens will lead to universal use of e-government services, making such platforms also suitable for broad-based participatory policy making (World Bank, 2016). The e-government platforms have improved work processes in public organizations, reduced bureaucratic obstacles and improved access to public services. Good and quality public services are not only aimed at meeting the practical needs of the public but also play a role in shaping the mutual trust relationship between the government and citizens (Alkrajji & Ameen, 2021). The potential benefits of e-government include better quality of public services, lower costs, transparency and accountability, reduction of corruption and improved decision-making processes (Lupu & Lazăr, 2015). The application of ICTs into government and public institutions has significantly transformed the way public administration interact with their citizens (Rodriguez-Hevía et al., 2020). Through e-government, citizens can participate in public matters and decision-making, as well as have greater control over their own lives (UNESCO, 2019). The continuous growth, and the rapid diffusion and use of ICT, has helped governments innovate and revitalize public services to leverage the power of information technology and change the traditional ways of service delivery. Through digital platforms or applications, the government can provide easier access for citizens to various services without the need to physically visit government offices (Taufiqurokhman et al., 2024). E-government platforms are designed to provide services and share information to citizens. Through receiving e-services, citizens can save time, reduce expenses, and can have easier access to communication at all levels of the government. By providing e-services and sharing information resources, the public service agencies can improve government efficiency, reduce administrative costs, and improve public service quality (Alshehri & Drew, 2011; Bélanger & Carter, 2012). The success of public organizations depends on the relationship between the organization and its customers, because citizens' satisfaction is the main factor for the organization's success (Karsh & Hussein, 2021). E-Government holds enormous potential in terms of improving delivery and efficiency, better response to citizens and businesses needs and provision of affordable government services. E-government is considered a powerful tool in the hands of the government to reduce costs, improve transparency and accountability, improve the quality of public service delivery, reduce corruption, and increase citizens' satisfaction. In this regard, it is important to present indicators that affect the consideration of citizens in relation to e-public services and increase awareness of the use of these services (Tomorri & Keco, 2023). The provision of e-services is linked with the level of management,

sustainable economic development, governance accountability, transparency, and decision-making (Michael et al., 2018). Innovation enables government to adopt new methods and advanced technologies for more efficient and effective service delivery. Investing in human resources training is also essential in increasing the competencies and professionalism of public administration employees, in order to provide better and quality services for citizens. Arguments for the improvement of governance and services for citizens, led the governments of different countries to the need to develop the information society based on the infrastructure and e-government platforms. To meet these goals, governments are implementing innovative approaches in their organizational structures, strategies and methods of using human, financial, information and technology resources. The use of technology in the providing of public services has had a strong upward trend at the international, but when we talk about electronic services in Albania, the use of technology has been a challenge for the government, public agencies, and citizens as well. Albania has made progress in terms of developing digital infrastructure. To prioritize digitization, the Albanian government has drawn up several strategic documents. Through these documents and strategies, it was intended to encourage the use of information technologies and the development of information technology infrastructure as the key to its successful implementation. E-Albania is the only online government platform, where public services, previously offered in physical offices, are now offered digitally for all society (citizens, businesses, NGOs, and public administration employees). Through this government platform, public institutions and agencies interact with each other, to provide digital public services to citizens and businesses. In Albania during the last years, providing electronic services has been a challenge for the government, with the objective to improve the performance of public service delivery, for citizens and society as a whole (Tomorri & Keco, 2023). An important factor of good governance is the application of ICT, in the providing of public services and the expansion of e-government, as an instrument for the modernization and performance of public administration. According to the World Bank, good governance is evaluated by the implementation capacity of governance principles of a country, providing a framework for development and economic growth. Good governance is an important instrument for evaluating the performance of the government and public administration worldwide. According to the OECD (2020), good governance is critical to long-term economic, social and environmental development. The ability of governments to operate effectively and efficiently depends in part on their management policies and practices. The quality of governance is closely related to transparency, accountability, efficiency and quality of public services provided by public institutions. Good governance requires an open and developmental policy, a professional administration, decision-makers who are willing to act for the public good and a strong civil society. In this regard, developing countries must focus more on reforms that improve governance if they want to achieve the 2030 Sustainable Development Goals (SDGs) set by the United Nations (Glass & Newig, 2019).

The purpose of this paper is to examine and evaluate the relationship between e-government and good government in Albania. To achieve this goal, the objectives of this study are: 1) what

relationship exists between e-government and good governance in Albania? 2) to examine and analyze the indicators that have an impact on the quality of governance, 3) to evaluate the impact of e-government on good governance in the country, and 4) to address, issues and challenges for good governance in Albania in the future.

LITERATURE REVIEW

The use of information and communication technologies (ICT) by government to improve service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. According to the World Bank (2016), e-Government includes the use of information and communication technologies, and especially digital platforms, by government and public agencies with the aim of improving public services for citizens, businesses and society as a whole. United Nations (2023), describes e-Government as a means to improve the efficiency, effectiveness, transparency and accountability. Digital government includes technological changes, but also new ways of leadership, decision-making processes, different ways of organizing and delivering services (Gil-Garcia et al., 2018). E-Government in developing countries plays a positive role in enhancing governance performance, including the quality of public service delivery and public organization efficiency (Deng et al., 2018). The efficiency and quality of the government reflect citizens' perceptions of the quality of public services, the quality of policy formulation and implementation, as well as the credibility of the government's commitment to such policies (Ferrari & Manzi, 2014). E-service quality includes not only technical aspects such as user-friendliness and transaction speed, but also includes trust-building elements such as data security and responsiveness to citizens' needs (Li & Shang, 2023). E-government combines the use of ICT by the government with organizational changes to improve their structures and operations. The development of e-government is a combination of the ICT system and the bureaucratic system, which helps the governments of different countries to realize the transformation of governance in line with the digital era in a more open and efficient government (Zou et al., 2023). Effective digital public services, or e-government, can provide a wide variety of benefits. These include more efficiency and savings for governments and businesses, increased transparency, and greater participation of citizens in political life (European Commission, 2023). The phenomenon of digitization of the public sector is an irreversible process that affects the way public institutions are organized and the communication relationships between citizens and institutions (Doran et al., 2023). E-government involves the use of ICT to improve public services, the interaction between government and public society, including the participation of citizens in decision-making processes (Estevez & Janowski, 2013; Alzahrani et al., 2017). E-government aims to improve the access and delivery of government services to citizens, businesses and employees, reducing corruption and costs, but increasing transparency on the other hand. Digitalization of public administration services is not a goal in itself, it needs to create a value for the government or citizens, or possibly both (Aranyossy, 2022). Government and public administration are responding to dynamic changes from information and communication technologies and their maturity and using them in governance processes (Linhartova, 2022). The usage of ICT was

not only a matter of increasing efficiency and effectiveness in internal working procedures, but also a means of handling interactions with external users, such as e-services, provided by public administrations, available to citizens (Twizeyimana & Andersson, 2019). Government should strive to boost citizens' trust in their actions, and encouraging e-government use might contribute to this goal (Pérez-Morote et al., 2020; Mansoor, 2021). The aim of e-government is mainly to provide better services to citizens in an efficient way and thus to facilitate the achievement of sustainability at various levels (Dhaoui, 2022). Realizing the benefits attributed to implementing e-government, in whichever socio-economic context, has an expectation that public services better meet the needs and requirements of citizens. (Tassabehji et al., 2019). The implementation of e-government in developing countries has become imperative for governments, aiming to improve transparency, efficiency, accountability and public participation. The impact of information technologies on public administrations and their customers can often be difficult to identify, as there may be ways that go beyond the traditional services to which users are accustomed (Panagiotopoulos, et al., 2019). Analyzing the extent to which e-service quality influences the public's trust in the government, will provide in-depth insights into the impact of technology implementation in delivering public services (Noori, 2022). E-services not only provide a digital alternative to conventional services but also open up new opportunities by providing greater access, expanding geographic reach, and improving service availability. By implementing quality electronic services, governments and organizations can significantly improve effectiveness in meeting the needs of the public (Chan et al., 2021; Hariguna et al., 2021). Considering the perception of citizens and their attitude regarding electronic services is an important indicator for all public agencies that will serve the government in further communication platforms that can affect the attitudes and behaviors of citizens (Cordella & Tempini, 2015). E-government platforms provide benefits for citizens and businesses, allowing them to save time and money by avoiding physical visits to offices, reducing expenses related to paperwork, and ensuring the accuracy of information transactions (Cantin et al., 2023). An e-government portal should offer digital public services to citizens efficiently and facilitate their interaction with public institutions (Yıldırım & Bostancı, 2021; Ziemba et al., 2014). The level of e-government services is the extent to which an e-government platform enhances the delivery of efficient e-services to citizens, businesses, and the general public. Increased public trust in digital services not only strengthens the relationship between the government and the public but also motivates and encourages citizens to be more active (Nawafleh, 2020; Abdulkareem & Mohd Ramli, 2022). E-governance has the potential to ensure that citizens are no longer passive consumers of services offered to them by allowing them to play a more proactive role in deciding the kind of services they want and the structure which could best provide them. In the case of public service delivery, focusing on citizens is a more realistic approach and an excellent opportunity for interaction between government and citizens. E-government must be given serious consideration also in developing countries not only for its potential for stronger institutional capacity building, for better service delivery to citizens (Deng et al., 2018). A citizen-centered approach will enable the government to achieve

substantial efficiency and improve service delivery levels, improve citizens' satisfaction with government services, and improve their quality of life. Digital technologies played a necessary and important role during the period of the COVID-19 pandemic, enabling the provision of basic public services for citizens. E-government is considered to be particularly important as it can bring higher levels of public sector transparency and accountability, reduce corruption, and provide more efficient services (Kettani & Moulin, 2014). By measuring the satisfaction of citizens, a government can improve its services and this will lead to many positive effects in terms of governance (Skordoulis, et al., 2017). Governance is defined "as a complex interaction system between the structures and processes characterized by transparency, responsibility and participation of citizens in decision-making". Good governance in public institutions is the key to successful and satisfactory efficiency to achieve better performance. Through the analysis of the Worldwide Governance Indicators (WGI), most studies have concluded that good governance has a positive impact on growth and economic development. According, to Mira & Hammadache (2017), good governance is the capacity of management and institutional reforms conducted by government that improves coordination and delivery of effective public services, and accountability of political actors in the driving of development policies. Raczowska, et al. (2023), argue that there is a significant relationship between good governance and economic growth. Governments worldwide are still seeking solutions that support sustainable development, and good governance is identified as a crucial tool for achieving this goal (Güney, 2017; Mahran, 2023). Good governance in developing countries is an important instrument to achieve better performance, as well as to promote an effective and sustainable development. Kaufmann et al. (2010) have developed the six indicators (WGI), corresponding to basic governance concepts, which, according to their study, show a strong causal relationship between good governance and improved development economic. Efficient governments, defined as those that provide digital public services and effectively support their citizens through modern tools and channels, can be the result of a variety of factors, including education, urbanization, infrastructure, and economic growth as measured by GDP per capita (Horobet et al., 2023). Good governance has considerable potential for the modernization of public administration, the improvement of public service delivery, sustainable development and the well-being of citizens. The successful implementation of good governance in different countries, indexes the quality of governance and in general, the maturity of the public administration in the public sector (Ardielli & Vavrek, 2019). Good governance is attributed to the functioning of a public administration with high performance, encouraging the participation of citizens, respecting democratic values and the rule of law. The principles of accountability and efficiency form a strong foundation in good governance. Transparency is a key element for the government to provide easily accessible information to the public about its policies and decisions (Androniceanu, 2021). The focus of our study is the examination of the relationship between e-governance and good governance in Albania, which is based on the analysis of digital public services provided by the government platform and Worldwide Governance Indicators (WGI).

MATERIALS AND METHOD

Based on the purpose and objectives of this study, it is used an analytical and descriptive approach, regarding the analysis of e-public services provided by the government platform (e-Albania) and e-Government Survey, as well as the indicators that have an impact on good governance. The methodology used for this paper includes, the review of the literature related to the purpose of the study, collection and analysis of data published by national and international institutions. The study is based on the use of the analysis method, through the collection, processing and interpretation of data and statistical indicators, focusing on the relationship between e-government and good governance in Albania.

▪ E-Government and Good Governance

E-government is one of the main pillars to develop the general structure of public services through the use of technology and communications to improve the performance of government agencies and to provide high-quality services. E-government is an efficient instrument to provide information and data, as well as public goods and services, when direct interaction between the government and citizens is carried out based on information and communication technologies. The satisfaction of citizens and other actors with e-government services is closely related to their perception and usage of government platforms, and their trust in the government. E-Government is perceived as an alternative for better delivery of public services in three ways: a) offers opportunities to achieve an open government, b) helps to provide a personalized public service for citizens, c) contributes to increasing the efficiency, and performance of the public administration. Improving citizens' satisfaction, developing strong relationships with businesses and other actors, and the reduction of service delivery costs, are some of the main reasons for the development of e-government services.

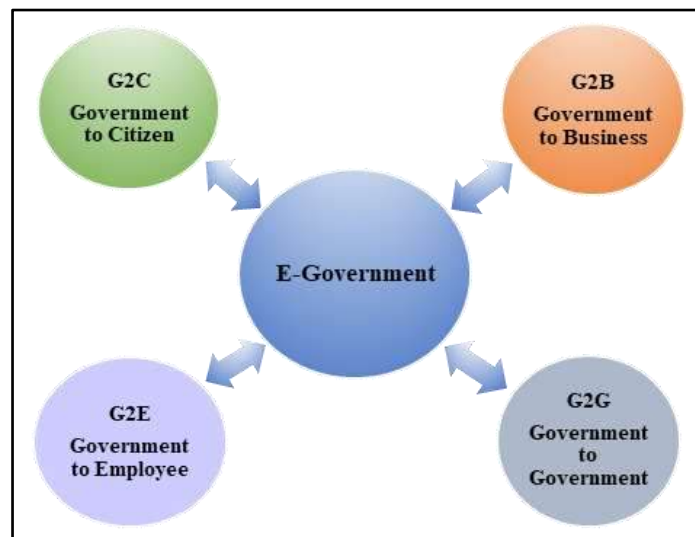


Figure 1. E-Government components and interactions

Source: Authors' composition, 2024

E-government involves the relationships between four main groups of actors: citizens, businesses, government, and employees. Electronic transactions and interactions between government and four main groups include: 1) Government to Citizen (G2C): interaction between government and citizens, regarding access to public services from their government; 2) Government to Business (G2B): interaction between government and businesses; 3) Government to Government (G2G): interaction among government departments and agencies as they work to provide services to the society; 4) Government to Employees (G2E): internal activities of government employees as they perform their duties.

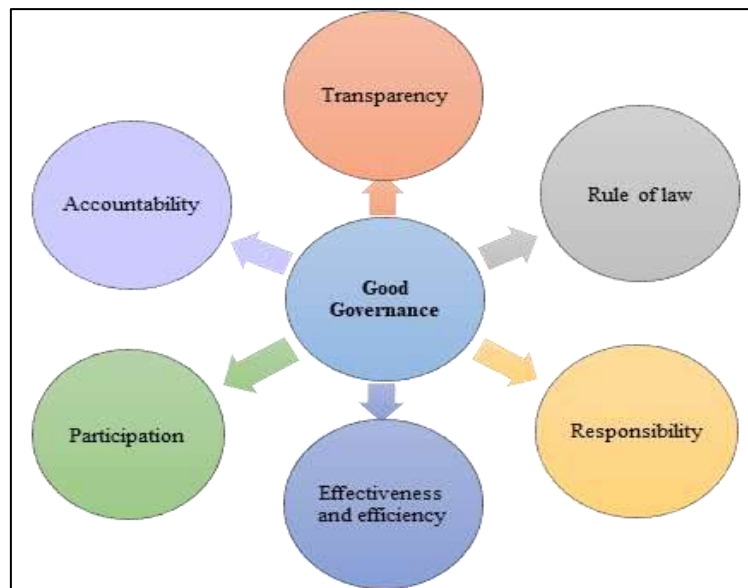


Figure 2. Good governance' indicators

Source: Authors' composition, 2024

The performance of good governance is measured using and analyzed these indicators:

- **Transparency.** Includes public institutions and agencies that provide sufficient information that is accessible to citizens and all stakeholders.
- **Participation.** Involvement of citizens and other actors in the decision-making processes of public institutions and government agencies.
- **Accountability.** Reflects the responsibility of government institutions and public organizations towards citizens for their decisions and activities.
- **Rule of law.** Includes policy formulation and implementation of activities of public organizations and government institutions in compliance with laws and regulations.
- **Effectiveness and efficiency.** It refers to the activity and competencies of public institutions and agencies in performing their functions and providing public services with efficiency and effectiveness.
- **Responsibility.** It reflects the accountability of government institutions and public organizations to citizens and other actors regarding the provision of services and their activities.

▪ **Quality of Governance**

The quality of governance is defined and evaluated by the World Bank (Kaufmann et al, 2010), according to these indicators:

- 1) **“Voice and Accountability”**, is crucial to how citizens participate in the choice of government, as well as for freedom of expression, freedom of association, and the state of the free media.
- 2) **“Political Stability and Absence of Violence/Terrorism”**, is related to the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
- 3) **“Government Effectiveness”**, is an indicator that evaluates and shows the quality of public services, the quality of civil service performance and the degree of its independence from political pressures, the quality of the formulation and implementation of public policies, and the credibility of the government’s commitment to such policies.
- 4) **“Regulatory Quality”**, is related to the government’s ability to choose appropriate policies and implement legislation that enables and supports private sector development.
- 5) **“Rule of Law”**, is an indicator frames and standardizes rules, related to trust in the law, its observance and enforcement, the protection of property rights, the activities of the police and courts, and the likelihood of crime and violence.
- 6) **“Control of Corruption”**, is an indicator concerning the abuse of public power to pursue private interests, including petty and serious forms of corruption and the degree of control over the state by elites or private interests.

The quality of governance has gained importance in recent years in developing countries as a way to promote sustainable development, as well as reduce corruption and increase trust in government.

Government strategies should improve the levels of transparency and access to information, accountability, encourage citizens’ participation in the drafting of public policies decision-making processes.

▪ **E-Government and its impact on Good Governance**

E-government promotes good governance in these main directions: 1) by increasing transparency, information and accountability, 2) by facilitating and encouraging citizens’ participation in decision-making processes and 3) by improving the quality of public service delivery. Citizens’ perception of public services, reflects to a significant extent the success of the government in accomplishing broader social-economic and political goals of a country.

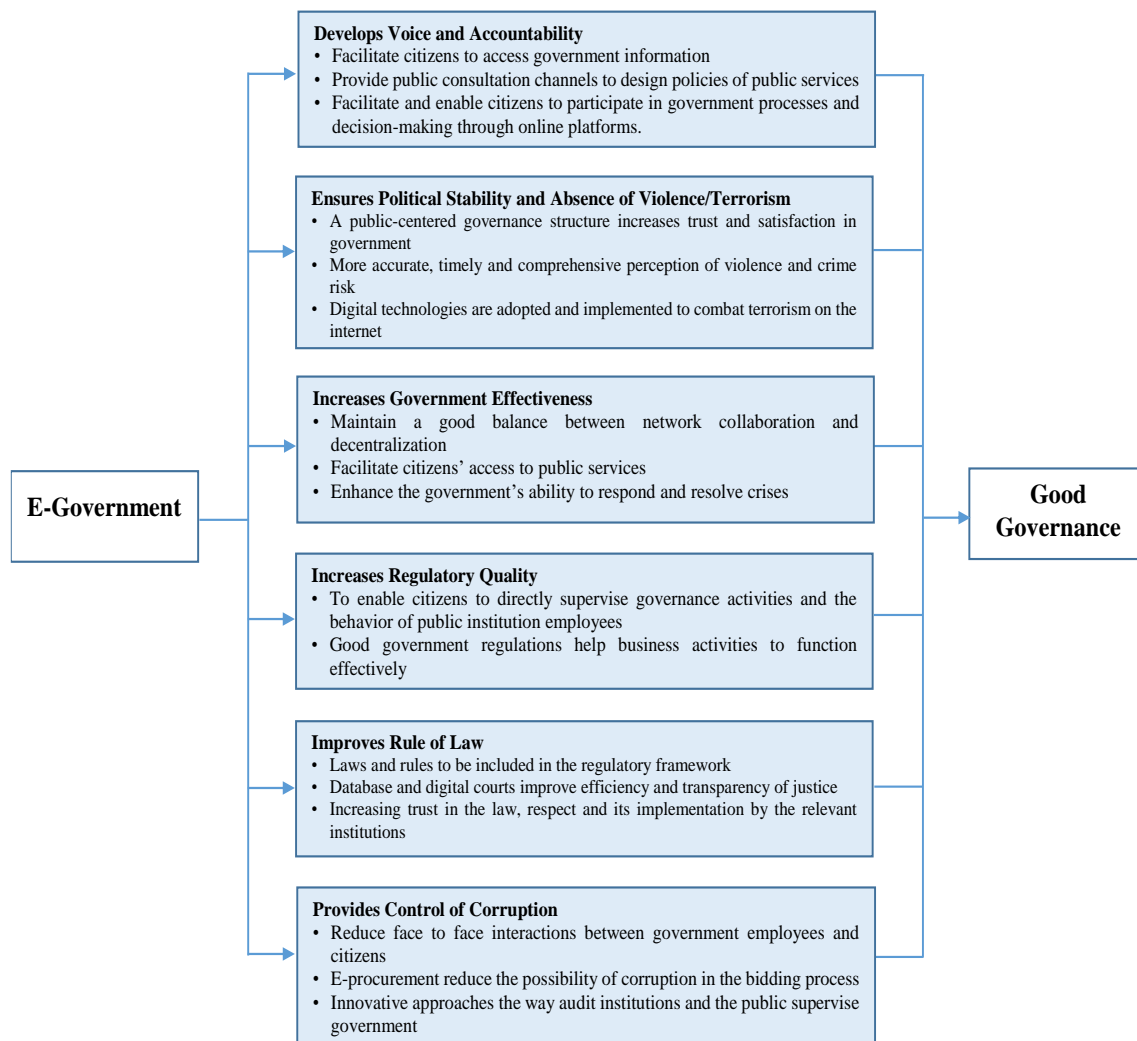


Figure 3. The mechanisms of e-government to promote good governance

Source: Zou et al., 2023; Authors' composition, 2024

The above figure shows the impact and vision of e-government to improve all aspects of good governance. E-government aims to improve public services, interaction between government and society, including citizen participation in government decision-making, transparency, promoting social equity and economic development for the future.

The indicators used in the statistical analysis, their symbols and data sources are presented in table below.

Table 1. Indicators used in the statistical analysis

Indicators	Symbol	Unit of measure	Source
E-Government Development Index	EGDI	(0 to 1)	United Nations, e-Government Survey, 2023

Voice and Accountability	VA	(-2.5 to +2.5)	World Bank Indicators, 2023
Political Stability and Absence of Violence	PSAV	(-2.5 to +2.5)	World Bank Indicators, 2023
Government Effectiveness	GE	(-2.5 to +2.5)	World Bank Indicators, 2023
Regulatory Quality	RQ	(-2.5 to +2.5)	World Bank Indicators, 2023
Rule of Law	RL	(-2.5 to +2.5)	World Bank Indicators, 2023
Control of Corruption	CC	(-2.5 to +2.5)	World Bank Indicators, 2023

Source: Authors' composition, 2024

RESULTS AND DISCUSSION

E-government is characterized by inter-organizational relationships including coordination and implementation of policies and the provision of digital public services to citizens. E- public services can play a critical role in improving the quality of services provided to its customers, increasing citizen satisfaction, and the performance of public organizations. E-government has the potential to greatly improve how public institutions operate, and how it serves its citizens. During the last decade in Albania, significant positive developments have been observed in the quality and variety of e-public services offered through the e-Albania platform, showing the government's efforts to improve the quality of public services for citizens. Some of the issues and challenges that must be addressed for good governance in our country are, drafting and implementation of sound legal and institutional policies; law enforcement; macroeconomic stability; quality of public services, efficient use of public resources, transparency and accountability of public institutions. The results show that there is a significant relationship between e-government and good governance in a country for the indicators analyzed in the study.

The e-Government Survey is one of the main global reports that assesses the e-government development status. It tracks the progress of e-government development via the e-Government Development Index (EGDI), which assesses e-government development at the national level, and measures e-government effectiveness in the delivery of public services. The E-Government Development Index (EGDI) was chosen as an indicator to evaluate the level of e-government and how a particular country uses information technologies to support and involve its citizens. The EGDI consists of three indices (factors), namely the Online Services Index, the Telecommunications Index, and the Human Capital Index. The values of EGDI, have a range

from 0-1, is derived by taking the arithmetic average of the three component indices, where 1 indicates high values, while 0 indicates low values, regarding the implementation of e-government in different countries. The EGDI is used as a benchmark to determine a numerical ranking of e-government development of United Nations Member States (United Nations, 2023).

Table 2. E-Government Indicators, in Albania

Indicators/ Year	EGDI rank	EGDI value	EPI rank	EPI value
2003	114	0.31	123	0.02
2004	110	0.34	97	0.03
2008	86	0.47	152	0.02
2010	85	0.45	86	0.13
2012	86	0.52	101	0.11
2016	82	0.53	55	0.64
2018	74	0.65	59	0.76
2020	59	0.74	36	0.85
2022	63	0.74	22	0.76

Source: Authors' composition, 2024

Referring to the above data for the e-Government Development Index, Albania has made enough steps towards the development and implementation of e-Government. In 2003 it was ranked 114th, while in 2022 it was ranked 63rd. In terms of the E-Participation Index, from 123rd, ranked in 2003, it is ranked 22th, in 2022.

The reforms and actions undertaken in Albania, have as their objective the improvement of public services by government institutions. E-Albania is the only online government platform, where public services, previously offered in physical offices, are now offered digitally for all society (citizens, businesses, NGOs, public administration employees). Through this government platform, public institutions and agencies interact with each other, to provide digital services to citizens and the whole society. The e-public services offered by the e-Albania platform have been added and improved continuously.

Table 3. The number of e-services, users and transactions on the e-Albania platform

Year	No of e-services	No of users	No of transactions
2013	14	49,738	683,207
2014	119	43,299	2,884,726
2015	248	76,731	11,420,798
2016	465	71,698	25,570,757
2017	527	151,439	26,624,830
2018	591	334,786	52,400,816
2019	601	302,068	70,224,089
2020	1,021	758,735	144,326,634
2021	1,212	628,296	215,835,976
2022	1,227	417,246	265,436,673
2023	1,232	240,289	297,727,640

Source: Authors' composition based on data from NISA, 2024

Referring to the above data, the number of services provided by the e-Albania platform in 2013 was 14, while in 2023 it is 1,232, the number of users in 2013 was 49,738, while in 2023 it is 240,289, and the number of transactions in 2013 was 683,207, while in 2023 it is 297,727,640 (NISA, 2024). During the last ten years, significant positive developments have been observed in the variety, number and transactions of services offered through this government platform. In this regard analyzing the data, it turns out that the government's efforts have aimed to improve, expand and increase the quality of public services for citizens.

Table 4. Values of six governance indicators (WGI), in Albania

Year	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
2000	-0.29	-0.54	-0.92	-0.42	-1.02	-0.86
2002	-0.01	-0.30	-0.62	-0.31	-0.76	-0.85
2004	0.01	-0.43	-0.41	-0.19	-0.70	-0.72
2006	0.08	-0.51	-0.58	-0.15	-0.70	-0.79
2008	0.17	-0.03	-0.37	0.14	-0.60	-0.61

2010	0.11	-0.19	-0.27	0.23	-0.44	-0.49
2012	0.01	-0.16	-0.27	0.20	-0.54	-0.70
2014	0.15	0.45	-0.07	0.23	-0.37	-0.55
2016	0.17	0.34	0.06	0.20	-0.30	-0.45
2018	0.18	0.37	0.11	0.27	-0.40	-0.52
2020	0.09	0.09	-0.12	0.24	-0.35	-0.55
2022	0.14	0.11	0.07	0.16	-0.17	-0.41

Source: Authors' composition, based on data from World Bank, 2024

Referring to the data in the table above, the values of these indicators are interpreted as follows.

- *Voice and Accountability*, has a positive trend and values after 2004 and continues until 2022. This indicator has improved, positively influencing the quality of governance.
- *Political Stability and Absence of Violence*. This indicator had negative values until 2012. From 2014 onwards, this indicator has positive values and a significant impact on the quality of governance, which indicates political stability in our country.
- *Government Effectiveness*. This indicator had negative values until 2014. While for the period 2016- 2022, there are positive values. The improving values of this indicator show the government's efforts to increase the quality of public services.
- *Regulatory Quality*, has a positive trend and values after 2008. This indicator has had a positive impact on the quality of governance, in terms of the drafting and implementation of sound policies and regulations that promote and support the development of the private sector.
- *Rule of Law and Control of Corruption*, are the two indicators that have negative values for the entire 2000-2022 period. The rule of law and control of corruption continue to be one of the main challenges for our country.

Based on the above data analysis, we conclude on some key findings:

Referring to the above data, Albania has made enough steps towards the development and implementation of e-Government. During the last ten years, significant positive developments have been observed in the variety, number and transactions of services offered through government service platform. In this regard, analyzing the data, it turns out that the government's efforts have aimed to improve and increase the quality of public services for citizens.

Albania has made important steps towards the quality of governance. After the 1990s, our country has undertaken and implemented a series of structural and institutional reforms in the direction of good governance. These reforms have aimed at increasing the effectiveness of the

government, the performance of the public administration, and the best functioning of the public institutions.

Good governance is of particular importance, especially in developing countries, because it significantly affects economic development and examines the differences in economic development between different countries.

Voice and accountability and political stability, have a positive impact on the quality of governance. Government effectiveness reflects the quality of public services and government decision-making processes. Regulatory quality has had a positive impact on the quality of governance, in terms of the drafting and implementation of sound policies and regulations that promote and support the development of the private sector.

Control of corruption and the rule of law, are two indicators that negatively affect the quality of governance. The rule of law is considered a key indicator of good governance, as it is important for maintaining public order and security, controlling corruption, improving public service delivery and sustainable economic development in the country.

CONCLUSION

The role of e-government in providing and improving the quality of public services and the impact it has on the good governance of a country like Albania is of particular importance. The main objective of this study was to evaluate the relationship between e-government and good governance.

The quality of government and its impact on economic development has become more important in recent years, especially in transition countries such as our country that need to reform their institutions to meet the conditions for EU membership.

E-government has the potential to improve service delivery and increase citizen satisfaction, minimize corruption, provide efficient service, ensure accountability and transparency through interaction with citizens. ICT and digital technologies are one of the most important factors in terms of current developments, including their impact on effective good governance and sustainable development.

Referring to the data from the e-Government Survey and the National Information Society Agency (NISA), it turns out that Albania has made enough steps during the last ten years, which shows an increase in the level of use of e-public services for citizens, provided by the government platform.

Good Governance is represented by six world governance indicators (WGIs) defined by the World Bank: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. The results show that there is a significant relationship between e-government and good governance, for the indicators analyzed in this study.

E-government promotes good governance in these directions; by increasing transparency, information and accountability to citizens; by facilitating and encouraging citizen participation in decision-making processes and by improving the quality of public services.

The quality of governance has gained importance in recent years in developing countries as a way to promote sustainable development, as well as reduce corruption and increase trust in government.

Strengthening public institutions, increasing the performance of public administration, transparency and accountability, and participation of citizens in decision-making processes, are essential for good governance.

Some of the challenges that must be addressed for good governance in Albania are, the drafting and implementation of legal and institutional policies, the rule of law, efficient use of public resources, sustainable economic development, transparency and accountability of public institutions, citizens' well-being, as well as the future integration into the European Union.

LIMITATIONS AND SCOPE FOR FURTHER STUDIES

The research has its limitations, but the results and findings of the study are intended to help the government and relevant institutions, to improve and promote good governance. The paper points to the need for further research into the impact of the use of e-government on the good governance.

Further research in this area will focus on a more in-depth analysis to explore this relationship to provide a framework for effective implementation of e-government as part of governance reform steps that will lead to a real and noticeable improvement in the quality of governance.

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EMPLOYEE PERCEPTIONS TOWARDS THE QUALITY OF QUALITY PROCESSES IN ORGANIZATIONS: A RESEARCH IN THE AEGEAN REGION

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ABSTRACT

The main purpose of this research is to determine employee perceptions about quality processes in organizations reaching the expected quality level. The survey prepared for this purpose was conducted in various sectors (energy, mining, automotive, chemistry, packaging, health, finance, education, information systems, public, other service sectors, etc.) in the Aegean Region between June 2024 and July 2024. It was applied to 311 employees in organizations. The 15 propositions within the scope of the study, which include revealing the quality of quality, were gathered under a single factor as a result of exploratory factor analysis, and Cronbach's Alpha value is 0.974.

As a result of the research, participants found each proposition and the general factor average consisting of propositions that reveal the quality of quality to be highly important. Positive, very high, high and medium level correlations were determined between the propositions. In addition, according to the structural equation model, the factors that reveal the importance of quality in the confirmatory framework show integrity.

According to the experiences of the participants, the main problems encountered in the management of quality processes are summarized as low employee participation and awareness, top management not knowing the quality management content correctly, processes not being clearly defined, lack of experience, resistance to change and excessive documentation. The main solutions suggested by the participants are in summary, artificial intelligence, etc. providing practical solutions with technological and software supports, using communication channels that explain the importance and scope of the work done in order to create a quality culture and increase ownership among employees, giving up the perception of quality management as only product control by senior management, determining strategic goals regarding quality and concrete performance indicators of these goals. the employee staff who believe in change and need the energy of change, periodic process evaluation and simplification of the processes.

Keywords: Quality in organizations, quality processes, perception of quality, quality of quality

1.INTRODUCTION

In today's business world, the organizations' tendency to global markets from national ones gains importance in a competitive atmosphere within a holistic frame with quality. In this context, success of organizations is not only limited with increasing market share but also related to remedation of process, product and service qualities continuously. Whereas quality expresses suitability of products and services with determined standards, carrying features which are reliable and exceed customer expectations, quality management involves methods and approaches that include managing preproduction, production, sale, postpurchase processes systematically and also continuous improvement

Therefore, quality management is a whole of strategic approaches that organizations use them by the aim of increasing productivity, reducing the costs and maximizing customer satisfactions. This strategic process includes the stages like determining quality standards, checking and improving processes regularly. From a strategic point of view, quality management systems do not only protect current quality standards of organizations but also systematically organise the efforts towards improving these standards continuously.

Therefore, the organizations need to have a strong quality management approach to achieve success in global competitive environment. This approach zero in on understanding customer needs and expectations, making continuous improvements in process, product and services and providing quality assurance. Effective quality management will be able to provide organizations to become prominent increasing their competition advantages in a sustainable frame and to maximize customer satisfaction. Accordingly, it can be commended that quality and quality management should take place in the center of strategic planning of modern businesses and continuous improvement culture has to be encouraged within an assurance frame questioning quality of quality.

2. LITERATURE REVIEW

2.1. QUALITY AND QUALITY MANAGEMENT

The word quality is derived from the term "Qualis" in Latin. Within this frame quality can be remarked as a journey which reveals tendency of excellence everyway (Öztürk, 2024: 23). It can be remarked that the journey mentioned reveals both the quality of processes and created products and services including internal and external shareholders together.

Quality is a reality that can be perceived differently in various processes. The perception of quality differs from time to time as; examination/control in early 1900s, statistical quality control in 1920-1930s, quality assurance until 1980s and it turns into total quality management that frames entire processes since 1980s (Bergman and Klefsjö: 2003: 34).

One of the major pioneers of mentioned differentiation process is W. A. Shewhard, who shows a scientific approach and focuses on statistical quality since early 1900s. Once after the World War II, quality studies were speeded up around the world, during this process W. E. Deming presented PDCA (plan, do, control, act) and 14 Basic Rules of quality, around 1950s

J. M. Juran emphasized leadership and processuality and also K. Ishikawa featured quality control cycle, cause effect diagram, statistical techniques, around 1960s G. Taguchi adopted quality oriented education, participation in quality, inside and outside customer approach, around 1970s A. V. Feigenbaum revealed total quality control and P. B. Crosby emphasized on conformity to standards, around 1980s T. Peters and R. H. Waterman discussed excellence of quality and quality culture within the management frame (Dale, 1999: 21; Chileshe, 2007: 52; Knowles, 2011: 10-11; Kolb ve Hoover, 2012: 7-8; Neyestani, 2017: 13).

Quality can be remarked as a strategic frame which has importance for the organizations to achieve a long-term sustainable success within a high quality framework (Lakhe and Mohanty, 1994: 10, 14). Therefore, as a strategic factor, quality will satisfy customer expectations (strength, confidence, design, aesthetic, attractiveness, guarantee and service etc.) and needs (product/service performance).

Quality is associated not only with the final state of the product but also with manufacturing process, materials used and service style directly (Schermerhorn, 1999: 34).

Quality of product and service has a critical importance for providing success around the sector a sustainable competitive advantage. Within this frame quality plays a determining role in competitive market (Shank and Govindarajon, 1993: 203). Moreover, it specifies to what extend a product satisfies customers' needs in consumption chain and how much proper to intended use (Tan and Peşkirçioğlu, 1985: 7).

Quality management is a comprehensive process that aims developing product and service quality continuously. During this process some of the prominent quality strategies can be remarked as maximizing quality oriented organization performance, determining quality standards clearly, supervising the current processes regularly and continuous improving (Charantimath, 2006, p.177-180).

Main components of quality management form the building blocks of a successful quality management system and contains following elements. These components facilitate organizations to achieve quality targets and to develop strategies towards continuous improvement providing a systematic approach (www.prodan.com.tr) :

- Quality Planning
- Quality Control
- Quality Assurance
- Continuous Improvement
- Customer Satisfaction Management
- Documantation and Register Management

Consequently, quality and quality management can be defined as two basic concepts which have strategic importance for the organizations. While quality describes replying customer

satisfaction level of product and services, quality management offers a systematic approach by the aim of satisfying and going beyond these expectations. This management approach helps organizations to optimize processes increasing productivity and to maximize customer satisfaction. Quality management enables organizations to keep competitive advantage in market and to achieve sustainable success. Additionally, while an effective quality management system provides improvement for organizational processes, it may also have potential of increasing customer commitment and market share. Therefore, quality and quality management become building blocks of a competitive and successful organization

2.2. RESEARCHES TOWARDS QUALITY AND QUALITY OF QUALITY

Researches towards quality are systematic examinations conducted to understand, evaluate and improve quality of products and services of organizations. These researches contribute improving innovative methods and strategies in the field of quality management.

2.2.1. Quality Measurement and Evaluation Methods

Quality measurement and evaluation analyses product and service performance by various criterias and specifies quality levels. Researches develop innovative methods to increase accuracy of measurement tools (Garvin, 1984:25-43).

2.2.2. Customer Satisfaction Researches

Customer satisfaction researches specify how the product and services perceived analysing consumer feedback and offer necessary improvements to satisfy customer expectations (Parasuraman, Zeithaml, & Berry, 1988:12-40).

2.2.3. Process Remediation and Innovation Researches

Process remediation researches determine issues of the process and offer solutions to improve productivity and reduce costs. Innovation researches develop new technologies and methods to improve quality.

2.2.4. Researches of Quality Management Systems

Researches of quality management system evaluate feasibility and effectiveness of quality standards, examine how they affect organizational performance and specify the best application examples (ISO 9001:2015).

2.2.5. Performance Measurement and Analysis

Performance measurement and analysis evaluates effects of quality management and provides information towards examining the organizational results of quality remediations analysing performance data (ISO 9001:2015).

2.2.6. Quality and Human Resources Management

Quality and human resources management evaluates effects of employees on quality and examines how the factors like education and motivation enhance quality (Kavi,2005:784-809).

Quality researches offer comprehensive data for the organizations towards in depth understanding quality management systems and continuous remediation. These researches enable to specify deficiencies and develop and practise the best application methods. Consequently, Quality researches contribute organizations significantly to strengthen competition advantage and maximize customer satisfaction.

Generally there have been quality researches as dealt above. However, a research that reveals the “quality of quality” may contribute to both literature and practice. What are the perceptions of managers and other employees take place in quality processes towards quality processes and practices? Since the concept of quality emerges and develops within the frame of customer expectations and needs, looking quality of quality from the viewpoint of internal and external customer perceptions will be able to form a participatory, rational and modern basis. Moreover, it is impossible to mention a universal consent quality and static quality sense for today’s dynamic organizations and markets.

3. RESEARCH

3.1. Purpose of the Research

The main purpose of this research is to determine employee perceptions about quality processes in organizations reaching the expected quality level.

3.2. Data Collection Tools

The survey form used in research has been consisted of three main parts. In the first part, socio-demographic variables take place like age, gender, educational level, position (manager, other), professional experience duration and sector. In the second part of the survey there is the section in which employees are asked to identify three main issues they encounter and solution offers. And the third section of the survey includes 15 statements that are anticipated to be important in achieving the desired level of quality in quality processes. Within this context, the writers’ studies about quality like Erdal (2000), Aktan (2012), Akan (2018), Aksoy (2014), Kavi (2005), Özürc (2024) etc. take place in literature.

The statements are given values within the scope of 5 Likert Scale as; strongly disagree 1, disagree 2, neutral 3, agree 4, strongly agree 5

3.3. Data Collection and Analysis

The survey was applied 311 employees of 57 organizations from various sectors (energy, mining, automotive, chemistry, packaging, health, finance, education, information systems, public, other service sectors, etc.) in the Aegean Region between June 2024 and July 2024. In

the research factor analysis, one sample t test, correlation analysis and structural equation modelling are included. The statistics were practised by SPSS and AMOS packaged software and the data collected were evaluated in the light of literature.

3.4.Main Hypotheses of the Research

Main hypotheses of the research are as follows:

H₁: The propositions (items) towards quality of quality show integrity within the frame of factor analysis.

H₂:proposition (item) is important for the quality processes to achieve expected quality level.

H₃: Quality of quality factor is perceived as important by participants.

H₄: A positive linear correlation is observed between propositions for achieving expected quality level.

4.FINDINGS

4.1.Findings Towards Independent Variables

The participants' (n=311) age average is (min – max= 24-69) and standard deviation is 45,0 ± 10,89. It is 41,2 ±9,01 for female participants (n=104, %33,4) and 46,9±11,27 for male participants (n=207, %66,6). Educational status distribution is as follows. licence (n=187) %60, postgraduate (n=187) %60,1. Leader-positions are (n=199) %64 and other positions (n=112) are %36. Distribution according to duration of experience is specified as 1-9 years experience %17,4 (n=54), 10 years and over experience is %82,6 (n=257). %86,5 of participants (n=269) work in private sector and %13,5 of them (n=42) work in public sector.

4.2.Commentaries Within the Frame of Findings Towards Issues Encountered in Quality Processes Management and Solution Offers

In the second section of the survey the participants were asked to define issues they encounter during quality process and their solution offers for these problems. Defined issues and solutions offers are summarized in groups.

The feedback from the participants during quality process have been collected around various issue fields and solution offers towards these fields. Examining these feedback, issues around specific themes and solution offers attract attention. Commenting these themes in details will help to understand difficulties encountered in quality management and awareness level against this difficulties.

4.2.1.Lack of Awareness

Lack of awareness is associated with inability of employees' participation into quality processes and lack of their awareness about importance of these processes. This situation shows that quality culture is not adopted around the organization and contribution of

employees to this process is limited. As a solution, organizing trainings and communication campaigns towards increasing quality awareness are offered. These kind of efforts can provide participating of employees into quality management processes.

4.2.2.Top Management Leadership

Lack of top management's support and knowledge about quality management become preminent as an important problem. It is quite hard to practice quality management processes effectively without support of top management. One of the solution offer is to include top management into quality processes and strengthen leadership roles about it. This will help to increase the importance given to quality in organizations and contribute to course of proceeding.

4.2.3.Process Management

The issues about process management are remarked as undefined processes and lack of communication around processes. These kind of structural deficiencies may cause incoherence and loss of productivity in quality processes. Solution offers include providing more co-operation and conversation between process officers. Clarifying processes and eouraging effective communication among employees have a critical importance in terms of quality management.

4.2.4.Personnel Proficiency

The subject Personnel proficiency emerges as another main issue encountered in quality processes. Unexperienced and inefficient personnel may affect processes negatively. As a solution, more investment for personnel training and giving more responsibility to experienced fieldworkers are offered. This approach may help to protect quality standards and to provide a continuous improvement in organizations.

4.2.5.Quality Organization

Structure of the organization and its place in the organization reveal as a factor which affect effectiveness of quality management directly. Position of quality unit in organization has to be clarified strengthened. If quality management is being run by a single department, roles and effects of this unit can be reexamined. Positioning quality unit at the top level of the organization will improve strategic importance of studies performed in this area.

4.2.6.Technological Progresses

Difficulties about orientation with technological progresses are another important problem. Integration of digital solutions into quality processes has a critical importance for modernization of these processes. However, these kind of integrations may meet with a resistance and adaptation process can be tough. As a solution, enhancing trainings about digital solutions and adopting these solutions throughout the organization are suggested. This will provide to use technology effectively in quality management and make the processes more productive.

Consequently, feedback from the participants show the existence of distinct structural and cultural problems in quality management processes. Solution offers developed towards these issues reveal that this problem can be overcome via organizational changes and training programs. During this process top management's leadership and participation of employees into quality processes become prominent for achieving success.

4.3. Validity-Reliability of Measurement Tool and Structural Equation Modeling

Principal components analysis has been preferred for explanatory factor analysis within the scope of 15 propositions which are predicted to be important for expected quality level in the third section of the survey. The result of Kaiser-Meyer-Olkin = 0,952 and Bartlett's Test of Sphericity showed up properly ($\chi^2 = 5474, 533$, Sd=66, p=0,000). Diagonal values of anti-image correlation matrix take value between 0,933 - 0,875. In accordance with these findings, actualizing explanatory factor analysis is determined to be proper. 15 propositions have been collected under one factor as a result of factor analysis. Total variance explained by composed factor is %73,714. Cronbach Alpha value of single factorial structure is 0,974. According to this result, it is revealed that factors pointed by propositions take place in the survey explain the subject at a high level reliability. Within this frame internal consistency is provided (Table 2). General item average of 15 factor structure is 4,491 and variance is 0,732. Each of the propositions is shown with the symbol "Q" and the single factor is named as "quality of quality factor" accordance with the propositions it includes.

Table 1. Validity and Reliability Tests Findings

For achieving expected quality level of quality processes.....proposition (item) is important		Quality of Quality Factor	Cronbach's Alpha
Q1	Existence of effective and efficient educational processes towards quality	,897	General 0,974
Q2	Employees' practice of activities and works adopting quality philosophy	,895	
Q3	Having the sense that quality has a processual, circular and a continuous nature	,876	
Q4	Establishing and maintaining the system that carries to expected quality standards	,869	
Q5	Existence of effective and efficient behavioural processes towards quality (leadership, motivation, team work, stress, confliction, communication, perception, attitude, behaviour etc.)	,869	
Q6	Canalizing objectives and targets which satisfy customer/shareholder (internal and external) expectations	,868	
Q7	Handling strategies, objectives, targets and performance indicators within the scope of quality, measurement and updating	,867	
Q8	Harmonisation organizational culture towards quality perception and quality processes	,862	
Q9	Adopting quality as a process start with leadership and continues	,853	
Q10	Perceiving quality sense and processes as a philosophy within a strategic frame	,853	
Q11	Building on and supporting participation for the subjects about job	,849	
Q12	Maintaining promotion processes supported by internal or external associations kindly	,845	
Q13	Having and using the current technologies necessary for quality management effectively	,837	
Q14	Prompting creative thinking potential towards quality level, improvement and development	,831	

Q15	Carrying over the quality to a location provides sustainable competitive advantage that increase image and dignity	,803	,973	
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As a result of structural equation, as it is observed in Table 2 which is a kind of factor analysis, H₁ (Items/propositions specified towards quality of quality show integrity within the frame of factor analysis) is considered significant (Table 2). Coefficients of model are at high level and important consequentially (Table 2). In Table 1, Q symbols for each proposition are observed. The values CMIN/DF= 0,779, GFI=0,889, NFI=0,901, CFI=0,903 and RMSEA= 0,797 show that harmony in the model is acceptable (Figure 1)

Table 2. Structural Equation Findings

Quality Items	Path	Quality of Quality	Estimate (β)	Standard Error	Critical Ratio	P	Result
Q1	<---	QofQ	1,000				
Q2	<---	QofQ	,983	,041	24,229	***	Accepted
Q3	<---	QofQ	,904	,040	22,783	***	Accepted
Q4	<---	QofQ	,949	,042	22,613	***	Accepted
Q5	<---	QofQ	,997	,045	22,320	***	Accepted
Q6	<---	QofQ	,962	,043	22,168	***	Accepted
Q7	<---	QofQ	,960	,043	22,281	***	Accepted
Q8	<---	QofQ	,903	,041	21,816	***	Accepted
Q9	<---	QofQ	,956	,044	21,539	***	Accepted
Q10	<---	QofQ	,905	,043	21,199	***	Accepted
Q11	<---	QofQ	,917	,044	20,729	***	Accepted
Q12	<---	QofQ	,981	,048	20,394	***	Accepted
Q13	<---	QofQ	,955	,048	20,062	***	Accepted
Q14	<---	QofQ	,916	,047	19,618	***	Accepted
Q15	<---	QofQ	,879	,047	18,761	***	Accepted

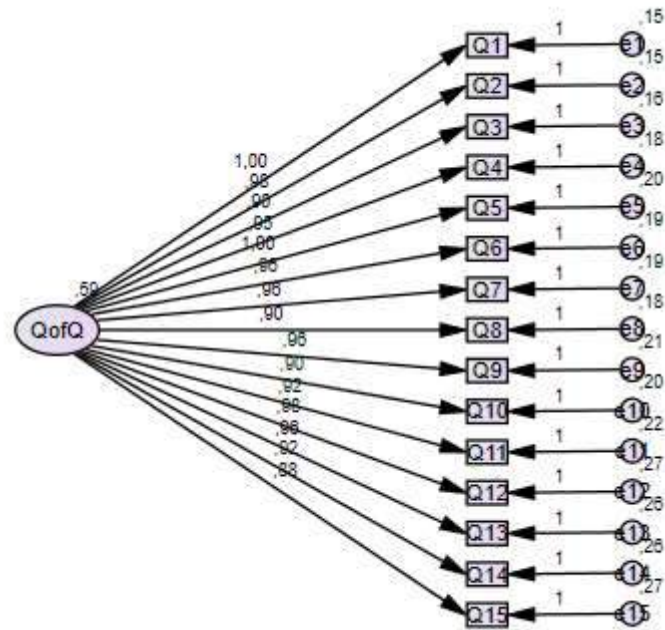


Figure 1. Structural Equation Modeling Towards Quality of Quality

4.4. Propositions and Findings towards Factor

Within the scope of research, hypothesis H₂ (... proposition/item is important for quality processes to achieve expected quality level) is accepted for all propositions. Besides, hypothesis H₃ (the factor quality of quality is perceived as important byparticipants) is also accepted (Table 3). In other words, according to these findings hypothesis/thought revealed within the scope of each proposition is specified as highly important for organizations to achieve expected quality level in quality processes. Moreover, as all propositions are evaluated together, a key condition for achieving expected quality level in quality processes is shown up within the frame of quality of quality factor (Table 3).

Table 3. Propositions and One Sample t Test Within the Scope of Quality of Quality Factor

Symbol	Proposition (Item)	N	Mean	Std. Deviation	Test Value=3	
					T	P
Q1	Existence of effective and efficient educational processes towards quality	311	4,5627	,85859	32,097	,000
Q2	Employees' practice of activities and works adopting quality philosophy	311	4,4855	,84564	30,980	,000
Q3	Having the sense that quality has a processual, circular and a continuous nature	311	4,4952	,79867	33,014	,000
Q4	Establishing and maintaining the system that carries to expected quality standards	311	4,5884	,84112	33,304	,000
Q5	Existence of effective and efficient behavioural processes towards quality (leadership, motivation, team work, stress, conflict, communication, perception, attitude, behaviour etc.)	311	4,5466	,88914	30,676	,000
Q6	Canalizing objectives and targets which satisfy customer/shareholder (internal and external) expectations	311	4,5370	,86009	31,514	,000

Q7	Handling strategies, objectives, targets and performance indicators within the scope of quality, measurement and updating	311	4,5402	,85619	31,724	,000
Q8	Harmonisation organizational culture towards quality perception and quality processes	311	4,5434	,81352	33,457	,000
Q9	Adopting quality as a process start with leadership and continues	311	4,5659	,86584	31,894	,000
Q10	Perceiving quality sense and processes as a philosophy within a strategic frame	311	4,4759	,82612	31,506	,000
Q11	Building on and supporting participation for the subjects about job	311	4,4920	,84573	31,110	,000
Q12	Maintaining promotion processes supported by internal or external associations kindly	311	4,3891	,91215	26,856	,000
Q13	Having and using the current technologies necessary for quality management effectively	311	4,3730	,89575	27,031	,000
Q14	Prompting creative thinking potential towards quality level, improvement and development	311	4,3891	,86867	28,200	,000
Q15	Carrying over the quality to a location provides sustainable competitive advantage that increase image and dignity	311	4,3859	,85326	28,643	,000
QofQ	Quality of Quality Factor	311	4,4913	,73396	35,832	,000

Within the scope of research for all binary interchange H_4 (there is a positive linear correlation between propositions for achieving expected quality level by quality processes) is accepted. In other words, possible interaction of propositions has to be conserved to achieve expected quality level in quality processes of organizations. Examining correlation coefficient R the existence of correlation power can be observed as very high (between 1,00-0,8) and high (0,8-0,6) (Table 4).

Table 4. Correlations Within the Scope of Propositions

		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Q2	R	,818**													
	P	,000													
Q3	R	,787**	,780**												
	P	,000	,000												
Q4	R	,822**	,767**	,761**											
	P	,000	,000	,000											
Q5	R	,758**	,839**	,703**	,737**										
	P	,000	,000	,000	,000										
Q6	R	,725**	,731**	,767**	,770**	,741**									
	P	,000	,000	,000	,000	,000									
Q7	R	,783**	,746**	,726**	,798**	,713**	,770**								
	P	,000	,000	,000	,000	,000	,000								
Q8	R	,720**	,802**	,776**	,710**	,752**	,702**	,749**							
	P	,000	,000	,000	,000	,000	,000	,000							
Q9	R	,768**	,712**	,741**	,839**	,695**	,799**	,787**							
	P	,000	,000	,000	,000	,000	,000	,000							
Q10	R	,763**	,763**	,644**	,728**	,751**	,733**	,739**	,000						
	P	,000	,000	,000	,000	,000	,000	,000	,675**	,714**					
Q11	R	,688**	,720**	,746**	,653**	,692**	,727**	,719**	,000	,000					
	P	,000	,000	,000	,000	,000	,000	,000	,721**	,685**	,712**				
Q12	R	,720**	,687**	,735**	,638**	,731**	,699**	,651**	,000	,000	,000	,730**			
	P	,000	,000	,000	,000	,000	,000	,000	,692**	,647**	,682**	,000			

Q13	R	,737**	,714**	,733**	,641**	,634**	,702**	,679**	,000	,000	,000	,762**	,821**		
	P	,000	,000	,000	,000	,000	,000	,000	,677**	,650**	,657**	,000	,000		
Q14	R	,696**	,691**	,689**	,595**	,730**	,682**	,649**	,000	,000	,000	,770**	,851**	,750**	
	P	,000	,000	,000	,000	,000	,000	,000	,686**	,577**	,726**	,000	,000	,000	
Q15	R	,755**	,741**	,689**	,716**	,703**	,618**	,641**	,000	,000	,000	,617**	,611**	,626**	,624**
	P	,000	,000	,000	,000	,000	,000	,000	,696**	,625**	,695**	,000	,000	,000	,000

5. CONCLUSION

In this research employee perceptions and their participation in these processes is emphasized to have a critical role for carrying organizations to expected quality level. Data collected from 311 employees work in various sectors in Aegean Region reveal that quality management is not only a procedural application but also it is a process necessitates conscious and effective participation of employees. In this context, increasing the employees' awareness level towards quality processes give them the opportunity of acting more proactively in each stage of the process.

Research findings show that strategic approaches are needed for quality of quality processes, remediation and sustainability of them. Besides, participation of the employees in process actively, incentive training programs, improving communication channels and establishing a corporate culture which creates awareness about importance of these processes are remarked as decisive factors for success of quality management. These kinds of strategies can contribute to develop both individual and general organizational productivity deepening commitment of employees to quality processes.

Besides, using artificial intelligence and other high technological supports in a qualified quality management enable to maintain the processes more productive and correctly. Additionally, integration of technologic tools not only increase productivity, but also provides managing quality processes more flexible and dynamically. However, it is necessary to create awareness towards technology and give the essential trainings around the organization in order to practice these innovations successfully.

Consequently, these findings have the characteristics of a guide for the organizations to carry the quality processes to expected quality, to manage the quality processes more effectively and to get competitive advantage. Quality success of quality depends on not only using technical tools but also commitment and participating of the employees to the process. Therefore, reviewing the quality management strategies and shaping these strategies to feature effective usage of technology and participation of the employees have great importance.

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**SAĞLIK KURUMLARINDA YÖNETİM SÜRECİNE ETKİ EDEN KÜRESEL
FAKTÖRLERİN İNCELENMESİ**
REVIEW OF GLOBAL FACTORS AFFECTING THE MANAGEMENT PROCESS IN
HEALTH INSTITUTIONS

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ÖZET

Verimli ve etkili bir Sağlık Yönetim Bilgi Sistemi (SYBS), politika planlaması, hedef belirleme ve politika uygulama zorlukları için sistem ve veri merkezi sağlayarak hem sağlık sistemi hem de insanların sağlığı için kritik öneme sahiptir. Sürdürülebilirlik için, SYBS tasarlanırken hastanelerin örgütsel yapısı dikkate alınmalıdır. Sağlık Yönetim Bilgi Sisteminin (SYBS) önemi ihmal edilemez çünkü herhangi bir ülkedeki sağlık politikaları ve planlaması genellikle çeşitli sağlık sorunları hakkında doğru ve zamanında bilgilere bağlıdır. Sağlık bilgisi, insanların sağlığı ve kendilerinin, hükümetin ve diğerlerinin bu konuda ne yaptığı hakkında bilgidir. Önemli hastalıkların oluşumunu, sıklığını ve nedenlerini, ayrıca tedavi edici faaliyetlerin erişilebilirliğini ve verimliliğini açıklamaktadır.

Bu çalışmanın amacı, Hastanelerdeki Sağlık Yönetim Bilgi Sisteminin (SYBS) uygulanmasını etkileyen faktörlerini incelemek ve bunun sağlık kurumları yönetim sürecindeki önemini araştırmaktır.

Çalışmanın bulguları, bağımsız değişkenler olan; teknolojik faktörler, yönetsel faktörler ve operasyonel faktörler ile bağımlı değişken olan hastane uygulaması arasında pozitif bir ilişki olduğu incelenen araştırmalarda ortaya çıkmıştır. İnceleme literatür taraması şeklinde gerçekleştirilmiş ve çıkarımsal analiz yapılmıştır. Bu çalışma bulgularına göre devlet ve özel hastanelerin yönetimlerine; sistem analizi ve tasarımı konusunda usulüne uygun süreci takip etmeleri ve sistem gereksinimlerinin tanımlanması sırasında tüm kaynakları bir araya getirmeleri önerilmektedir.

Anahtar kelimeler: Bilgi İletişim Teknolojisi, Sağlık Kurumları, Yönetim Süreci, Teknolojik Faktörler, Yönetsel Faktörler ve Operasyonel Faktörler.

ABSTRACT

An efficient and effective Health Management Information System (HMIS) is critical to both the healthcare system and people's health by providing the system and data center for policy planning, target setting, and policy implementation challenges. For sustainability, the organizational structure of hospitals should be taken into account when designing HMIS. The importance of Health Management Information System (HMIS) cannot be neglected because

health policies and planning in any country often depend on accurate and timely information about various health issues. Health information is information about people's health and what they, the government, and others are doing about it. It describes the occurrence, frequency and causes of major diseases, as well as the accessibility and efficiency of therapeutic activities.

The aim of this study is to examine the factors affecting the implementation of Health Management Information System (HMIS) in hospitals and to investigate its importance in the management process of healthcare institutions.

The findings of the study are the independent variables; It has been revealed in the studies examined that there is a positive relationship between technological factors, managerial factors and operational factors and the dependent variable, hospital practice. The review was carried out in the form of a literature review and inferential analysis was performed. According to the findings of this study, the managements of public and private hospitals; It is recommended that they follow the proper process for system analysis and design and bring all resources together when defining system requirements.

Keywords: Information Communication Technology, Healthcare Institutions, Management Process, Technological Factors, Managerial Factors and Operational Factors.

1. GİRİŞ

Günümüzde hastaneler arasında rekabet ortamı oluşmaktadır. Hastanelerin tercih edilebilmesi için bilgili ve deneyimli personele, gelişmiş teknolojik alt yapıya ve kaliteli hizmete sahip olması gerekmektedir. Hastalar tarafından tercih edilebilmesi dışında hangi hastanenin bireyler tarafından tercih edilip edilmemesinde etkili olan faktörlerin bilinmesi gerekmektedir. Hastaların hastane tercihlerini etkileyen faktörler konusunda yapılan çalışmalarda, hastane tercihlerini genel olarak etkileyen faktörlerin diğerleri ile benzer olduğu görülmektedir. Hastane tercihi, sağlık hizmeti tüketicisinin veya bakım vereninin seçme şansı varsa sağlık kuruluşlarından birini seçmesidir (Tengilimoğlu, 2001). Yapılan araştırmalar; hastane personelinin tutum ve davranışları, sunulan sağlık hizmetinin kalitesi, hastanenin temizliği, hastanenin fiziksel olanakları ve hastanenin imajının hastaların hastane tercihlerini etkilediği görülmektedir (Toraman vd., 2019). Ayrıca, hijyen ve temizlik konusunda bilgilendirilme, personelin tutum ve davranışları, eve yakın olma, ilgili hekim ve teknolojik donanıma sahip olma, hastane ile ilgili geçmiş deneyimler, hizmet maliyeti, hastane büyüklüğü, dini inanç gibi faktörlerin hastaların hastane tercihinde etkili olduğu bulunmuştur. Verma ve Khandelwal (2011) tarafından yapılan çalışmada ise tıbbi kalite, hijyen, altyapı, ödeme yöntemi, tedavi süresi, teknolojik imkân, fiziksel imkân, hastanenin imajı ve itibarı, hastanenin büyüklüğü, personelin tutum ve davranışı, hizmetin hızı, doktor ve yakınlarının tavsiyeleri, hizmet çeşitliliği, bekleme süresi ve hastanenin konumu gibi faktörlerin hastaların hastane tercihlerinde etkili olduğu görülmüştür.

Malik ve Sharma (2017)'ya göre hastanenin eve yakınlığı, görevli hekimin bulunması, personelin işlerini zamanında yapması, yeterli teknik donanıma sahip olması, hekim ve hasta arasındaki iyi iletişim, hasta kabul sürecinin hızlı olması, yapılan tedavinin güvenilir olması ve hastane tanıtımı hastaların hastane tercihlerinde etkilidir. Literatürde yapılan çalışmalar incelendiğinde personelin tutum ve davranışları, hijyen, hastanenin fiziksel olanakları, hizmet kalitesi, eve yakınlık ve teknolojik donanımın hastaların hastane tercihlerini etkilediği söylenmektedir.

Modern bilgi teknolojisinin kullanımı, klinik hataları azaltması, sağlık profesyonellerini desteklemesi, bakım verimliliğini artırması veya hatta hasta bakımının kalitesini iyileştirmesi nedeniyle sağlık hizmeti sunumunda muazzam fırsatlar sunmaktadır (Magutu, vd., 2010). Ayrıca Bilgi ve İletişim Teknolojisi (BİT), elektronik araçlar aracılığıyla bilginin işlenmesini, iletilmesini ve görüntülenmesini kolaylaştıran bir dizi etkinlik olarak tanımlanmaktadır. Sağlık Yönetimi Bilgi Sistemlerini kullanmanın genel avantajı, sınırlamalarından çok daha ağır basmaktadır. Sistemler, hastanede gerçekleştirilen işlevlerin kolaylaştırılmasına yardımcı olarak sağlık hizmeti sunumunda verimliliği ve etkinliği büyük ölçüde artırmaktadır.

Kithinji'ne (2018) göre, Sağlık Yönetimi Bilgi Sistemi, sağlık sisteminin güçlendirilmesi için gerekli altı yapı taşından biridir. Sağlık Bilgi Sistemi (SBS), bir sağlık sisteminin veya herhangi bir bileşen parçasının performansı ile ilgili verileri sistematik olarak toplamak, sürdürmek ve yaymak için yapılan herhangi bir organize çabayı ifade etmektedir. Sağlık sistemi karar almanın temellerini sağlar ve veri oluşturma, derleme, analiz ve sentezleme ile iletişim ve kullanım olmak üzere dört işlevi vardır (WHO, 2008). Bu nedenle, herhangi bir sağlık sisteminin potansiyel olarak içinde işleyen birçok sağlık uygulaması vardır.

Elektronik para transferlerinin ortaya çıkması, sağlık tesislerini tesis düzeyinde ödeme süreçlerini kolaylaştırmak ve mali sorumluluğu teşvik etmek için sağlayıcı ödeme yöntemlerini ve sistemlerini benimsemeye de neden olmuştur (Kimama, 2008). Bu ödeme sistemleri Sağlık Yönetimi Bilgi Sistemine bağlıdır. Bir sağlayıcı ödeme yöntemi, basitçe sağlık hizmeti satın alan kişiden sağlayıcılara para aktarmak için kullanılan mekanizma olarak tanımlanabilir ve bir sağlayıcı ödeme sistemi, ödeme yönteminin yönetim bilgi sistemleri ve ödeme yöntemine eşlik eden hesap verebilirlik mekanizmaları gibi tüm destekleyici sistemlerle birleştirilmesi olarak tanımlanabilir (Cheryl Cashin, 2008). Ayrıca, yalnızca sağlık sistemi hedeflerini ilerleten ve hastalar için gerekli sağlık hizmetlerine erişimi, yüksek kalitede bakımı ve iyileştirilmiş eşitliği teşvik eden, aynı zamanda kaynakların etkili ve verimli kullanımını ve uygun durumlarda maliyet kontrolünü destekleyen ödeme sistemlerinin devreye sokulması gerektiğini ileri sürer.

Ayrıca, dijital uygulamaların ve çözümlerin kullanımı, toplumun karşı karşıya olduğu bazı faktörlerle başa çıkmak için Elektronik Sağlık (e-sağlık) gibi fırsatlar sunarak insan hayatında giderek daha fazla yer edinmektedir. E-sağlık, sağlık sektöründe sağlık kuruluşları, uygulayıcılar ve hastalar tarafından hastaların sağlık durumlarını iyileştirme çabasıyla kullanılan klinik ve iş süreçlerinin erişimini, verimliliğini, etkinliğini ve kalitesini iyileştirmek

için İnternet ve cep telefonları gibi diğer ilgili teknolojilerin uygulanmasıdır (Rodrigues, 2003). Dolayısıyla, E-sağlık, sağlık hizmeti sunumunda BİT'nin kullanılmasıdır.

Küresel alanda, Hindistan'daki sağlık verilerinin kalitesini iyileştirme ve yakın zamanda başlatılan programların etkinliğini ve etkisini anlama amacıyla geliştirilen bir Sağlık Yönetim Bilgi Sistemi'ni (SYBS) tanıtmak için Ulusal Kırsal Sağlık Misyonu'nun ülke çapında bir girişimine sahiptir (Rohit, 2012). Brezilya'da, gelişmiş SBS, çok sayıda kentsel yoksul nüfusa hizmet eden bir kamu sağlık sistemindeki kaynakları yönetmek için açıkça tasarlanmıştır. Bir Kurumsal Kaynak Yönetimi sisteminin birçok özelliğiyle, rutin iş operasyonlarından gösterge verileri üretirken aynı zamanda sağlık sistemi performansının belirli yönlerini iyileştirmek için sistem verilerini kullanan karmaşık, operasyonel bir sistemin potansiyelini anlama şansı vardır.

Öte yandan, Zambiya'da Avrupa Birliği-SYBS projesi, SmartCare ve ZEPRS tarafından desteklenen üç önemli sağlık bilgisi yönetimi çabası bulunmaktadır. SmartCare, ön saflardaki sağlık hizmeti sağlayıcılarına elektronik tıbbi kayıtlarda saklanan ilgili, zamanında hasta bilgileri sağlayarak hasta sağlık sonuçlarını iyileştirmek için önemli, ülke çapında bir girişim temsil ettiği için özellikle ilgi çekicidir. Dahası, bu çaba, temel sağlık bilgi sistemini reform etmeye yönelik ulusal çabalarla birlikte gerçekleşiyordu ve birden fazla SBS girişimiyle başa çıkan ülkelerin karşılaştığı zorlukları anlama fırsatı sunmaktadır. Yöneticilerin sağlık hizmeti sunumunun tüm seviyelerinde kanıta dayalı karar almalarını sağlamak için tasarlanmıştır (Kithinji, 2018).

Bilgi sistemi uygulaması, bir organizasyonda yeni bir sistemi operasyonel hale getirmeyi amaçlayan bir dizi faaliyeti içerir. Uygulama, sistem tasarımı tamamlandıktan sonra gerçekleştirilen ve proje kullanıcı tarafından kabul edildiğinde sona eren faaliyetlerdir. Ayrıca, bu uygulama aşaması projenin en uzun aşamasıdır ve en fazla emek gerektiren aşamadır. Yönetimin yeni sistemi uygulamaya koymayı onaylaması gibi bir dizi faaliyeti içerir. Uygulama aşaması başlamadan önce, yöneticiler sistemi uygulamak için gereken personel de dahil olmak üzere kaynakları kontrol ettiğinden yönetim onayı çok önemlidir (Yeates & Wakefield (2003).

Yöneticiler, sürecin kendilerini içermediğini düşünürlerse bir bilgi sisteminin başarılı bir şekilde uygulanmasını engelleyebilirler. Bu nedenle sistem geliştirmenin her aşamasında yer almaları önemlidir. İkincisi, Donanım ve yazılım edinimidir. Bu, sistemi uygulamak için gereken donanım ve yazılımın tedarikini ve kurulumunu içerir. Teklif sahiplerinin teklif vermeye davet edildiği ve dolayısıyla en yüksek teklifi veren tedarikçinin seçildiği tedarik süreci sıkıcıdır. Bazı durumlarda, tedarikçinin üstlendiği önceki projelerde kıyaslama yapılır. Üçüncüsü, Sistem testidir. Bu, yeni sistemin kullanıma sunulmadan önce hiçbir hatası olmadığından emin olmak için alınan bir önlemdir. Bir sistemin kullanıcı gereksinimlerini karşıladığından emin olmak için test edilmesi gerekir. Tespit edilen tüm hatalar hata ayıklanır (düzeltilir). Test, girdileri test süreci ve sistem için hayati önem taşıdığından sistem son kullanıcılarını içermelidir (Kimama 2008).

Dördüncüsü, dosya dönüştürme ve veri tabanı oluşturmadır. Bu, eski sistemdeki veri dosyalarının yeni sistemle uyumlu olmasını sağlar. Bazı durumlarda eski dosyalar yeni sistemin biçimine uyacak şekilde değiştirilir. Beşincisi, değişim ajanlarının kullanımudur. Bunlar, yeni bir sistemle ilgili konularda personel üyelerini kolayca etkileme yeteneğine sahip, organizasyondaki etkili liderleri temsil eder. Yeni sistemin uygulanmasına öncülük etmek üzere belirlenir ve eğitilirler. Genellikle yüksek bütünlüğe sahip etkili kişilerdir. Altıncısı, kullanıcıların seçilmesi ve eğitilmesidir. Yeni sistemin kullanıcıları, hataları azaltmak ve üretkenliği ve kabulü artırmak için sistemle aşina olmalıdır (Kimama, 2008). Bu nedenle, kullanıcılar sistemin nasıl kullanılacağı ve yeni sistemin faydaları konusunda eğitilmelidir. Eğitim, pratik demolar, dersler ve video sunumları yoluyla gerçekleştirilebilir. Kullanıcı kılavuzları ve sistem belgeleri de eğitimde çok önemlidir.

Son olarak, yeni sistemi devreye almak veya başlatmaktır. Sistem test edildikten ve gerektiği gibi tam olarak çalıştığı görüldükten sonra başlatılır ve kullanıma sunulur (Kimama, 2008). Bu aşama esas olarak 3 aktiviteyi içerir; kurulum, devreye alma ve sistem değişimidir. Değişiklik için çeşitli teknikler kullanılır ve bunlar şunları içerir; doğrudan, paralel, aşamalı veya pilot şeklindedir. Sistem canlıya alındığında yeni hatalar ortaya çıkabilir ve yazılım geliştiricilerinin desteğine ihtiyaç duyulabilir. Bu nedenle, hatalara ve sorunlara ortaya çıktıkça çözüm sağlamak için bir Uygulama Sonrası ekibi kurulabilir.

BİT insan hayatının ayrılmaz bir parçası olmuştur ve kitlesel bilgilerin hızla işlenmesine yol açmıştır. İnsanların bilgisayarlar ve ağları aracılığıyla bilgi paylaşmasını, dağıtmasını, toplamasını ve iletişim kurmasını sağlamıştır. Kenya'daki kamu hastanelerinin %80' inden fazlası geçmişte sağlık kayıtlarını geleneksel olarak manuel olarak yönetmiştir. Teknolojik ve Bilgi çağının yükselişiyle birlikte, büyük sağlık tesislerinde yönetim ve kayıt tutma için daha sürdürülebilir bir çözüm olarak Sağlık Yönetim Bilgi Sistemlerine odaklanma ihtiyacı artmıştır.

Bu araştırma çalışması, Hastanelerdeki Sağlık Yönetim Bilgi Sisteminin (SYBS) uygulanmasını etkileyen faktörlerini incelemek ve bunun sağlık kurumları yönetim sürecindeki önemini araştırmaktır.

2. LİTERATÜR

2.1. Sağlık Yönetimi Bilgi Sistemlerinin Belirleyicileri

Bir dizi faktör, herhangi bir Sağlık Yönetimi Bilgi Sisteminin başarılı bir şekilde uygulanmasını etkileyebilir. Bu faktörler; teknolojik, yönetsel, operasyonel ve örgütsel faktörler şeklinde incelenebilir.

2.1.1. Teknolojik Faktörler

Teknolojik faktörler esas olarak bilgi teknolojilerinin donanım ve yazılım sorunlarından kaynaklanır. Bunlar iki kategoriye ayrılabilir;

- ❖ Arayüz Kullanılabilirliği ve
- ❖ Bilgi Parçalanması.

Arayüz kullanılabilirliği, iki sistemin bir araya gelip etkileşime girdiği, bir kullanıcının istihbarat iletişimi kurmasını sağlayan bir cihaz veya programdır. Kullanılabilirlik, bir ürünün belirli kullanıcılar tarafından belirli bir kullanım bağlamında etkililik, verimlilik ve memnuniyetle belirli hedeflere ulaşmak için kullanılabilme yeteneğini ifade eder (Bondarenko vd., 2021). Bir kullanıcı arayüzünün karmaşıklık düzeyi, belirli bir sistemin kullanımını büyük ölçüde belirler. Karmaşık bir kullanıcı arayüzü, kullanıcıların sisteme erişimini engelleme olasılığı yüksektir. Bu nedenle, bir sistemin 'En Az Çaba İlkesi'ne uyması gerekir. Bu sonuç, dijital çalışma ortamlarındaki iş görevlerinin nasıl farklı, sıklıkla kesintiye uğrayan ve parçalanmış olduğunu ve bunların gerçekleştirilmesini entegre edecek ve kolaylaştıracak bir sisteme ihtiyaç duyulduğunu gösteren farklı çalışmalarla ilgilidir. Tutarlılık, yazılım, web siteleri ve bilgi aygıtlarındaki kullanıcı arayüzlerinin en çok istenen özelliklerinden biridir (Nielsen, 2001). Bir kişinin kullandığı cihaz havuzunda çok sayıda arayüz nedeniyle tutarlılık eksikliği, hayal kırıklığına, hatalara ve öğrenme sorunlarına neden olur. Genellikle bu tutarlılık, aynı üretici/satıcı tarafından üretilen bir ürün serisinde korunur. Bu nedenle üreticiler, operasyon için tutarlı bir arayüz sağlamalıdır.

Ayrıca, veri büyümesini büyük bir hızla birbirine bağlayan bilgi parçalanması, kuruluşların veri depolarından verilerin kolayca ve tutarlı bir şekilde bulunabildiği bilgi yönetiminin temel gereksinimini görmezden gelmesini ve gözden kaçırmasını kolaylaştırabilir. Bilgi parçalanması, kişisel bilgi yönetimi (PIM) uygulamaları için temel bir zorluktur ve son kullanıcıya çok çeşitli araç ve teknolojilerin sunulmasının doğrudan bir sonucudur (Jones, 2007). Sistem entegrasyonu, kâğıt belgeler, e-posta, ofis üretkenlik yazılımı, depolama destekleri, mobil cihazlar ve web sayfaları gibi farklı kaynakların parçalanmasına yol açan önemli bir sorundur. Farklı belge biçimleri veya sürümleri arasındaki birlikte çalışabilirliğin olmaması da bu parçalanmaya ilişkin zorlukları artırmaktadır (Bondarenko vd., 2021).

Sağlık tesisleri geleneksel olarak kayıt tutma dosyalama sistemini kullanmıştır. Geleneksel dosyalama sisteminden sağlık yönetimi bilgi sistemine geçiş, esas olarak bilgi parçalanmasının bir sonucu olarak sayısız zorluk sunar. İşyerinde, bilgi parçalanmasıyla ilgili zorluklar, emek yoğun bilgi arama, görev kesintileri ve karmaşık veri yedekleme prosedürleri ve kâğıt ve dijital bilgiler arasında sürekli geçiş gerektirir (Jones 2007, Bondarenko vd., 2021). Boardman ve Sasse'ye (2004) göre, araçlar arasındaki sinerjiler, yalnızca farklı bilgi parçalarının bütünleştirilmesini kolaylaştırmak için değil, aynı zamanda bireysel kullanıcıları belirli görevlerinde daha iyi desteklemek için de daha iyi değerlendirilmelidir.

Ayrıca, teknolojik aşırı yüklenme faktörleri de katkıda bulunur. Teknolojik aşırı yüklenme, günlük aktivitelerde birden fazla görevi yerine getirmek için birden fazla işlevi olan birden fazla aletin kullanılması nedeniyle insanlarda bilişsel ve fiziksel yüklere neden olan cihaz yaygınlaşması ve bilgi aşırı yüklenmesi olarak tanımlanmaktadır. Teknoloji uzmanları, psikologların yıllardır insanların bilgiyi depolama ve işleme kapasitesinin sınırlı olduğunu kabul ettiklerini kabul etmektedirler (Jones ve diğerleri, 2004). Ancak, insan bilişi üzerindeki yükü hafifletmek için tasarlanan araçlar ve cihazlar yalnızca yetersiz olmakla kalmayıp, aşırı

yüklenmeye de katkıda bulunurlar. Artan yükümlülükler ve bilgileri takip etme ihtiyacı ile birlikte, çoklu görev bir yaşam biçimi haline gelmiştir (Kirsh, 2001). Sürekli teknolojik olarak aracılık edilen kesintiler düzenli bir şekilde meydana gelmekte ve bu da kasıtlı (örneğin bir görevi ertelemek) veya kasıtsız (örneğin başa çıkamamak) olabilen eksik ve yetersiz eylemlerle sonuçlanmaktadır. Her iki durumda da bu, insanın bilgiyi uygun bir şekilde alma ve yanıtlama yeteneğinin bozulmasına yol açmakta ve bu da hatalar ve hayal kırıklığı olarak ortaya çıkabilmektedir. Dolayısıyla teknolojideki ilerlemeler son 10 yıl öncesine kıyasla daha yüksek bir bilgi işleme düzeyine getirirse de, aynı zamanda eldeki görevlere odaklanılmasını engelleyen dikkat dağıtıcı şeyler ve engeller de getirmektedir.

2.1.2. Yönetmel faktörler

Bilgi sistemi, farklı konularla çalışmak için bir yaklaşım ve tüm bilgi yönetimi yönlerinin farkındalığını sağlamalıdır. Bazen üst düzey yönetim amacı anlamakta yetersiz kalabilir veya bunu gerçekleştirmek için Bilgi Sistemi Stratejileri (BSS) yeteneğine güvenmeyebilir. Bu nedenle, yöneticilerin planı uygulama sorumluluğunu incelemelerini ve aynı zamanda BSS'yi geliştirmek için gereken zaman ve bütçeyi teyit etmelerini önermektedir. Yönetimin bugün karşı karşıya olduğu zorluklardan bazıları, bilgi sistemleri stratejisini ve iş stratejisini uyumlu hale getirme ihtiyacıdır (Barreau, 2008). Bu, organizasyonun bulunduğu yer ile gelecekte olmak istediği yer arasındaki Bilgi Sistemi boşluğunu belirleyerek yapılabilir.

- ❖ Yönetim zorlukları şunlar olabilir;
- ❖ Stratejinin uygulanmasına yönelik üst düzey yönetimin bağılılığının olmaması;
- ❖ Uygulamada zayıf yönetim rolleri;
- ❖ Sistemin oluşturulması ve uygulanmasında üst düzey yönetimin desteğinin olmaması;
- ❖ Üst düzey yönetimin yerini alan değişiklikler ve
- ❖ Zayıf koordinasyon ve sorumluluk paylaşımı

Koordinasyon, istenen hedeflere ulaşılabilmesi için farklı faaliyetler arasında uyum sağlama sürecidir (Hatch, 2010). Bu nedenle, görevlerin birbirini kesintiye uğratmadan veya engellemeden paralel olarak yürütülmesini sağlar. Altta yatan ilke, sistemin tüm parçalarının birbirine bağımlı olmasıdır. Koordinasyon yaygın olmalıdır, ancak bilinçli bir çaba gerektirir ve bu nedenle her yöneticinin sorumluluğunun bir parçası olmalıdır. İyi yapıldığında, koordinasyon takım ruhunu oluşturur, personele net bir yön verir ve kaynakların kullanımını optimize eder. Tüm bunlar, kuruluşların hedeflerine ulaşmalarına ve verimliliği artırmalarına yardımcı olur (Hatch, 2010).

Öte yandan, zayıf işyeri iletişimi olumsuz bir geri bildirim döngüsü yaratır. Proje ekibi kendilerinden ne beklendiğini anlamadığında, moralleri düşer ve bu da iletişimi daha da zorlaştırır. Zayıf işyeri iletişimine yönelik çözümler, projeye yalnızca iletişimi iyileştirmekten daha fazla şekilde fayda sağlayacak daha açık ve yapıcı bir işyeri kültürü yaratmaya dayanır. Çatışan hedeflerden kaynaklanan zayıf işyeri iletişiminin kaynaklarını ele almak için düzenli

toplantılar yapın ve istenen sonuçları açıkça tanımlamaya odaklanın, böylece tüm yöneticiler ve çalışanlar aynı hedeflere doğru hareket eder (Hatch, 2010).

2.1.3. Operasyonel faktörler

Bunlar, tipik bir yazılım uygulama sürecinin ortalama uzunluğu olan zaman uzunluğu gibi faktörleri içerir ve büyük ölçüde değişir. Örneğin bir Kurumsal Kaynak Planlama (ERP) sistemi gibi sağlam, entegre bir çözüm için, ortalama uygulama 11 ila 18 ay sürebilir. Veri tabanı merkezli ERP'ler genellikle tüm bir organizasyonda finans, satış, hizmet, müşteri ilişkileri yönetimi ve insan kaynakları gibi alanları kapsar. Bu çözümler, daha basit kullanıma hazır yazılımların aksine, işletme genelindeki bilgilerin entegrasyonu nedeniyle daha uzun uygulama süreleri gerektirir.

Finans ve muhasebe, planlama, insan kaynakları, bordro, envanter, uyumluluk ve ekipman takibi, iş maliyeti ve müşteri ve çalışan performansı, operasyonel faaliyetlerle ilişkili işlevlerden sadece birkaçıdır. Dahası, yeni bir sisteme öğrenme, eğitim ve geçiş yaparken her zamanki gibi iş yapmak operasyonel faktörleri kapsar. Uzun bir uygulama süreciyle birlikte gelen sorunları daha da karmaşık hale getiren şey, sağlık kurumunun günlük olarak her zamanki gibi iş yapmak zorunda olmasıdır. Genellikle bütçe eksikliği, personel kaynağı eksikliği veya her ikisi nedeniyle, çalışanlardan temel işlerinin görevlerine bakmaları ve yazılım projesine katkıda bulunmaları istenir. Bu uygulama çabaya zarar verebilir ve uygulama süresinin ilk plandan daha uzun sürmesine neden olabilir (Salazar, 2004).

Bu nedenle, tutarsız veya yetersiz eğitim; ayrıntılı, kapsamlı bir eğitim yaklaşımının olmaması, herhangi bir yazılım uygulama projesi için büyük bir aksilik olabilir. Başlangıçtan itibaren net hedefler ve zaman çizelgeleri belirlenmezse, uygulama ters gidebilir veya hatta tamamen durabilir. İhtiyaçlarınız ve kaynaklarınız için mantıklı bir plan oluşturmak ve üzerinde anlaşılacak kilometre taşlarına yol boyunca ulaşıldığından emin olmak önemlidir. Ayrıca, zaman alıcı veri girişi; herhangi bir yazılım uygulamasının en çok zaman alan kısmının, verilerin eski sistemden yeni çözüme aktarılması olduğu ileri sürülmektedir. Ne yazık ki, bu sürecin gerekli bir parçasıdır, bu nedenle bunu daha kolay ve daha doğru hale getirmenin yollarını bulmak, uygulama zaman çizelgenizi yolda tutabilir ve canlıya geçişte veri hatalarını ve sorunlarını en aza indirebilir. Dahası, sürecin başlarında bu kısma odaklanmak eğitim çabalarına yardımcı olabilir ve riski azaltabilir.

Son olarak, bir diğer faktör de uygulama aşamasının ötesinde desteğin kullanılabilirliğini içerebilir. Yazılım çözümlerini araştırırken, sistemi devreye alma tarihi gelip geçtikten sonra hizmet veren firmaların hastaneyi nasıl desteklemeye devam edeceğini düşünmek ve planlamak gerekmektedir. En başarılı uygulamalarda bile, son kullanıcıların günlük operasyonlar sırasında bir tür engele takılma olasılığı yüksektir. Yazılım satıcıları tarafından sağlanan satış sonrası kaynaklar ve hizmet, hastanenin bir yazılım uygulamasından sonra sağlam bir yatırım getirisi elde etme becerisinde belirleyici faktör olabilir. Şirketler yazılım seçerken, yazılım ürününün arkasındaki işletmeye de bakmalı ve kararda faktör olarak uygulama programını ve uzun vadeli destek seçeneklerini göz önünde bulundurmalıdır (Kimama, 2008).

2.1.4. Organizasyon Faktörleri

Günümüzde, kuruluşlar son derece rekabetçi bir alanda performans göstermektedir ve bu nedenle bir kuruluşun rekabetçi piyasa koşullarını sürdürmek, piyasa üretkenliğini artırmak ve değişen iş gücü, küresel iş ortamı ve e-ticaret gelişimi nedeniyle yeniden yapılandırmak için son derece uyarlanabilir olması gerekmektedir. Çalışmalar, kuruluşları birbirinden ayıran şeyin, örgütsel faaliyetlerinde bilgi teknolojisinin uygulanma derecesi olduğunu göstermektedir. Optimize edilmiş bilgi teknolojisi kullanan kuruluşlar sürdürülebilir rekabet avantajlarına sahiptir ve diğer kuruluşlardan daha seçkindir. Örgütsel faktörler, sürecin örgütsel faktörlerin engel olmadan sorunsuz bir şekilde yürütülmesini sağlayarak Sağlık Yönetimi Bilgi Sistemlerinin uygulanmasında önemli bir rol oynamaktadır. Sağlık sistemlerinde Bilgi Teknolojisi uygulaması, örgütsel kaynaklar, örgütsel bilgi, örgütsel süreçler, yönetim yapısı, örgütün değerleri ve hedefleri gibi çeşitli faktörlerle ilişkilidir (Hatch, 2010).

Örgütsel bilgi, bir kuruluşa ait olan kişilerin sahip olduğu kolektif bilgi ve yeteneklerdir. Çalışanlar bilgilerini bir kuruluş içinde bir araya getirdiğinde, bu bilgi kuruluşa aynı alandaki diğerlerine göre avantaj sağlayabilir. Birkaç alt birim veya gruptan gelen grup bilgisi birleştirildiğinde ve yeni bilgi oluşturmak için kullanıldığında, ortaya çıkan örtük ve açık bilgi örgütsel bilgi olarak adlandırılabilir. Bu nedenle, örgütsel bilgi bir kurumda sağlık yönetimi bilgi sistemlerinin uygulanmasını yönlendirmek için önemli bir kaynaktır. Örgütsel süreçler, hedefe ulaşmak için hangi işin gerekli olduğunu belirlemeyi, bu görevleri bireylere atamayı ve bu bireyleri bir karar alma çerçevesinde düzenlemeyi içerir. Bir örgütlenme sürecinin sonucu, hedeflere hem etkili hem de verimli bir şekilde ulaşmak için uyum içinde çalışan bir örgüttür. Yönetimsel yapı, bir örgütün nasıl işlediğini belirlemek ve örgütün gelecekteki büyümeye olanak sağlamak için hedeflerine ulaşmasına yardımcı olmak için geliştirilir. Örgütün değerleri ve hedefleri, örgüt üyelerinin davranışlarını örgüt hedeflerine ulaşma yönünde yönlendiren ilkeleri ve etiği listeler. Bu nedenle, örgütsel faktörler sağlık yönetimi bilgi sistemlerinin uygulanması için önemlidir (Hatch, 2010).

3. YÖNTEM

Bu araştırmada nitel araştırma yöntemlerinden birisi olan doküman analizi kullanılmıştır. Sosyal bilimlerde hakikat ve gerçeklik araştırılırken pozitivizm, yorum, eleştirel teori ve postyapısalcılık gibi bazı teorik ve felsefi çerçevelerin olduğu belirtilmektedir (Glesne, 2011). Nitel araştırma kavramını, farklı disiplinleri ve birçok kavramı bir araya getirdiği için tek bir şekilde tanımlamak güçtür. Nitel araştırma, gözlem, görüşme ve doküman analizi gibi nitel veri toplama yöntemlerinin kullanıldığı, alguların ve olayların doğal ortamda izlendiği bir araştırma türüdür. Başka bir deyişle, çevrelerindeki sosyal olguları kurama dayalı bir anlayışla araştırmaya ve anlamaya odaklanan bir yaklaşımdır (Yıldırım ve Şimşek, 2018).

Nitel araştırma, olguların ardındaki anlamları araştırmayı amaçlayan ve araştırmacının da katılımcı olduğu insan deneyimlerinin nasıl yorumlanabileceğini ve anlamlandırılabilirliğini ortaya koyan esnek bir yapıya sahiptir (Merriam, 2009). Nitel araştırma stratejileri farklı

kaynaklar tarafından çeşitlendirilmekle birlikte çeşit sayısı konusunda fikir birliği yoktur (Denzin ve Lincoln, 2018).

Doküman incelemesi, uzun yıllardır antropolojide, kütüphanecilikte ve tarihteki gibi disiplinlerin etkisinde olan bir araştırma yöntemidir. Diğer yandan doküman incelemesinin önemi ve özellikle avantajının anlaşılması sebebiyle sosyal bilimler daha sık kullanmaya başlanmıştır. Nedeni ise bu yönteme ait sosyal bilimlerde sıklıkla kullanılan anket, görüşme veya katılımcı gözlemi kadar iyidir (Mogalakwe, 2006).

Belge tarama diye de tanınan doküman analizi, mevcut kayıt ve belgeler incelenerek veriler elde edilir. Doküman analizi, belirlene amaçlara yönelik kaynakları bulma, okuma, not alma ve değerlendirme süreçlerini içerir (Karasar, 2005). Başka bir deyişle, doküman analizi, basılı ve elektronik (bilgisayar tabanlı ve internet özellikli) materyallerin incelenmesi ve değerlendirilmesi ile ilgili bir dizi işlemdir. Bu süreç, araştırılması amaçlanan olgu veya olgular hakkında bilgi içeren yazılı materyallerin incelenmesi olarak da tanımlanmaktadır. Aynı zamanda resmi veya özel kayıtların toplanması, sistematik olarak incelenmesi ve değerlendirilmesidir (Seyidoğlu, 2016). Veri toplama çalışmalarında ağırlıklı olarak tez ve makalelerden yararlanılmıştır.

4. TARTIŞMA ve SONUÇ

Çalışma, kamu hastanelerinde SYBS uygulamasının belirleyicilerini belirleme ana amacıyla literatür taraması şeklinde yürütülmüştür. İncelenen araştırmalarda, SYBS uygulaması, teknolojik faktörlerden önemli ölçüde etkilenmektedir. Bilgi teknolojisi, yeterli şekilde kullanıldığında sağlık sonuçlarını büyük ölçüde artırabilir. Benzer şekilde, yapılan araştırmalar, teknolojik faktörlerin SYBS'nin başarılı bir şekilde benimsenmesini önemli ölçüde etkilediğini ileri sürmüştür (Kithinji, 2018).

Diğer yandan, yönetsel faktörler SYBS uygulamasını büyük ölçüde etkilemektedir. Yönetsel faktörlerle ilgili gözlemlenen bazı önlemler şunlardır; Yöneticiler, yöneticiler arasında sistem faaliyetlerinin uygun iletişimini, etkili paylaşımını, izlenmesini ve değerlendirilmesini ve yöneticilerin SYBS uygulamasına aktif katılımını sürdürürse, SYBS uygulaması olumlu yönde etkilenecektir (Kithinji, 2018).

Daha önce gösterildiği gibi, operasyonel faktörler SYBS uygulamasını etkilemektedir. Operasyonel faktörler altında gözlenen ölçümler arasında sistem uygulaması sırasında son kullanıcılara yeterli eğitim verilmesi, uygulama aşamasının ötesinde yeterli destek sağlanması, sistemi desteklemek için sağlam bir BT altyapısı olması ve edinilen donanım ve yazılımın halihazırda mevcut sistemlerle uyumlu olması yer almaktadır.

Organizasyonel faktörler, bilgi teknolojisinin uygulanmasında sağlık sistemlerinde önemli bir rol oynamaktadır. Bu, yeni teknolojinin uygulanmasından önce iş görevlerinde ve süreçlerinde değişiklikler gerektirir. Bu organizasyonel değişim, yalnızca sistemlerin verimli bir şekilde çalışmasını sağlamaya kendini adanmış çalışanlar ve yöneticiler tarafından yönlendirilebilir.

Ancak, işyeri politikaları, yasal sorunlar, çalışan direnci ve iş birliği yapmayan yönetim vb. gibi faktörler, sorunsuz SYBS uygulamasını büyük ölçüde engelleyebilir.

Sağlık Yönetimi Bilgi Sistemi, sağlık hizmeti, işletme yönetimi ve bilgi sistemlerinin bir entegrasyonudur (WHO, 2008). Sağlık hizmeti sunum sistemi daha fazla hesap verebilirliğe tabi tutulduğu için, sağlık hizmeti sağlayıcıları ve kuruluşları kaliteli sonuçlar, mali sorumluluk, verimli ve etkili uygulamalar göstermelidir. Bunu yapmak için, sağlık yönetimi bilgi sistemleri profesyonelleri verileri toplar ve analiz eder, yenilikçi yönetim tekniklerini dahil eder ve sağlık hizmetini yeniden tasarlamak için yeni teknolojilerden yararlanır.

SYBS, sistemdeki ilgili rollerinde tüm bilgi işleme eylemlerini, insan ve teknik aktörleri içeren bir hastanenin sosyoteknik alt sistemidir. Tan ve arkadaşlarına (2005) göre SYBS, idari ve hasta bakım uygulamalarını desteklemek için rutin yönetim raporlamasını otomatikleştirir. Hayajneh ve diğerleri (2006), SYBS'in şunlar için kullanıldığını belirtmektedir: Ana hasta dizini - benzersiz bir hasta numarası aracılığıyla bir hastanede kayıtlı tüm hastaların kaydını sağlar. Hastanın demografik, finansal ve tıbbi ayrıntılarını tutar. Hasta yönetimi, hasta klasörlerinin hastanenin koşulları, klinikleri ve diğer yerleri arasında izlenmesine yardımcı olur; yatan ve ayakta hasta planlaması - hastaların ilgili kliniklerine ve doktorlarına esnek bir şekilde planlanmasına olanak tanır. Rezervasyonları, randevu fişlerinin oluşturulmasını, randevuların yeniden planlanmasını ve iptal edilmesini yönetir. Yatan hasta yönetimi, yataklar dahil olmak üzere hasta kabul, transfer ve taburcu süreçlerinde yardımcı olur. Koşuş ve yatak yönetimi için hükümler içerir ve hastaların uygun şekilde tanımlanmasını sağlamak için barkod etiketleri ve kabul formları üretir. Faturalama, hasta kayıt zamanından taburcu zamanına kadar hasta ücretlerini izleme ve birleştirme konusunda esnek ve kapsamlı bir yol sağlar ve ayrıca hastalar veya yakınları tarafından talep edildiğinde hastalar için gerçek zamanlı faturalar oluşturulmasına yardımcı olur. Sigorta Yönetimi, hastaların onayları, ödemeleri, muafiyetleri, kapsamları ve hariç tutmaları için sigortalarını yönetmede kullanılır. Eczane ilaç bilgilerini, reçeteleri, dağıtım işlevlerini ele alır ve eksiksiz ilaç dozaj ayrıntılarını korur ve çeşitli ilaç sınıflandırmalarını ve endekslerini destekler. Radyoloji kaynak planlamasını ve muayene ayrıntıları, raporlama, muayene sonrası kayıt, film izleme ve yönetim bilgileriyle istek kaydını destekler.

Hesap Yönetimi, borçlulardan alacakların takibinde, makbuz yönetiminde, günlük kayıtlarda, hatırlatıcıların ve beyanların otomatik üretiminde kullanılır. Sipariş Girişi, koşuşlardan ve kliniklerden çeşitli hizmetler için yapılan istekleri korur. Ameliyathane, ameliyathane rezervasyon ayrıntılarını korur, herhangi bir mevcut veya gelecekteki tarih için ameliyathanelerin çevrimiçi planlamasını gerçekleştirir, acil operasyonları barındırır ve alet listeleri ve personel atama sayfaları dahil olmak üzere ameliyat öncesi kontrol listeleri oluşturur (Kimama, 2008).

Araştırmalar, hastanelerin SYBS'lere uyacak şekilde iş süreçlerini değiştirme konusunda çizgi çekmede zorluklar yaşadığını göstermektedir (Kithinji, 2018). İnsanların çalışma biçimlerini değiştirmek yerine, sistemi değiştirmeye çalışıyorlar ve bu da daha fazla zaman alıyor ve

uygulama maliyetlerini artırıyor. Ayrıca, Sağlık Yönetimi Bilgi Sistemleri, yetersiz süreç tanımı nedeniyle verimsizlikleri ve fazlalıkları belgeliyor. Bürokrasiler tedarik sürecinde önemli engel görülmektedir.

Karar Vericilere Öneriler

SYBS uygulaması, sağlık sistemlerini dahil etmek isteyen herhangi bir sağlık kurumu için kritik bir süreçtir. Özellikle, şehir hastanelerinde uygulama sürecini kontrol etme konusunda Sağlık Bakanlığı yetkilileri çalışmalar yürütebilir.

Araştırmacılara Öneriler

SYBS uygulamasının diğer yönlerini göz önünde bulundurarak benzer çalışmalar yapılması gereklidir.

- ❖ Türkiye'deki özel hastaneler, üniversite hastaneleri, ve kamuya ait olan şehir hastanelerinden aile polikliniklerine kadar olan kurumlarda sağlık yönetim sistemini etkileyen araştırmalar yapılabilir.
- ❖ Sistem kalitesi gibi diğer ilgili teorilerde önerilen ana faktörler, SYBS uygulamasını nasıl etkilediklerini incelenebilir.

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MEDİKAL TURİSTLERİN DESTİNASYON TERCİH NEDENLERİ: İSTANBUL ÖRNEĞİ

DESTINATION PREFERENCE REASONS OF MEDICAL TOURISTS: THE CASE OF
ISTANBUL

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ÖZET

Medikal turizm, turistlerin tedavi amacıyla ikamet ettikleri bölgeden farklı bir bölgeye gerçekleştirdikleri seyahatler olarak tanımlanmaktadır. Bu tanımdaki seyahat edilen bölge, medikal turizm destinasyonu olarak ifade edilebilir. Medikal turizm destinasyonlarının medikal turistler için tercih edilmeleri, gelecek turist sayısı ve elde edilecek gelir için kritik bir değer taşımaktadır. Ayrıca sağlık turizmi endüstrisinin sürdürülebilirliği açısından da önemlidir. Medikal turistlerin destinasyon seçimini etkileyen faktörler oldukça fazladır. Destinasyonda kaliteli hizmetlere uygun fiyatlarla erişebilme imkânı, prosedürlerin hızlı işleyiş göstermesi, ileri düzey tıbbi teknolojilerin ve donanımlı sağlık çalışanlarının olması, sigorta sisteminin düzgün işleyişi, turistik arz kaynaklarının çeşitliliği, genel olarak destinasyona duyulan güven öne çıkmaktadır. Bu unsurlar, medikal turistlerin kendi ülkelerinde bulamadıkları sağlık hizmetlerine başka ülkelerde erişimlerini kolaylaştırmakta ve destinasyonlara uluslararası sağlık turizmi pazarında rekabetçi bir avantaj sağlamaktadır. Medikal turistlerin destinasyon tercihleri turistlerin demografik özelliklerine göre farklılıklar gösterebilmektedir. Bu farklılıkların tespit edilmesi medikal turizm paydaşları için büyük bir önem taşımaktadır.

Çalışmada, sağlık hizmetleri alanında uluslararası itibarı, yüksek standartları ve kültürel zenginlikleri ile dikkat çeken İstanbul'un medikal turistler tarafından tercih edilme nedenlerini belirlemek amaçlanmıştır. Bu kapsamda, İstanbul'u ziyaret eden medikal turistlere yönelik anketler gerçekleştirilmiştir. Anketlerden elde edilen veriler istatistiksel analiz yöntemleri kullanılarak değerlendirilmiş ve sağlık turizmi paydaşlarına öneriler sunulmuştur.

Anahtar Kelimeler: Medikal turizm, medikal turist, destinasyon, İstanbul.

ABSTRACT

Medical tourism is defined as the travel undertaken by tourists to a region different from the one in which they reside, for the purpose of receiving medical treatment. The region traveled to can be referred to as a medical tourism destination. The preference of medical tourists for

particular medical tourism destinations is critical for the number of tourists that will visit and the revenue that will be generated. It is also important for the sustainability of the health tourism industry. Many factors influence the destination choice of medical tourists. The ability to access quality services at affordable prices in the destination, the fast processing of procedures, the presence of advanced medical technologies and well-equipped healthcare professionals, the proper functioning of the insurance system, the diversity of tourism resources, and the general sense of trust in the destination are prominent factors. These elements facilitate medical tourists' access to healthcare services in other countries that they cannot find in their own and provide destinations with a competitive advantage in the international health tourism market. The destination preferences of medical tourists can vary according to the demographic characteristics of the tourists. Identifying these differences is of great importance for medical tourism stakeholders.

The study aims to determine the reasons why Istanbul, with its international reputation in healthcare services, high standards, and cultural richness, is preferred by medical tourists. In this context, surveys were conducted with medical tourists who visited Istanbul. The data obtained from the surveys were evaluated using statistical analysis methods, and recommendations were provided to health tourism stakeholders based on the findings. The study aims to contribute to making the medical tourism sector in Istanbul more competitive and efficient.

Keywords: Medical tourism, medical tourist, destination, Istanbul.

GİRİŞ

Medikal turizm, fiziksel ve zihinsel tedavi amacı ile gerçekleştirilen (İle ve Tigu, 2017; Alp, 2021) programlı seyahatler olarak tanımlanmaktadır (Connell, 2015). Tedavi amacı ile seyahat eden bireyler ise, alanyazında medikal turist olarak ifade edilmektedir (Öksüz ve Altıntaş, 2017). Geçmiş dönemlerde medikal turizm kapsamında turistler, gelişmekte olan ülkelere gelişmiş ülkelere seyahat etmekteyken (De Arellano, 2007, 193; Kodalak ve Baltacı, 2022) günümüzde, şartların değişmesi sebebiyle artık gelişmiş ülkelere gelişmekte olan ülkelere seyahat etmektedirler (Alp, 2021). Bu durum, medikal turizm pazarını, özellikle gelişmekte olan ülkeler için büyük bir fırsat haline getirmiştir. Fırsatı değerlendirmek isteyen ülkeler (destinasyonlar) için, pazarı oluşturan turistlerin tercih nedenlerini bilmek büyük önem taşımaktadır (Ekizoğlu, 2022).

Turistik çekim alanı olarak tanımlanan destinasyonlar, doğal, kültürel ve tarihi değerleri bünyesinde barındırmaktadır (Akyol ve Zengin, 2020). Medikal turizm destinasyonu ise, geleneksel turistik çekiciliklerin yanında, sağlık tesisleriyle de öne çıkan varış bölgesi olarak ifade edilebilir. Medikal turizm destinasyonlarının tercihinde etkili olan birçok neden bulunmaktadır. Bu nedenler arasında; medikal turistin geliri, yasal ve sosyo-kültürel kısıtlamalar, kaliteli hizmetin uygun fiyata sunulması, prosedürlerin hızlı işleyiş göstermesi

(Crozier ve Baylis, 2010; Ile ve Tigu, 2017), ileri düzey tıbbi teknolojiler, yüksek eğitimli sağlık personelleri, sigorta sisteminin düzgün işleyişi bulunmaktadır (Ile ve Tigu, 2017: 1114). Diğer tercih nedenleri; kültürel benzerlik, coğrafi yakınlık (Ile ve Tigu, 2017; Hanefeld vd. 2015), turistlerin ikamet ettiği bölgede bulunmayan veya yasadışı olan sağlık hizmetleri (Crozier ve Baylis, 2010), politik ve sosyal istikrar, destinasyonda turist akışının mevcut olması (Ile ve Tigu, 2017), sağlık tesislerinin hijyen koşullarına uygunluğu, kalitesi, sertifikasyon ve akreditasyonlara sahip olması (Ile ve Tigu, 2017; Aydın ve Karamehmet, 2017) ve destinasyona olan güvendir (Öksüz ve Altıntaş, 2017; Aydın ve Karamehmet, 2017). Tercih edilebilirlik için destinasyonların güven inşa etmeleri kritik önem taşımaktadır. Çünkü tercih nedenleri arasında güven ve fiziki mesafe en önemli faktörler arasında yer almaktadır (Aydın ve Karamehmet, 2017). Destinasyonların marka imajının oluşmasında akraba ve arkadaşlar tarafından yapılan yorumlar ve teknolojinin gelişmesiyle birlikte sosyal medyanın gücü oldukça etkilidir (Çınar ve Sivük, 2021)

Medikal turistler için destinasyon tercihi nedenleri farklılıklar gösterebilmektedir. Örnek verilecek olursa, Kanadalı bir medikal turist için bekleme süreleri büyük önem taşırken, Amerikalı bir medikal turist için maliyet büyük bir önem taşımaktadır (Crozier ve Baylis, 2010). Medikal turistlerin tedavi türüne göre de tercih nedenleri farklılık gösterebilmektedir. Obezite veya infertilite (kısırlık) tedavisi için destinasyon tercihinde bulunan bir turist için uzmanlık büyük önem taşımaktadır. Kozmetik cerrahi (dolgu, botoks, diş estetiği uygulamaları vb.) amacıyla seyahat eden bir turist için ise maliyet en önemli faktördür (Hanefeld vd., 2015).

Türkiye, tarihi ve kültürel turistik çekicilikleri, coğrafi konumu ve kaliteli sağlık hizmeti sunan akredite olmuş tesisleri ile medikal turizm kapsamında tercih edilen destinasyonlar arasında yer almaktadır (Kantar ve Işık, 2014). Kodalak ve Baltacı (2022)'ya göre, medikal turizm destinasyonu tercihinde Türkiye ilk sıralarda yer almaktadır. Öyle ki Türkiye'yi sağlık turizmi kapsamında 2023 yılında ziyaret eden turist sayısı 1.538.643 kişidir. Gelen turistlerden elde edilen döviz ise 3.006.092 bin dolardır (USHAS, 2024). Medikal turizm kapsamında Türkiye'nin tercih edilme nedenleri arasında, geleneksel turizm destinasyonu olması, tedavi maliyetlerinin uygun olması, uygun konum, vize kolaylıkları, sağlık tesislerinin ve verilen hizmetin kaliteli olması, hekimlere duyulan güven bulunmaktadır (Üstün ve Uslu, 2022). Ayrıca, akredite sağlık kuruluşları, uzman sağlık personelleri ve diğer destinasyonlara oranla daha düşük maliyetli olması tercih nedenlerindedir (Kodalak ve Baltacı, 2022).

Sağlık turizminin merkezi konumunda yer alan İstanbul, medikal turizm kapsamında Dünya'daki birçok destinasyondan daha fazla avantaja sahiptir. Bu avantajlar arasında, uygun maliyeti, uzman sağlık personelleri, hijyen açısından uygun tesislerin mevcut olması, tesislerde kullanılan ürünlerin uygun fiyatı ve kalitesi sayesinde uzun süre kullanıma uygun olmaları, tedavide kısa bekleme süreleri, kamuya bağlı sağlık tesislerinin standartlarının yüksek olması ve alandaki uluslararası yasal düzenlemelerin var olması bulunmaktadır (Heper ve Kayuk, 2024). Ayrıca kaliteli hizmet, ikamet edilen ülkedeki yüksek fiyat, hekim başarısı, sağlık tesisinin konumu ve hasta memnuniyeti öne çıkan diğer faktörlerdir (Aksoy ve Yılmaz, 2019).

Medikal turizm kapsamında hizmet verebilecek sađlık tesisi sayısı 1782'dir. Yine bu kapsamda hizmet veren seyahat acentası ise 590 adettir (TÜRSAB, 2024). İstanbul, medikal turizm alanında yaptığı yatırımlar ile plastik ve diđer cerrahi birimlerde, göz ve açık kalp ameliyatları, tüp bebek, kulak burun bođaz, ortopedi ve medikal onkoloji gibi tıbbi tedavilerde büyük bir başarı elde etmiştir (Heper ve Kayuk, 2024). Destinasyonu ziyaret eden medikal turistlerin tercihleri arasında en dikkat çeken faktörler ise, hekim veya diđer sađlık personellerine duyulan güven, düşük maliyet ve turistik çekiciliklerdir (Zengingönül vd., 2012).

İLGİLİ ARAŞTIRMALAR

Bostan ve Yalçın (2016), sađlık turistlerinin destinasyon seçimini etkileyen faktörleri incelemek amacıyla yapmış oldukları çalışmada 150 sađlık çalışanı üzerine anket gerçekleştirmişler ve araştırma sonucunda medikal turistlerin Türkiye'yi tercih nedenleri arasında ilk sırada hizmet kalitesi olduğunu tespit etmişlerdir. Sađlık personellerinin yaşadıkları en büyük sorun ise hastalarla iletişimidir.

Dökme (2019), medikal turistlerin tercihlerini belirlemeye yönelik çalışma yapmıştır. Bu kapsamda yapılan araştırmalar ve değerlendirme çalışmaları dikkate alınmıştır. Araştırmacı yapmış olduğu incelemeler sonucunda, medikal turistlerin *ülke seçimi* etkileyen faktörleri; sosyo ekonomik ve politik durum, mevzuat, aracı kuruluşlar, ulaşım kolaylığı ve diđer turizm faaliyetleri olarak tespit etmiştir. Medikal turistlerin *kurum seçimini* etkileyen faktörler ise, kalite, maliyet, bekleme süresi, iletişim, tanıtım ve teknoloji faktörleridir.

Sevim ve Sevim (2019), medikal turizm kapsamında Türkiye'ye gelen turistlerin tercihini etkileyen faktörleri araştırmışlardır. Araştırma için anket tekniđinden yararlanılmıştır. İstanbul'da 284 medikal turist üzerine anket yapılmıştır. Araştırma sonuçlarına göre; hizmet kalitesinin, seçilen kurumun modernliğinin ve Türkiye'nin doğal güzelliklerinin en yüksek ortalamaya sahip olduğu görülmüştür. Ayrıca araştırma ile turistlerin demografik özellikleri de belirlenmeye çalışılmıştır. Turistlerin büyük bir çođunluđunun 51 yaş ve üzeri kişiler olduğu, düşük eğitim (lise ve altı) düzeyinde oldukları ve turistlerin %54,6'sının medikal turizm amacıyla Türkiye'yi en az 2 kez ziyaret ettiđi tespit edilmiştir.

Çapar (2019), potansiyel medikal turistlerin medikal turizme katılma motivasyonlarını ve Türkiye'ye gelen medikal turistlerin geliş amaçlarını belirlemek amacıyla araştırma yapmıştır. 317 medikal turist üzerine anket gerçekleştirilmiştir. Türkiye'ye geliş amaçlarında ilk sıralarda, kozmetik cerrahi, hastalığı iyileştirme, kontrol ve sađlığı geliştirme yer almaktadır. Turistlerin ülkelerindeki sađlık bakım maliyetlerinin yüksek olması, sađlık hizmetlerine erişim için bekleme süresinin uzun olması ve gereksiz idari prosedürler nedeniyle Türkiye'yi tercih ettikleri tespit edilmiştir.

Gönül ve İçöz (2020), alt medikal turistik ürün olan dental turizm kapsamında araştırma yapmışlardır. Didim'e gelen dental turistlerin seyahat motivasyonlarını belirlemek amacıyla anket gerçekleştirmişlerdir. 206 turist üzerine yapılan araştırma sonucunda; turistlere yapılan

bilgilendirmelerin yeterliliği, yapılan yorumlar, etkili iletişim ve tavsiyenin birincil derecede önemli faktörler olduğu tespit edilmiştir.

Demir vd. (2020), medikal turistlerin tercih nedenlerini Samsun ili özelinde incelemişlerdir. Amerika, Avrupa, Orta Asya ve Orta Doğu ülkelerinden gelen 111 medikal turist üzerine anket gerçekleştirmişlerdir. Elde edilen veriler doğrultusunda turistlerin, Samsun ilinde hizmet veren hastanelerin tedavi ücretlerinin uygun olması, teknolojik ekipmanların yeterli olması ve hekimlerin uluslararası tanınırlığının olması nedeniyle tercih ettikleri belirlenmiştir. Araştırmacıların ülkeler itibarıyla yapmış olduğu karşılaştırma sonucunda, Amerika ve Avrupa ülkelerinden gelen medikal turistlerin konaklama hizmetlerini yeterli bulduğunu ve aracı kurumlarla olan iletişimin iyi seviyede olduğunu, Orta Doğu ülkelerinden gelen medikal turistlerin Samsun ilini dini yakınlık nedeniyle tercih ettiklerini belirlemişlerdir.

Alp (2021), medikal turistlerin en fazla tercih ettiği destinasyonların karşılaştırmasını yapmıştır. Araştırmada ikincil veri kaynakları kullanılmıştır. Sonuç olarak, tıbbi işlemler bakımından en uygun ülkenin (en çok uygulananlar ortopedi, kardiyoloji ve kozmetik cerrahi) Türkiye, doktor sayısı bakımından en fazla olan ülkenin Hindistan, kişi başına en yüksek doktor ortalamasına sahip ülkenin Singapur, en fazla akreditasyona sahip ülkenin Tayland olduğu belirlenmiştir.

Çınar ve Sivük (2021), medikal turistlerin tercihlerinde etkili olan faktörleri incelemişler ve turistlerin demografik özelliklerine göre bu nedenlerin farklılık gösterip göstermediğini araştırmışlardır. Araştırmacılar, İstanbul ve Ankara illerine gelen 415 medikal turist üzerine anket gerçekleştirmişlerdir. Araştırma sonucunda, “ülke ortamı”, “turizm varış noktası”, “tıbbi turizm maliyetleri” ve “tesis ve hizmetler” faktörlerinin turistlerin demografik özelliklerine göre farklılıklar gösterdiğini tespit etmişlerdir.

Üstün ve Demir Uslu (2022), Türkiye'nin sağlık turizmi destinasyonu olarak tercih edilme nedenlerini araştırmışlardır. Araştırmada 4 boyuttan oluşan Medikal Turizm Endeksi dikkate alınmıştır. Sağlık turizmi için Türkiye'ye gelen 42 turist ile mülakatlar yapılmıştır. Elde edilen veriler içerik analizi yardımıyla itici ve çekici faktörler şeklinde temalara ayrılmıştır. Hastaların Türkiye'yi tercih nedenleri; sağlık tesis ve hizmetleriyle ilgili faktörler, ülkenin turizm destinasyonu olması, sağlık maliyetlerinin uygunluğu ve çevresel faktörler olduğu tespit edilmiştir.

Şengel ve Şeyho (2023), Arap turistlerin sağlık turizmi kapsamında Türkiye'yi tercih nedenlerini araştırmışlardır. Araştırma için nitel araştırma yöntemi tercih edilmiş ve 30 Arap turist ile mülakatlar gerçekleştirilmiştir. Elde edilen veriler doğrultusunda, Türkiye'nin medikal (tıbbi) turizmde önemli bir destinasyon olması, kaliteli olması, duyulan memnuniyet, uygun tedavi maliyetleri, eş dost tavsiyesi, profesyonel danışmanlık hizmetlerinin olması, kültürel yakınlık ve Türkiye'nin sahip olduğu doğal ve tarihi güzellikler olduğu tespit edilmiştir.

Cengiz ve Koç (2024), medikal turizm kapsamında Türkiye'ye saç ekimi için gelen 156 medikal turist üzerine anket gerçekleştirmişlerdir. Medikal turistler İstanbul'da bulunan özel hastanelere gelmiş olan kişilerdir. Yapılan araştırma sonucunda, turistlerin Türkiye'de saç ekimini riskli

görmedikleri ve istedikleri hizmetleri alabilecekleri ile ilgili korku yaşamadıkları tespit edilmiştir.

YÖNTE

Bu araştırmanın amacı, medikal turizm kapsamında İstanbul'a gelen turistler hakkında bilgi edinmek ve İstanbul'u tercih etme nedenlerini tespit etmektir. Günümüzde destinasyonların medikal turizm pazarından elde ettikleri geliri artırmaları, tercih edilebilirlikleri ile doğrudan bağlantılıdır. Araştırmadan elde edilen sonuçların medikal turizm paydaşlarına katkı sağlayacağı düşünülmektedir. Bu kapsamda alan yazın taraması yapılmış, medikal turizm destinasyonlarının tercihinde etkili olan nedenler incelenmiş ve araştırma kapsamında aşağıdaki araştırma sorusu belirlenmiştir.

1. Medikal turistlerin İstanbul'u medikal turizm açısından tercih etme nedenleri nelerdir?

Bu çalışmada veriler, nicel analiz yöntemlerinden biri olan anket tekniği ile toplanmıştır. Medikal turistlerin tercih nedenleri belirlemek amacıyla Sag ve Zengul (2019) ve Akdu ve Akdu, (2014) çalışmalarından faydalanarak anket formu geliştirilmiştir. Anket formu 2 bölümden oluşmaktadır. Birinci bölümde medikal turistlerin demografik özelliklerini belirlemeye yönelik 8 tane soru bulunmaktadır. İkinci bölümde bahsedilen yazarların çalışmalarından faydalanarak hazırlanan tercih nedenlerini belirlemeye yönelik 16 önerme bulunmaktadır. Önermelerin skorları 1- Kesinlikle Katılmıyorum, 2- Katılmıyorum, 3- Katılmıyorum 4- Katılıyorum ve 5-Kesinlikle Katılıyorum aralığında oluşturulmuştur. Ayrıca, önermeler dışında tercih nedeni belirlemek isteyenler için "diğer" seçeneği yer almaktadır. Anketler, İngilizce diline çevrilmiş ve alanda uzman kişilerin görüşleri alınmıştır. Anketin pilot uygulaması 2024 Haziran ayında İstanbul'da bulunan 50 medikal turist üzerinde gerçekleştirilmiştir. Veriler bilgisayar ortamına aktarılmıştır. Anketlerin güvenilirlik değeri 0,67 bulunmuştur. Anketler bizzat araştırmacılar tarafından turistlerle yüz yüze görüşülerek yapılmıştır. Anket formunda yer alan sorular ile ilgili anlaşılmayan bir husus olmadığı tespit edilmiştir.

Araştırma verileri 1 Temmuz ve 8 Ağustos 2024 tarihleri arasında İstanbul'un Asya bölgesinde sağlık tesislerini ziyaret eden 117 medikal turist üzerinden toplanmıştır. Anketler istatistik programı aracılığıyla analiz edilmiş olup, aritmetik ortalama, standart sapma, frekans ve yüzde analizi tekniklerinden yararlanılmıştır. Araştırmanın zaman kısıtı bulunmaktadır ve geniş bir zaman diliminde büyük bir gözlem sayısına ulaşılarak anket yapılamamıştır. Araştırmada, katılımcıların ölçüm ifadelerini doğru anladıkları ve ankete samimi ve doğru işaretlemeler yaptıkları varsayılmaktadır.

BULGULAR

Çalışmanın bu bölümünde, yapılan analizler sonucunda elde edilen bulgulara yer verilmiştir. Aşağıda Tablo 1'de katılımcıların demografik özelliklerine ait bilgiler yer almaktadır.

Tablo 1. Araştırmaya Katılanlara Ait Demografik Bilgiler

Özellikler		N	%
Cinsiyet	Erkek	117	100
	Kadın	0	0
	Toplam	117	100
Yaş	20-30	52	44,4
	31-40	51	43,6
	41-50	9	7,7
	51 ve üzeri	5	4,3
	Toplam	117	100
Medeni Durum	Evli	38	32,5
	Bekar	71	60,7
	Dul	8	6,8
	Toplam	117	100
Öğrenim Durumu	Lise	49	41,9
	Lisans	52	44,4
	Yüksek Lisans	13	11,1
	Doktora	3	2,6
	Toplam	117	100
	Gelir (USD)	0-2000	3
2001-4000		41	35
4001-6000		45	38,5
6000 ve üzeri		28	23,9
Toplam		117	100
Ülke	ABD	49	41,9
	Avustralya	32	27,4
	Almanya	13	11,1
	Yeni Zelanda	2	1,7
	İngiltere	21	17,9
	Toplam	117	100

Tablo 1 incelendiğinde katılımcıların %100'ünün erkek olduğu görülmektedir. Katılımcıların yaş, medeni durum ve öğrenim durumlarına göre en yüksek değerler incelendiğinde; %44,4'ünün 20-30 yaş aralığında, %60,7'sinin bekar, %44,4'ünün lisans mezunu olduğu görülmektedir. Katılımcıların gelir durumları incelendiğinde, en yüksek katılımın %38,5 ile 4001-6000 USD aralığında olduğu tespit edilmiştir. Medikal turistlerin %41,9'unun ABD ülkesinden geldikleri görülmektedir.

Tablo 2. Araştırmaya Katılanların İstanbul'u Ziyaretlerine İlişkin Bulgular

İstanbul'u Ziyaret	İlk defa	81	69,2
	İkinci defa	27	23,1
	Üç ve üzeri	9	7,7
	Toplam	117	100
İstanbul'u Medikal Turizm Amacıyla Ziyaret	İlk Defa	109	93,2
	İkinci defa	8	6,8
	Toplam	117	100

Tablo 2'de yer alan katılımcıların İstanbul ilini ziyaretlerine ilişkin bulgular incelendiğinde, medikal turistlerin %69,2'sinin İstanbul'a ilk defa geldiği tespit edilmiştir. Turistlerin İstanbul'a medikal turizm amacıyla gerçekleşen ziyaretlerinin çoğunun (%93,2) ilk defa olduğu tespit edilmiştir.

Tablo 3. Araştırmaya Katılanların İstanbul'u Tercih Etme Nedenlerine İlişkin Bulgular

Önermeler	N	\bar{x}	s.s.
Tanıdıklarımın referansı	117	3,58	1,47
Ülkemde sağlık hizmetlerinin pahalı olması	117	3,70	1,34
Ülkemdeki sağlık hizmetlerinden memnun olmamam	117	2,64	1,06
Ülkemdeki sağlık tesislerinde teknolojik cihazların eksik olması	117	2,19	1,07
Ülkemdeki uzun bekleme süresi	117	2,42	1,22
Ülkemdeki yasal kısıtlamalar	117	2,07	0,92
Ülkemdeki ahlaki kısıtlamalar	117	2,05	1,08
Ülkeme yakın mesafede olması	117	1,85	0,83
İstanbul'da sağlık hizmetlerinin ucuz olması	117	4,04	1,16
İstanbul'da turistik alanların zenginliği	117	4,07	0,84
Dini yakınlık	117	2,88	1,10
İstanbul'un medikal turizm açısından güçlü imaja sahip olması	117	4,09	0,83
İstanbul'un kaliteli hizmet veren sağlık tesislerine sahip olması	117	4,48	0,62
İstanbul'da konaklama imkanlarının fazla olması	117	3,97	0,71
İstanbul'un ulaşım imkanlarının kolay olması	117	4,23	0,71
İnternet üzerinden yapılan tanıtımlar	117	4,35	0,60
Cronbach's Alpha: 0,65			

Tablo 3 incelendiğinde, “İstanbul’un kaliteli hizmet veren sağlık tesislerine sahip olması” ($\bar{x}=4,48$), “İnternet üzerinden yapılan tanıtımlar” ($\bar{x}=4,35$), “İstanbul’un ulaşım imkanlarının kolay olması” ($\bar{x}=4,23$) önermelerine katılımın diğer önermelere göre nispeten daha yüksek olduğu görülmektedir. “İstanbul’un medikal turizm açısından güçlü imaja sahip olması” önermesine ($\bar{x}=4,09$), “İstanbul’da turistik alanların zenginliği” önermesine ($\bar{x}=4,07$) ve “İstanbul’da sağlık hizmetlerinin ucuz olması” önermesine ($\bar{x}=4,04$) katılım yüksektir. “Ülkeme yakın mesafede olması” katılımın en düşük olduğu önermedir. ($\bar{x}=1,85$). “Ülkemdeki ahlaki kısıtlamalar” önermesine ($\bar{x}=2,05$) ve “Ülkemdeki yasal kısıtlamalar” önermesine de ($\bar{x}=2,07$) katılım düşüktür.

SONUÇ VE ÖNERİLER

Medikal turizm, ulaşım ve iletişim teknolojisinde meydana gelen gelişmeler ve tıp alanında yaşanan ilerlemeler sonucunda özellikle gelişmekte olan ülkeler için önemli bir turizm türü haline gelmiştir. Sağlık turizmi kapsamında medikal turizm açısından ülkeler adeta bir yarış içerisindedirler.

Medikal turistler, artık istedikleri bilgilere çok daha rahat ulaşabilmekte, alternatiflerinin artması ile rekabetçi piyasanın imkanlarından yararlanmaktadırlar. Ülkelerin medikal turizm kapsamında pazarlarını iyi analiz etmesi ve pazarlama stratejilerini buna göre geliştirmesi gerekmektedir. Plansız atılan adımlar ülkelerin rekabetçi piyasada geride kalmasına neden olacaktır. Destinasyonların hedef pazarları belirlemesi, bu pazarları oluşturan medikal turistlerin tercih, beklenti ve memnun olmadıkları unsurları tespit etmesi, büyük önem taşımaktadır. Destinasyonların SWOT analizi aracılığıyla planlı bir şekilde hareket etmeleri bir diğer önemli konudur.

Türkiye, medikal turizm açısından birçok avantaja sahip olan, tercih edilen fakat sahip olduklarına kıyasla hak ettiği konumda olmayan bir ülkedir. Türkiye’nin medikal turizm pazarında hak ettiği konumda yer alabilmesi için deniz-güneş-kum turizminin geliştirilmesi kapsamında yapılan hataların tekrarlanmaması gerekmektedir. Hedef pazarların belirlenmesi ve markalaşmaya gidilmesi önemlidir. Türkiye sadece medikal hizmetleri bakımından değil, sahip olduğu turizm kaynaklarıyla da oldukça güçlü bir ülkedir. Türkiye’nin medikal turizm kapsamında en çok turist ağırlayan illerinin aynı zamanda turizm açısından da gelişmiş iller olduğu söylenebilir. Bu illerden biri İstanbul’dur. İstanbul medikal turistleri ağırlamak için çok güçlü kaynaklara sahip olan bir ildir. İstanbul’u tercih eden/edecek olan turistlerin tercih nedenlerini bilmek, kendi ülkelerinden İstanbul’a gelmelerine neden olan faktörleri tespit etmek ve gerekli tedbirleri almak gerekmektedir. Çalışma, bu düşünceden yola çıkarak hazırlanmıştır.

Araştırma sonucunda medikal turistlerin destinasyon tercihinde etkili olan faktörler arasında katılımın en yüksek olduğu önermeler; İstanbul’da kaliteli hizmet veren sağlık tesislerinin olması, internet üzerinden yapılan tanıtımlar ve ulaşım imkanlarının yeterli olmasıdır. Araştırmaya katılan medikal turistlerin çoğunun 20 ile 40 yaş aralığında ve çoğunun bekar olduğu tespit edilmiştir. Araştırmaya katılan turistlerin çoğu ABD’den gelen turistlerdir. Turistlerin büyük bir

çoğunluğu İstanbul'a ilk defa geldiklerini, medikal hizmetlerden de ilk defa yararlanmak için geldiklerini belirtmişlerdir.

Tanıtım çalışmaları medikal turistlerin destinasyon tercihinde oldukça etkili olduğu görülmektedir. İstanbul'un tercih edilme nedenlerinde öne çıkan, güçlü yönlerini vurgulayan tanıtım çalışmalarının yapılması gerekmektedir. Bu çalışmaların uygun kanallar ile aktarılması da bir diğer önemli konudur. Özellikle demografik bilgiler referans alınarak tercih edilen tanıtım kanallarının destinasyonları başarıya ulaştırabileceği ifade edilebilir. Bu çalışmanın sonuçları arasında yer alan demografik bilgiler, medikal turizm kapsamında hizmet veren aracı kuruluşlara yön gösterebilmesi açısından büyük önem taşımaktadır

Kamu kurum ve kuruluşları tarafından gerçekleştirilecek tanıtım çalışmaları, özel sektörde faaliyet gösteren tesislere oranla daha fazla ikna edici özelliğe sahip olduğu ifade edilebilir. Bunun nedeni, medikal turistlerin resmî kurumların paylaşımlarına daha fazla itibar etmesidir.

Hindistan, Malezya, Singapur, Tayvan, Tayland, Güney Kore gibi Uzakdoğu ülkeleri "üçüncü dünya fiyatına birinci sınıf hizmet" sloganıyla pazarlama çalışmalarını yürütmektedirler. Medikal turizmde İstanbul bir marka şehir haline getirilmeli ve şehir için bir slogan oluşturulmalıdır. Ancak Türkiye için düşük fiyat ile kaliteli hizmet algısı yerine, yüksek fiyat ile en kaliteli hizmetin bu destinasyonda alınabileceğine dair bir slogan tercih edilmelidir.

Alan yazındaki birçok çalışmada, medikal turizm destinasyonlarının ikamet edilen ülkeye olan yakınlığı, destinasyon tercihinde önemli bir faktör olduğu görülmektedir. Ancak bu çalışmada, katılımcıların yanıtları doğrultusunda mesafenin tercih nedenleri arasında etkili bir faktör olmadığı sonucuna ulaşılmıştır. Araştırma sonucunda elde edilen bir diğer sonuç, İstanbul ilinin tercihinde turistlerin kendi ülkelerindeki ahlaki ve yasal kısıtlamaların belirleyici olmadığıdır.

Fiyat unsurunun turistlerin tercihinde etkili olması, araştırma sonucunun dikkat çeken tespitleri arasında yer almaktadır. İstanbul'da verilen hizmetin kalitesi, destinasyonun medikal turizm kapsamında marka haline gelmiş olması, ulaşım, transfer, konaklama, yeme içme ve turistik çekicilikler konusundaki avantajları, gelişmiş ülkelere göre uygun, gelişmekte olan ülkelere göre ise daha yüksek fiyat ile hizmet verilmesini gerektirmektedir. Ayrıca medikal turizm kapsamında verilen hizmette ortak ücret tarifesi oluşturulmalıdır. Paydaşların ortak kararları ile düşük fiyata kaliteli hizmet algısı kırılmalıdır.

Araştırmanın sonuçlarından biri de kaliteli hizmetin turistlerin destinasyonun tercihinde etkili olmasıdır. Bu doğrultuda kaliteli hizmetin sağlanabilmesi için ilgili kurumlar tarafından sağlık tesislerinin, konaklama, yeme içme ve diğer bağlantılı işletmelerin sık bir şekilde denetlenmesi gerekmektedir. Medikal turizmde kalite ile bağdaştırılan bir diğer faktör sağlık tesislerinin akredite olmasıdır. Bu doğrultuda, tesislerin akredite olması için gerekli çalışmaların yapılması büyük önem taşımaktadır. Yine kaliteli hizmet için eğitim kurumlarının ilgili bölümlerinde medikal turizm kapsamında verilecek eğitimler, büyük önem taşımaktadır. Eğitimlerin içeriğinde özellikle Türkiye'nin medikal turizm pazarını oluşturan ülkelerin kültürleri üzerine yoğunlaşması önerilmektedir.

İstanbul'un tercih edilme nedenleri arasında dikkat çeken bir diğer faktör turistik çekiciliklerdir. Bu nedenle medikal turizm kapsamında verilen bütüncül hizmette çekiciliklerin daha fazla ön plana çıkması için gerekli çalışmalar yapılmalıdır. Medikal turizm kapsamında destinasyonu ziyaret eden her turist için kültür ve sanat etkinliklerine katılım sağlaması için gerekli çalışmalar yapılmalıdır.

Bu araştırmanın daha önce belirtilen sınırlılıkları nedeniyle birtakım eksikleri bulunmaktadır. Gelecekte daha fazla turiste ulaşılarak araştırmanın örnekleminin genişletilmesi, Türkiye'nin medikal turizmde öne çıkan diğer destinasyonlarına yönelik araştırmaların artırılması ve il özeline yönelik öneriler sunulması, medikal turizminin diğer paydaşlarının görüşlerini belirlemeye yönelik araştırmalar yapıp konunun bütüncül değerlendirilmesi gerekmektedir.

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KADIN OKUL YÖNETİCİLERİNİN LİDERLİĞİ

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ÖZET

Bu araştırmanın amacı, kadın okul yöneticilerinin liderlik stillerini, karşılaştıkları zorlukları ve liderliklerinin okul performansına etkilerini incelemektir. Kadın liderlerin okul yönetiminde oynadıkları rol ve bu rolün öğrenci, öğretmen ve okul toplumu üzerindeki etkilerini anlamak hedeflenmiştir. Araştırma nitel ve nicel araştırma desenlerinin birleşimini içeren karma yöntemle gerçekleştirilmiştir. Veri toplama sürecinde anketler ve yarı yapılandırılmış görüşmeler kullanılmıştır. Anketler, liderlik stillerini ve zorlukları değerlendirmek için kullanılırken, görüşmeler derinlemesine bilgi sağlamak amacıyla yapılmıştır. Çalışma, Türkiye'deki devlet ve özel okullarda görev yapan toplam 50 kadın okul yöneticisi ile gerçekleştirilmiştir. Katılımcılar, çeşitli eğitim kademelerinde görev yapan deneyimli yöneticiler arasından rastgele örnekleme yöntemi ile seçilmiştir. Anket verileri, betimsel istatistikler ve faktör analizi ile değerlendirilmiştir. Görüşmelerin transkripsiyonu yapıldıktan sonra, içerik analizi ile veriler kodlanmış ve temalar oluşturulmuştur. Verilerin analizi, kadın liderlerin karşılaştıkları zorlukları ve liderlik stillerinin etkilerini ortaya koymak için yapılmıştır. Araştırma sonuçları, kadın okul yöneticilerinin genellikle dönüşümcü liderlik stili benimsediklerini ve bu stilin okul performansına olumlu etkileri olduğunu göstermiştir. Kadın liderler, empati, iletişim ve işbirliği becerileri ile öne çıkmakta ve bu beceriler, öğretmen motivasyonu ve öğrenci başarısı üzerinde olumlu etkiler yaratmaktadır. Ancak, kadın yöneticilerin cinsiyet temelli önyargılar ve iş-yaşam dengesi gibi zorluklarla karşılaştıkları da belirlenmiştir. Kadın okul yöneticilerinin liderlik rollerini desteklemek ve karşılaştıkları zorlukları azaltmak için politika ve uygulamaların geliştirilmesi önerilmektedir. Ayrıca, cinsiyet eşitliğini teşvik eden ve kadın liderlerin profesyonel gelişimlerini destekleyen programların yaygınlaştırılması gerektiği vurgulanmıştır.

Anahtar Kelimeler: *Kadın Liderler, Okul Yönetimi, Liderlik Stilleri, Eğitimde Cinsiyet Eşitliği, Dönüşümcü Liderlik.*

ABSTRACT

This study aims to examine the leadership styles of women school administrators, the challenges they face, and the impact of their leadership on school performance. The goal is to understand the role of female leaders in school management and their influence on students, teachers, and the school community. The research was conducted using a mixed-method approach that combines qualitative and quantitative research designs. Surveys and semi-structured interviews were used in the data collection process. Surveys were employed to assess leadership styles and challenges, while interviews were conducted to provide in-depth information. The study was conducted with a total of 50 women school administrators working in public and private schools in Turkey. Participants were selected using a random sampling method from experienced administrators at various educational levels. Survey data were evaluated using descriptive statistics and factor analysis. After transcribing the interviews, the data were coded and themes were created using content analysis. The analysis aimed to reveal the challenges faced by female leaders and the effects of their leadership styles. The results of the study showed that women school administrators generally adopt a transformational leadership style, which positively impacts school performance. Female leaders excel in empathy, communication, and collaboration skills, which positively influence teacher motivation and student success. However, it was also found that female administrators face challenges such as gender bias and work-life balance. It is recommended to develop policies and practices to support the leadership roles of women school administrators and reduce the challenges they face. Additionally, it is emphasized that programs promoting gender equality and supporting the professional development of female leaders should be expanded.

Keywords: Women Leaders, School Administration, Leadership Styles, Gender Equality in Education, Transformational Leadership.

GİRİŞ

Eğitimde liderlik, okul performansının, öğretmen motivasyonunun ve öğrenci başarısının en kritik belirleyicilerinden biri olarak kabul edilmektedir. Ancak, eğitim yönetiminde kadın liderlerin sayısının azlığı ve karşılaştıkları zorluklar, cinsiyet eşitliğine ulaşma yolunda önemli bir engel oluşturmaktadır. Bu araştırmanın temel amacı, kadın okul yöneticilerinin liderlik stillerini, bu liderlik stillerinin okul performansı üzerindeki etkilerini ve kadın liderlerin karşılaştıkları zorlukları derinlemesine incelemektir.

Kadın liderlerin eğitim yönetiminde oynadıkları rol, yalnızca bir yönetim fonksiyonu olarak değil, aynı zamanda cinsiyet eşitliği ve toplumsal cinsiyet rolleri üzerindeki etkisi açısından da önemlidir. Eğitim kurumlarının en tepe noktalarında yer alan kadın liderlerin, cinsiyet temelli önyargılar ve toplumsal engeller karşısında nasıl bir liderlik sergiledikleri, onların profesyonel gelişimlerini ve dolayısıyla okulun genel başarısını doğrudan etkilemektedir (Shakeshaft, 1989). Bu bağlamda, araştırmanın amacı, kadın liderlerin bu zorluklarla nasıl başa çıktıklarını,

hangi liderlik stillerini benimsediklerini ve bu stillerin eğitim ortamına nasıl yansıdığını ortaya koymaktır.

Araştırmanın bir diğer amacı ise, kadın liderlerin desteklenmesine yönelik politika önerileri geliştirmektir. Türkiye'deki eğitim sisteminde kadın liderlerin sayısının artırılması ve onların karşılaştıkları engellerin minimize edilmesi, eğitimde cinsiyet eşitliğinin sağlanması açısından kritik öneme sahiptir (Aydın, 2017). Bu araştırma, politika yapımcılar ve eğitim yönetimi alanındaki uygulayıcılara yol gösterici olmayı hedeflemektedir.

Kadın liderlerin eğitim yönetiminde oynadıkları rol, sadece bir liderlik meselesi olarak değil, aynı zamanda toplumsal cinsiyet eşitliğinin sağlanması açısından da büyük bir öneme sahiptir. Eğitim kurumlarında liderlik pozisyonlarında yer alan kadınların sayısının artması, bu kurumların toplumsal cinsiyet eşitliği açısından model olma potansiyelini artırmaktadır (Blackmore, 1999). Ancak, kadın okul yöneticileri, toplumsal cinsiyet normlarından kaynaklanan önyargılar, cam tavan sendromu ve iş-yaşam dengesi gibi çeşitli zorluklarla karşılaşmaktadır. Bu zorluklar, kadın liderlerin liderlik kapasitelerini tam anlamıyla kullanmalarını engelleyebilmektedir (Eagly ve Carli, 2007).

Araştırmanın önemi, bu zorlukların aşılması ve kadın liderlerin desteklenmesi konusunda somut öneriler sunmasında yatmaktadır. Eğitim yönetimi literatüründe kadın liderlerin liderlik stilleri üzerine yapılan çalışmalar, genellikle bu liderlerin dönüşümcü liderlik stilini benimsediklerini göstermektedir (Bass ve Riggio, 2006). Dönüşümcü liderlik, empatinin, iletişimin ve işbirliğinin ön planda olduğu, liderin takipçileri üzerinde olumlu etkiler yarattığı bir liderlik tarzıdır. Bu araştırmanın bulguları, dönüşümcü liderlik stilinin kadın liderler tarafından nasıl benimsendiğini ve bu stilin okul performansı üzerindeki etkilerini derinlemesine inceleyecektir.

Bu çalışma, ayrıca, kadın liderlerin karşılaştıkları cinsiyet temelli zorluklar ve bu zorluklarla başa çıkma stratejileri üzerine de önemli bilgiler sunacaktır. Eğitim yönetimi alanında kadın liderlerin karşılaştıkları engellerin aşılması hem bireysel liderlik kapasitelerinin gelişmesini hem de kurumların genel performansının artmasını sağlayacaktır (Northouse, 2018). Bu bağlamda, araştırmanın sonuçları, eğitim politikaları ve uygulamaları açısından önemli katkılar sunmayı hedeflemektedir.

Literatür Taraması

Eğitimde liderlik ve cinsiyet arasındaki ilişki üzerine yapılan çalışmalar, kadın liderlerin liderlik tarzlarının genellikle dönüşümcü liderlik olarak tanımlandığını göstermektedir (Bass, 1985). Dönüşümcü liderlik, liderin takipçileri üzerinde derin bir etki yaratmayı amaçladığı, onları motive ettiği ve daha yüksek düzeyde performans sergilemeleri için ilham verdiği bir liderlik tarzıdır. Bu liderlik stilinin, özellikle kadın liderler arasında yaygın olarak benimsenmesinin nedeni, empati, iletişim ve iş birliği gibi özelliklerin ön planda olmasıdır (Avolio ve Bass, 2004). Ancak, kadın liderlerin liderlik rollerinde karşılaştıkları zorluklar, bu olumlu etkileri sınırlayabilmektedir. Literatürde, kadın liderlerin karşılaştıkları en yaygın

zorluklardan biri, toplumsal cinsiyet normlarından kaynaklanan önyargılardır (Eagly ve Carli, 2007). Bu önyargılar, kadınların liderlik kapasitelerini sorgulamakta ve onların liderlik pozisyonlarına erişimini zorlaştırmaktadır. Buna ek olarak, iş-yaşam dengesi, kadın liderlerin karşılaştığı bir diğer önemli zorluktur. Kadınlar, profesyonel ve kişisel yaşamlarını dengelemekte zorlanabilirler ve bu da liderlik performanslarını olumsuz etkileyebilir (Korkmaz, 2020).

Kadın liderlerin bu zorluklarla başa çıkma stratejileri üzerine yapılan çalışmalar, onların dayanıklılık ve esneklik geliştirdiğini göstermektedir. Kadın liderler, cinsiyet temelli engelleri aşmak için dönüştürücü liderlik stillerini ve iş birliği becerilerini kullanmaktadır (Yılmaz, 2019). Ayrıca, kadın liderlerin profesyonel gelişimlerine yönelik destek programlarının, onların liderlik kapasitelerini artırmada önemli bir rol oynadığı literatürde sıklıkla vurgulanmaktadır (Erdoğan, 2021).

Türkiye bağlamında yapılan araştırmalar da benzer sonuçlar ortaya koymaktadır. Türkiye'deki kadın okul yöneticilerinin karşılaştıkları zorluklar, cinsiyet eşitliği konusunda önemli engeller olarak görülmektedir. Kadın liderlerin profesyonel gelişimlerini destekleyen programların ve politikaların yaygınlaştırılması, bu engellerin aşılmasında kritik bir rol oynamaktadır (Kaya, 2018). Ancak, bu alandaki çalışmaların sınırlı sayıda olması, daha fazla araştırmanın yapılması gerektiğini göstermektedir.

Araştırma Problemleri

Bu araştırmanın temel araştırma problemleri, kadın okul yöneticilerinin liderlik stilleri, karşılaştıkları zorluklar ve bu zorluklarla başa çıkma stratejileri üzerine odaklanmaktadır. Araştırmada yanıtlanması gereken temel sorular şunlardır:

1. **Kadın okul yöneticilerinin liderlik stilleri nelerdir ve bu stiller okul performansını nasıl etkilemektedir?**
 - Bu soru, kadın liderlerin hangi liderlik stillerini benimsediklerini ve bu stillerin okulun genel performansı üzerindeki etkilerini ortaya koymayı amaçlamaktadır. Dönüştürücü liderlik stili, kadın liderler arasında yaygın olarak benimsenen bir stil olarak öne çıkmakta ve bu stilin okul performansı üzerindeki olumlu etkileri literatürde sıkça vurgulanmaktadır (Bass ve Riggio, 2006).
2. **Kadın liderlerin karşılaştıkları başlıca zorluklar nelerdir ve bu zorluklar liderlik performanslarını nasıl sınırlamaktadır?**
 - Bu soru, kadın liderlerin karşılaştıkları cinsiyet temelli önyargılar, cam tavan sendromu ve iş-yaşam dengesi gibi zorlukları ve bu zorlukların liderlik performanslarını nasıl sınırladığını incelemektedir. Bu bağlamda, kadın liderlerin bu zorluklarla başa çıkmak için geliştirdikleri stratejiler de detaylı bir şekilde ele alınacaktır (Eagly ve Carli, 2007).

3. Kadın okul yöneticilerinin liderlik rollerini desteklemek için hangi politika ve uygulamalar geliştirilmelidir?

- Bu soru, kadın liderlerin liderlik rollerini desteklemek ve karşılaştıkları zorlukları minimize etmek için geliştirilebilecek politika ve uygulamaları belirlemeyi amaçlamaktadır. Eğitimde cinsiyet eşitliğini teşvik eden politikaların ve kadın liderlerin profesyonel gelişimlerini destekleyen programların önemi bu sorunun merkezinde yer almaktadır (Blackmore, 1999).

4. Eğitimde cinsiyet eşitliği ve kadın liderliğinin desteklenmesi konusunda hangi stratejiler etkili olabilir?

- Bu soru, kadın liderliğinin desteklenmesi ve eğitimde cinsiyet eşitliğinin sağlanması için uygulanabilecek stratejileri incelemektedir. Bu stratejilerin geliştirilmesi, kadın liderlerin liderlik kapasitelerini artırmada ve eğitimde toplumsal cinsiyet eşitliğini sağlamada önemli bir rol oynayacaktır (Northouse, 2018).

YÖNTEM

Bu araştırmada, kadın okul yöneticilerinin liderlik stillerini, karşılaştıkları zorlukları ve bu liderlik stillerinin okul performansları üzerindeki etkilerini incelemek amacıyla karma araştırma yöntemi kullanılmıştır. Karma araştırma yöntemi, nitel ve nicel araştırma desenlerinin bir arada kullanıldığı, araştırmacının daha kapsamlı ve derinlemesine veri elde etmesini sağlayan bir yaklaşımdır (Creswell, 2014). Araştırmanın yöntemi, katılımcıların liderlik deneyimlerini ve bu deneyimlerin eğitim ortamlarına yansımalarını anlamak amacıyla özenle tasarlanmıştır.

Araştırma Tasarımı

Bu araştırmada, karma araştırma deseni benimsenmiştir. Karma araştırma deseni nitel ve nicel verilerin bir arada toplandığı, analiz edildiği ve yorumlandığı bir araştırma tasarımıdır. Araştırmanın nicel kısmı, kadın okul yöneticilerinin liderlik stillerini ve karşılaştıkları zorlukları değerlendirmek amacıyla bir anket aracılığıyla gerçekleştirilmiştir. Bu anket, katılımcıların liderlik stillerini, okul performansını ve karşılaştıkları zorlukları ölçen soruları içermektedir (Tashakkori ve Teddlie, 2003).

Araştırmanın nitel kısmı ise, kadın liderlerin liderlik deneyimlerini daha derinlemesine anlamak için yarı yapılandırılmış görüşmeler yoluyla gerçekleştirilmiştir. Yarı yapılandırılmış görüşmeler, araştırmacının belirli bir konu çerçevesinde sorular sormasına olanak tanıırken, katılımcıların deneyimlerini ve görüşlerini daha ayrıntılı bir şekilde ifade etmelerine de olanak tanır (Yıldırım ve Şimşek, 2016). Bu tasarım, araştırmanın hem geniş çapta veri toplamasını hem de bu verilerin derinlemesine incelenmesini sağlamıştır.

Çalışma Grubu

Araştırmanın çalışma grubu, Türkiye'deki devlet ve özel okullarda görev yapan kadın okul yöneticilerinden oluşmaktadır. Araştırma kapsamında, farklı eğitim kademelerinde (ilkokul,

ortaokul, lise) görev yapan toplam 50 kadın okul yöneticisi rastgele örnekleme yöntemi ile seçilmiştir. Rastgele örnekleme yöntemi, her bir katılımcının seçilme şansının eşit olduğu, dolayısıyla örneklemedeki çeşitliliği artıran bir örnekleme tekniğidir (Patton, 2002).

Çalışma grubundaki katılımcılar, en az 5 yıllık yönetim deneyimine sahip kadın okul yöneticilerinden oluşmaktadır. Bu kriter, katılımcıların liderlik deneyimlerinin yeterince olgunlaşmış ve değerlendirilebilir olmasını sağlamayı amaçlamaktadır. Ayrıca, katılımcıların farklı eğitim kademelerinde görev yapması, araştırmanın bulgularının genellenebilirliğini artırmaktadır.

Veri Toplama Araçları

Bu çalışmada, veri toplama araçları olarak anketler ve yarı yapılandırılmış görüşme formları kullanılmıştır. Anket, katılımcıların liderlik stillerini, karşılaştıkları zorlukları ve okul performansını değerlendiren sorular içermektedir. Anket soruları, literatürde yer alan geçerliliği ve güvenilirliği kanıtlanmış ölçeklerden uyarlanmıştır (Burns, 1978; Kouzes ve Posner, 2002). Anket, Likert tipi bir ölçek kullanılarak hazırlanmış olup, katılımcıların belirli bir ifadeye ne derece katıldıklarını beşli bir ölçek üzerinde derecelendirmelerine olanak tanımaktadır.

Yarı yapılandırılmış görüşme formu ise, katılımcıların liderlik deneyimlerini daha derinlemesine anlamak amacıyla tasarlanmıştır. Görüşme formu, kadın liderlerin liderlik stilleri, karşılaştıkları zorluklar ve bu zorluklarla başa çıkma stratejileri üzerine sorular içermektedir. Görüşmelerin her biri yaklaşık 45 dakika sürmüştür ve ses kayıt cihazı kullanılarak kaydedilmiştir. Görüşmelerin tamamı daha sonra yazılı metne dönüştürülmüş ve içerik analizi için hazırlanmıştır.

Veri Toplama Süreci

Veri toplama süreci, araştırma grubunun belirlenmesi ve onayların alınması ile başlamıştır. Katılımcılara araştırmanın amacı, süreci ve gönüllü katılımın esas olduğu açıklanmış, katılım onayları yazılı olarak alınmıştır. Anketler, çevrim içi bir platform üzerinden katılımcılara iletilmiş ve katılımcıların anketi doldurması için iki hafta süre verilmiştir. Çevrim içi anket, katılımcıların zaman ve mekan bağımsız olarak anketi doldurabilmelerine olanak tanımıştır (Dillman, Smyth ve Christian, 2014).

Yarı yapılandırılmış görüşmeler ise, katılımcılarla yüz yüze veya çevrim içi platformlar aracılığıyla gerçekleştirilmiştir. Görüşmelerin çevrim içi olarak yapılması, pandemi koşullarının etkilerini minimize etmek amacıyla tercih edilmiştir. Görüşmelerde, katılımcıların rahat ve güvenli hissetmeleri için gerekli önlemler alınmış ve araştırmacı, görüşme sürecinde tarafsız ve empatik bir yaklaşım sergilemiştir (Kvale ve Brinkmann, 2009).

Veri toplama süreci boyunca, araştırmacı, katılımcıların mahremiyetini koruma ilkesine sıkı sıkıya bağlı kalmış ve toplanan verilerin yalnızca araştırma amaçları doğrultusunda kullanılacağını taahhüt etmiştir. Veri toplama süreci, toplamda iki ay sürmüştür ve bu süre zarfında toplanan veriler, dijital ortamda güvenli bir şekilde saklanmıştır.

Veri Analizi

Bu arařtırmada, elde edilen veriler hem nicel hem de nitel analiz teknikleri kullanılarak analiz edilmiřtir. Anket verileri, betimsel istatistikler ve faktör analizi kullanılarak deęerlendirilmiřtir. Betimsel istatistikler, katılımcıların liderlik stillerine, okul performansına ve karřılařtıkları zorluklara iliřkin genel eęilimleri ortaya koymuřtur (Field, 2013). Faktör analizi ise, anket verilerinin altında yatan yapısal iliřkileri incelemek için kullanılmıřtır (Tabachnick ve Fidell, 2013).

Nitel veriler ise, içerik analizi yöntemi kullanılarak analiz edilmiřtir. İçerik analizi, yazılı metinlerin sistematik bir řekilde kodlanması ve bu kodlar arasındaki iliřkilerin incelenmesi yoluyla anlamlı temaların ortaya ıkarılmasını saęlar (Miles ve Huberman, 1994). Görüřmelerin transkriptleri, arařtırmacı tarafından dikkatlice okunmuř ve belirli temalar altında kodlanmıřtır. Daha sonra, bu temalar arasındaki iliřkiler ve ortak noktalar belirlenmiř ve sonuçlar yorumlanmıřtır.

Nitel veri analizi sürecinde, arařtırmacı, katılımcıların ifadelerini birebir yansıtmak ve verilerin doęruluęunu korumak için büyük özen göstermiřtir. Kodlama sürecinde, her bir görüşme ayrı ayrı analiz edilmiř ve benzer kodlar bir araya getirilerek ana temalar oluşturulmuřtur. Bu temalar, kadın okul yöneticilerinin liderlik stillerini, karřılařtıkları zorlukları ve bu zorluklarla bařa ıkma stratejilerini derinlemesine anlamamıza olanak tanımıřtır (Saldaña, 2015).

Geçerlilik ve Güvenilirlik

Arařtırmanın geçerlilięi ve güvenilirlięi, elde edilen bulguların doęruluęunu ve genelleřtirilebilirlięini saęlamak amacıyla çeřitli yöntemlerle güvence altına alınmıřtır. Nicel verilerin geçerlilięini artırmak için, kullanılan anket ölçekleri daha önce literatürde geçerlilięi kanıtlanmış ölçeklerden uyarlanmıřtır. Ölçeklerin iç tutarlılık katsayıları (Cronbach's alpha) hesaplanmış ve yeterli düzeyde bulunmuřtur (Cronbach, 1951).

Nitel verilerin geçerlilięi ise, arařtırmacının katılımcıların ifadelerini doęru ve tarafsız bir řekilde yansıtmayı ile saęlanmıřtır. İçerik analizinin güvenilirlięi, kodlama sürecinde baęımsız bir arařtırmacının da yer alması ve kodlama sürecinin bu arařtırmacı ile karřılařtırılması yoluyla artırılmıřtır (Lincoln ve Guba, 1985). Bu süreç, kodlamaların tutarlılıęını ve temaların doęruluęunu saęlamıřtır.

Ayrıca, arařtırma sürecinde toplanan verilerin güvenlięi ve katılımcıların mahremiyetine gösterilen özen, arařtırmanın etik standartlara uygun bir řekilde yürütülmesini saęlamıřtır. Katılımcıların kimlik bilgileri gizli tutulmuř ve elde edilen veriler, yalnızca arařtırma amaçları doęrultusunda kullanılmıřtır.

ARAŐTIRMA BULGULARI VE TARTIŐMA

Bu bölümde, arařtırmanın nicel ve nitel verilerinden elde edilen bulgular detaylı bir řekilde sunulmuřtur. Bulgular, kadın okul yöneticilerinin liderlik stilleri, karřılařtıkları zorluklar ve bu zorluklarla bařa ıkma stratejileri etrafında řekillenen ana temalar altında incelenmiřtir. Ayrıca,

bu bulguların anlamlandırılmasında ve yorumlanmasında, katılımcılardan alınan doğrudan alıntılar kullanılmıştır.

1. Kadın Okul Yöneticilerinin Liderlik Stilleri

Araştırmada elde edilen bulgular, kadın okul yöneticilerinin büyük çoğunluğunun dönüşümcü liderlik stilini benimsediğini göstermektedir. Dönüşümcü liderlik, katılımcıların iş birliğine dayalı, empati odaklı ve öğretmen motivasyonunu artırmaya yönelik bir liderlik yaklaşımını benimsediklerini ortaya koymuştur. Katılımcıların %78'i, dönüşümcü liderlik stilini uyguladıklarını belirtmiş ve bu stilin okul performansı üzerinde olumlu etkiler yarattığını vurgulamıştır.

Tema 1.1: Empati ve İletişim Becerileri

Katılımcıların çoğu, empati ve iletişim becerilerini liderliklerinin temel unsurları olarak tanımlamıştır. Empati, liderin takipçileri ile derin bir bağ kurmasını ve onların ihtiyaçlarını anlamasını sağlar. Bir katılımcı, bu durumu şu şekilde ifade etmiştir:

"Öğretmenlerimle kurduğum ilişki, onların ihtiyaçlarını anlama ve bu ihtiyaçlara yönelik çözümler üretme konusunda bana büyük avantaj sağlıyor. Empati, liderliğimin merkezinde yer alıyor." (Katılımcı 12)

Bu alıntı, empati ve iletişim becerilerinin dönüşümcü liderlik stilinde ne denli önemli olduğunu vurgulamaktadır. Katılımcıların %65'i, empati ve etkili iletişim kurma becerilerinin, öğretmenlerin motivasyonunu ve öğrencilerin başarı düzeyini artırmada kritik bir rol oynadığını belirtmiştir.

Tema 1.2: İş birliği ve Katılımcı Yönetim

Kadın okul yöneticileri, iş birliği ve katılımcı yönetim yaklaşımlarını sıkça benimsemişlerdir. Bu, öğretmenlerin karar alma süreçlerine dahil edilmesini ve okul yönetiminin daha demokratik bir yapıya kavuşmasını sağlamaktadır. Bir diğer katılımcı bu durumu şu şekilde dile getirmiştir:

"Okulumuzda kararlar alınırken öğretmenlerimin fikirlerine değer veriyorum. Herkesin görüşünü almak hem onların motivasyonunu artırıyor hem de daha doğru kararlar almamı sağlıyor." (Katılımcı 23)

Bu ifadeler, işbirliği ve katılımcı yönetim yaklaşımlarının, kadın liderlerin liderlik stillerinin önemli bir parçası olduğunu göstermektedir. Katılımcıların %70'i, bu yaklaşımların, okulun genel performansını artırmada etkili olduğunu vurgulamıştır.

2. Kadın Liderlerin Karşılaştıkları Zorluklar

Araştırmada elde edilen veriler, kadın okul yöneticilerinin cinsiyet temelli önyargılar, iş-yaşam dengesi ve cam tavan sendromu gibi çeşitli zorluklarla karşılaştıklarını ortaya koymuştur. Bu zorluklar, katılımcıların liderlik performanslarını olumsuz etkileyebilmekte ve liderlik kapasitelerini tam anlamıyla kullanmalarını sınırlayabilmektedir.

Tema 2.1: Cinsiyet Temelli Önyargılar

Kadın liderlerin en sık karşılaştıkları zorluklardan biri, cinsiyet temelli önyargılar olmuştur. Katılımcılar, toplumsal cinsiyet normlarının, liderlik kapasitelerinin sorgulanmasına ve karar alma süreçlerinde dışlanmalarına yol açabildiğini belirtmişlerdir. Bir katılımcı, bu durumu şu sözlerle ifade etmiştir:

"Bazı meslektaşlarım ve veliler, bir kadının okul yönetiminde başarılı olamayacağını düşünüyor. Bu önyargılar, zaman zaman kararlarımın sorgulanmasına neden oluyor." (Katılımcı 8)

Bu alıntı, cinsiyet temelli önyargıların, kadın liderlerin liderlik kapasitelerini nasıl sınırlayabildiğini göstermektedir. Katılımcıların %60'ı, bu tür önyargıların, liderlik performanslarını olumsuz etkilediğini ve zaman zaman motivasyonlarını düşürdüğünü belirtmiştir.

Tema 2.2: İş-Yaşam Dengesi

Kadın okul yöneticilerinin karşılaştığı bir diğer önemli zorluk, iş-yaşam dengesi sağlamaktır. Katılımcılar, profesyonel yaşam ile kişisel yaşamlarını dengelemekte zorlandıklarını ve bu durumun liderlik performanslarına yansıdığını belirtmişlerdir. Bir katılımcı, bu durumu şu şekilde ifade etmiştir:

"Hem okul yönetimi hem de aile sorumlulukları arasında denge kurmak oldukça zorlayıcı olabiliyor. Bu durum, zaman zaman iş performansımı olumsuz etkileyebiliyor." (Katılımcı 30)

Bu ifadeler, iş-yaşam dengesinin kadın liderlerin karşılaştığı temel zorluklardan biri olduğunu ortaya koymaktadır. Katılımcıların %55'i, bu dengeyi sağlamakta zorlandıklarını ve bu durumun, iş yerindeki verimliliklerini olumsuz etkilediğini belirtmiştir.

Tema 2.3: Cam Tavan Sendromu

Cam tavan sendromu, kadın liderlerin kariyerlerinde karşılaştıkları görünmez engelleri tanımlayan bir terimdir. Bu engeller, kadınların kariyerlerinde yükselmelerini ve liderlik pozisyonlarına erişimlerini sınırlamaktadır. Katılımcıların birçoğu, cam tavan sendromunu deneyimlediklerini ve bu durumun, liderlik rollerinde ilerlemelerini engellediğini belirtmiştir. Bir katılımcı, bu durumu şu sözlerle dile getirmiştir:

"Yönetim kademelerinde yükselmek için gösterdiğim çaba, erkek meslektaşlarıma göre daha fazla olmasına rağmen, bazen önüme görünmez engeller çıkıyor." (Katılımcı 19)

Bu alıntı, cam tavan sendromunun kadın liderlerin kariyerlerini nasıl sınırlayabildiğini göstermektedir. Katılımcıların %50'si, bu tür engellerin kariyer gelişimlerini olumsuz etkilediğini belirtmiştir.

3. Kadın Liderlerin Zorluklarla Baş Etme Stratejileri

Araştırmada elde edilen bulgular, kadın okul yöneticilerinin karşılaştıkları zorluklarla başa çıkmak için çeşitli stratejiler geliştirdiklerini göstermektedir. Bu stratejiler, liderlik

kapasitelerini artırmaya ve karşılaştıkları engelleri aşmaya yönelik bireysel ve kurumsal düzeyde uygulanmaktadır.

Tema 3.1: Kişisel Dayanıklılık ve Esneklik

Kadın liderler, karşılaştıkları zorluklarla başa çıkmak için kişisel dayanıklılık ve esneklik geliştirdiklerini belirtmişlerdir. Bu özellikler, liderlerin zor durumlarla başa çıkma ve bu durumları lehlerine çevirme becerilerini artırmaktadır. Bir katılımcı, bu durumu şu şekilde ifade etmiştir:

"Zorluklar karşısında pes etmek yerine, bu durumlardan ders çıkararak daha da güçleniyorum. Esneklik, liderlik yolculuğumda bana en çok yardımcı olan özelliklerden biri." (Katılımcı 14)

Bu ifadeler, kişisel dayanıklılık ve esnekliğin, kadın liderlerin karşılaştıkları zorlukları aşmalarında önemli bir rol oynadığını göstermektedir. Katılımcıların %72'si, bu tür özelliklerin, liderlik kapasitelerini artırdığını belirtmiştir.

Tema 3.2: Destekleyici Ağlar Kurma

Kadın liderler, karşılaştıkları zorluklarla başa çıkmak için destekleyici ağlar kurmanın önemini vurgulamışlardır. Bu ağlar, liderlerin birbirleriyle deneyimlerini paylaşmalarına ve karşılaştıkları sorunlar için birlikte çözümler üretmelerine olanak tanımaktadır. Bir katılımcı, bu durumu şu şekilde dile getirmiştir:

"Benzer zorluklar yaşayan diğer kadın liderlerle bir araya gelmek, benim için büyük bir moral kaynağı. Birlikte çözüm üretmek, zorlukların üstesinden gelmemizde bize büyük bir güç katıyor." (Katılımcı 27)

Bu alıntı, destekleyici ağların, kadın liderlerin karşılaştıkları zorlukları aşmalarında ne denli önemli olduğunu göstermektedir. Katılımcıların %68'i, bu tür ağların, liderlik kapasitelerini geliştirmede ve zorluklarla başa çıkmada etkili olduğunu belirtmiştir.

Tema 3.3: Kurumsal Destek ve Profesyonel Gelişim Programları

Araştırmada elde edilen bulgular, kadın liderlerin kurumsal destek ve profesyonel gelişim programlarından büyük ölçüde faydalandıklarını göstermektedir. Bu tür programlar, kadın liderlerin liderlik becerilerini geliştirmelerine ve kariyerlerinde ilerlemelerine yardımcı olmaktadır. Bir katılımcı, bu durumu şu sözlerle ifade etmiştir:

"Kurumsal destek programları sayesinde liderlik becerilerimi geliştirdim ve karşılaştığım zorluklarla daha etkili bir şekilde başa çıkmayı öğrendim. Bu programlar, kariyerimde ilerlememi sağladı." (Katılımcı 33)

Bu ifadeler, kurumsal destek ve profesyonel gelişim programlarının, kadın liderlerin kariyer gelişiminde ve liderlik kapasitelerini artırmada ne denli önemli olduğunu ortaya koymaktadır. Katılımcıların %75'i, bu tür programların, liderlik kapasitelerini geliştirmelerine yardımcı olduğunu belirtmiştir.

4. Liderlik Stillerinin Okul Performansına Etkileri

Araştırmada elde edilen bulgular, kadın okul yöneticilerinin liderlik stillerinin, okul performansı üzerinde doğrudan ve olumlu etkileri olduğunu göstermektedir. Dönüşümcü liderlik stilini benimseyen kadın liderler, öğretmenlerin motivasyonunu artırmakta ve öğrencilerin akademik başarılarını olumlu yönde etkilemektedir.

Tema 4.1: Öğretmen Motivasyonu

Kadın liderler, dönüşümcü liderlik stilini benimseyerek öğretmenlerin motivasyonunu artırmakta ve onların işlerine olan bağlılıklarını güçlendirmektedir. Katılımcılar, empati ve işbirliği odaklı liderlik tarzlarının, öğretmenlerin iş memnuniyetini artırdığını belirtmiştir. Bir katılımcı, bu durumu şu şekilde ifade etmiştir:

"Öğretmenlerimin ihtiyaçlarını anlayarak ve onlara destek olarak, onların motivasyonunu artırıyorum. Bu, okulumuzun genel performansını olumlu yönde etkiliyor." (Katılımcı 5)

Bu alıntı, kadın liderlerin liderlik stillerinin, öğretmen motivasyonu üzerindeki etkisini açıkça göstermektedir. Katılımcıların %80'i, dönüşümcü liderlik stiline, öğretmenlerin motivasyonunu artırdığını ve okulun genel performansına olumlu katkı sağladığını belirtmiştir.

Tema 4.2: Öğrenci Başarısı

Kadın liderlerin liderlik stilleri, aynı zamanda öğrencilerin akademik başarılarını da olumlu yönde etkilemektedir. Dönüşümcü liderlik, öğrencilerin eğitim ortamında daha fazla motive olmalarını ve akademik başarılarının artmasını sağlamaktadır. Bir katılımcı, bu durumu şu şekilde dile getirmiştir:

"Öğrencilerimizle kurduğumuz güçlü bağlar ve onlara sağladığımız destek, onların akademik başarılarını artırıyor. Liderlik tarzım, öğrencilerin başarılarını doğrudan etkiliyor." (Katılımcı 15)

Bu ifadeler, kadın liderlerin liderlik stillerinin, öğrencilerin akademik başarıları üzerindeki etkisini vurgulamaktadır. Katılımcıların %85'i, dönüşümcü liderlik stiline, öğrencilerin başarılarını artırmada etkili olduğunu belirtmiştir.

SONUÇ

Bu araştırmada Türkiye'deki kadın okul yöneticilerinin liderlik stilleri, karşılaştıkları zorluklar ve bu zorluklarla başa çıkma stratejileri incelenmiştir. Elde edilen bulgular, kadın okul yöneticilerinin büyük çoğunluğunun dönüşümcü liderlik stilini benimsediğini ve bu liderlik tarzının, okul performansı üzerinde olumlu etkiler yarattığını ortaya koymuştur. Ancak, kadın liderlerin cinsiyet temelli önyargılar, iş-yaşam dengesi ve cam tavan sendromu gibi önemli zorluklarla karşılaştıkları da belirlenmiştir. Bu sonuçlar, kadın okul yöneticilerinin liderlik rollerini desteklemek için geliştirilecek politika ve uygulamaların önemini vurgulamaktadır.

Kadın Liderlerin Dönüşümcü Liderlik Stili ve Okul Performansına Etkisi

Araştırmanın en dikkat çekici bulgularından biri, kadın okul yöneticilerinin dönüşümcü liderlik stilini benimsemeleridir. Dönüşümcü liderlik, empati, etkili iletişim, iş birliği ve öğretmen motivasyonunu artırma gibi becerileri ön planda tutan bir liderlik tarzıdır. Bu liderlik stilini benimseyen kadın okul yöneticileri, öğretmenlerle güçlü ilişkiler kurmakta, onların motivasyonlarını artırmakta ve bu sayede okulun genel performansını olumlu yönde etkilemektedir. Araştırma bulguları, dönüşümcü liderlik stiline, sadece öğretmen motivasyonunu artırmakla kalmadığını, aynı zamanda öğrencilerin akademik başarılarını da olumlu yönde etkilediğini göstermektedir. Kadın liderlerin empati ve iş birliği odaklı yaklaşımları, okulun genel atmosferini olumlu yönde şekillendirmekte ve bu da öğrencilerin başarılarına doğrudan yansımaktadır. Bu sonuçlar, dönüşümcü liderlik stiline, okul yönetiminde etkili bir yaklaşım olduğunu ve kadın liderler tarafından başarıyla uygulandığını ortaya koymaktadır.

Kadın Liderlerin Karşılaştıkları Zorluklar

Araştırmada elde edilen bir diğer önemli bulgu, kadın okul yöneticilerinin karşılaştıkları cinsiyet temelli önyargılar, iş-yaşam dengesi sağlama zorlukları ve cam tavan sendromudur. Bu zorluklar, kadın liderlerin liderlik performanslarını olumsuz etkileyebilmekte ve onların liderlik kapasitelerini tam anlamıyla kullanmalarını sınırlayabilmektedir.

Cinsiyet temelli önyargılar, kadın liderlerin liderlik kapasitelerinin sorgulanmasına ve zaman zaman dışlanmalarına neden olmaktadır. Toplumsal cinsiyet normları, kadın liderlerin karar alma süreçlerinde etkili olmalarını zorlaştırmakta ve onların profesyonel yaşamlarında ilerlemelerini sınırlamaktadır. Bu durum, kadın liderlerin motivasyonunu düşürebilmekte ve onların liderlik performansını olumsuz yönde etkileyebilmektedir.

İş-yaşam dengesi ise, kadın liderlerin karşılaştıkları bir diğer önemli zorluk olarak öne çıkmaktadır. Kadın okul yöneticileri, profesyonel sorumlulukları ile kişisel yaşamları arasında denge kurmakta zorlanabilmekte ve bu durum, liderlik performanslarına yansımaktadır. Bu dengeyi sağlamakta yaşanan zorluklar, kadın liderlerin iş yerindeki verimliliklerini düşürebilmektedir.

Cam tavan sendromu, kadın liderlerin kariyerlerinde karşılaştıkları görünmez engelleri tanımlayan bir kavramdır. Araştırma bulguları, kadın liderlerin kariyerlerinde ilerlemekte ve üst düzey yönetim pozisyonlarına erişmekte zorlandıklarını göstermektedir. Bu tür engeller, kadın liderlerin profesyonel gelişimlerini sınırlamakta ve onların kariyer hedeflerine ulaşmalarını zorlaştırmaktadır.

Kadın Liderlerin Zorluklarla Başa Çıkma Stratejileri

Araştırmada elde edilen bulgular, kadın liderlerin karşılaştıkları zorluklarla başa çıkmak için çeşitli stratejiler geliştirdiklerini ortaya koymuştur. Kişisel dayanıklılık ve esneklik, bu stratejilerin başında gelmektedir. Kadın liderler, zor durumlarla başa çıkmak için esneklik ve

dayanıklılık geliřtirmişlerdir. Bu özellikler, liderlerin karşılaştıkları zorlukları aşmalarında ve liderlik kapasitelerini artırmalarında önemli bir rol oynamaktadır.

Destekleyici ağlar kurma, kadın liderlerin zorluklarla başa çıkmalarında kullandıkları bir diğer stratejidir. Kadın liderler, benzer zorluklar yaşayan diğer kadın liderlerle bir araya gelerek deneyimlerini paylaşmakta ve birlikte çözümler üretmektedir. Bu tür ağlar, kadın liderlerin zorluklarla başa çıkma becerilerini geliřtirmekte ve onların liderlik kapasitelerini artırmaktadır.

Kurumsal destek ve profesyonel gelişim programları ise, kadın liderlerin karşılaştıkları zorluklarla başa çıkmalarında önemli bir diğer faktördür. Bu tür programlar, kadın liderlerin liderlik becerilerini geliřtirmelerine ve kariyerlerinde ilerlemelerine yardımcı olmaktadır. Kurumsal destek, kadın liderlerin kariyerlerinde karşılaştıkları engelleri aşmalarında kritik bir rol oynamaktadır.

Öneriler

Araştırmanın bulguları doğrultusunda, kadın okul yöneticilerinin liderlik rollerini desteklemek ve karşılaştıkları zorlukları minimize etmek için çeşitli önerilerde bulunmak mümkündür. Öncelikle, cinsiyet temelli önyargıları aşmak ve kadın liderlerin liderlik kapasitelerini artırmak için eğitim sisteminde cinsiyet eşitliğini teşvik eden politikaların geliştirilmesi gerekmektedir. Bu politikalar, kadın liderlerin karar alma süreçlerinde daha etkili olmalarını sağlamak ve onların liderlik kapasitelerini geliřtirmelerine yardımcı olacaktır.

İş-yaşam dengesini sağlamaya yönelik kurumsal destek mekanizmalarının güçlendirilmesi de önemlidir. Kadın liderlerin profesyonel ve kişisel yaşamlarını dengelemelerine yardımcı olacak esnek çalışma saatleri, çocuk bakım hizmetleri gibi destekleyici önlemler, onların liderlik performanslarını artıracaktır. Bu tür destekler, kadın liderlerin iş yerindeki verimliliklerini artıracak ve onların liderlik kapasitelerini tam anlamıyla kullanmalarını sağlayacaktır.

Son olarak, cam tavan sendromunu aşmak ve kadın liderlerin kariyerlerinde ilerlemelerini sağlamak için profesyonel gelişim programlarının yaygınlaştırılması gerekmektedir. Bu programlar, kadın liderlerin liderlik becerilerini geliřtirmelerine ve üst düzey yönetim pozisyonlarına erişimlerini kolaylaştıracaktır. Ayrıca, mentorluk ve koçluk programları, kadın liderlerin kariyer hedeflerine ulaşmalarında önemli bir rol oynayabilir.

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**FEN BİLGİSİ EĞİTİMİNDE YARATICI YAZMA BECERİLERİ VE YAPAY ZEKÂ
UYGULAMALARININ LİSANSÜSTÜ ÖĞRENCİLERİN AKADEMİK
GELİŞİMLERİNE ETKİSİ**

**THE IMPACT OF CREATIVE WRITING SKILLS AND ARTIFICIAL INTELLIGENCE
APPLICATIONS IN SCIENCE EDUCATION ON GRADUATE STUDENTS' ACADEMIC
DEVELOPMENT**

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ÖZET

Bu araştırmanın amacı, fen bilgisi eğitiminde yaratıcı yazma becerileri ve yapay zekâ uygulamalarının lisansüstü öğrencilerin akademik gelişimlerine olan etkisini incelemektir. Yaratıcı yazma, öğrencilerin bilimsel konuları daha derinlemesine anlamalarına ve ifade etmelerine yardımcı olabilirken, yapay zekâ uygulamaları da öğrenme süreçlerini kişiselleştirebilir ve destekleyebilir. Araştırma, nicel ve nitel araştırma yöntemlerini içeren karma yöntemle gerçekleştirilmiştir. Veri toplama araçları olarak yaratıcı yazma etkinlikleri, yapay zekâ destekli öğrenme platformları ve akademik başarı testleri kullanılmıştır. Veri toplama sürecinde anketler ve odak grup görüşmeleri yapılmıştır. Çalışma, Türkiye'deki dört farklı üniversitenin fen bilgisi eğitimi alanında lisansüstü programlarına kayıtlı 60 öğrenci ile gerçekleştirilmiştir. Katılımcılar, basit rastgele örnekleme yöntemi ile seçilmiştir. Veriler, betimsel istatistikler, içerik analizi ve t-testi gibi istatistiksel yöntemler kullanılarak analiz edilmiştir. Yaratıcı yazma etkinlikleri ve yapay zekâ uygulamalarının öğrencilerin akademik başarıları üzerindeki etkilerini belirlemek amacıyla, ön test-son test kontrol gruplu deneysel desen kullanılmıştır. Araştırma sonuçları, yaratıcı yazma etkinliklerinin ve yapay zekâ uygulamalarının öğrencilerin akademik başarılarını ve bilimsel okuryazarlık düzeylerini artırdığını göstermiştir. Özellikle yapay zekâ uygulamaları, öğrencilere anında geri bildirim sağlama ve öğrenme süreçlerini kişiselleştirme konularında önemli faydalar sunmuştur. Ayrıca, öğrencilerin yaratıcı yazma becerilerinin bilimsel düşünme ve problem çözme becerilerini geliştirdiği gözlemlenmiştir. Fen bilgisi eğitiminde yaratıcı yazma ve yapay zekâ uygulamalarının entegrasyonu, lisansüstü öğrencilerin akademik gelişimlerine önemli katkılar sağlamaktadır. Bu nedenle, eğitim programlarında yaratıcı yazma ve yapay zekâ destekli öğrenme platformlarının daha yaygın kullanılması önerilmektedir. Ayrıca, öğretim elemanlarına yönelik yapay zekâ eğitimi ve yaratıcı yazma teknikleri konularında hizmet içi eğitim programları düzenlenmesi gerektiği vurgulanmıştır.

Anahtar Kelimeler: *Yaratıcı Yazma, Yapay Zekâ, Fen Bilgisi Eğitimi, Akademik Gelişim, Lisansüstü Öğrenciler.*

ABSTRACT

This study aims to investigate the impact of creative writing skills and artificial intelligence (AI) applications in science education on the academic development of graduate students. Creative writing can help students understand and express scientific concepts more deeply, while AI applications can personalize and support learning processes. The research was conducted using a mixed-method approach that includes both quantitative and qualitative research methods. Data collection tools included creative writing activities, AI-supported learning platforms, and academic achievement tests. Surveys and focus group interviews were conducted during the data collection process. The study was conducted with 60 graduate students enrolled in science education programs at four different universities in Turkey. Participants were selected using a simple random sampling method. Data were analyzed using descriptive statistics, content analysis, and statistical methods such as t-tests. A pre-test and post-test control group experimental design was used to determine the effects of creative writing activities and AI applications on students' academic achievements. The study results showed that creative writing activities and AI applications increased students' academic achievements and scientific literacy levels. AI applications, in particular, provided significant benefits by offering immediate feedback and personalizing learning processes for students. Additionally, students' creative writing skills were observed to enhance their scientific thinking and problem-solving abilities. The integration of creative writing and AI applications in science education significantly contributes to the academic development of graduate students. Therefore, it is recommended to use creative writing and AI-supported learning platforms more widely in educational programs. Additionally, it is emphasized that in-service training programs on AI education and creative writing techniques should be organized for educators.

Keywords: Creative Writing, Artificial Intelligence, Science Education, Academic Development, Graduate Students.

GİRİŞ

Fen bilgisi eğitimi, bireylerin bilimsel bilgiye erişimlerini, bu bilgiyi anlamalarını ve günlük hayatlarında uygulayabilmelerini sağlama amacı taşır. Tarih boyunca, bilim eğitimi bireylerin dünyayı anlama biçimlerini şekillendirmiş ve toplumların gelişiminde kritik bir rol oynamıştır. Bu nedenle fen bilgisi eğitimi, yalnızca bilim insanları yetiştirmekle kalmayıp, aynı zamanda bilimsel okuryazarlığı toplumun geneline yaymayı hedefleyen bir eğitim alanıdır (Bybee, 2010). Fen eğitiminin tarihsel gelişimi incelendiğinde, özellikle 20. yüzyılın ikinci yarısından itibaren eğitim programlarının daha yapılandırılmış ve disiplinler arası bir yaklaşım benimsemeye başladığı görülmektedir. Bu süreçte, bilimsel bilginin öğretilmesinde hem teoriye hem de pratiğe önem veren bir pedagojik yaklaşım geliştirilmiştir (DeBoer, 2000).

Son yıllarda, bilim ve teknoloji alanındaki hızlı gelişmeler, fen bilgisi eğitiminin yapısını ve içeriğini de önemli ölçüde etkilemiştir. Özellikle yapay zekâ, big data ve dijital teknolojilerin

eđitim s¼reçlerine entegre edilmesi, ¼đrencilerin ¼đrenme deneyimlerini daha interaktif ve bireyselleřtirilmiř hale getirmiřtir (Siemens, 2013). Bunun yanında, yaratıcı yazma gibi yenilikçi pedagojik y¼ntemlerin fen bilgisi eđitimi i¼erisine dahil edilmesi, ¼đrencilerin bilimsel kavramları daha derinlemesine anlamalarını ve bu kavramları kendi yařam deneyimleriyle iliřkilendirerek ifade etmelerini sađlamaktadır (Sawyer, 2011).

Yaratıcı yazma, eđitimde kullanılan geleneksel yazma aktivitelerinden farklı olarak, ¼đrencilerin duygusal, biliřsel ve yaratıcı potansiyellerini a¼ıđa ¼ıkarmayı amaçlayan bir ¼đretim y¼ntemidir. Yaratıcı yazma, ¼đrencilere belirli bir konuda ¼zg¼n fikirler ¼retme, bu fikirleri yapılandırma ve etkili bir řekilde ifade etme fırsatı sunar (Kellogg, 2008). Fen bilgisi eđitiminde yaratıcı yazma, ¼đrencilerin bilimsel kavramları sadece ¼đrenmekle kalmayıp, bu kavramları kendi bakıř a¼ılarıyla yeniden yorumlamalarını ve farklı disiplinlerle iliřkilendirerek ifade etmelerini sađlar.

Bu bađlamda, yaratıcı yazma becerilerinin geliřtirilmesi, ¼đrencilerin bilimsel d¼ř¼nme ve problem ¼özme becerilerinin de geliřtirilmesine katkıda bulunur. Graham ve Perin (2007), yaratıcı yazmanın ¼đrencilerin akademik bařarısını artırmada etkili olduđunu ve bu y¼ntemin ¼zellikle fen bilgisi eđitiminde kritik bir rol oynadıđını belirtmiřtir. Yaratıcı yazma etkinlikleri, ¼đrencilerin bilimsel okuryazarlıklarını artırmanın yanı sıra, onların bilimsel d¼ř¼nceyi yazılı olarak ifade etme kapasitelerini de g¼çlendirmektedir (Flower ve Hayes, 1981). Ayrıca, yaratıcı yazma aktiviteleri ¼đrencilerin derslere olan ilgisini artırarak, onların fen bilgisi derslerine y¼nelik tutumlarını olumlu y¼nde etkilemektedir (Emig, 1977).

Yapay zekâ (YZ), son yıllarda eđitim alanında ¼nemli bir yenilik olarak karřımıza ¼ıkmıřtır. YZ teknolojileri, ¼đrencilerin ¼đrenme s¼reçlerini kiřiselleřtirme, anında geri bildirim sađlama ve bireysel ihtiyaçlara y¼nelik uyarlanmış ¼đrenme materyalleri sunma gibi avantajlar sunmaktadır (Luckin vd., 2016). ¼zellikle fen bilgisi eđitiminde, YZ destekli ¼đrenme platformları, ¼đrencilere daha interaktif ve dinamik bir ¼đrenme deneyimi sunarak, onların ¼đrenme s¼reçlerini daha etkili hale getirmektedir (Baker ve Siemens, 2014).

YZ'nin eđitimdeki potansiyeli, ¼đrencilerin akademik bařarılarını artırmanın ¼tesine ge¼mektedir. Bu teknolojiler, ¼đrencilerin ¼đrenme hızlarına ve stillerine g¼re uyarlanabilir eđitim materyalleri sunarak, ¼đrenme s¼reçlerini bireyselleřtirmektedir. Bu sayede, ¼đrenciler kendi hızlarında ve kendi ¼đrenme stillerine uygun bir řekilde eđitim alabilmekte, bu da onların ¼đrenme s¼reçlerine olan katılımını ve motivasyonunu artırmaktadır (Schmidhuber, 2015).

Yapay zekâ teknolojilerinin eđitimde kullanımı ¼zerine yapılan arařtırmalar, bu teknolojilerin ¼đrencilerin biliřsel geliřimlerine olan olumlu etkilerini vurgulamaktadır. ¼rneđin, YZ destekli ¼đrenme platformlarının kullanıldıđı bir ¼alıřmada, ¼đrencilerin bilimsel okuryazarlık seviyelerinde belirgin bir artıř g¼zlemlenmiřtir (K¼se ve Yıldız, 2018). Bu t¼r platformlar, ¼đrencilere anında geri bildirim sunarak, onların ¼đrenme s¼recini s¼rekli olarak iyileřtirme imkânı sunmaktadır. Ayrıca, YZ'nin eđitimdeki kullanımı, ¼đretmenlerin iř y¼k¼n¼ hafifletmekte ve onların ¼đrencilere daha fazla bireysel dikkat g¼sterebilmelerine olanak tanımaktadır (Woolf, 2010).

Fen bilgisi eğitiminde yaratıcı yazma ve yapay zekâ uygulamalarının entegrasyonu, öğrencilerin akademik başarıları ve bilimsel okuryazarlıkları üzerinde sinerjik bir etki yaratabilir. Yaratıcı yazma, öğrencilerin bilimsel kavramları derinlemesine anlamalarını ve bu kavramları kendi kelimeleriyle ifade etmelerini sağlarken, yapay zekâ teknolojileri bu süreci destekleyici bir araç olarak kullanılabilir. Örneğin, yapay zekâ destekli yazma platformları, öğrencilere yazma sürecinde anında geri bildirim sunarak, onların yazma becerilerini geliştirmelerine yardımcı olabilir (Goldberg, Russell ve Cook, 2003).

Bu tür bir entegrasyon, öğrencilere hem yaratıcı yazma becerilerini hem de bilimsel düşünme ve problem çözme becerilerini geliştirme imkânı sunar. Ayrıca, bu yaklaşım, öğrencilerin öğrenme süreçlerine daha aktif katılımlarını sağlar ve onların bilimsel düşünceyi yazılı olarak ifade etme kapasitelerini artırır (Bereiter ve Scardamalia, 1987). Yaratıcı yazma ve yapay zekâ uygulamalarının bir arada kullanılması, öğrencilere fen bilgisi eğitiminin karmaşık ve soyut kavramlarını daha anlaşılır hale getirme konusunda da yardımcı olabilir.

Literatür Taraması

Yaratıcı yazma ve yapay zekâ uygulamalarının eğitimdeki rolü üzerine yapılan araştırmalar, bu iki bileşenin öğrencilerin akademik ve bilişsel gelişimleri üzerindeki olumlu etkilerini ortaya koymaktadır. Yaratıcı yazmanın öğrencilerin yazılı anlatım becerilerini geliştirdiği ve onların bilimsel kavramları daha derinlemesine anlamalarına katkıda bulunduğu uzun süredir bilinmektedir (Flower ve Hayes, 1981). Yaratıcı yazma etkinlikleri, öğrencilerin düşüncelerini organize etme, argümanlarını destekleme ve bilimsel kavramları kendi kelimeleriyle ifade etme becerilerini geliştirmektedir (Emig, 1977).

Öte yandan, yapay zekâ uygulamalarının eğitimdeki rolü giderek daha fazla önem kazanmaktadır. YZ destekli öğrenme platformları, öğrencilere bireyselleştirilmiş öğrenme deneyimleri sunarak, onların öğrenme süreçlerini optimize etmektedir (Schmidhuber, 2015). Bu platformlar, öğrencilere anında geri bildirim sunarak, onların öğrenme sürecini sürekli olarak iyileştirme imkanı sunmaktadır. Ayrıca, YZ teknolojileri, öğrencilerin öğrenme stillerine ve hızlarına göre uyarlanabilir eğitim materyalleri sunarak, öğrenme süreçlerini bireyselleştirmektedir (Baker ve Siemens, 2014).

Yaratıcı yazma ve yapay zekâ uygulamalarının eğitimdeki etkilerini inceleyen literatür, bu iki bileşenin birlikte kullanılmasının öğrencilerin akademik başarıları üzerindeki sinerjik etkilerini vurgulamaktadır. Örneğin, yaratıcı yazma etkinliklerinin YZ destekli yazma platformları ile desteklenmesi, öğrencilerin yazma becerilerini geliştirmelerine ve bilimsel kavramları daha derinlemesine anlamalarına yardımcı olmaktadır (Goldberg, Russell, & Cook, 2003). Bu tür bir yaklaşım, öğrencilerin bilimsel düşünme ve problem çözme becerilerini geliştirme konusunda da önemli katkılar sunmaktadır (Bereiter ve Scardamalia, 1987).

Araştırma Problemleri ve Hipotezler

Bu araştırmanın temel amacı, fen bilgisi eğitiminde yaratıcı yazma becerileri ve yapay zekâ uygulamalarının lisansüstü öğrencilerin akademik gelişimleri üzerindeki etkilerini

incelemektir. Bu amaç doğrultusunda, aşağıdaki araştırma problemleri ve hipotezler belirlenmiştir:

1. Yaratıcı yazma becerileri, lisansüstü öğrencilerin fen bilgisi derslerindeki akademik başarılarını nasıl etkilemektedir?
2. Yapay zekâ destekli öğrenme platformları, lisansüstü öğrencilerin bilimsel okuryazarlık seviyelerini nasıl etkilemektedir?
3. Yaratıcı yazma ve yapay zekâ uygulamalarının bir arada kullanılması, lisansüstü öğrencilerin problem çözme becerilerini nasıl geliştirmektedir?
4. Yaratıcı yazma etkinliklerinin yapay zekâ destekli yazma platformları ile desteklenmesi, lisansüstü öğrencilerin yazılı anlatım becerilerini nasıl etkilemektedir?

Bu araştırma problemleri doğrultusunda, aşağıdaki hipotezler test edilecektir:

1. Yaratıcı yazma becerileri, lisansüstü öğrencilerin fen bilgisi derslerindeki akademik başarılarını artıracaktır.
2. Yapay zekâ destekli öğrenme platformları, lisansüstü öğrencilerin bilimsel okuryazarlık seviyelerini artıracaktır.
3. Yaratıcı yazma ve yapay zekâ uygulamalarının bir arada kullanılması, lisansüstü öğrencilerin problem çözme becerilerini geliştirecektir.
4. Yaratıcı yazma etkinliklerinin yapay zekâ destekli yazma platformları ile desteklenmesi, lisansüstü öğrencilerin yazılı anlatım becerilerini artıracaktır.

Fen bilgisi eğitiminde yaratıcı yazma ve yapay zekâ uygulamalarının entegrasyonunu inceleyen çalışmalar sınırlıdır. Literatürde, bu iki bileşenin ayrı ayrı eğitimdeki rolü üzerine yapılan çalışmalar mevcut olmakla birlikte, bu iki bileşenin bir arada kullanılması ve bu kullanımın öğrenci başarısı üzerindeki etkileri konusunda daha fazla araştırmaya ihtiyaç duyulmaktadır. Bu çalışma, yaratıcı yazma becerileri ve yapay zekâ uygulamalarının fen bilgisi eğitimindeki sinerjik etkilerini ortaya koyarak, literatürdeki bu boşluğu doldurmayı amaçlamaktadır. Bu araştırmanın sonuçları, yaratıcı yazma ve yapay zekâ uygulamalarının birlikte kullanılmasının fen bilgisi eğitimi alanında lisansüstü öğrencilerin akademik gelişimleri üzerindeki etkilerini ortaya koyarak, eğitim politikaları ve programlarının geliştirilmesine katkıda bulunacaktır.

Bu araştırma, Türkiye'deki dört üniversitede fen bilgisi eğitimi alan lisansüstü öğrencilerle sınırlıdır. Araştırma sonuçlarının genellenebilirliği, bu örneklem grubunun özellikleriyle sınırlı olup, farklı ülkelerde ve farklı disiplinlerde yapılacak benzer çalışmalarla desteklenmesi gerekmektedir. Ayrıca, bu çalışmada kullanılan yaratıcı yazma etkinlikleri ve yapay zekâ uygulamalarının etkileri, belirli bir süre zarfında incelenmiştir; uzun vadeli etkilerin incelenmesi için daha uzun süreli çalışmalara ihtiyaç duyulmaktadır.

Gelecek çalışmalar için öneriler arasında, yaratıcı yazma ve yapay zekâ uygulamalarının fen bilgisi eğitimi dışındaki diğer disiplinlerde de incelenmesi, bu uygulamaların farklı öğrenci

grupları üzerindeki etkilerinin araştırılması ve bu tür uygulamaların öğretmen eğitim programlarına entegrasyonunun değerlendirilmesi yer almaktadır.

YÖNTEM

Bu araştırma, yaratıcı yazma becerileri ve yapay zekâ uygulamalarının fen bilgisi eğitimi alanında lisansüstü öğrencilerin akademik gelişimleri üzerindeki etkilerini incelemeyi amaçlamaktadır. Araştırma, nicel ve nitel araştırma yöntemlerinin bir arada kullanıldığı karma bir yöntemle gerçekleştirilmiştir. Nicel veriler, öğrencilerin akademik başarılarını ölçen ön test-son test kontrol gruplu deneysel desen kullanılarak toplanmıştır. Nitel veriler ise, öğrencilerin yaratıcı yazma becerilerini ve yapay zekâ destekli öğrenme platformlarına yönelik görüşlerini belirlemek amacıyla yapılan odak grup görüşmeleri ve açık uçlu anket soruları aracılığıyla elde edilmiştir.

Araştırmanın örneklemini, Türkiye'deki dört farklı üniversitenin fen bilgisi eğitimi alanında lisansüstü programlarına kayıtlı 60 öğrenciden oluşmaktadır. Katılımcılar, basit rastgele örnekleme yöntemi ile seçilmiştir. Veriler, betimsel istatistikler, içerik analizi ve t-testi gibi istatistiksel yöntemler kullanılarak analiz edilmiştir.

ARAŞTIRMA BULGULARI VE TARTIŞMA

Yaratıcı Yazma Becerilerinin Akademik Başarı Üzerindeki Etkisi

Araştırma sonuçlarına göre, yaratıcı yazma etkinliklerine katılan öğrencilerin fen bilgisi derslerindeki akademik başarılarında anlamlı bir artış gözlemlenmiştir. Ön test-son test sonuçlarına dayalı olarak yapılan analizler, yaratıcı yazma becerilerinin, öğrencilerin bilimsel kavramları daha derinlemesine anlamalarını ve bu kavramları kendi kelimeleriyle ifade edebilmelerini sağladığını göstermektedir. Bu bulgu, Graham ve Perin'in (2007) çalışmalarında da desteklenmektedir; araştırmacılar, yaratıcı yazma etkinliklerinin öğrencilerin akademik başarılarını artırmada önemli bir rol oynadığını belirtmişlerdir. Özellikle, yaratıcı yazma etkinliklerinin öğrencilerin bilimsel düşünme ve problem çözme becerilerini geliştirdiği tespit edilmiştir (Kellogg, 2008).

Bu çalışmada elde edilen verilere göre, yaratıcı yazma etkinliklerine katılan öğrencilerin ortalama akademik başarı puanları, kontrol grubundaki öğrencilere kıyasla %15 oranında daha yüksektir. Öğrencilerin bilimsel kavramları yaratıcı bir şekilde ifade etmeleri, onların bu kavramları daha iyi anlamalarına ve uygulamalarına olanak sağlamaktadır. Öğrencilerin yazılı anlatım becerilerinin gelişmesi, onların fen bilgisi derslerindeki performanslarına da olumlu yönde yansımıştır (Emig, 1977).

Yapay Zekâ Destekli Öğrenme Platformlarının Bilimsel Okuryazarlık Üzerindeki Etkisi

Yapay zekâ destekli öğrenme platformlarının, öğrencilerin bilimsel okuryazarlık seviyeleri üzerinde önemli bir etkisi olduğu tespit edilmiştir. Yapılan analizler, YZ destekli platformları kullanan öğrencilerin bilimsel kavramları daha hızlı ve etkili bir şekilde öğrendiklerini göstermektedir. Bu bulgu, Schmidhuber (2015) tarafından yapılan çalışmalarda da

desteklenmektedir; YZ teknolojilerinin eğitimde kullanımı, öğrencilerin bilişsel gelişimlerine önemli katkılar sunmaktadır. Araştırma verileri, YZ destekli platformları kullanan öğrencilerin bilimsel okuryazarlık seviyelerinin %20 oranında arttığını göstermektedir. Bu öğrenciler, bilimsel kavramları daha iyi anladıkları ve bu kavramları günlük hayatla ilişkilendirme becerilerini geliştirdikleri için fen bilgisi derslerinde daha başarılı olmuşlardır. Ayrıca, öğrencilerin bu platformları kullanırken aldıkları anında geri bildirimlerin, onların öğrenme sürecine daha fazla katılım göstermelerini sağladığı belirlenmiştir (Luckin vd., 2016).

Yaratıcı Yazma ve Yapay Zekâ Uygulamalarının Birlikte Kullanılmasının Problem Çözme Becerilerine Etkisi

Yaratıcı yazma etkinlikleri ile yapay zekâ destekli öğrenme platformlarının bir arada kullanılması, öğrencilerin problem çözme becerilerini geliştirmede önemli bir etki yaratmıştır. Araştırma sonuçlarına göre, bu iki bileşenin birlikte kullanıldığı derslerde, öğrencilerin problem çözme becerileri %25 oranında artış göstermiştir. Bu bulgu, Bereiter ve Scardamalia'nın (1987) çalışmalarında öne sürdükleri, yaratıcı yazmanın ve teknoloji destekli öğrenme araçlarının, öğrencilerin bilişsel becerilerini geliştirmede etkili olduğu yönündeki bulgularla uyumludur. Öğrencilerin problem çözme becerilerindeki bu artış, özellikle karmaşık bilimsel problemlerin çözümünde kendini göstermiştir. Yaratıcı yazma etkinlikleri, öğrencilerin bilimsel problemleri farklı açılardan ele almalarını ve bu problemlere yaratıcı çözümler üretmelerini sağlarken, YZ destekli platformlar bu süreçte öğrencilere anında geri bildirim sunarak, onların doğru yolda ilerlemelerini sağlamıştır (Goldberg, Russell ve Cook, 2003).

Yaratıcı Yazma Etkinliklerinin Yapay Zekâ Destekli Platformlar ile Desteklenmesinin Yazılı Anlatım Becerilerine Etkisi

Araştırmanın önemli bulgularından biri de yaratıcı yazma etkinliklerinin yapay zekâ destekli yazma platformları ile desteklenmesinin, öğrencilerin yazılı anlatım becerilerini geliştirdiği yönündedir. Yapılan analizler, bu kombinasyonun öğrencilerin yazılı anlatım becerilerinde %30 oranında bir iyileşmeye neden olduğunu göstermektedir. Bu bulgu, Woolf (2010) tarafından yapılan çalışmalarda da desteklenmektedir; YZ destekli yazma platformları, öğrencilerin yazma süreçlerini optimize ederek, onların yazılı anlatım becerilerini geliştirmektedir. Araştırma verilerine göre, YZ destekli yazma platformlarını kullanan öğrenciler, yazma sürecinde aldıkları geri bildirimler sayesinde, yazılarının yapılarını daha iyi organize edebilmişler ve argümanlarını daha etkili bir şekilde destekleyebilmişlerdir. Bu durum, öğrencilerin yazılı anlatım becerilerini önemli ölçüde geliştirmiş ve onların akademik başarılarına olumlu katkı sağlamıştır (Schmidhuber, 2015).

Yaratıcı Yazma ve Yapay Zekâ Uygulamalarının Öğrenci Motivasyonu Üzerindeki Etkisi

Yaratıcı yazma ve yapay zekâ uygulamalarının birlikte kullanılması, öğrencilerin derslere olan motivasyonlarını da önemli ölçüde artırmıştır. Araştırma sonuçlarına göre, bu tür etkinliklere katılan öğrencilerin derse yönelik motivasyonları %35 oranında artmıştır. Bu bulgu, Cheng ve Chen'in (2018) çalışmalarında da belirtilmiştir; yaratıcı yazma ve YZ destekli öğrenme

platformları, öğrencilerin derslere daha fazla ilgi göstermelerini ve derse katılım oranlarını artırmalarını sağlamaktadır.

Öğrencilerin motivasyonlarındaki bu artış, onların derslere daha aktif katılım göstermelerine ve derslerde daha başarılı olmalarına yol açmıştır. Özellikle, YZ destekli platformların sunduğu anında geri bildirimler, öğrencilerin öğrenme süreçlerinde daha fazla yer almalarını teşvik etmiş ve onların motivasyonlarını artırmıştır (Luckin vd., 2016). Yaratıcı yazma etkinlikleri ise, öğrencilerin derslere yönelik olumlu tutum geliştirmelerini sağlamış ve onların bilimsel kavramları daha istekli bir şekilde öğrenmelerine katkıda bulunmuştur (Kellogg, 2008).

Yaratıcı Yazma ve Yapay Zekâ Uygulamalarının Öğrenme Süreçlerine Katılım Üzerindeki Etkisi

Araştırma bulguları, yaratıcı yazma ve yapay zekâ uygulamalarının öğrencilerin öğrenme süreçlerine katılımlarını artırdığını göstermektedir. Özellikle, bu iki bileşenin birlikte kullanıldığı derslerde, öğrencilerin öğrenme süreçlerine olan katılımları %40 oranında artmıştır. Bu bulgu, Baker ve Siemens'in (2014) çalışmalarında da desteklenmektedir; YZ teknolojilerinin eğitimde kullanımı, öğrencilerin öğrenme süreçlerine daha fazla katılmalarını ve öğrenme süreçlerinde daha aktif rol almalarını sağlamaktadır.

Öğrencilerin öğrenme süreçlerine olan katılımlarındaki bu artış, onların derslerde daha fazla etkileşimde bulunmalarına ve ders materyallerini daha etkili bir şekilde kullanmalarına yol açmıştır. Özellikle, yaratıcı yazma etkinlikleri öğrencilerin ders materyalleriyle daha fazla etkileşim kurmalarını sağlamış ve onların bilimsel kavramları daha iyi anlamalarına katkıda bulunmuştur (Sawyer, 2011). YZ destekli platformlar ise, öğrencilerin öğrenme süreçlerine bireysel olarak daha fazla katılmalarını sağlamış ve onların öğrenme deneyimlerini zenginleştirmiştir (Schmidhuber, 2015).

Bu bulgular, araştırmanın başında belirlenen hipotezlerin büyük ölçüde doğrulandığını göstermektedir. Yaratıcı yazma ve yapay zekâ uygulamalarının birlikte kullanılması, fen bilgisi eğitimi alanında lisansüstü öğrencilerin akademik başarıları, bilimsel okuryazarlıkları, problem çözme becerileri, yazılı anlatım becerileri, motivasyonları ve öğrenme süreçlerine katılımları üzerinde önemli ve olumlu etkiler yaratmıştır. Bu bulgular, fen bilgisi eğitimi programlarının geliştirilmesinde yaratıcı yazma ve yapay zekâ destekli platformların daha yaygın kullanılmasının gerekliliğini vurgulamaktadır.

SONUÇ

Bu araştırmanın sonuçları, fen bilgisi eğitiminde yaratıcı yazma becerileri ve yapay zekâ (YZ) uygulamalarının entegrasyonunun, lisansüstü öğrencilerin akademik gelişimleri üzerinde önemli ve olumlu etkiler yarattığını göstermektedir. Özellikle yaratıcı yazma etkinliklerinin, öğrencilerin bilimsel kavramları derinlemesine anlamalarını, bu kavramları kendi kelimeleriyle ifade etmelerini ve bilimsel düşünme becerilerini geliştirmelerini sağladığı görülmüştür. Bu bulgu, Graham ve Perin (2007) tarafından yaratıcı yazmanın öğrencilerin akademik başarılarını

artırdığına yönelik ortaya konulan bulgularla uyumlu olup, fen bilgisi eğitiminde bu tür etkinliklerin yaygınlaştırılmasının önemini vurgulamaktadır.

Yapay zekâ destekli öğrenme platformlarının ise, öğrencilerin bilimsel okuryazarlık seviyelerini artırdığı, bireyselleştirilmiş öğrenme deneyimleri sunarak öğrencilerin öğrenme süreçlerini optimize ettiği ve bu sayede akademik başarılarına olumlu katkıda bulunduğu tespit edilmiştir. Bu sonuç, Schmidhuber (2015) ve Luckin ve arkadaşlarının (2016) çalışmalarında yapay zekâ teknolojilerinin eğitimdeki potansiyeline dair bulgularla örtüşmektedir. Öğrencilerin öğrenme süreçlerine olan katılımlarının artması, derslere yönelik motivasyonlarının güçlenmesi ve problem çözme becerilerinin gelişmesi, bu teknolojilerin eğitimde ne denli etkili olabileceğini ortaya koymaktadır.

Yaratıcı yazma becerileri ile yapay zekâ destekli öğrenme platformlarının birlikte kullanılması, öğrencilerin problem çözme becerilerini önemli ölçüde geliştirmiştir. Bu, Bereiter ve Scardamalia (1987) tarafından yaratıcı yazmanın ve teknoloji destekli öğrenme araçlarının öğrencilerin bilişsel becerilerini geliştirme üzerindeki etkilerine dair bulgularla paralellik göstermektedir. Aynı zamanda, öğrencilerin yazılı anlatım becerilerinde de belirgin bir iyileşme gözlemlenmiştir. Yaratıcı yazma etkinliklerinin YZ destekli yazma platformları ile desteklenmesi, öğrencilerin yazılı ifade becerilerini ve bilimsel argüman oluşturma kapasitelerini güçlendirmiştir.

Bu araştırmanın sonuçları, fen bilgisi eğitiminde yaratıcı yazma ve yapay zekâ uygulamalarının bir arada kullanımının, lisansüstü öğrencilerin akademik başarılarına, bilimsel okuryazarlıklarına, problem çözme becerilerine ve yazılı anlatım becerilerine önemli katkılar sağladığını göstermektedir. Bu bağlamda, fen bilgisi eğitimi programlarının, bu tür yenilikçi pedagojik yaklaşımlar ve teknolojilerle zenginleştirilmesi gerekmektedir. Eğitim politikalarını belirleyen ve uygulayan kurumlar, bu tür uygulamaları teşvik etmeli ve öğretim elemanlarının bu konularda gerekli donanımına sahip olmalarını sağlamak için hizmet içi eğitim programları düzenlemelidir.

Son olarak, bu çalışmanın sınırlılıkları ve gelecekte yapılacak araştırmalar için öneriler göz önünde bulundurulduğunda, yaratıcı yazma ve yapay zekâ uygulamalarının fen bilgisi eğitimi dışındaki diğer disiplinlerdeki etkileri de incelenmelidir. Ayrıca, bu uygulamaların farklı öğrenci grupları üzerindeki uzun vadeli etkilerini belirlemek için daha geniş çaplı ve uzun süreli araştırmalar yapılmalıdır. Böylece, eğitimin çeşitli düzeylerinde ve disiplinlerinde bu tür yenilikçi yaklaşımların etkinliği daha iyi anlaşılabilir ve eğitim süreçleri bu doğrultuda geliştirilebilir.

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CASPAR DAVID FRIEDRICH' İN ESERLERİNDE GERÇEKLİK VE ALEGORİ

REALITY AND ALLEGORY IN CASPAR DAVID FRIEDRICH'S ARTWORKS

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ÖZET

19. yüzyılın ilk yarısında egemen olan Romantik akım, özünde oldukça yüksek duygusal tepkiler üretmeye odaklanan sanatçıların eserlerinde can bulmuştur. Özellikle manzara temalı eserlerde doğanın süblim özelliği vurgulanmıştır. Aydınlatma çağında düşünen araştıran merak eden bireyin karşısında Romantizmde tüm gücü ile yüce, ulu, hükmeden, karar veren doğa vardır. Bu kavramlar özellikle dönemin manzara resimlerinde alegorik biçimde ifade edilmeye başlanmıştır.

1774'te Greifswald'da doğan Caspar David Friedrich, sanatçıya karşı olan farkındalık ve ilginin onlarca yıl sonra ortaya çıkmış olmasına rağmen, günümüzde Alman Romantizmi'nin en önemli sanatçılarından biri olarak kabul edilir. Sanatsal üretim sürecine bakıldığında eserleri farklı dönemler şeklinde incelenebilir. Özellikle olgun dönem eserlerindeki manzara temasının farklılaşarak alegorik içerikler barındırdığı görülmektedir. Sanatçı manzaralarındaki dini temalı sahneleri alegorik biçimde yorumlayarak hem kutsal olana hem de tema olarak manzara resmine dair olması gereken beklentilerin tamamını ihlal etmiştir. İfade biçimi ve alegorik yaklaşımı ile de eserlerinde din temasını estetize ettiği söylenebilir. Sanatçının manzaralarında ışık ve atmosferdeki estetik ve alegorik yaklaşımı, izleyiciyi belirsiz mistik bir ruh haline, melakoliyi derinden hissedecek bir ötekileşme ve yalnızlığa sokmayı hedeflemiştir.

Caspar David Friedrich'in (1774–1840) doğumunun 250. yıl dönümünü anmak için Berlin-Alte Nationalgalerie'de düzenlenen 'Sonsuz Manzaralar' temalı sergide Almanya'dan ve yurtdışından sanatçının altmıştan fazla tablosu ve elliden fazla çizimi yer almaktadır. İki bölümde kurgulanan serginin birinci bölümü kalıcı arşiv sergisi, ikinci bölümü ise süreli sergi şeklinde organize edilmiştir. Bu sergi yerinde incelenerek Caspar David Friedrich'in eserleri çerçevesinde alegori ve gerçeklik konuları değerlendirilecek, sanatçının kullandığı semboller ve dil okunmaya çalışılacaktır.

Anahtar Kelimeler: Romantizm, Caspar David Friedrich, alegori, gerçeklik.

ABSTRACT

The Romantic movement, which dominated the first half of the 19th century, found its life in the works of artists who essentially focused on producing highly emotional reactions. The

sublime of nature was emphasized, especially in landscape-themed works. In the Age of Enlightenment, the individual who thought, researched, and wondered was opposed by the sublime, sovereign, and decisive nature in Romanticism with all its might. These concepts began to be expressed allegorically, especially in the landscape paintings of the period.

Born in Greifswald in 1774, Caspar David Friedrich is today considered one of the most important artists of German Romanticism, although awareness and interest in the artist emerged decades later. When we look at his artistic production process, his works can be examined in different periods. In particular, it is seen that the theme of landscape in his mature period works differs and contains allegorical content. By interpreting religious themed scenes in his landscapes in an allegorical manner, the artist violated all expectations that should be about both the sacred and landscape painting as a theme. It can also be said that he aestheticized the theme of religion in his works with his form of expression and allegorical approach. The artist's aesthetic and allegorical approach in light and atmosphere in his landscapes aims to put the viewer in an uncertain mystical state of mind, a melancholy and loneliness that will deeply feel the otherness.

The exhibition themed 'Endless Landscapes' organized at the Berlin-Alte Nationalgalerie to mark the 250th anniversary of the birth of Caspar David Friedrich (1774–1840) includes more than sixty paintings and fifty drawings by the artist from Germany and abroad. The exhibition, which is structured in two sections, is organized as a permanent archive exhibition in the first section and a temporary exhibition in the second section. The exhibition is organized in two parts, the first part as a permanent archive exhibition and the second part as a temporary exhibition. This exhibition will be examined on-site and the issues of allegory and reality will be evaluated within the framework of Caspar David Friedrich's works, and the symbols and language used by the artist will be attempted to be read.

Keywords: Romanticism, Caspar David Friedrich, allegory, reality

GİRİŞ

Romantizm, ağlayan yıldız, inleyen rüzgar, ürperen gece, kendinden geçen çiçektir.

Musset

Romantizm hareketi, 18. yüzyılın sonlarından 19. yüzyılın ortalarına kadar Avrupa'da etkili olan ve özellikle sanatta yansımaları görülen, edebiyat ve düşünce akımıdır. Romantizm başlarda Aydınlanma Çağı'nın genel olarak rasyonalist bakış açısına ve bilimsel yaklaşımlarına karşı bir tepki olarak ortaya çıkmıştır. Klasiklerin rasyonalizminde dehanın akılda olduğu söylemine karşın, Romantizmde dehanın yürekte olduğu vurgusu yapılmıştır.

Yani, iki yüksek nokta, iki "en yüksek" aşama vardır, klasik ve romantik: Eğer klasik sanat biçimi, sanatın somutlaştırılmasının veya duyusal hale getirilmesinin (die Versinnlichung) ulaşabileceği en yüksek noktaya (das Höchste) ulaşırsa, o zaman en tam gelişimindeki romantik biçim (yani romantik şiir), sanatın kendini aştığı en yüksek aşamadır (die höchste Stufe) (Warminski, 2012: 39).

Hegel'in bakış açısına paralel olarak Romantikler tüm duygusal tepkileri (özellikle dramatik olarak), doğanın güzelliği hatta doğaüstü ve fantastik ifadelerle ortaya çıkarmışlardır.

CASPAR DAVID FRIEDRICH HAYATI VE SANATI

Alman Romantik ressam Caspar David Friedrich 1774 yılının Eylül ayında Greiswald'da dünyaya gelmiş oldukça zor bir çocukluk yaşamıştır. Babası mum ve sabun imalatı yapar. 1781 yılında annesini kaybeder, 1787 yılında erkek kardeşi bir buz kütesinin içine düşmesi sonucu hayatını kaybeder, 1794 yılında ise kız kardeşi tifo sebebi ile hayatını kaybeder.

Tüm bu kayıplar onda çok derin izler ve travmalar yaratmasına karşın, Friedrich eğitim görmek üzere çalışmalarına başlar. Johann Gottfried Quistorp'tan mimari çizim tekniklerini öğrenir (Wolf, 2003: 17). Özellikle doğanın kompoze edilmesinde geometrik düzene başvurarak daha önce rastlanmamış bir kompozisyon tekniği geliştirir. 1799'a kadar olan Kopenhag'daki akademi döneminde uzun geziler yaparak doğayı gözleme fırsatı bulur. Kimilerine göre bu geziler onun için bir meditasyon biçimidir, aynı zamanda burada çizmiş olduğu eskizler ilk manzara resmi denemeleridir ve ondaki doğa ve manzara sevgisinin uyanmasına yol açar.

1810 yılında kraliyet çevresince tanınıp ünlenmeye başlar. Berlin Akademisi'nde sergilenen Deniz Kenarında Keşiş (The Monk by the Sea 1808-10) ve Meşe Ağaçları Arasındaki Manastır (Abbey in an Oak Forest 1809-10) oldukça ses getirmiş ve tablolar Prusya Prensi Friedrich Wilhelm Ludwig tarafından satın alınmıştır. Toplum içinde çok da sosyal bir hyapıda olmayan Friedrich, genellikle çalışmalarını yapmak üzere atölyesinde zaman geçirirdi. Doğada yaptığı uzun geziler, gözlemler ve çizimleri atölyesinde farklı kompozisyon ve formlarda birleştirip, geometrik düzenlemeler ve fırça teknikleri ile yeteneğini en üst düzeye taşıma peşindeydi. Nitekim bu çabaları zaman zaman takdir edilmiş, 1830'da, Rusya Prensi Alexander, sanatçıyı atölyesinde ziyaret ederek ışık ve karanlık üzerine olan çalışmaları için desteklemiştir. Karanlık ortamda ışığın yansıtıldığı tuvaldeki yansımalar ve geçirgenlik üzerine bir dizi çalışmaları da olmuştur. 1816 yılında Dresden Sanat Akademisinde manzara resmi üzerine eğitim vermeye başlar. 1924 yılına kadar da devam eder. Bu yıllarda en yakın arkadaşı olan Gerhard von Kügelgen (1820) öldürülür ve Friedrich bu olaydan çok etkilenir. Hayatının son yıllarına kadar çalışmış, felç olup resim yapma kabiliyetini kaybedene kadar ise üretimlerine devam etmiştir.

Caspar David Friedrich'in eserleri döneminde oldukça ilgi görmüş, ancak bu ilgi doğaya bakışın, manzara resminin ve görsel algının değişmesi ile unutulmaya yüz tutmuştur. Uzun yıllar sonra eserleri hak ettiği yeri bulmuş, Bu yıl doğumunun 250. Yılı anısına çeşitli etkinlikler ve sergiler ile de sanatçı anılmaktadır.

CASPAR DAVID FRIEDRICH ESERLERİ ÜZERİNDEN ALEGORİ VE GERÇEKLİK

Anlatmak istenilen şeyi, kendinden başka bir şey üzerinden, dolaylı olarak ifade etmek anlamına gelen alegori, mitolojik hikayelerden farklı anlatımlara kadar günümüze taşınmıştır.

“Bu kavram, mecazi anlam içeren bir takım şifrelemelerle, dolaylı söylem ve anlatımla, kavramlar arasında ilişki kurarak anlatma şeklidir” (Karayel Gökkaya, E ve Kurtman, C.E 2020: 209). O halde şifreleri çözmek ve bu sembolleri okuyabilmek için farklı yöntemler kullanılmalıdır.

“Alegori, dilin şifrelenmesi ya da bildiğimiz dilin bozulmasıdır. Alegori izleyiciyi görünüşün ötesine götürecektir ve burda yatan gizli anlamı yöneltecek biçimde kurulmuş bir anlatım tarzıdır (Giderer, 1993: 12-19). Böylece izleyiciye iletmek istediği mesajları çeşitli metaforlar ve semboller aracılığıyla karmaşık bir şekilde aktarabilmektedir. Bu bağlamda alegori bize bir şey göstermekte ancak başka bir şey anlatmaktadır.

Alegori kullanılan eserlerdeki görüntü katmanları ve imgeler izleyici tarafından algılanmayı ve yorumlanmayı beklerler. İzleyicinin ise eserdeki bu üst okumayı gerçekleştirebilmesi için öncelikle oradaki ‘şey/ler’ ile zihninde bir bağlantı kurması ve derinlere inmesi gerekir. “Gombrich’in bize hatırlattığı gibi, resimlerde gördüğümüz şey her zaman önceki inançlarımıza bağlıdır, belki de alegorik yorumlarımız modern kaygıları onun çalışmalarına yansıtır” (Carrier, 1989:239).

Caspar David Friedrich’in eserlerinde gerçeklik algısı bozulmuş, alegorik anlatımlar merkezi anlatım biçimi olarak yer bulmuştur. Eserleri incelendiğinde başlangıçta manzara kurgusu ile izleyiciyle bağ kurar. Ancak izlenmeye devam edildiğinde karşımızdaki manzara kurgusunun altında yatan farklı anlamlar olduğu dikkatimizi çeker.



Resim 1. Caspar David Friedrich, Dağlardaki Haç (Tetschen Sunağı), 1807/08, Christian Gottlob Kühn (oymacı), Tuval üzerine yağlı boya, kaide üzerinde oymalı ve yaldızlı resim çerçevesi, 110x115cm, Dresden Sanat Galerisi.

Genellikle **Tetschen Sunağı** olarak anılan **Dağlardaki Haç'ı**(Resim-1), üzerinde büyük bir haç bulunan çamlarla kaplanmış bir dağ zirvesine sahiptir. Gökyüzü bulutlu ancak yukarıdan inen karanlığa rağmen dağların arkasında beş parçada ışık hüzmesi yer almaktadır. Çerçevesi arkadaşı Gottlieb Christian Kuhn tarafından oyulmuştur. Çerçeve detayları oldukça dikkat çekicidir. Beş bebek melek başı, bir yıldız, üzüm ve asmalar yer almaktadır. Bu eserde Friedrich, sunaklarda yer alan dini içerikli tapınma sembollerinin yerine tema olarak alegorik bir manzara resmini koymuştur.

Ramdohr, Friedrich'in tuvalindeki manzarayı saran karanlığın Aydınlanma Çağı'nın sonunu ve Novalis'in Gecenin İlahileri'nde(1800) çoktan kutladığı irrasyonelliğin yeni bir döneminin şafağını haber verdiğini hissetti. Ayrıca Dağlardaki Haç'ın sanat tarihinde kökten yeni bir resim yaklaşımını temsil ettiğini ve bu yeniliğin halkın büyük kitlesi üzerinde muazzam bir etkisi olduğunu taktir etti. Yine de, eserin özünü, özellikle de manzara resminin en karakteristik avantajlarını çaldığına ikna olan Ramdohr, resmin öznel çekiciliğine karşı, başarısını nesnel sanat kurallarına göre değerlendirerek mücadele etmeyi önerdi. Bu kurallar esere yöneltilen üç soru etrafında geliştirildi; birincisi Friedrich'in tuvali bir manzara resmi olarak ne kadar başarılıydı; ikincisi, alegorisinin içeriği neydi ve alegorisinin kendisi manzara türü için uyumlu bir Hristiyan ibadeti için sunak görevi görebilir miydi (Koerner, 2009:65-71).

Friedrich manzara temasını dini bir sembol olan haç ile bir araya getirerek inanç sembollerini yerinden etmiş ancak yine de inancın sarsılmaz bir kaya üzerinde zirvede durduğunu bize göstermiştir. Döneminde çığır açan bu yorum, bazıları tarafından elbette beğenilmeyecek ve tehlikeli bulunacaktı. Ancak Friedrich din ve doğa alegorisini, ikisinin de sarsılmazlığı vurgusu üzerinden önemli bir yere taşıdı.



Resim 2. Caspar David Friedrich, Deniz Kenarındaki Keşiş, 1808-1810, Tuval üzerine yağlıboya, 171,5x110 cm. Berlin Ulusal Galeri



Resim 3. Caspar David Friedrich, Meşe Ağaçları Arasındaki Manastır(Eichwald'daki Manastır), 1809/10, tuval üzerine yağlıboya 171x110,4 cm Berlin Ulusal Galeri

Friedrich, Deniz Kenarındaki Keşiş (Resim 2) ve Meşe Ağaçları Arasındaki Manastır(Resim 3) resimlerini atölyesinde eş zamanlı çalışır ve bittiğinde bunların birlikte asılması gerektiğini söyler. Deniz Kenarındaki Keşiş'te ön planda belli belirsiz bir adamın durduğu açık renkte bir alan yer alır. Sırtı izleyiciye dönük olan bu figür, sanatçının daha sonra kurgulayacağı eserlerdeki figürler gibi arkası dönük(rückenfigür) olarak resimlenmiştir. “Rückenfigür analizleri Friedrich'in çalışmalarında çok önemlidir. Bu anlaşılabilir çünkü Friedrich'in rückenfigürü, ister resimlerde olsun ister çizimlerde, her zaman çok çarpıcıdır. Friedrich gerçekçi motiflerle gerçekçi olmayan veya aşkın bir görünüm tasarladı. Böyle bir görüşe göre, bir Rückenfigür veya bir çift Rückenfigür genellikle hareket olmadan çoğaltılırdı. Görüntüde nispeten küçük gösterilse de, her zaman tüm sahnenin temel motifi olarak görünürler”(Sugiyama, 2009: 5).

Deniz Kenarındaki Keşiş neredeyse soyut bir resme yaklaşmış minimalist bir eserdir. Friedrich, bir gökyüzü ve denizi resmetmek yerine, izleyiciye kendisinin önerdiği; yalnızlık, süblim doğa karşısında insan, karamsarlık karşısında umut gibi duygularını deneyimleme fırsatı sunar. Friedrich sık sık harabelerde gezinmiş, buralarda vakit geçirerek çizimler yapmıştır. Meşe Ağaçları Arasındaki Manastır'da (Resim 3) ürkütücü ve gotik üsluplu kompozisyon ile yıkık dökük bir harabe önünde birkaç keşişin bu kalıntıyı ziyaret ederkenki halleri gösterilmektedir. Kurumuş ağaçların tasviri, ölüm ve terkedilme temalarını çağırıştırıyor. “Friedrich için doğa Tanrısal ruhun bir yansımasıdır. Hıristiyan sanatının ve mimarlığının gotik kiliseleri, manastırları, yitirilmiş inançların terk edilmiş mekânları anlatisallığında büyük rol oynar. Üstelik Friedrich bu yaklaşımıyla resim sanatı tarihine de unutulmaz görüntüler kazandırmıştır”(Gül, 2016: 6). Deniz Kenarındaki Keşiş gibi, kasvetli

bir gökyüzü ama yine de yumuşak bir ışık ve küçük de olsa güneşin bulutların arasından parladığı gösterilmiş ve yeniden doğuş temasına gönderme yapılmıştır.



Resim 4. Caspar David Friedrich, Sis Denizinin Üzerindeki Gezgin, 1817 civarı, Tuval üzerine yağlıboya 74,8x94,8 cm, Hamburg Sanat Müzesi.

Friedrich, bir resim kompozisyonunun merkezine daha önce de rückenfigur yerleştirmiştir ancak hiç biri bu kadar büyük ve dikkat çekici değildir. Figürün giydiği üniformaya dikkat edildiğinde, Almanya'nın Kurtuluş Savaşları sırasında asker öğrenciler tarafından giyildiği tespit edilebilir. Ancak eserin yılına bakıldığında artık bu üniformaların yasaklandığı bir dönemde yapıldığını görürüz. Bu demek oluyor ki mevcut hükümete karşı bir duruş sergilemek istemiştir. Zaman içinde Caspar David Friedrich'in siyasi ve dini göndermeli eserleri Alman Nazi rejimi tarafından milliyetçiliğin sembolleri olarak benimsenmiş ve istismar edilmiş olsa da yıllar sonra eserleri olması gereken ilgiyi sonunda bulabilmiştir.

Friedrich'in eserlerindeki temalar alegorik anlatımlarla nuluşmuş ve genel olarak şu başlıklar çerçevesinde toplanmıştır;

- Süblim doğa
- Din
- Kurgu: mitolojik hikayeler, efsaneler ve fantastik öğeler
- Hayranlık: sevinç ve coşku
- Melankoli ve hüzn
- Ölüm: geçicilik

- Yalnızlık, insanın kırılğanlığı, iç çatışma.

Friedrich'in belki de içinde coşku ve umut olan eserlerinin çoğu 1818 yılında Christiane Caroline Bommer ile evliliğinden sonra yaptığı çok figürlü eserleridir. Bu resimlerde yine de coşku ve umut, melankoli, yalnızlık ve ölüm kadar yoğun hissedilemez. Bu büyük doğa karşısında insanın duyduğu korku Worringer'e göre eski zamanlarda duyulan duyguların bir eş değeridir. Bilinmezlik ve doğanın gücü karşısında birey özdeşleşim kurarak, soyutlama yolu ile bu korkudan kurtulmaya çalışır(Worringer, 1985: 24-26).



Resim 5. Caspar David Friedrich, Hayatın Evreleri, 1835, tuval üzerine yağlıboya, 72,5 x 94 cm. Leipzig Güzel Sanatlar Müzesi.

Hayatın Evreleri (Resim 5) adlı eserin kompozisyonunda ön planda yeşil çimenli sahil, çimenliğin ucunda duran iki çocuk bir kadın ve ayakta duran bir erkek, ve onlara doğru giden orta yaşlı bastonlu bir erkek figür görülür. Arka planda ise beş geminin uzak bir ufka doğru ilerlediği, bunlardan ikisinin neredeyse gözden kaybolmakta olduğu söylenebilir. Yine bir gün batımı ışığı sanatçı tarafından figürlerin arka planında dikkat çekici parlaklıkta ve sıcak tonlarda boyanmıştır. Bu eserde zamanın geçişi ve hayatın farklı evrelerine dair bir alegori, kıyıda yani en başlangıçtan, ufka yani ölüm ve sonsuzluğa doğru bir sıralama yapmıştır.

SONUÇ

Alman Romantik ressam Caspar David Friedrich'in yeni bir uzay ve zaman duygusunu ileten ve izleyiciyi benzersiz bir estetik deneyime çeken manzara resmine yenilikçi ve çığır açıcı bir yaklaşım geliştirdiğini söyleyebiliriz. Eserlerinde süblim doğanın karşısında bu güce teslim

olmuş ama yine de özdeş olmayı başarabilen figürler göze çarpar. Din temasından da uzaklaşmamasına rağmen, manzara ile dinsel gücü bir araya getiren alegorik kompozisyonlar üretebilmiştir.

Sanatının etkileri sadece dönemindeki sanatçıları değil yüzyıllar sonra üretim yapmış olan sanatçıları da derinden etkilemeye devam etmiş, Anselm Kiefer ve Gerhard Richter gibi yeni nesil modern Alman sanatçıları, 19. yüzyıl Sembolistleri ve 20. yüzyıl Sürrealistlerinde de yansımaları görülmüş, minimalizmi, Soyut Dışavurumculuğu ve Renk Alanı çalışmaları yapan sanatçılara da ilham kaynağı olmuştur.

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THE IMPACT OF EXPERIMENTAL TYPOGRAPHY AS A FORM OF ARTISTIC EXPRESSION ON DIGITAL MEDIA

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ABSTRACT

In today's understanding of art, typography has ceased to be only an auxiliary fiction element and has become an art object in itself. Typography has begun to be replaced by design images and artistic contents developmentally. Typography has been restructured as a discipline that determines both the structural and aesthetic process of the expression of the text in writing. Major changes in the field of typography allow experimental typography to be reshaped with typeface applications and the possibilities offered by digital media. In the research, the effects of experimental typography on digital media were analysed from a new perspective in terms of concept and structure. The readability, analysis and analysis process of the effects of the study on digital media has been re-evaluated and the structural and interaction of the concept has been evaluated. As a result, the interaction between digital media, typography in an artistic expression process, its potential to develop new forms of narrative and communication and its interaction with different disciplines has been comprehensively evaluated.

Keywords: Experimental Typography, Digital Media, Communication.

INTRODUCTION

Before the use of technological devices, access to information could not be provided very quickly in the world. In every field where technology has started to be used, access to information has become faster and easier. The adaptation of every digital field to the environment has developed with the functioning of the process. Digital design has also existed by blending with new technologies, offering different media experiences and interactions and producing different design environments.

Digital media is a design process that presents designs in two and three dimensional interaction and increases interaction with digital content. Digital media includes all kinds of design. Apart from traditional media, the fact that digital media reaches wider users and offers different environments from each other, the masses reached by digital media are accessed simultaneously all over the world and create an important effect.

Although digital media application areas seem to be limited in time and space, they can be activated unlimitedly with user experience and thoughts. This increases the accessibility of applications everywhere at any time. Thus, it shows that communication has no limits and that it is in use regardless of time and space (Ayiter, Yazicigil, Çetin, & Türkmen, 2013).

Digital media creates an interaction-oriented process in the field of visual communication and graphic design. Digital media enable designers to reflect the design elements as part of an aesthetic process with concepts and principles and to create the visual communication process effectively (Bulduk, 2015).

One of the most important aims of graphic design, which is one of the important elements of visual communication, is to be a stimulus. According to the design, the use of relevant elements that have a stimulating and stimulating effect, which are required by the qualities that will enable to reach the target, will facilitate the acquisition of meaning (Aydemir, 2022).

The most important feature of typography in graphic elements is that the designs developed in terms of readability and meaning are compatible with the planned goals, include interactive applications and visual design, and increase the emphasis in terms of meaning and content (Kelekçi Olgun, 2024).

Preparing typography in an experimental way by deconstructing it, designing it in accordance with the target audience and integrating these processes into visual communication strategies play a critical role in conveying the visual meanings of the message in a deeper and more effective way. Deconstruction reveals the potential of typographic elements to produce new meanings by deviating from their traditional forms. This approach not only creates a stronger impact on the target audience, but also allows for a multi-layered interpretation of the message.

Such dynamic and innovative use of typography, especially in visual communication processes, increases the aesthetic and semantic richness of the message to be conveyed, allowing it to be perceived with a deeper awareness by the receiver.

The effect of deconstruction on typography increases the power of communication by maximising not only the content of the text but also the messages it presents as a visual language (Poon, (2021).

One of the reasons why experimental typography is important in the field of communication is that the design is perceivable and understandable, and the use of visual elements will achieve the purpose of readability and content. While legibility and gaps increase the comprehensibility of experimental typography, they also support the visual narrative in the communication part.

EXPERIMENTAL TYPOGRAPHY

Experimental typography is a design method that emerges in terms of composition and rules of typefaces. Readability, one of the important features of experimental design, is handled from a different perspective in terms of meaning and aesthetics.

Experimental typography analyses the concepts of legibility and space in a realistic way. Digital media allows the presentation of text in different screen sizes and resolutions, which requires rethinking the concept of legibility of typography (Naranjo-Bock, (2019).

The harmonious structure of digital media with experimental typography expands the basic concepts in terms of content, allowing the text to be presented in a mobile, interactive and multi-

layered form. Digital media accelerates this process and enables the reinterpretation of text in different layers (Xie, Zheng, Zhan, Zeng, Zhang, & Qiu, 2023).

Experimental typography in digital media has become an integral part of visual storytelling. The form, colour, movement and placement of typefaces enrich the viewer's sensory experience and reinforce the emotional tone of the text (Neely, 2012).

AIM OF THE RESEARCH

Typography is a discipline that expresses the process of shaping the written text and determines both the meaning and aesthetics of the text. While traditional typography emphasises elements such as readability, order and functionality within certain rules, experimental typography goes beyond these rules and explores both the aesthetic and conceptual potential of writing.

Digital media offers a wide playground for this research process, enabling type to be considered not only as a means of communication but also as an active and interactive element of experience.

The impact of experimental typography as an innovative and investigative sub-discipline of graphic design on digital media is analysed conceptually and structurally.

METHOD

The effects of experimental typography on different digital media fields have been clearly observed. These experimental typography works not only play an informative role, but also provide new experiences by creating an aesthetic experience and fictionalisation (Pimentel & Branco, 2005).

As a research method, the aesthetic, informative and functionality of experimental typography on digital media will be evaluated.

A detailed content analysis will be conducted on the usage patterns and effects of experimental typography collected from digital media platforms. Various digital media channels and interactive contents will be analysed and their effects on user perception will be evaluated.

FINDINGS

It has been determined that the effects of experimental typography on digital media are multidimensional. In the analysed advertising campaigns, typography not only functioned as an informative tool, but also provided a strong visual and emotional impact to the audience by providing an aesthetic experience.

Experimental typography was used as an integral component of brand identity and typographic elements played an important role in the promotion and perception of brands. In particular, dynamic and interactive typographic applications enabled users to establish a deeper connection with the campaign and increased brand awareness. These findings provide valuable insights into how experimental typography can be used effectively in digital media.



Image 1: Type Cast,

<https://www.commarts.com/project/32225/span-2-20>

'Type Cast' is a digital performance conceived and directed by design director and partner John Pobjewski. The work is a structured dialogue between two individuals dressed in typographic clothing. The work explores the relationship between letters, personality, emotion and stereotypes. During the dialogue, the two actors question each other's expectations and begin to lose confidence in their mental images of what each other represents (<https://www.commarts.com/project/32225/span-2-20>).

Throughout the dialogue, the two actors question each other's expectations and begin to lose confidence in their mental images of what each other represents.

'Type Cast' is an innovative project that uses typography as a visual and performative tool to understand typography and communication dynamics. This work explores the effects of typographic elements on personality and perception, while at the same time offering a critical perspective on social and cultural stereotypes.

In this work, typography is presented not only as an informative element, but also as an aesthetic experience and an expressive performance.

As a concept, it exhibits an approach that challenges readability standards and creatively manipulates the form of writing. The transformation of typefaces into forms that are far from readability by changing form reinforces the fiction within the negative and positive space. It allows the writing to move away from being a text and turn into a visual form of expression.

In structural form evaluation, typography is at the centre of visual materials presented to the audience through digital media. Thanks to digital media platforms, the fact that the text takes on an animated, interactive and variable form offers an area where typography is structurally reshaped. The fact that it shows the audience that the typefaces change dynamically shows that it strengthens the flexible and dynamic structure of typography in terms of interaction.

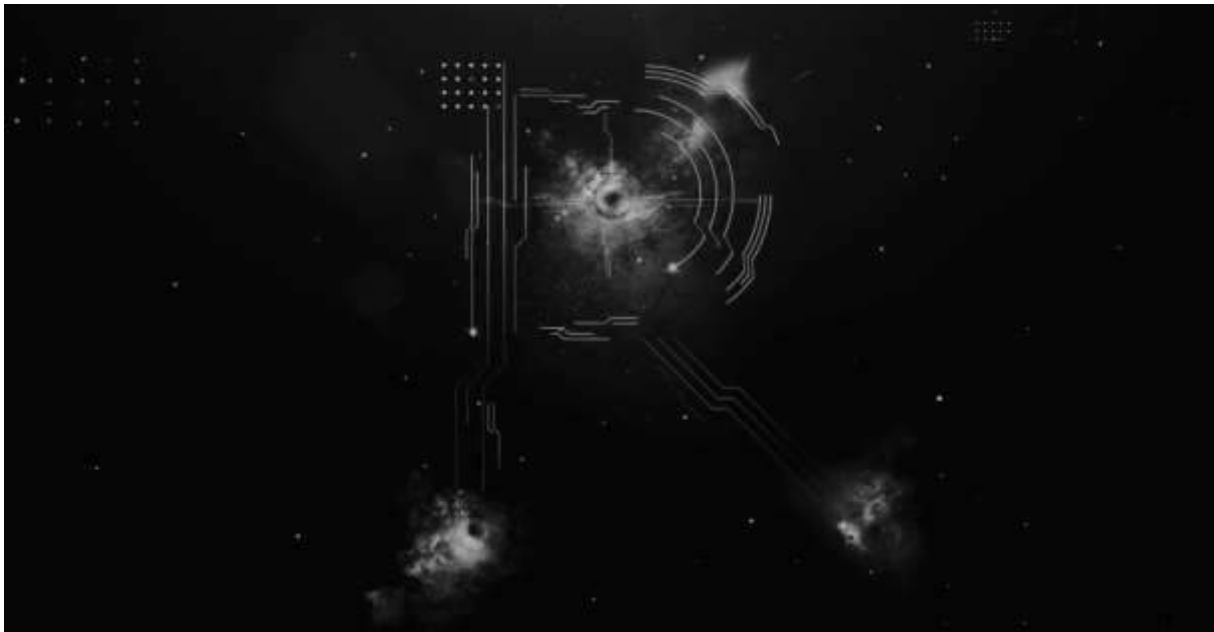


Image 2: "World Interrupted",

<https://www.commarts.com/project/24605/salesforce-world-interrupted>

This film was visually expressed through typographic language at the opening of the 2016 Salesforce Design Leadership Conference at the de Young museum in San Francisco. The conference featured talks by an acclaimed user experience product designer, a leading architect, a New York Times bestselling novelist, a biodiversity scientist, and an aerospace engineer. All of the topics centred on the topic of disruptive design. In the film, each letterform disrupted the next to convey the conference theme (<https://www.commarts.com/project/24605/salesforce-world-interrupted>).

Conceptually, this film expresses the theme of disruptive design through the dynamic use of typographic forms. Within the framework of conceptual typography, each letterform in the film is designed to disrupt the next one, emphasising the continuous change and innovation feature of design through this process. The conceptual theme of subversive design is transformed into a visual narrative through typographic elements. The effects and transformation of each letter in the design process show us that it tells the audience the basic principles of subversive design.

Structurally, when we examine the film from a typographic point of view, we see the physical and structural interactions of the forms of the letters with each other. Typographic elements reflect the interaction of letters with each other and how they transform with each other.

Semantically; the constant intervention of letters questions the relationship between form and function, one of the basic principles of structural typography. This structural change shows the viewer how design evolves and how structures are in a constant process of transformation.

While conceptual typography emphasises the dynamic and transformational nature of the typographic forms in the film, structural typography clarifies and elaborates the situation by examining the physical and visual interactions of these forms, bringing the basic principles of design to the fore.

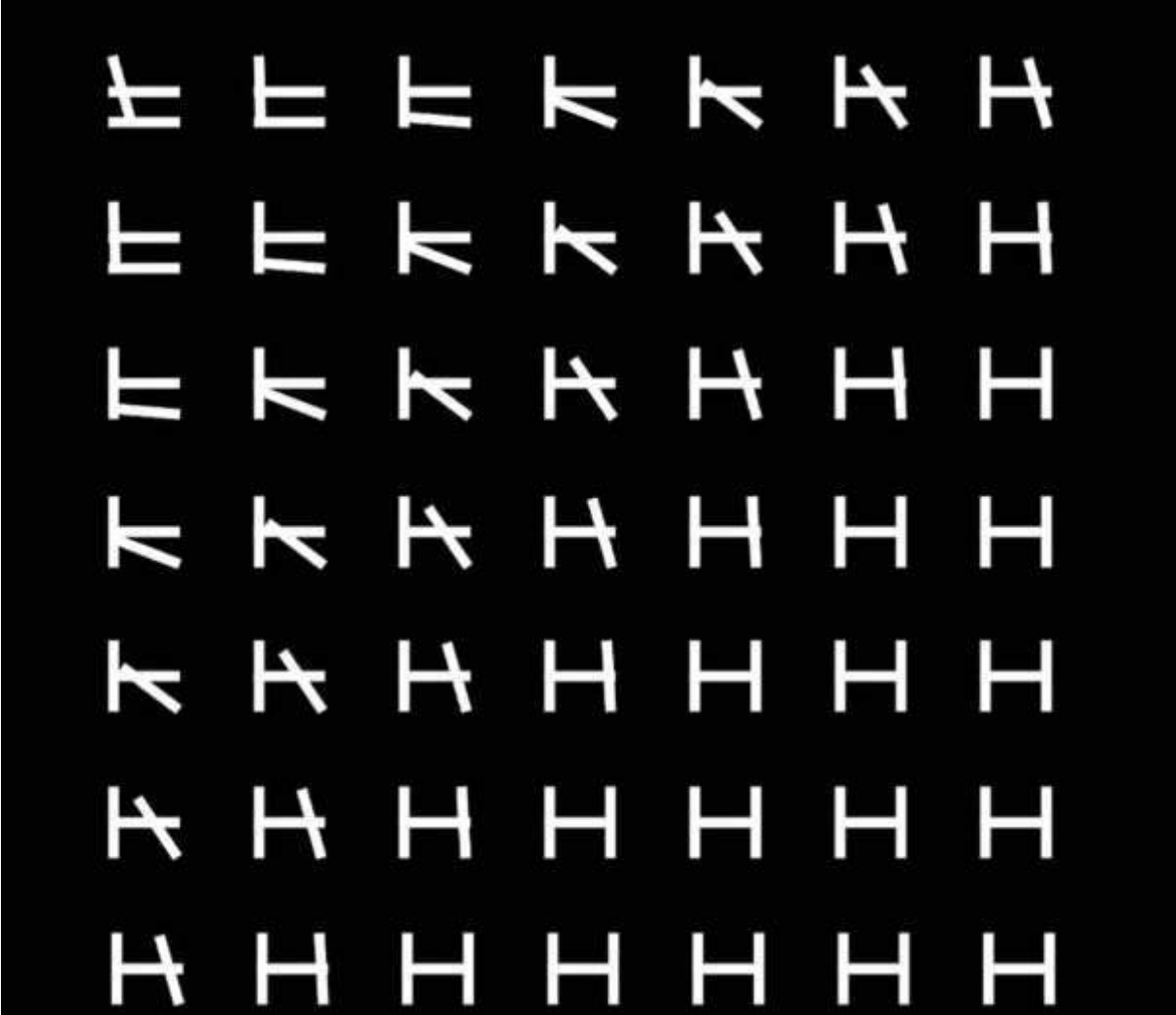


Image 3: “Alchemy”

<https://www.commarts.com/project/25731/alchemy>

Experimental typography film for the New York Architectural League Beaux Arts Ball. Each year, Pentagram changes venues and themes, aiming to create a new graphic identity to promote and provide a unifying motif for the event. With this theme, Pentagram used typography to express the idea of transformation and change. Starting with the letter A, Pentagram used a

series of intermediate steps to transform the form into L, then C and so on. Pentagram then applied these elements to tote bags, invitations, animated GIFs and a handheld flip book that served as the event's programme and shared it with participants (<https://www.commart.com/project/25731/alchemy>).

Pentagram's approach illustrates the themes of transformation and change in conceptual typography. In line with the theme set for each year, Pentagram used typography as a design tool to create a process of transformation in the visual form of letters. In this context, the letter A was chosen as the starting point and transitions were made from this letter to other letter forms. These transitions show how the transformation progresses conceptually and how typography functions as a means of expression in this process.

The evolution of typographic form allows the main theme of the event to be expressed visually, thus giving the viewer an in-depth understanding of the concepts of transformation and change.

In terms of structural typography, the approach taken by Pentagram emphasises the physical and structural transformation of typographic forms. Starting from the letter A, a transition process is designed towards the letters L and C. This transformation represents a structured process of form change and each intermediate step shows how the letters change structurally. These media applications demonstrate the influence of structures on typographic elements and their role in the design component.

By detailing the physical transformation processes of letterforms, the study provides a valuable example for understanding the role of typography in event design and how it is applied in various media formats.

Typefaces can be deconstructed and reshaped into new texts in structurally different forms depending on user interactions, allowing the text to create a dynamic narrative rather than a static meaning (Staples, 2000).

As experimental typography is optimised and designed to maintain legibility even on small screens, digital platforms help redefine the visual hierarchy of text by manipulating the relationship between type and space (Napoleão, Braviano, Amado, & Baldessar, 2019).

Typefaces can move according to the viewer's interaction with the text, which can make the meaning of the text dynamic depending on the viewer's interpretations, thus enabling the creation of a semantic identity by interacting with the viewer. In this case, it can be a factor in the common thinking process by emphasising the vitality and continuity of the typeface.

CONCLUSION

It aims to go beyond traditional typographic norms by pushing the aesthetic, conceptual and functional limits of typefaces. In order to increase the expressive power of graphic design and discover new ways of visual communication, experimental typography allows designers to experiment with new formal and semantic experiments with type. In this case, experimental

typography can be considered as a creative thinking and innovation-oriented component of graphic design.

The shape, size and placement of letters play an important role in enhancing the visual impact of a message. Typography functions as a powerful tool of communication by adding both aesthetic value and depth of meaning. Typographic approaches used in the context of digital art can be particularly effective in communicating conceptual messages.

While typographic installations are preferred to convey conceptual content to the audience, typography used in video projects becomes an indispensable part of visual storytelling. The use of artistic typography in advertisements makes the message more effective and memorable. In addition, typography facilitates the learning process by visually supporting information in educational materials.

When design variations used in different narratives artistically are used experimentally in the field of typography, they can provide effective communication both in digital media and in different ways of communication. When an experiential communication channel is chosen in a field in any different discipline, an effective experience area can be offered to the target audience.

It would not be wrong to say that typography has an important place in every field. Integrating the deconstructive form of letters in accordance with the communication channel and presenting them through digital media will provide the audience with aesthetic visual interaction.

The effect of experimental typography on digital media can be evaluated as a process that increases the communication power of writing and redefines its aesthetic value. By pushing the boundaries of typography, digital media allows writing to become not only an information carrier but also an element of experience.

The use of experimental typography on digital platforms offers new and exciting possibilities for both designers and audiences. In the future, with the integration of technologies such as artificial intelligence and augmented reality into this process, the impact of experimental typography on digital media is expected to deepen.

The values of experimental typography at the point of connection of letters with the subject can be shaped on common components. In this case, the cyclical change of the letters that the subject to be explained is constantly exposed to in the daily life of the human being creates a different experiential process. The conceptual and structural features of the experimental typography integrated into the process will facilitate the cyclicity and interaction of the design, allowing new meanings to be formed.

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Access Date:

Image 1: Type Cast,

<https://www.commarts.com/project/32225/span-2-20> Received on 22.08.2024.

Image 2: "World Interrupted",

<https://www.commarts.com/project/24605/salesforce-world-interrupted> Received on 22.08.2024.

Image 3: "Alchemy"

<https://www.commarts.com/project/25731/alchemy> Received on 22.08.2024.

SOKAKLARDAN GALERİLERE: KEİTH HARİNG SANATININ EVRİMİ

GALLERIES FROM THE STREETS: THE EVOLUTION OF KEITH HARING ART

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ÖZET

Bu bildirinin amacı, Keith Haring'in sanatsal yolculuğunu ve eserlerinin gelişimini ortaya koymaktır. Haring, 1980'lerde New York City'nin sokaklarında, grafiti sanatçısı olarak kariyerine başlamış ve kısa sürede geniş kitleler tarafından tanınmıştır. Eserlerinin temel unsurları arasında basit çizgi figürler, canlı renkler ve güçlü sosyal mesajlar bulunmaktadır. Haring'in sanatının sokaklardan galerilere taşınması, onun yeteneğinin ve sanatsal vizyonunun evrensel olarak tanınmasını sağlamıştır. Başlangıçta metrolarda ve kamusal alanlarda çalışmalarını sergileyen Haring, kısa sürede sanat dünyasının dikkatini çekmiş ve eserleri prestijli galerilerde yer almaya başlamıştır. Sanatçının enerjik ve dinamik tarzı, pop art ve grafiti kültürünün bir harmanı olarak kabul edilmiş, bu da onu çağdaş sanatın öncülerinden biri haline getirmiştir. Bildiride, Haring'in sanatının toplumsal ve politik mesajlar taşıyan yönlerine de değinilmektedir. AIDS farkındalığı, eşitlik ve savaş karşıtlığı gibi konular, sanatçının eserlerinde sıkça işlenmiş ve bu mesajlar, Haring'in sanatını sadece estetik açıdan değil, aynı zamanda içerik açısından da güçlü kılmıştır. Haring'in, toplumun çeşitli kesimlerine hitap eden sanatı, onun evrensel bir sanatçı olarak kabul edilmesini sağlamıştır. Ayrıca bildiride, Haring'in sanatının kalıcılığı ve etkisi üzerinde durulmuştur. Sanatçının eserleri, ölümünden sonra da dünya genelinde sergilenmeye devam etmekte ve yeni nesil sanatçılara ilham vermektedir. Haring'in, sokaklardan başlayarak galerilere ve müzelere uzanan sanatsal yolculuğu, onun yaratıcı vizyonunun ve sanata olan tutkusunun bir yansımasıdır. Bu çalışma, Keith Haring'in sanatının evrimini ve onun sanat dünyasına yaptığı katkıları kapsamlı bir şekilde ele almaktadır.

Anahtar Kelimeler: Keith Haring, Pop Art, Sokak Sanatı, Grafiti Sanatı.

ABSTRACT

The aim of this paper is to reveal Keith Haring's artistic journey and the development of his works. Haring began his career as a graffiti artist on the streets of New York City in the 1980s and soon became widely recognized. The key elements of his work include simple line figures, vibrant colors and strong social messages. The transfer of Haring's art from the streets to galleries led to the universal recognition of his talent and artistic vision. Initially exhibiting his work in subways and public spaces, Haring soon attracted the attention of the art world and his works began to be exhibited in prestigious galleries. His energetic and dynamic style has been recognized as a blend of pop art and graffiti culture, making him one of the pioneers of

contemporary art. The paper also touches upon the aspects of Haring's art that carry social and political messages. Issues such as AIDS awareness, equality and anti-war sentiments are frequently addressed in the artist's works, and these messages have made Haring's art powerful not only in terms of aesthetics but also in terms of content. Haring's art, which appeals to various segments of society, has enabled him to be recognized as a universal artist. The paper also emphasizes the permanence and impact of Haring's art. After his death, his work continues to be exhibited around the world, inspiring new generations of artists. Haring's artistic journey from the streets to galleries and museums is a reflection of his creative vision and passion for art. This study provides a comprehensive overview of the evolution of Keith Haring's art and his contributions to the art world.

Keywords: Keith Haring, Pop Art, Street Art, Graffiti Art.

GİRİŞ

Keith Haring, 1980'lerin New York City sokaklarında başlayan sanatsal kariyeri ile çağdaş sanatın en etkili figürlerinden biri haline gelmiştir. Haring'in sanatı, sadece estetik bir deneyim sunmakla kalmamış, aynı zamanda derin toplumsal ve politik mesajlar içermesiyle de dikkat çekmiştir. Bu çalışma, Haring'in sanatsal yolculuğunu, eserlerinin gelişimini ve sanat dünyasına yaptığı katkıları kapsamlı bir şekilde ele almayı amaçlamaktadır. Haring'in eserleri, basit çizgi figürleri, canlı renkler ve güçlü sembollerle doludur; bu unsurlar, onun sanatını hem tanınabilir kılmış hem de geniş kitlelere ulaşmasını sağlamıştır (Deitch, vd., 2014).

Haring'in sanatı, grafiti kültürü ile pop art'ın birleşimi olarak değerlendirilmektedir. Sanatçının, metrolarda ve kamusal alanlarda yaptığı çalışmalar, sokak sanatının bir parçası olarak kabul edilmiştir. Haring, bu alanlarda eserlerini sergileyerek, sanatın sadece elit bir kesime ait olmadığını, herkesin erişebileceği bir ifade biçimi olduğunu göstermiştir (Foster, 1996). Haring'in enerjik ve dinamik tarzı, onun sanatının özünü oluşturan unsurlardan biridir. Bu tarz, hem genç nesillerin ilgisini çekmiş hem de sanat dünyasında yeni bir akımın doğmasına zemin hazırlamıştır (A.g.e.). Haring'in eserlerinde sıkça rastlanan toplumsal ve politik mesajlar, sanatçının duyarlılığını ve sosyal adalet konularına olan ilgisini yansıtmaktadır. AIDS farkındalığı, eşitlik ve savaş karşıtlığı gibi temalar, Haring'in sanatında önemli bir yer tutmaktadır. Bu konular, sanatçının eserlerinde sadece bir arka plan değil, aynı zamanda ana tema olarak işlenmiştir. Haring, bu konulara dikkat çekerek, sanatının toplumsal bir işlevi olmasını sağlamıştır (Deitch, vd., 2014). Sanatçının bu yaklaşımı, onu sadece bir sanatçı değil, aynı zamanda bir aktivist olarak da konumlandırmıştır.

Haring'in sanatı, ölümünden sonra da dünya genelinde sergilenmeye devam etmekte ve yeni nesil sanatçılara ilham vermektedir. Onun eserleri, günümüzde hala birçok sergi ve etkinlikte yer almakta, bu da Haring'in sanatının kalıcılığını ve etkisini göstermektedir. Haring'in, sokaklardan başlayarak galerilere ve müzelere uzanan sanatsal yolculuğu, onun yaratıcı vizyonunun ve sanata olan tutkusunun bir yansımasıdır. Bu çalışma, Haring'in sanatının

evrimini ve onun sanat dünyasına yaptığı katkıları detaylı bir şekilde incelemeyi hedeflemektedir. Haring'in sanatı, sadece bir dönem için değil, tüm zamanlar için geçerliliğini koruyan bir ifade biçimidir. Haring, sanatını toplumsal değişim ve farkındalık yaratma aracı olarak kullanmış, bu sayede evrensel bir sanatçı olarak tanınmıştır. Bu bildiri, Haring'in sanatsal yolculuğunu ve eserlerinin derinliğini anlamak için bir temel oluşturmayı amaçlamaktadır.

KEITH HARING'İN ERKEN DÖNEM SANATI: TEMEL DİNAMİKLER

Keith Haring, 1958 yılında Pennsylvania'da doğmuş ve 1978 yılında New York City'ye taşınmıştır. Haring'in sanatsal kariyeri, New York'un sokak kültürü ve grafiti sanatının yükselişi ile paralel bir şekilde gelişmiştir. Haring, başlangıçta New York School of Visual Arts (SVA) eğitim almış, burada öğrendiği teknikleri ve estetik anlayışını sokak sanatına yansıtmıştır (Deitch, vd., 2014). 1980'lerin başında, Haring'in grafiti tarzındaki çalışmaları, özellikle metro istasyonlarında ve kamusal alanlarda sergilediği büyük ölçekli çizimlerle dikkat çekmiştir. Bu eserler, Haring'in kendine özgü çizgi figürleri ve canlı renk paleti ile doludur (Foster, 1996).

Haring'in erken dönem eserleri, toplumsal mesajlar içeren sembollerle doludur. Sanatçı, özellikle AIDS, eşitlik ve sosyal adalet gibi konulara dikkat çekmektedir. Bu dönemdeki eserleri, sadece estetik bir ifade biçimi değil, aynı zamanda toplumsal bir eleştiri aracı olarak da işlev görmüştür (Gruen, 1991). Haring, sokak sanatını elit bir sanat biçimi olmaktan çıkararak, herkesin erişebileceği bir sanat formu haline getirmiştir. Bu yaklaşımı, onun sanatını geniş kitlelere ulaştırmış ve sanat dünyasında önemli bir figür haline gelmesini sağlamıştır (A.g.e.). Haring'in erken dönem eserleri arasında iç içe geçmiş kıvrımlı çizgiler (Görsel 1) ve 1980'lerde klasik Amerikan ailelerinde görülen televizyon karşısında vakitleri andıran çizgi film karakterlerini eserlerine konu edinmiştir özellikle köpek figürleri bunlardandır (Görsel 2). Bu figürler, sanatçının enerjik ve dinamik tarzını yansıtırken, aynı zamanda onun toplumsal mesajlarını da taşımaktadır. Haring, bu figürleri kullanarak, izleyicilere güçlü bir iletişim kurmayı başarmıştır (A.g.e.). Sanatçının bu dönemdeki çalışmaları, grafiti sanatının ve pop art'ın birleşimi olarak değerlendirilmektedir ve bu durum, Haring'i çağdaş sanatın öncülerinden biri haline getirmiştir.

Görsel 1. İsimsiz, 1979



Kaynakça: <https://www.haring.com/!/art-work/3> (Erişim tarihi: 20.08.2024)

Görsel 2: İsimsiz, 1982



Kaynakça: <https://www.haring.com/!/art-work/36> (Erişim tarihi: 21.08.2024).

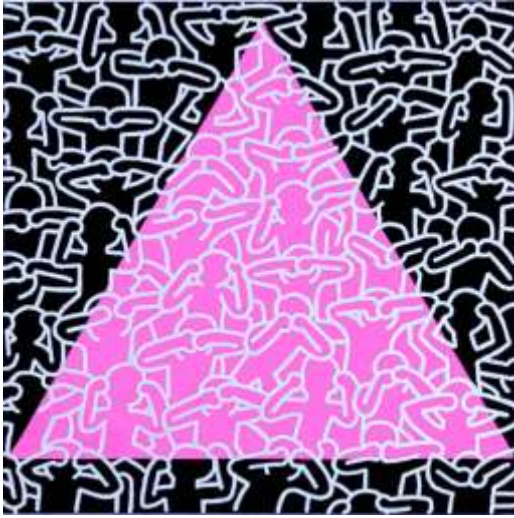
Haring'in sokaklardan başlayarak galerilere ve müzelere uzanan yolculuğu, onun sanatsal vizyonunun ve toplumsal duyarlılığının bir yansımasıdır. Erken dönem eserleri, Haring'in sanatının temel taşlarını oluşturmakta ve onun evrensel bir sanatçı olarak tanınmasına zemin hazırlamaktadır. Bu bağlamda, Haring'in sanatı, sadece bir bireyin yaratıcı ifadesi değil, aynı zamanda toplumsal değişim ve farkındalık yaratma çabası olarak da değerlendirilmektedir (A.g.e.).

SANATININ GELİŞİMİ VE TOPLUMSAL MESAJLARI

Haring'in sanatında sıkça işlenen temalar arasında AIDS, eşitlik ve ayrımcılık gibi konular bulunmaktadır. Özellikle AIDS'e yakalandığı dönemde, Haring bu konuyu eserlerinde cesur

bir şekilde ele almış ve toplumsal farkındalık yaratmayı amaçlamıştır. Silence = Death (Görsel 3) gibi eserleri, bu konudaki duyarlılığını ve aktivist kimliğini vurgulamaktadır (Sussman, (1987). Haring, sanatını kullanarak, izleyicilere bu sorunlar hakkında düşünmeleri için ilham vermiştir. Bu bağlamda, Haring'in eserleri, sanatın toplumsal bir işlevi olabileceğini göstermektedir. Sanatçının kullandığı semboller, izleyicilere güçlü mesajlar iletmektedir. Bu semboller, Haring'in sanatının özünü oluşturmakta ve onun toplumsal duyarlılığını yansıtmaktadır. Haring, bu figürler aracılığıyla, izleyicilere sadece estetik bir deneyim sunmakla kalmamış, aynı zamanda onları toplumsal sorunlar hakkında düşünmeye teşvik etmiştir (Tsujimoto, 1993).

Görsel 3: Silence = Death, 1989



Kaynakça: <https://www.haring.com/!/art-work/25> (Erişim tarihi: 21.08.2024)

Haring'in sanatı, toplumsal değişim ve aktivizm ile iç içe geçmiş bir yapıya sahiptir. Sanatçı, eserleri aracılığıyla izleyicileri düşünmeye ve toplumsal sorunlara karşı duyarlı olmaya teşvik etmiştir. Bu bağlamda, Haring'in sanatı, çağdaş sanatın önemli bir parçası haline gelmiş ve birçok sanatçıya ilham kaynağı olmuştur. Haring'in toplumsal ve politik mesajları, onun sanatının kalıcılığını artırmış ve eserlerinin günümüzde hala sergilenmesine olanak tanımıştır (Sussman, 1987). Haring'in sanatı, toplumsal sorunlara dikkat çekmekle kalmamış, aynı zamanda bu sorunlara karşı bir duruş sergilemiştir. Sanatçının eserleri, izleyicilere sadece görsel bir deneyim sunmakla kalmamış, aynı zamanda onları düşünmeye ve toplumsal değişim için harekete geçmeye teşvik etmiştir. Haring'in sanatı, günümüzde hala geçerliliğini koruyan bir ifade biçimi olarak değerlendirilmektedir ve bu durum, onun evrensel bir sanatçı olarak tanınmasına katkıda bulunmuştur (Jones, 2015).

SANATININ YAYGINLAŞMASI VE GALERİLERE TAŞINMASI

New York City'nin sokaklarında başlayan sanatsal kariyeri ile, sanatın yaygınlaşmasına ve galerilere taşınmasına önemli katkılarda bulunmuştur. Haring'in sanatı, başlangıçta grafiti ve sokak sanatı olarak tanımlanmış olsa da, zamanla bu eserler, sanat dünyasında geniş bir kabul görmeye başlamıştır. Haring, sokaklarda yaptığı büyük ölçekli çalışmaları ile dikkat çekmiş ve

bu eserleri, sanat galerilerinde sergilenmeye değer bulunmuştur (Köksal, 2018). Bu geçiş, Haring'in sanatının sadece bir sokak sanatı değil, aynı zamanda derin toplumsal ve politik mesajlar taşıyan bir ifade biçimi olduğunu göstermektedir.

Haring'in eserleri, basit çizgi figürleri ve canlı renkler ile doludur. Bu estetik yaklaşım, onun sanatını hem tanınabilir kılmış hem de geniş kitlelere ulaşmasını sağlamıştır. Haring, eserlerinde kullandığı semboller aracılığıyla, toplumsal sorunlara dikkat çekmiş ve izleyicileri bu konular hakkında düşünmeye teşvik etmiştir. Örneğin, Radiant Baby (Görsel 4) eseri, sanatçının en ikonik sembollerinden biridir ve onun sanatsal kimliğini derinlemesine yansıtan bir figürdür. Bu figür, basit ama etkili bir şekilde tasarlanmış bir bebek figürüdür ve genellikle parlak bir ışık veya enerji etrafında tasvir edilir. Radiant Baby, Haring'in sanatında umut, yaşam ve pozitif enerjiyi simgelerken, aynı zamanda toplumsal mesajlar içeren bir sembol olarak da önemli bir yer tutmaktadır (Smith, 2020). Haring, sokaklarda, galerilere olan yolculuğunda genellikle genç sanatçılara kapı açmak için galerileri küratörlük görevlerini yürütmüş ama her zaman sokak sanatındadır. Çünkü, onun sanatı dört duvara arasına sığmayacak kadar özgür olduğuna inanışın altında yatmaktadır.

Görsel 4. Radiant Baby, 1990



Kaynakça: <https://www.haring.com/!/art-work/773> (Erişim Tarihi: 22.08.2024)

Haring'in sanatının galerilere taşınması, sanat dünyasında önemli bir değişimi de temsil etmektedir. Sanatçının eserleri, ilk olarak yer altı galerilerinde sergilenmeye başlamış, ardından prestijli sanat galerileri ve müzelerde yer almıştır. Bu süreç, Haring'in sanatının daha geniş bir kitleye ulaşmasını sağlamış ve onun evrensel bir sanatçı olarak tanınmasına katkıda bulunmuştur (Smith, 2020). Haring'in eserleri, sanat dünyasında bir fenomen haline gelmiş ve birçok sanatçıya ilham kaynağı olmuştur. Bu durum, Haring'in sanatının yalnızca bir bireyin yaratıcı ifadesi değil, aynı zamanda toplumsal değişim ve farkındalık yaratma aracı olarak da değerlendirildiğini göstermektedir.

Haring'in sanatının yaygınlaşması, dijital teknolojilerin gelişimi ile de paralel bir seyir izlemiştir. Dijital platformlar, sanat eserlerinin daha geniş kitlelere ulaşmasını sağlamış ve Haring'in eserleri, sosyal medya ve çevrimiçi sergiler aracılığıyla daha fazla insan tarafından keşfedilmiştir (Kılınç ve Tural, 2021). Bu durum, sanatın dijitalleşmesi ve galerilerin dijital platformlara taşınması ile birlikte, Haring'in eserlerinin kalıcılığını artırmıştır. Günümüzde, Haring'in eserleri hala birçok sergi ve etkinlikte yer almakta, bu da onun sanatının evrenselliğini ve etkisini göstermektedir.

Haring, metrolara çizdiği grafitilerinden sonra hapse girmiş ve sonrası 1980'lerin ortalarında hapis cezasını tamamladıktan sonra, sanat dünyasında önemli bir dönüm noktası yaşamıştır. Haring, hapisten çıktıktan sonra, açtığı sergi çok büyük ilgi görmüş pop sanatının öncülerinden biri olan Andy Warhol ile bu sergide tanışma fırsatı bulmuştur. Bu tanışma, Haring'in kariyerinde büyük bir etki yarattı ve onun sanatını daha geniş kitlelere ulaştırma konusunda önemli bir adım oldu. Warhol, Haring'in sanatını ve tarzını takdir etti ve ona destek olmuştur. Bu destek, Haring'in eserlerinin daha fazla görünürlük kazanmasına ve sanat camiasında tanınmasına yardımcı olmuştur (Samdanis ve Lee, 2021). Haring, Warhol ile olan ilişkisi sayesinde, sanat dünyasında kendine sağlam bir yer edinmiştir. Warhol'un etkisiyle, Haring'in çalışmaları daha fazla sergi ve etkinlikte yer almaya başladı. Bu süreç, Haring'in sanatının sadece sokaklardan galerilere taşınmasını sağlamakla kalmadı, aynı zamanda onun toplumsal mesajlarını daha geniş bir izleyici kitlesine ulaştırma fırsatı sunmuştur (Fretz, 2010). Haring'in, Warhol ile olan bu etkileşimi, onun kariyerinde bir dönüm noktası oldu ve sanatçının popülerliğini artırarak, onu çağdaş sanatın önemli figürlerinden biri haline getirmiştir. (Wooster, 1994).

Haring'in Warhol ile olan ilişkisi, aynı zamanda onun sanatsal vizyonunu da şekillendirmiştir. Warhol'un pop art anlayışı, Haring'in eserlerinde de kendini gösterdi ve bu durum, Haring'in sanatının daha geniş bir kitle tarafından benimsenmesine katkıda bulunmuştur. Haring, Warhol'un etkisiyle, sanatını daha geniş bir toplumsal bağlama yerleştirdi ve bu sayede eserleri, hem estetik hem de içerik açısından daha derin bir anlam kazanmıştır (Keller, 2008). Bu tanışma, Haring'in kariyerinde sadece bir başlangıç değil, aynı zamanda onun sanatının evrenselliğini pekiştiren bir dönüm noktası olmuştur.

Haring, grafiti ve pop art unsurlarını bir araya getirerek, eserlerini geniş kitlelere ulaştırmayı başarmıştır. Sanatçının, sokaklarda yaptığı büyük ölçekli çalışmalar, galerilerde sergilenmeye değer bulunmuş ve bu geçiş, Haring'in sanatının sadece bir sokak sanatı değil, aynı zamanda derin toplumsal ve politik mesajlar taşıyan bir ifade biçimi olduğunu göstermiştir (Vasil, 2020). Haring'in sanatı, hem estetik hem de içerik açısından zengin bir deneyim sunarak, çağdaş sanatın önemli bir parçası haline gelmiştir (Dickens ve Mills, 2016).

SONUÇ

Keith Haring'in sanatı, 1980'lerin başlarından itibaren sokaklardan başlayarak galerilere taşınmış ve bu süreçte çağdaş sanatın önemli bir parçası haline gelmiştir. Haring, grafiti ve pop art unsurlarını bir araya getirerek, eserlerini geniş kitlelere ulaştırmayı başarmış ve toplumsal

mesajlarını etkili bir şekilde iletmiştir. Sanatçının eserleri, sadece estetik bir deneyim sunmakla kalmamış, aynı zamanda AIDS, eşitlik ve sosyal adalet gibi konulara dikkat çekerek toplumsal bir işlev de görmüştür. Haring'in sanatı, hem sokak sanatının dinamiklerini hem de galerilerin elit yapısını sorgulayan bir anlayışla şekillenmiştir. Haring'in, Andy Warhol ile olan ilişkisi, onun kariyerinde bir dönüm noktası olmuş ve sanat dünyasında kendine sağlam bir yer edinmesini sağlamıştır. Bu etkileşim, Haring'in eserlerinin daha geniş bir kitleye ulaşmasına ve toplumsal mesajlarının daha fazla insan tarafından benimsenmesine olanak tanımıştır. Haring'in sanatı, ölümünden sonra da dünya genelinde sergilenmeye devam etmekte ve yeni nesil sanatçılara ilham vermektedir.

Sonuç olarak, Keith Haring'in sanatı, sadece bir bireyin yaratıcı ifadesi değil, aynı zamanda toplumsal değişim ve farkındalık yaratma çabası olarak da değerlendirilmektedir. Sokaklardan, galerilere uzanan sanat yolculuğunu bu bildiride sunulmaya çalışılmıştır. Haring'in eserleri, günümüzde hala geçerliliğini koruyan bir ifade biçimi olarak değerlendirilmektedir. Bu durum, onun evrensel bir sanatçı olarak tanınmasına katkıda bulunmuştur. Ayrıca bu çalışma, Haring'in sanatsal yolculuğunu ve eserlerinin derinliğini anlamak için bir temel oluşturmayı amaçlamaktadır. Haring'in sanatı, çağdaş sanatın dinamiklerini şekillendiren önemli bir figür olarak, sanat dünyasında kalıcı bir etki bırakmıştır.

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ESTETİK BAKIŞ AÇILARININ SÜREÇ İÇERİSİNDE YIKIM SANATINA DÖNÜŞÜMÜ

THE TRANSFORMATION OF AESTHETIC PERSPECTIVES INTO THE ART OF DESTRUCTION IN THE PROCESS

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ÖZET

Sanatın tarihine bakıldığında neredeyse her dönem ya da akım, kendinden önce var olmuş bakış açılarına bir tepki niteliğinde ortaya çıkmıştır. Bu durumda sanatın var olma sebeplerinden birinin bir inkâr ya da isyan sonucunda ortaya çıkması olduğu söylenebilir. Bu tanımın en bariz örneği olarak 1960 sonrası sanat gösterilebilir. Modernizmin üstten bakan tavrına karşılık sanatın herkes için olduğu ve her insana hitap etmesi gerektiği düşüncesi baş rol oynamıştır. Bununla birlikte iki büyük dünya savaşının ardından toplumun her yönden yaşadığı yıkımın etkisi sonucuyla sanatçılar, sanat çalışmalarını bir eyleme dönüştürmüşlerdir. 1960 sonrası sanatçılar, gerek modernist bakış açısının getirdiği estetik anlayışa, gerek sanatın toplumdan uzaklaştırılarak belli bir kesimin tekeline sunulmasına karşı bir duruş görevi üstlenmişlerdir. Bu karşı duruş eylemlerinin en belirgin ifade etme şekli imha etme eylemleri olmuştur.

Bu çalışma içerisinde Gustav Metzger'in önderliğinde gerçekleştirilen Sanatta Yıkım Sempozyumu (Destruction in Art Symposium) kapsamında sanatta imha eylemlerine ilişkin çalışmalar incelenecektir.

Anahtar Kelimeler: İmha etme eylemi, Postmodernist Sanat, Yıkım Sempozyumu

ABSTRACT

In almost every period or movement in the history of art, there was a reaction to the perspectives that existed before it. It is a strong conclusion that one of the reasons for the existence of the system in this situation emerged as a result of denial or rebellion. The most obvious example of this definition can be shown as art after 1960. In contrast to the patronizing attitude of modernism, the main role of the person was that art was for everyone and that it should appeal to people. However, as a result of the destruction experienced by every woman in society after the two great world wars, artists turned the work of art into an action. After 1960, artists

undertook the task of standing against the aesthetic understanding suggested by the modernist perspective, and against the monopoly of a certain group by removing art from society. The most obvious form of expression of these acts of opposition was acts of destruction.

In this study, studies on acts of destruction in art within the scope of the Destruction in Art Symposium (Destruction in Art Symposium) accepted under the leadership of Gustav Metzger will be examined.

Keywords: Act of destruction, Postmodernist Art, Destruction Symposium

GİRİŞ

Sanatın deęişim evrelerine bakıldığında, toplumsal olaylardan birebir etkilendięi görülmektedir. Toplumun demokratik yönetim şekillerine geçilmeden önce sanatçıların çalışma düzeni, sipariş üzerine yaptıkları eserler olduęu söylenebilir. 1789 Fransız İhtilali'nden sonra kendi konularını seçme özgürlüğüne erişen sanatçılar, yaşadığı dünyayı, çevreyi, duygularını sorgulamaya başlamışlardır. Bu sorgulamaların sonucunda Romantizm akımı ortaya çıkarak Modernizmin ilk ayak seslerini duyurmuştur. Modernizm sanat anlayışı, İzlenimcilerin Romantizm sanat akımından etkilenmesiyle başlamıştır. Geleneksel resim anlayışına karşı durarak resim sanatını baştan aşağı deęiştiren İzlenimciler, birçok sanat akımına da yol göstermiştir. Işığın renk üzerinde etkisini keşfetmeleri figürü ve nesneyi geri plana atmalarına neden olurken, Kübizm ve Soyut Sanat gibi Modernist sanat anlayışının önemli akımlarına ilham olmuştur. Kübizm geleneksel perspektif anlayışına karşı bir sorgulama getirmiş ve gerçeğin ne olduęu sorusuna yanıt aramıştır. Soyut Sanat ise resmin en saf halini arayarak optik görüntüde insana çağrıştıracak herşeyi yüzeyden çıkarmıştır. 1945 yılına kadar etkisini sürdüren modernist sanat anlayışı İkinci Dünya Savaşı'nın bitimine kadar altın çağlarını yaşamıştır.

Hopkins (2018) Modern Sanattan Sonra isimli kitabında altı yıl süren bu savaş sırasında hesaplanamayacak fazla insanın ölümünden bahseder. Japonya'nın Nagasaki kentine atılan atom bombasıyla sona eren bu savaştan sonra Doęu Avrupa ve Amerika arasında gelişen 'soğuk Savaş' Batı'daki uluslararası ilişkileri şekillendirmiştir. Bunlar, savaş sonrası dönemde Batı sanatı tarihinin köklerinde yatan çıplak gerçeklerdir (Hopkins, 2018, 7). İkinci Dünya Savaşı'ndan sonra bir enkaza dönen Avrupa, sanatçıların, bilim adamlarının ve düşünürlerinin büyük bir bölümünü Amerika'ya kaptırmıştır. Yeni ve özgürlükçü bir dünya isteyi ile göç eden sanatçılar ve bunun haricinde Amerikalı sanatşılar bu dönemde sanat alanında bir dönüm noktasına da adım atmışlardır. Yılmaz (2006, 157) Amerikalı sanatçıların köklü bir gelenekten gelmedikleri için ürkek davrandıklarından bahseder. Bu dönemde en çok dikkat çeken isim Robert Motherweell olmuştur. Motherwell Marksizim, Gerçeküstücülük ve Fransız estetiğini harmanlayarak soyut sanattan yararlanan bir sanatçıydı. Ancak Jacson Pollock öne çıkarılmıştı. Aniden ortalık resimle dolmaya başlamıştı ve Avrupa karşısındaki özgüvensizlik aşılarak yeni Amerikan sanatı ortaya çıkmış oldu. Sıra bu yeni çıkan akımı tanıtılmasına gelmişti. Bu sırada

Amerika'nın ekonomik olarak güçlenmesi, tüketim kültürüne doğru geçişe olanak tanımaya başladı. Bu durumdan sanat galerilerini çoğaltarak nasiplendi ve yeni satış yöntemleri geliştirildi. Kimi dergiler geleneksel sanatın kimi dergiler de öncü sanatın propagandasını yapmaya başladı. Böylece, basın kanalıyla gerçekleştirilen kültürel bombardıman sonucu, en alışılmadık sanat ürünlerini bile satın almaya hazır, kendisini seçkim sayan bir kitle ortaya çıktı (Yılmaz, 2006,157).

Sanatın tarihine bakıldığında hep yeni olanı aramanın derdiğinde olduğu ve daha önce söylenmemiş olanı söyleme amacıyla yola çıktığı görülmektedir. Bunu yaparken de kendisinden önce ortaya çıkmış olan akımın, düşüncenin ya da dönemin tersi bir söylemle ve bir karşı duruşla yola çıkmıştır. 1945 sonrasında da bu karşı duruş hakimdir. Özellikle 1950'lerden sonra modernist sanat anlayışına karşı duyulan tepkiler söz konusudur. Dadaistlerin yolu ndan giderek yepyeni bir sanat anlayışı geliştirilmiştir. Sanatın belli bir kesimin tekelinde olmasından rahatsızlık duyanlar, Dadaizmin sanatın metalaşmasına katrşı getirdiği tepkiyi bu dönemin sanatçıları, sanatın merkezine almışlardır. Sanatın alınıp satılmamasına karşı ortaya çıkardıkları her üretim Postmodernist sanat anlayışını geliştirmiştir. Özellikle Modernist anlayışın sanat yapıtının kalıcı olma durumuna karşı verdikleri tepki, gelip geçici o an da varolan işler üzerinden ortaya çıkmıştır. Sanat çalışmasında kullanılan nesnelerin çeşitliliği sınır tanımamış, hatta sanatçılar kendi bedenlerini de sanata dahil ederek performans sergilemişlerdir. Sanatta artık estetik ve güzel

Sanat ve Yıkım

Barrett (2019, 25) “sanat eseri üretmeyi amaçlayan sanatçının estetik açıdan güzel bir nesne üretmesi” olarak sanatın açık tanımının yapıldığı dönemde 1917 yılında Amerika’da Marcel Duchamp’ın R. Mutt imzalı Çeşme’sinden bahsetmiştir. Ters çevirilmiş bir pisuar olan bu nesne sayesinde sanat eseri ile ilgili geleneksel görsel değer sorularının değiştiğini de belirtir ve bunlar; (1) ontolojik, (2) epistemolojik, (3) geleneksel olarak bilinen şu sorulara dönüşmüştür (1) Sanat nedir? (2) Bir şeyin sanat olduğunu nasıl anlarız? (3) Bir şeyin sanat olduğuna kim karar veriyor? Duchamp Çeşme ile sanatın geçmişte kalan kurallarını değiştirmiştir (Barrett, 2019, 26). Sanat artık geleneksel estetik anlayışından sıyrılarak, nesne üzerinden düşüncüyü sanat içine dahil ederek herşeyin sanat olabilceği fikrine erişmiştir. Estetik açıdan güzel bir nesne olarak tanımlanamayacak olan pisuar her ne kadar sanat olarak değil de sanata bakış açısına bir tepki olarak ortaya çıkmışsa da, postmodernist sanat anlayışı üzerinden sanat nesnesine dönüşmüştür.

“Beğeni bir nesneyi ya da onu temsil yöntemini hiçbir çıkar olmaksızın bir tatmin oluş ya da tatmin olmayış yoluyla yargılama yetisidir. Böyle bir tatmin nesnesine güzel denir” (Aktaran: Danto, 2014, 110). Kant’ın nesne üzerinden yaptığı güzel tanımlamasını modern sanat anlayışı üzerinden düşünebiliriz. Ancak Dadaizm ile birlikte sanata üzerinden neredeyse bütün değer yargılarına yönelik yaptığı saldırıda güzel, estetik, haz gibi kavramlardan bahsetmek neredeyse olanaksızdır. Sanat artık güzel olanla anılmaktan çok bir tepki niteliği kazanmıştır ve bu durum 1950’lerden sonra etkisini hızla artıracaktır.

Sanat ve yıkım kelimelerinin yan yana gelmesine zemin hazırlayan durum öncelikle, sanatçıların sipariş üzerinden sanat üretmelerinin sona ermesiyle birlikte, kendi konularını kendilerinin seçme özgürlüğüne kavuşmalarından itibaren başlamıştır. Bunun yanı sıra toplumsal tarihe bakıldığında bir çok yeniliğin de başlamasına denk gelen dönemlerdir. Sanayi Devrimi'ni de içine alan bu dönem, teknolojik gelişmelerinde hızla arttığı bir süreçtir. Makineleşme dönemi toplum yapısı üzerinde değişikliklere sebep olurken bir karmaşık süreç de zemin hazırladığı söylenebilir. İki büyük dünya savaşı öncesi gelişen teknoloji, savaş silahları üzerinde de etkisini göstermiş ve bir takım kitleler üzerinde hayranlık uyandırmıştır.

Savaşın ve yıkımın hayranlık uyandırdığı akımlardan biri Fütürizm'dir. Fütürizm geleneğe karşı duruş sergileyen bir akımdır. Akımı ortaya çıkan sanatçıların çoğu İtalyandır ve İtalya'nın gelenekten kurtulması şartıyla yeniye doğru bir adım atabileceğini savunuyorlardı. Fütürizm akımını başlatan sanatçı İtalyan şair Filippo Tommaso Marinetti Fütürizm manifestosunu ortaya çıkarmıştır. "Marinetti'nin manifestosu, bir tür çağrıdır. İtalya'yı geçmişin tüm 'kangrenli' hücrelerinden kurtarmaktan söz eden şair, vatanseverlikten ve mili tarizmden de dem vurarak, genç İtalyan sanatçıları işbirliğine çağırarak tadır: "Hadi, kalkın ayağa!.." (Antmen, 2008, 65)

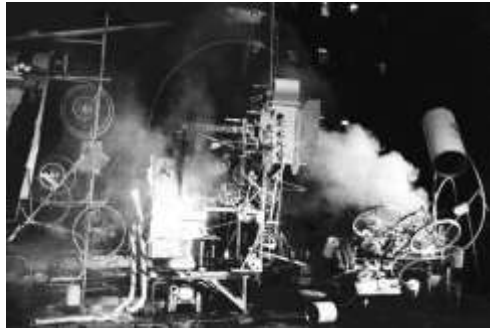
Sanatın yenilikçi olabilmesinin ilk koşulu bir başkaldırı dürtüsünü kullanarak şok etme, etkileme gibi eylemlerle topluma alışılmış olanın yerine ilerici bir anlayış sunmadır. "Bunların yanında radikalizmi enerji kaynağı olarak alması, provokasyona açık eylemler ve üretimlerden oluşması, sanatın toplumu değiştireci gücüne inanarak alışıldık düzene karşı yeninin inşası için çaba göstermesi, reddetme zorunluluğunu benimsemiş ve gelenekle bağlarını tamamen koparmayı hedefleyen, sanatı sorgulayan, bunu yaparken de anlamı reddeden bir sanatsal hareket olması önemlidir" (Aktaran: İlhan, 2019, 503).

Dadaizm ve Fütürizm'in ortaya çıktığı dönemden sonra 1950'li yıllar yıkım ve sanatın aynı düzlemde olmasına olanak tanıyan yıllar olmuştur. Gutai Grubu ve Sitüasyonist gibi öncü sanat hareketleri çeşitli yıkım performanslarıyla adından söz ettiren Oto Yıkıcı Sanata Zemin hazırlamıştır Gutai Grubu'nun bu dönemde yaptığı en ses getiren performansı Murakami'nin Geçiş performansıdır. "Geçiş, sanatçının kâğıt kaplı yirmi bir adet tahta çerçeveden geçmesi ile resim düzlemini aşarak parçaladığı bir çalışmadır. Sanatçı geleneksel bir malzemeyi performansa dayalı eylemle yıkıma uğratarak, mevcut sanat ortamına karşı da eleştirisini ortaya koymuştur" (Aktaran: İlhan, 2019, 503).



Görsel 1. Sabur Murakami, 1956, *Geçiş / Passing Through*.

Bu yıllarda en sert biçimde yıkım üzerinden faaliyet gösteren topluluk Sitüasyonistlerdir. “1957-72 yılları arasında faaliyet gösteren grup, 1968 Fransız ayaklanmalarının tam ortasında bulunmuş, eylemler yapmış, kurumsallaşmış sanatın karşısında durarak anarşist bir çizgide örgütlenmiştir” (Bilginer, 2018: 11). Avangard hareketlerden biri olan Sitüasyonist Enternasyonel, Hayalci Bauhaus ve Letrist Enternasyonel’in birleşimiyle 1957 yılında kurulur. Sonrasında Londra Psikocoğrafya Birliği de harekete dahil olur. CoBrA’dan katılan Asger Jorn ve Guy Debord liderliğindeki bu hareketin amacı ise “dünyayı değiştirmek” ve “sitüasyonlar” inşa etmektir (Aktaran: Gümgüm, 2020: 207). Bu oluşum sonrasında yıkım eylemleriyle sanat üzerinde etkisini sürdüren başka hareketlere de ilham olmuştur. Bunlardan biri Oto Yıkıcı Sanat’tır. Bu oluşumun temsilcilerinden biri Jean Tinguely’dir. Tinguely kendi kendini imha eden bir makine tasarlamıştır. “Yeni Gerçekçi ler’den İsviçreli heykeltıraş Jean Tinguely (1925-91), modern çağın tek nolojiye olan aşırı merakını hicveden heykelleriyle tanınmış, kendi kendini yok eden kinetik heykeller tasarlamıştır” (Antmen, 2008, 178).



Görsel 2. Jean Tinguely, New York’a Saygı, 1960.

1960’lı yıllar sanatın tepkilerle, protestolarla çeşitli eylemlerle ifade alanı bulduğu yıllardır. Yıkıcı Manifeosta da buyılların ürünüdür ve Raphael Montañez Ortiz yazmıştır. Bu manifesto şunları içermektedir:

Hayatın besini ölüm hissidir. Biz tahripçi sanatçılar, en önce, her ne pahasına olursa olsun bilinçaltının gücünü koruma gereğinin farkındayız. İtiraf ediyoruz ki, sakin bir yüzün arkasındaki öfke ve ıstırap ölümün hizmetindedir. Ve bu ölüm ruhsal olmaktan ötedir. Sanatçı uyarıda bulunmalıdır, mücadelesi ses getirmelidir, bir işaret olmalıdır. Öfke ve ıstırap çığlıklarımız yüzümüzü ve bedenimizi gerektirir, “ölümün canı cehenneme” diye bağıracağız, eylemlerimiz cenneti de cehennemi de sarsacak bir gürültü çıkaracaktır. İşte bütün bunlardan sonra, sanatımız yapıları bozacaktır, inşa edileni yıkacaktır. Sanatçı yalaka olmaktan çıkacaktır, sadece gerçeklik çerçevesinde anlam arayan bir ahlakın yükünden kurtulacaktır. Sanatçının tahrip hissi, korkusundan dolayı içinde kalmayacaktır. Yıkıcılığı içeren sanat arınacaktır; çünkü ölüm getirdiği kadar hayat da verecektir (Skopbülten, 2022).

Sanatçı, toplumun savaş sonrasında içinde bulunduğu çıkmazlar ve siyasi sorunlar hakkında geliştirdiği çalışmalarıyla dönemin problemlerine dikkat çekmiştir. 1945 sonrasında içinde bulunduğu kaos ortamının, yıkımı ve ölümü getireceği görüşüne paralel olarak, heykellerinde yıkıma dayalı uygulamalar gerçekleştirerek çağına gönderme yapmıştır.

Oto Yıkıcı Sanat’ın diğer bir öncüsü de Gustav Metzger’dir. Metzger de tıpkı Tinguely gibi Kendi Kendini Yok Eden Sanatını meydana getirmiştir.

Bu yapıtı oluşturmada önce dünyada siyasi ve kültürel anlamda pek çok yıkıcı olay meydana gelmekteydi. Bunlar Metzger'in sanatsal yaklaşımını besleyen unsurlar oldu. Sanatçının kendi ifadeleri bu durumu açıkça ortaya koymaktadır:

“İlk önce savaş, sonrasında Hiroşima'ya atılan bomba. Atom bombası, gerçek anlamda benim çalışmalarımın temelini oluşturur. Sanat öğrencisi olarak içinde bulunduğum andan itibaren sanat da dâhil olmak üzere her şeyin farklı olduğu noktasında bilinçlendiğim o an, sanatın sınırlarının ötesinde toplumun yararına nasıl kullanılabileceğini sorguladığım bir süreç oldu (Aktaran: Alpsoy, 2019, 433).



Görsel 3. Gustav Metzger, Asit Resim, 1961

Metzger kendi kendini yok eden çalışmasıyla, capitalist düzenin özellikle sanat eserleri üzerinde hakimiyetine karşı bir tepki sunduğu söylenebilir. “Tablonun üzerine atılmış bir çeşit asit ile eriyerek kendini yok etmesi, Metzger'in gözünden nükleer silahlara ve kapitalist sömürgeci güçlerin doğaya karşı potansiyel tehlikesine bir referans olarak aktarılmaktadır” (Erdoğan, 2022).

İlk önce savaş, sonrasında Hiroşima'ya atılan bomba. Atom bombası, gerçek anlamda benim çalışmalarımın temelini oluşturur. Sanat öğrencisi olarak içinde bulunduğum andan itibaren sanat da dâhil olmak üzere her şeyin farklı olduğu noktasında bilinçlendiğim o an, sanatın sınırlarının ötesinde toplumun yararına nasıl kullanılabileceğini sorguladığım bir süreç oldu (Aktaran: Alpsoy, 2019, 433).

Oto Yıkıcı Sanat 20. yüzyıl insanın maruz kaldığı savaşların ardından, toplumu kapitalist sistemin içine çektiği kaos ortamından uzaklaştırmak amacı ile ortaya çıkmıştır. Sanatın her yerde ve her şekilde olabildiği düşüncesi ile yola çıkan sanatçılar, şiddet, sökme, yakma, tahrip etme gibi imha etmeye yönelik eylemleri kullanmışlardır. Amaç, sanat üzerindeki her türlü baskıyı yok edip, topluma yeni bir bakış açısı kazandırmaktır.

Oto Yıkıcı Sanat'ın ortaya çıkışını hazırlayan bu nedenleri, akımın amacını ve kapsamını uluslararası platformda duyurmak isteyen Gustav Metzger ve Raphael Montanez Ortiz 1966'da Londra'da Sanatta Yıkım Sempozyumu 'nu düzenlemiştir.

Ortiz manifestosunu ilan ettikten sonra, 1960 yılında “baltayla piyano parçalama konserleri”ni icra etmeye başlar. Konserlerinden üçünü ise 1966 yılının Eylül ayı boyunca Londra'da düzenlenen Sanatta Yıkıcılık Sempozyumu'nda [Destruction in Art Symposium] hayata geçirir

(Arslan, Eriřim tarihi: 21.12.2021). Farklı uluslardan sanatçıların gerekleřtirdiđi Sanatta Yıkım Sempozyumu'nda en dikkat eken isimlerden biri de Ivor Davies'tir.

Ivor Davies de Tinguely'nin alıřmalarından olduka etkilenen bir sanatçıdır. İlk alıřmalarından biri tuval yzeyinde oluřturduđu yırtıklar, ocukluđunda yařadığı savař dnemi ve gzlemlediđi avangard sanatçıların etkisi sayesinde ortaya ıkmıřtır (Bařar, 2019: 79). İnfalak Gsterisi (Detonation Demonstration) (1966), Anatomik Patlamalar (Anatomic Explosions) Ivor Davies'in patlayıcı kullanarak gerekleřtirdiđi ilk sanatsal eylemleri arasında yer almaktadır (Aktaran: Bařar, 2019: 79).

SONU

Toplumsal olaylar sanatın geliřim ve deđiřim srecini her zaman etkilemiřtir. Fransız İhtilali sonrası sanatçıların sipariř alması yerine kendi konularını kendilerinin seme zgrlđne eriřmesi, ardından Sanayi Devrimi ile birlikte teknolojinin ilerlemesi ve seri retim toplumu yapısını etkilemesi, makineleřme ađından sonra yařanan iki byk dnya savařı gibi toplumu temelden deđiřtiren olaylar sanatın ifade alanını da etkilemiřtir. Sanayi Devrimi ile birlikte kyden kente gcn artarak yeni bir toplum sınıfının oluřması ve sanatın sadece belli bir kesime hitap etmesi Dadaizm sanatın metalařmasına karřı tepkilerinin oluřmasına neden olmuřtur. Yařanan toplumsal olaylar da dřnldđnde, sanatçıların Marcel Duchamp'ın bakıř aısını benimsemeleri olađan gzkmektedir.

1950'lerde sanatın merkezinin Avrupa'dan Amerika'ya savař sebebiyle tařınması ve sanatçıların imha etme eylemini sanatın retimine dahil etmeleri, Marcel Duchamp'dan aldıkları cesaretin sonucudur. Teknolojik geliřmelerin amacı insan yařamını olaylařtırmak iken savařlar teknolojilerine etkisi, atom bombaları gibi yokediciler dzeye gelmesini gzlemleyen sanatçıların malzeme olarak řiddeti ve imha etme eylemini semeleri bu nedenle olađandır. Bu sebeplerden tr dnemin bazı sanatçıları iin tahrip etme, řiddet ve řok etme sadece sanatın iinde var olmalıdır. İnsanın igdsel olarak řiddet eđilimine sahiptir ve sanat bu durumun zararsız bir řekilde aıđa ıkmasına yardımcı olur. Sanat artık yok ederek var olma zgrlđndedir.

Savař teknolojilerinin haricinde kitle iletiřim aralarının da teknoloji ile beraber geliřimi bazı sanatçıların tarafından toplum yapısına zarar verdiđi dřnlmřtr. Kapitalist sistemin tketime ynlendirmesi ve kitlelere kolay ulařımı, tketicilik kltrnn oluřuma sebep olmuř ve nesneye bađımlı bireylerin oluřumunda etkili olmuřtur. Modernizmin en deđerlisi olan sanat yapıtının da imha edilmesi, nesne zerindeki bađımlılıđa bir tepki niteliđindedir. Sanatta artık kalıcılık deđil geici olan var olmalıdır nk sanat alınıp satılabilen bir meta deđildir. 1960'lardan itibaren hakimiyet kuran o anda var olan performanslar, imha etme eylemleri ve infalak gsterileri bu sebeple sanatın iinde var olmuřtur

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JANNIS KOUNELLIS SANATINDA İNSAN, DOĞA VE KÜLTÜREL HAFIZA VURGUSU

EMPHASIS ON HUMAN, NATURE AND CULTURAL MEMORY IN JANNIS
KOUNELLIS ART

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ÖZET

Jannis Kounellis Roma'da yaşayan Yunan asıllı bir sanatçı olarak, İtalya'da 1960'ların sonlarında gelişmeye başlayan, insan-doğa-kültür ilişkisini tartışan ve adını kullanılan materyallerin tamamen değersiz ve önemsiz malzemeler olmasından alan "Yoksul Sanat" (Arte Povera)'ın en önemli temsilcilerindendir. Kounellis'in sanatında kömür, metal, yün, kahve çuvalları gibi materyaller kullanarak oluşturduğu enstalasyonlar, kültürün bu tür materyaller üzerinden nasıl şekillendirildiğini gözler önüne serer. Kendi yaşam deneyimlerinden yola çıkarak, farklı kültürel geçmişlere sahip insanlar arasındaki etkileşimi ve bu etkileşimin sanata yansımalarını araştırır. Bu bağlamda, Kounellis'in çalışmaları, küreselleşen dünyanın kültürel çeşitliliğini ve bu çeşitliliğin yarattığı gerilimleri ele alır ve insan, doğa ve kültür arasındaki gerilimleri, modern dünyanın çevresel ve kültürel meselelerine dair derinlemesine bir düşünce süreci sunar.

Bu çalışma ile Jannis Kounellis sanatında sıklıkla üzerinde durulan insan, doğa ve kültür temaları ve bu bağlamda gerçekleştirdiği çalışmalar incelenecektir.

Anahtar Kelimeler: Yoksul Sanat (Arte Povera), İnsan, Doğa, Kültür

ABSTRACT

Jannis Kounellis, a Greek artist living in Rome, is one of the most important representatives of "Poor Art" (Arte Povera), which began to develop in Italy in the late 1960s, discussing the relationship between humans, nature and culture, and taking its name from the fact that the materials used were completely worthless and insignificant. Kounellis's installations using materials such as coal, metal, wool and coffee sacks in his art reveal how culture is shaped by such materials and how it is under threat at the same time. Drawing on his own life experiences, he investigates the interaction between people with different cultural backgrounds and the

reflection of this interaction in art. In this context, Kounellis' works address the cultural diversity of the globalizing world and the tensions created by this diversity, and offer an in-depth thought process on the tensions between humans, nature and culture, and the environmental and cultural issues of the modern world.

This study will examine the themes of humans, nature and culture, which are frequently emphasized in Jannis Kounellis' art, and the works he has realized in this context.

Keywords: Poor Art (Arte Povera), Human, Nature, Culture

GİRİŞ

Jannis Kounellis, Yunan asıllı İtalyan bir sanatçı olarak, 20. yüzyılın ikinci yarısında Avrupa sanat sahnesinde önemli bir yere sahip olmuştur. Kounellis'in çalışmaları, genellikle Arte Povera akımı çerçevesinde değerlendirilir. Jannis Kounellis'in sanatında insan, doğa ve kültür temaları sıklıkla iç içe geçer ve bu temaları araştırarak modern dünyanın karmaşıklığını, geleneksel değerlerin kayboluşunu ve doğa ile insan arasındaki ilişkiyi sorgular. Sanatçının sanatında sıklıkla üstünde durduğu kültür teması, özellikle kendi kökenlerine ve kimliğine dair bir sorgulama ile başlar. 1936'da Pire'de doğan Kounellis, İkinci Dünya Savaşı'nın zorlukları içinde büyüdü ve 1956'da İtalya'ya göç etti. Bu iki farklı kültür arasında yaşadığı deneyimler, sanatına derin bir iz bırakmıştır.

Kounellis, özellikle Arte Povera hareketi içinde yer alarak, doğanın ve kültürün, insanın elinde nasıl dönüştüğünü ve bu dönüşümün sanatsal ifadesini nasıl bulduğunu eserlerinde inceler. Sanatçının eserlerinde sıkça karşılaşılan doğal materyaller ve endüstriyel objeler, insanın doğayla olan etkileşiminin kültürel ve estetik boyutlarını gözler önüne serer. Eserlerinde canlı hayvan, kömür, güller ve demir gibi unsurları kullanarak, insanın doğayı şekillendirme çabası ve bu çabanın doğa üzerindeki etkilerini sorgular.

60'larda Sanatsal Değişimler ve Arte Povera

İtalya, 1960'ların sonu ile 1970'lerin başı arasında, savaş sonrası yeniden yapılanmadan, tarımsal Güney'den sanayileşmiş Kuzey'e büyük bir nüfus kaymasıyla gelişmiş kapitalizm aşamasına geçiyordu. 1968'de sanayileşmiş dünyanın çeşitli yerlerinde patlak veren protestolar, 1970'lerin başlangıcını tanımladı. Bu dönemin toplumsal ve siyasal çalkantıları, temsilden iletişime geçişte sanatsal olarak yansıtıldı. Sanatçılar, gerçekliği farklı bakış açılarından, yani toplumsal, müzikal, sanatsal, sinematografik ve teatral olarak yeniden inşa etme ihtiyacı hissettiler. Bu, beden, militanlığın, otorite karşıtlığının, küresel protestoların, karşı-enformasyonun ve faşizm karşıtlığının yeniden keşfiyle sonuçlandı. 1970'ler, 1960'larda zaten aktif olan nesnel olmayan sanat fikrinin radikalleştiği on yıl olarak düşünülebilir. Dadaist hareket, bu yıllarda şekillenen teorik ve pratik eğilimlerin, fikirlerin ve eylemlerin çoğunun referans noktasıdır. Bu bağlamdan ortaya çıkan yeni nesil sanatçılar, sanatsal açılımlarını, sanat galerilerinin ve dinamiklerinin yerini alacak yeni mekanlar ve sergileme çözümleri aramak, sanatın anlamı ve temsilini ve malzemeyi yeniden düşünmek gibi farklı şekillerde baltalamayı

amaçladılar. Sonuç olarak, eylemler ve performanslar geleneksel olana göre öncelik kazandı; mesaj özellikle eleştirildi ve sanat topluma giderek daha da yaklaştı. Happenings, çevresel sanat, Minimalizm, Arazi sanatı, Kavramsal sanat, Vücut sanatı, Almanya'da Joseph Beuys'un çalışmaları ve İtalya'da Arte Povera hareketi, hepsi 1968 ideolojisini yansıtır. Bu sanatsal hareketler ve eğilimlerle ilişkilendirilen sanatçılar, sanatın bir nesne ve bir meta olduğu fikrini reddettiler. Sanatçılar sanatın sınırlarını zorlarken, malzemelerin kullanımını genişletmişlerdir. Ayrıca sanatın kendisinin doğasıyla tanımını ve sanatın toplumdaki yerini sorgulamışlardır (Dempsey, 2007, 268).

Arte Povera, İtalya'da 1960'larda ortaya çıkan bir sanat akımı olarak, sanayi sonrası toplumun maddi zenginliğine karşı bir tepki olarak doğmuştur. Başlangıcı yaklaşık olarak 1960'lı yıllara dayanan ve özünde, çok çeşitli malzemelerle sanatçıların fikirlerini yansıtmalarını hedefleyen, geleneksel olmayan anlatım biçimleriyle ortaya koyulan kavramsal sanat süreci; ucuz, atık, doğal, gelip geçici malzemelerin kullanılmasını temel prensip edinen avangard bir anlatım biçimidir. Arte Povera İtalya'da gelişen özgürlükçü kavramsal temelli, klasik estetiği yıkmayı amaçlayan bir sanat hareketidir. İtalyan küratör ve yazar Germano Celant 1967 yılında dönemin çeşitli akımlarının genel özelliklerini ortaya koymak için 'Arte Povera' terimini kullanmıştır. Arte Poverayla ilgili ilk yazısında, "Hayvanlar, sebzeler ve mineraller sanat dünyasındaki yerini almaktadır" diyen Germano Celant, izleyiciyi bu tür malzemelerin geçirdiği fiziksel, kimyasal ya da biyolojik süreçlerimizle çığırını, sanatçıları da gündelik malzemeyi dönüştüren birer simyacıya benzetmiştir (Antmen, 2008, 213). Terimi, sanatçıların İtalya'daki politik, endüstriyel ve kültürel kurumlar tarafından oluşturulan değerlerden duydukları memnuniyetsizliğe yanıt olarak aldıkları radikal tavırdan doğmuştur. Hareketin Celant tarafından başlatılmasının ardından, 1968, dönemin sanat sahnesine sızan, dünya çapında sosyal ve politik değişimin yaşandığı bir yıldır ve bu değişim akımının ortaya çıkmasında önemli bir rolü bulunmaktadır.

Arte Povera tam anlamıyla 'fakir sanat' anlamına gelir ancak buradaki fakir kelimesi hareketin tuval üzerine yağlı boya, bronz veya oyulmuş mermer gibi geleneksel malzemelerin ötesinde geniş bir yelpazedeki malzemelerin kullanımını ifade eder. Akımın temel özelliği atık, geri dönüştürülebilir doğal malzemelerin sanat nesnesi olarak kullanımınıdır. Sanatçılar yapıtlarında doğa yasaları ve yaşanan dünya arasındaki zıtlıkları yan yana getirerek doğa yasalarının varlığına güçlü referanslar vermişlerdir; değerli olanla değersiz olanı, geçmişle bugünü, tarihsel olanla güncel olanı bir arada kullanarak kendilerine özel bir sanatsal bakış açısı geliştirmişlerdir (Türk, 2021, 3).

Başlıca Mario Merz, Jannis Kounellis, Pino Pascali, Michelangelo Pistoletto, Giovanni Anselmo ve Gilberto Zorio gibi sanatçılar tarafından temsil edilmektedir. Kounellis, bu akımın önde gelen isimlerinden biri olarak, eserlerinde genellikle gündelik ve "sanat dışı" malzemeleri kullanarak kültürün maddi dünyasıyla ilişkilendirilen unsurları sorgular. Bu yaklaşım, kültürün tüketim toplumunda nasıl metalaştırıldığını ve geleneksel değerlerin bu bağlamda nasıl erozyona uğradığını eleştirir. Kounellis'in sanatında kömür, metal, yün, kahve çuvalları gibi

materyaller kullanarak oluşturduğu enstalasyonlar, kültürün bu tür materyaller üzerinden nasıl şekillendirildiğini gözler önüne serer.

Jannis Kounellis

Jannis Kounellis, 23 Mart 1936'da Yunanistan'ın Pire kentinde doğdu: yirmili yaşlarına kadar burada kaldı. Çocukluğu boyunca 1946-1949 yıllarındaki Yunan iç savaşının ortasındaydı ve bu özel durum Kounellis'in siyasi kimliğinin gelişimini büyük ölçüde etkiledi ve ayrıca sanatsal vizyonunu da şekillendirdi.

Burada önce Atina Sanat Enstitüsü'ne kaydoldu fakat eğitimini tamamlamadan Atina'yı terkedip Roma'ya taşındı ve İtalya başkentindeki Güzel Sanatlar Akademisi'ne kaydoldu. 1960 yılında Güzel Sanatlar Akademisi'ndeki eğitimi sırasında yaptığı eserleri sergileyerek ilk kişisel sergisini açtı.

Kounellis için dönüm noktası olan yıl kesinlikle 1967'di. Aslında, bu tarihte her şeyden önce sanatında daha fazla bir evrim meydana geldi, böylece çağdaş sanatta kendini gösteren resim ve avangardla ilgili genelleşmiş bir kriz doğrultusunda, tuvali giderek terk ederek çevredeki alanı enstalasyonlar aracılığıyla sahiplendi. Dahası, aynı yıl Arte Povera kolektifini oluşturacak sanatçılarla işbirliğine başladı.

Kounellis'in diğer İtalyan sanatçılarından çok daha önce gelen aciliyeti, sanat ile nesnel gerçeklik arasında mümkün olduğunca doğrudan bir ilişki kurmayı başarmaktı. Bu nedenle farklı malzemelerle deneyler yapmaya başladı.



Resim1. Jannis Kounellis, 12 Canlı At "Untitled (12 Horses)" (1969)

Arte Povera sanatçılarının sanatın alınıp satılan bir meta olmasına yönelik tepkisinin uç noktada bir temsili olan bu eylem, sanatçının 12 adet atı galeriye bağlanmasıyla gerçekleşmiştir (Antmen, 2008, 216). Bu eser, Kounellis'in insan, doğa ve kültür arasındaki ilişkiyi nasıl sorguladığını gösteren en güçlü örneklerden biridir. Sanatçı, bir galerinin içine 12 canlı at yerleştirir. Bu sergiyle sanatçının anlatma istediği şey, bir sanat çalışmasının aşkın olmadığı, ancak yaşamın herhangi bir biçimine benzediğiydi: düşünce içeren bir kimlik (Fineberg, 2013, 317). Bu, doğanın ham gücünü ve sadeliğini temsil eden atların, kültürel bir mekâna sokulmasıyla,

insanın doğayı kontrol etme ve kendi estetik değerlerine göre biçimlendirme çabasını vurgular. Galerinin steril ve kapalı ortamı, doğanın özgür ruhunun kısıtlanmasını simgelerken, aynı zamanda doğa ve kültür arasındaki gerilimi gözler önüne serer. Atlar, insanla uzun bir ortak geçmişe sahip olan hayvanlar olarak, doğa ile kültür arasındaki aracı rolünü üstlenir. Kültür ürünü ile doğal olanın sergilenmesi ile sınırların eridiği bu alan önemli bir kırılma alanı olmuştur. Bir yandan da hem yapıta, hem de hayvana karşı tutumumuz muğlaklaşır. Sonunda da hem sanat mekânına hem nesnesine hem de kendimize yabancılaşarak pasif izleyici oluşumuzun altı çizilir. “Galeri mekânında yer alan izleyiciler, Kounellis’in atlarına benzemeye başlarlar. Canlı cansız arasındaki bu iç-içe geçmişlik, sanatı canlandırır” (O’Doherty, 2010, 120).

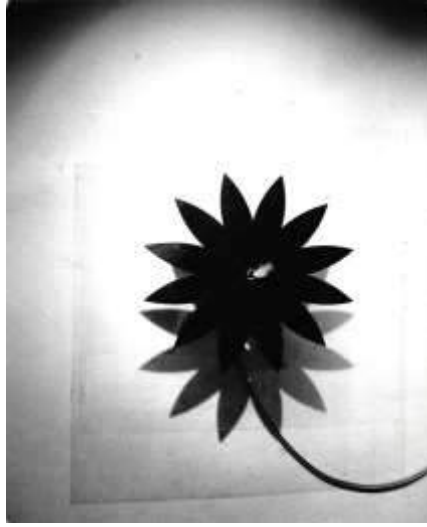
Bu büyük ölçekli enstalasyon, 1960’ların muazzam politik, sosyal ve kültürel değişimine kültürel kavşaklarla bağlıdır. Özellikle Arte Povera, Vietnam Savaşı ve Amerikan işgalini kınayan dünya çapındaki öğrenci protestolarıyla ilişkilendirilir. Enstalasyon ayrıca İtalya’nın Ekonomik Mucizesi olarak bilinen şeyin zirvesinde gerçekleşmiştir. İtalya daha önce ve daha sonra kırsal güneyden kuzeydeki sanayi şehirlerine bu kadar büyük bir nüfus göçü yaşamamıştı. Yaklaşık iki milyon insan, özellikle Torino’daki Fiat fabrikasında araba üretmek için fabrikalarda iş bulmak amacıyla aile çiftliklerini terk etti. İtalya’daki sanayi patlaması, 1,7 milyon insanın fabrikalarda veya küçük işletmelerde iş aramak için "kırsaldan ayrılmasına" neden oldu ve yirmi yıl içinde çiftlik işçilerinin sayısı 8 milyondan 3 milyona düştü. Arte Povera’nın başladığı yer de bu kuzeydeki Cenova ve Torino şehirleriydi. Bu bağlamda sanatçı toplumun yaşamakta olduğu bu büyük değişimi, insan ve doğa arasındaki ilişkiyi eserine yansıtmiş ve Arte Povera’nın en yüksek sesle söylediği “Sanat Hayattır” mottosunu bu enstelasyon üzerinden bir kere daha vurgulamıştır.



Resim 2. Jannis Kounellis, *Senza titolo (Campi, Pappagallo, Cotoniera)*, 1967

Kounellis'in 1967’de gerçekleştirdiği bu enstelasyonda yine bir canlı varlık yer almıştır. Gri metal plakalar içine yerleştirilmiş kaktüsler ve arka duvarda yine gri metal plaka üzerinde içinde

yemek için kabın bulunduğu tünekte evcil bir canlı papağandan oluşan çalışma, onu farklı düzeylerde analiz ederek iki evren arasındaki diyalektiği ortaya koymuştur. Metal levha ile temsil edilen endüstriyel evren ve egzotik hayvanla simgelenen doğal evren, dönemin siyasi perspektifi Kuzey ve Güney dünyası arası arasındaki ilişkileri, özellikle de Amerika Birleşik Devletleri ile Latin Amerika ülkeleri arasındaki ilişkileri temsil ediyor. O yıl Küba ile ABD arasındaki gerilimin çok güçlü olduğunu düşünürsek, Papağan ile metal plaka arasındaki bağımlılık ve çatışma açıkça görülüyor: Kuş özgürce uçabiliyor ancak yaşamak ve beslenmek için tüneklere geri dönmek zorunda kalıyor. Bu enstelasyon ile estetik düzeyde kontrast, düz ve soğuk olanla sıcak ve canlı olan üzerinden sağlanmıştır(Celant, 2012, 27).



Resim 3. Jannis Kounellis, Daisy of Fire (1967)

Tuvalin iki boyutluluğunu aşmak açısından bir diğer çok önemli eser ise, merkezinde bir gaz silindiri manifoldu bulunan ve içinden mavi bir alev çıkan metal bir çiçekten oluşan Daisy of Fire (1967)'dir. Alev, Kounellis için çok değerli olan ve yüzyıllar boyunca zarar görmeden ilerleyen, tarih öncesi çağlarda insan tarafından keşfedilen, daha sonra Orta Çağ'da bir ceza ve şehitlik aracı olarak kullanılan ve son zamanlarda modern endüstrideki uygulamasına kadar uzanan ateş elementine doğrudan bir göndermedir.

"Ateş sorunu özel bir sorundur," diyor Jannis Kounellis. "Benim bu ögeye olan ilgim sadece bir sorun olarak ateşten değil, aynı zamanda ortaçağ efsanelerinde ateşin ceza ve arınma ile özdeşleştirilmesinden kaynaklanıyor." (Fineberg, 2013, 317). Kounellis bu eserinde doğa ve kültürü yan yana koydu. Metal yaprakları kesmek için kullandığı kaynak makinesi eserde gösteriliyor, böylece çiçeğin organik yaşamı yerine, yenilenmesini temsil eden ateş geçiyor. Yanma olgusu sanatçının bundan sonraki çalışmalarında da sıklıkla görülmeye başlandı. Kounellis'in eserinde, doğal olarak ateşle bağlantılı olan duman, hem resimsel bir sürecin kalıntısı hem de zamanın geçişinin kanıtı olarak işlev görür. 1979 ve 1980 tarihli bazı eserlerini karakterize eden taşlar, tuvaler ve duvarlardaki is izleri, 1980'lerdeki resim üretiminin büyük bir bölümünde kullanılan anti-ideolojik ve hedonistik yaklaşıma karşı kişisel bir "resme dönüşü" gösterir.

Untitled, Smoke isimli enstalasyon, sanatçının gaz silindiri manifoldlarını odanın duvarları boyunca yerleştirmesiyle oluşturulmuştur. Gaz alevleri ve duman, galeri ortamında yayılarak izleyicilerin odaya girmesini imkansız hale getirmiştir. Böylece sanatçı ile eserlerinin izleyicisi arasındaki mesafe sahnelenmiş oldu ve 1968'de ideolojik ve politik muhalefetin alevlenmesinin metaforu da ortaya çıkmıştır.

Bu çalışma ile duman, geçici ve şekilsiz bir doğa unsuru olarak, hem doğanın hem de insan yaşamının geçiciliğini simgeler. Dumanın galeri içinde serbestçe dolaşması, doğanın insan yapımı kültürel alanlara nüfuz etme yeteneğini gösterir. Ancak bu aynı zamanda doğanın kontrol altına alınmış bir hali olarak da yorumlanabilir. Kounellis, bu eserinde, doğanın insan müdahalesine karşı nasıl savunmasız olduğunu, ancak aynı zamanda bu müdahalelerin geçiciliğini ve doğanın kalıcılığını vurgular.



Resim 4. Jannis Kounellis, Untitled, 1969

Untitled 1969, zeminde duvara yaslanmış, düzensiz bir sıra halinde dizilmiş yedi çuvaldan oluşuyor. Her çuval farklı bir kuru bakliyat veya fasulyeyle dolu: nohut, kahve çekirdeği, yeşil mercimek, yeşil bezelye, barbunya fasulyesi, beyaz fasulye ve mısır. Her çuvalın üstü, içindekilerin görülebilmesi için geriye doğru kıvrılmış. Çuvallar bu şekilde ve o şekilde çöküyor, bazıları birbirine yaslanıyor, bazıları duvara yaslanıyor ve bazıları da duvardan uzağa.

Bu eserde kullanılan malzemeler Kounellis'in repertuarının bir parçasıdır; çuvallar sıklıkla diğer eserlerde de yer almaktadır. Sanatçı, "Birçok eserimde çuval kullandığımı biliyorsunuz. Bu çuvallar deniz ticareti fikriyle bağlantılıdır. Bunları her limanda bulabilirsiniz." demiştir.

Deniz ticareti ve anaçla olan bu tür bağlantılar, Kounellis'in doğum yeri olan Pire'yi, Atina limanı olduğunu düşündürebilir. Sanatçı yirmi yaşında Yunanistan'ı terk edip Roma'ya yerleşmiş olsa da, yoğun limanın manzaraları, kokuları ve hisleri onu hiç terk etmemiş ve bu eserde yeniden yüzeye çıkmıştır.

Bir sanatçı ve bir insan olarak Kounellis, kendi gözleriyle memleketi Yunanistan'daki iç savaşı gördüğü için, siyasi ideoloji temasını her zaman kendisine çok yakın hissetti; bu travma, ona memleketiyle sabırsızlık ilişkisi getirdi. Ayrıca Kounellis, sıklıkla hayal kırıklığına uğrama ve belirli sanat geleneklerine karşı yeniden düşünme eğilimi gösterdi; buna, hayatının son evresinde bulunan gençliğinde zaten seyahat ettiği kalıplara bir tür yerleşme olarak, enstalasyonlarıyla yanıt vermeyi ihmal etmedi.

Untitled 1960-98, sanatçı Jannis Kounellis'in duvara monte edilmiş büyük bir eserdir. Eser, düz bir çelik panelin tepesine yakın bir yere asılmış, bir kısmı emaye ile boyanmış iki gerilmiş tuvalden oluşur. Bu tuvaler kırık beyaz kağıtla kaplanmış ve siyah sembollerle boyanmıştır. Tuvalerin üzerinde, üst kenarı kavrayan iki S şeklinde et kancasıyla çelik panelin tepesine katlanmış ve tutturulmuş, ham kenarlı haki bir branda parçası vardır. Bu iki kanca arasında, alt ucunda kömür dolu bir jüt çuvalın asılı olduğu üçüncü bir S şeklinde et kancası bulunan başka bir büyük metal çubuk aşağı doğru sarkmaktadır. Bu eser, Kounellis'in sanatsal kelime dağarcığının karakteristik sayısız ögesinin yanı sıra, küratör Germano Celant'ın 1960'ların sonlarında İtalya'da çalışan birçok sanatçının, Kounellis de dahil, uygulamalarına uyguladığı bir etiket olan arte povera'da kullanılan günlük malzemeleri de içerir.

Küratör Dieter Roelstraete, Kounellis'in çalışmalarındaki metal levhalardan sıklıkla 'kağıt levhalar' olarak bahsettiğini ve metal levhayı çalışmayı inşa etmek için bir fon veya destek olarak gördüğünü, burada da böyle düşünülebileceğini belirtiyor (Roelstraete, 2002, 16). Bu tuvalerin eklenmesi ve tuval kaplamaları, sanatçının kariyeri boyunca farklı malzemeler kullanmasına işaret ediyor; kancalar ve kömür, sadece arte povera ile ilişkilendirilen birçok eserde yer alan günlük nesnelere değil, aynı zamanda süspansiyon ve ateş öğelerinin sık kullanımına da işaret ediyor.



Resim 5. Jannis Kounellis, Untitled, 1969

SONUÇ

Jannis Kounellis sanatında, kişisel kökenlerinden yola çıkarak, hem bireysel hem de kolektif kültürel kimliği sorgular. Arte Povera'nın etkisiyle, kültürün maddi dünyayla olan ilişkisini eleştirir ve kültürel hafızayı canlı tutma çabası içinde geçmişi bugüne taşır. Kendi yaşam deneyimlerinden yola çıkarak, farklı kültürel geçmişlere sahip insanlar arasındaki etkileşimi ve bu etkileşimin sanata yansımaları araştırır. Bu bağlamda, Kounellis'in çalışmaları, küreselleşen dünyanın kültürel çeşitliliğini ve bu çeşitliliğin yarattığı gerilimleri ele alır ve insan, doğa ve kültür arasındaki gerilimleri, modern dünyanın çevresel ve kültürel meselelerine dair derinlemesine bir düşünce süreci sunar.

Bu çalışma, Jannis Kounellis'in sanatında insan, doğa ve kültür arasındaki karmaşık ilişkileri ele almaktadır. Kounellis, özellikle Arte Povera hareketi içinde yer alan çalışmalarıyla, doğanın insan kültürü tarafından nasıl dönüştürüldüğünü ve bu dönüşümün sanatta nasıl ifade bulunduğunu inceler. Sanatçının eserlerinde sıkça karşılaşılan doğal materyaller ve endüstriyel objeler, insanın doğayla olan etkileşiminin kültürel ve estetik boyutlarını gözler önüne serer. Eserlerinde atlar, kömür, güller ve demir gibi unsurları kullanarak, insanın doğayı şekillendirme çabası ve bu çabanın doğa üzerindeki etkilerini sorgular. Kounellis, bu eserleriyle insan, doğa ve kültür arasındaki gerilimleri, modern dünyanın çevresel ve kültürel meselelerine dair derinlemesine bir düşünce süreci sunar. Bu çalışma, Kounellis'in sanatı üzerinden insanın doğayla kurduğu ilişkiye dair eleştirel bir perspektif geliştirmeyi amaçlamaktadır.

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**İŞ KAZASI VE MESLEK HASTALIĞINDAN KAYNAKLANAN MANEVİ
TAZMİNAT DAVALARI**
MORAL DAMAGE CASES ARISING FROM WORK ACCIDENTS AND
OCCUPATIONAL DISEASES

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ÖZET

İşverenin çalışanı koruma ve gözetme borcu çalışanın iş görme borcunu yerine getirmesi esnasında kişiliğinin korunmasıyla iş sağlığı ve güvenliğinin sağlanmasını içerir (TBK m. 417). İşverenin çalışanın iş sağlığı ve güvenliğini korumak için gerekli önlemleri alma borcu 6331 sayılı İş Sağlığı ve Güvenliği Kanunu'nda (İSGK) da düzenlenmiştir. Ardından işbu Kanunun yürürlüğe girmesiyle birlikte 4857 sayılı İş Kanunu'nun ilgili madde ve hükümleri yürürlükten kaldırılmıştır (İSGK m. 37).

Çalışmamızda ilk önce iş kazası ve meslek hastalığı kavramlarına değinilecek, daha sonra işverenin çalışanı koruma ve gözetme borcu açıklanacak, nihayetinde işverenin çalışanı koruma ve gözetme borcuna aykırı davranışlardan doğan zarardan maddi tazminat davasına ve destekten yoksun kalma tazminatına değinilecek ve özellikle manevi tazminat davası incelenecektir.

Anahtar Kelimeler: İş kazası, Meslek hastalığı, Manevi tazminat, Maddi tazminat, Destekten yoksun kalma tazminatı.

ABSTRACT

The employer's duty to protect and supervise the employee includes ensuring the protection of the employee's personality and ensuring occupational health and safety while performing work duties (Turkish Civil Code, Article 417). The obligation of the employer to take necessary measures to protect the employee's occupational health and safety is also regulated in Law No. 6331 on Occupational Health and Safety (OHS Law). Subsequently, with the enforcement of this Law, the relevant provisions of Law No. 4857 on Labor have been abolished (OHS Law, Article 37).

Firstly, in our study, the concepts of occupational accident and occupational disease will be discussed, then the employer's duty to protect and supervise the employee will be explained, and finally, the damages arising from the employer's breach of duty to protect and supervise the employee will be discussed, including claims for pecuniary compensation and compensation for loss of support, and especially, the claim for non-pecuniary damages will be examined.

Keywords: Occupational accident, Occupational disease, Non-Pecuniary damages, Pecuniary compensation, Compensation for loss of support.

I. GİRİŞ

TBK m. 417 uyarınca “İşveren, hizmet ilişkisinde çalışanın kişiliğini korumak ve saygı göstermek ve işyerinde dürüstlük ilkelerine uygun bir düzeni sağlamakla, özellikle çalışanların psikolojik ve cinsel tacize uğramamaları ve bu tür tacizlere uğramış olanların daha fazla zarar görmemeleri için gerekli önlemleri almakla yükümlüdür. İşveren, işyerinde iş sağlığı ve güvenliğinin sağlanması için gerekli her türlü önlemi almak, araç ve gereçleri noksansız bulundurmak; çalışanlar da iş sağlığı ve güvenliği konusunda alınan her türlü önleme uymakla yükümlüdür. İşverenin yukarıdaki hükümler dâhil, kanuna ve sözleşmeye aykırı davranışı nedeniyle çalışanın ölümü, vücut bütünlüğünün zedelenmesi veya kişilik haklarının ihlaline bağlı zararların tazmini, sözleşmeye aykırılıktan doğan sorumluluk hükümlerine tabidir.”

İş kazası ve meslek hastalıklarından ötürü çalışanlar maddi ve/veya manevi tazminat davaları açabilecekleri gibi, çalışanın ölümü halinde yakınları destekten yoksun kalma tazminatı ve manevi tazminat talep edebilirler. (İş kazası ya da meslek hastalığından kaynaklanan maddi ve manevi tazminat ile bunlarla ilgili tespit itiraz ve rücu davaları hakkında arabuluculuk uygulanmayacaktır (İş Mahkemeleri Kanunu madde 3 uyarınca, (1) Kanuna, bireysel veya toplu iş sözleşmesine dayanan çalışan veya işveren alacağı ve tazminatı ile işe iade talebiyle açılan davalarda, arabulucuya başvurulmuş olması dava şartıdır. (Ek cümle:28/3/2023-7445/41 md.) Bu alacak ve tazminatla ilgili itirazın iptali, menfi tespit ve istirdat davaları hakkında birinci cümle hükmü uygulanır. (2) Davacı, arabuluculuk faaliyeti sonunda anlaşmaya varılamadığına ilişkin son tutanağın aslını veya arabulucu tarafından onaylanmış bir örneğini dava dilekçesine eklemek zorundadır. Bu zorunluluğa uyulmaması hâlinde mahkemece davacıya, son tutanağın bir haftalık kesin süre içinde mahkemeye sunulması gerektiği, aksi takdirde davanın usulden reddedileceği ihtarını içeren davetiye gönderilir. İhtarın gereği yerine getirilmez ise dava dilekçesi karşı tarafa tebliğe çıkarılmaksızın davanın usulden reddine karar verilir. Arabulucuya başvurulmadan dava açıldığının anlaşılması hâlinde herhangi bir işlem yapılmaksızın davanın, dava şartı yokluğu sebebiyle usulden reddine karar verilir. (3) İş kazası veya meslek hastalığından kaynaklanan maddi ve manevi tazminat ile bunlarla ilgili tespit, itiraz ve rücu davaları hakkında birinci fıkra hükmü uygulanmaz.)

Bu noktada fıkroda geçen ilgili durumlar için arabuluculuk dava şartı olarak düzenlenmemiştir. Esasen muvazaa tespiti, idari para cezaları ve SGK’ya karşı açılan davalar zorunlu arabuluculuk kapsamı dışında kalır. Buna ek olarak hizmet ilişkisine dayanmayan adi işçi alacakları ile iş kazası ve meslek hastalığından kaynaklanan maddi ve manevi tazminat davaları ile bunlarla alakalı tespit, itiraz ve rücu davaları da zorunlu arabuluculuğun kapsamı haricinde kalan uyuşmazlıklardır (Oğuz, 2019: s. 118).

İş kazaları ve meslek hastalıklarından kaynaklı olarak çalışanın maddi ya da manevi tazminat talebi oluşabilecektir ve çalışanın ölümü durumu gerçekleştiğinde yakınları destekten yoksun kalma tazminatı ve manevi tazminat talep edebileceklerdir (Kurt, 2015: s. 43).

İş kazasına uğrayan ya da meslek hastalığına tutulan işçi maddi tazminattan sair, TBK m. 56 uyarınca manevi tazminat da talep edebilir. İş Kanunu'nda ve diğer iş mevzuatında, bu hususta bir hüküm bulunmamaktadır. Fakat Türk Medeni Kanun'unda da manevi tazminat çeşitli maddelerde düzenlenmiştir. (Örneğin MK m. 25). TBK m. 58'de ise kişilik hakkının zedelenmesinden zarar gören kişi için manevi tazminat talep hakkı sağlanmıştır (Kaplan, 2023, s. 332).

TBK m. 56 uyarınca, “Hâkim, bir kimsenin bedensel bütünlüğünün zedelenmesi durumunda olayın özelliklerini göz önünde tutarak, zarar görene uygun bir miktar paranın manevi tazminat olarak ödenmesine karar verebilir. Ağır bedensel zarar ya da ölüm halinde zarar görenin veya ölenin yakınlarına da manevi tazminat olarak uygun bir paranın ödenmesine karar verilebilir.”

II. KAVRAMLAR

A. GENEL OLARAK KAZA KAVRAMI

Her ne kadar tedbir alınsa da kaza yapılması kaçınılmaz bir maddi durumdur. En çok üzerinde çalışılması gereken husus iş kazalarının en düşük seviyede kalmasıdır (Özen, 2015: s. 215-253). Kaza, ile ilgili en başta vurgulanması gereken husus gerçekleşmesi arzu edilmeyen olay olmasıdır. Kazanın istenmemiş olmasıyla öngörülmemiş olması farklı hususlardır. Olma olasılığı öngörülmüş olmasına rağmen olmaması için yapılması gerekenler yapılmadığından ötürü gerçekleşen zarar verici olaylara, bu olaylar istenilmeyen olaylar olsa da kaza demek mümkün değildir. Kazanın ortaya çıkardığı ve kazazedenin katlanmak zorunda kaldığı sonuçlar ise zarar kavramı içinde yer alır. Hukuk sistemleri ortaya çıktığı günden bu zamana kadar zararın giderilme yolları hususu üzerinde epeyce çaba sarf edilen bir kurum olmuştur (Taşkın, 2022: s. 27).

Türk hukuk sisteminde ise zararın giderilmesi hususu Türk Borçlar Kanunu bağlamında düzenlenmiştir bu sebeple iş kazalarından doğan zararların tazminine ilişkin esaslar borçlar hukukunun genel ilkelerine göre belirlenecektir borçlar hukukunun manasında kaza borçlunun iradesi dışında meydana gelen, öngörülemez kaçınılmaz mümkün olmayan ve borçlunun sorumluluğunu doğurmayan dıştan gelen ani olay olarak tanımlanmıştır (Taşkın,2022: s. 28).

Kazanın unsurları ise şunlardır; dıştan gelen bir olay olması, istenmemiş olması, aniden meydana gelmesi, vücut bütünlüğünün ihlaline veya ölüme sebebiyet vermesi, uygun illiyet bağının bulunmasıdır (Taşkın, 2022: s. 28).

B. İŞ KAZASI KAVRAMI

İş kazası (Hukuk Genel Kurulu 2004/21-529 E., 2004/527 K. ve 13.10.2004 tarihli kararında sigortalının işyerinde veya işyeri sayılan yerlerde herhangi bir olay ve işle ilgili olmaksızın kalp krizi geçirerek ölmesini iş kazası olarak nitelemiştir. Yargıtay 10. Hukuk Dairesi 2004/4465 E.,

2004/6425 K. ve 05.07.2004 tarihli kararında ise aynen “intihar eylemi eğer işyerinde gerçekleşmiş ise, olayın salt işyerinde meydana gelmesi durumunda bile, intihar eden sigortalının gördüğü işle ilgili ve işverenin kusurundan kaynaklanmamış olmasına rağmen 506 sayılı Yasanın 11. maddesi açıklığı gereği olay yine de iş kazasıdır.” kanaatine varmıştır. Ancak bu durumda olaylarla iş ve işveren arasında nedensellik bağı bulunmayacağı için işveren ve onun halefi olanlar Kuruma karşı sorumlu tutulamayacağı da kararda öngörülmüştür.) öğretilerde genellikle sosyal güvenlik hukuku bağlamında iş kazası ve bireysel iş hukuku bağlamında iş kazası olmak üzere 2 şekilde incelenmektedir. Ancak öğretilerde bir görüş, hukukumuzda 2 ayrı iş kazası tipinin bulunmadığını, sosyal sigortalar ve bireysel iş hukuku açısından ayrı ayrı incelenmesine gerek olmadığını ileri sürmüştür. Buna karşıt görüşe göre ise bireysel iş hukuku açısından ve sosyal sigortalar açısından illiyet bağı farklı bir şekilde ortaya çıkacaktır (Daha ayrıntılı bilgi için bkz., Taşkın, s. 32-33).

1. TANIM

İş kazası kavramı hususunda değişik kurum ve kuruluşlarca yapılmış bazı tanımlamalar vardır. Uluslararası Çalışma Örgütü (UÇÖ) iş kazasını; “Belirli bir zarara veya yaralanmaya neden olan, beklenmeyen ve önceden planlanmamış bir olaydır.” biçiminde tanımlamıştır. Dünya Sağlık Örgütü ise; “Önceden planlanmamış çoğu kez kişisel yaralanmalara, makinelerin, araç ve gereçlerin zarara uğramasına, üretimin bir süre durmasına yol açan bir olaydır.” biçiminde adlederek, iş kazasının ekonomik boyutuna değinmeyi hedeflemiştir. Avrupa İstatistik Ofisi (EUROSTAT) ise, iş kazasının, “İş sürecindeki fiziksel ve ruhsal yönden zarara sebep olan olay olduğunu” ifade etmiştir (Turan, 2021: s. 19).

5510 sayılı Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu'nun, İş Kazasının Tanımı Bildirilmesi ve Soruşturulması başlıklı m. 13'te iş kazası tanımlanmamış yalnızca hangi durumların iş kazası sayılacağı belirtilmiştir. Kanunun düzenlemesine göre, maddede belirtilen hallerde gerçekleşen ve sigortalıyı hemen ya da sonradan bedenen ya da ruhen engelli hâle getiren olaylar iş kazasıdır. Maddede iş kazası bir kavram olarak tanımlanmışsa da öğretilerde bazı yazarlar madde hükmünün iş kazasını tanımladığı kanaatinde bulunmaktadır (Taşkın, 2022: s. 33).

İş kazası buna ek olarak kavramsal açıdan 6331 sayılı İş Sağlığı ve Güvenliği Kanununda da (İSGK) tanımlanmıştır. 6331 sayılı Kanun m. 2 uyarınca “İş kazası: İşyerinde veya işin yürütümü nedeniyle meydana gelen, ölüme sebebiyet veren veya vücut bütünlüğünü ruhen ya da bedenen engelli hâle getiren olayı,” şeklinde bir tanım yapılmıştır.

Türk Borçlar Kanunu'nda da iş kazasının tanımı yapılmamış ancak işveren ve işçinin yükümlülükleri yer almıştır. Şöyle ki “İşveren, işyerinde iş sağlığı ve güvenliğinin sağlanması için gerekli her türlü önlemi almak, araç ve gereçleri noksansız bulundurmak; işçiler de iş sağlığı ve güvenliği konusunda alınan her türlü önleme uymakla yükümlüdür işverenin yukarıdaki hükümler dâhil, kanuna ve sözleşmeye aykırı davranışı nedeniyle işçinin ölümü, vücut bütünlüğünün zedelenmesi veya kişilik haklarının ihlaline bağlı zararların tazmini,

sözleşmeye aykırılıktan doğan sorumluluk hükümlerine tabidir (Atasoy Karyağdı, 2021: s. 20).”

İş hukukunda iş kazasından söz edebilmek için kazaya sebebiyet veren olayın dıştan ve irade dışı olacak şekilde oluşması, kaza ile zarar arasında ve kaza ile yapılan iş arasında uygun illiyet bağının olması, kaza sonucu zararın bulunması aranır. Ancak iş kazası tanımı unsurları ve doğurduğu sonuçlar iş hukuku ve sosyal güvenlik hukuku alanında birbirinden farklıdır (Atasoy Karyağdı,2021: s. 20).

C. GENEL OLARAK MESLEK HASTALIĞI KAVRAMI

Meslek hastalıkları genel olarak şöyle tanımlanabilir, çalışanın iş yerinde bulunduğu süreçte, işe bağlı tekrarlanan nedenlerden meydana gelen geçici veya sürekli hastalık, bedensel veya ruhsal özürlülük durumlarıdır (İlman, 2015: s. 21).

Meslek hastalığı, 5510 sayılı Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu'nun 14/1. maddesi ile 6331 sayılı İş Sağlığı ve Güvenliği Kanunu'nun 3/1-l. maddesinde tanımlanmıştır.

5510 sayılı Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu'nun 14/1. maddesi uyarınca “*Meslek hastalığı, sigortalının çalıştığı veya yaptığı işin niteliğinden dolayı tekrarlanan bir sebeple veya işin yürütüm şartları yüzünden uğradığı geçici veya sürekli hastalık, bedensel veya ruhsal engellilik halleridir.*”

6331 sayılı İş Sağlığı ve Güvenliği Kanunu'nun 3/1-l. maddesine göre ise, “*Meslek hastalığı: Mesleki risklere maruziyet sonucu ortaya çıkan hastalığı*” ifade eder.

Öğreti ve Yargıtay tarafınca genel kabul gören tanım uyarınca iş kazası, çalışanın, işverenin hakimiyeti altında bulunduğu sırada, onun için ifa ettiği işten veya iş dolayısıyla dış bir sebeple aniden meydana gelen bir olay sonucu uğramış olduğu kazadır. Bu bağlamda iş kazası ile meslek hastalığı farkı iş kazasının daha ziyade aniden meydana gelen bir olaydan tahakkuk etmesi hususunun önemli olmasıdır. Bu nedenden ötürü, meydana gelen olay zaman içerisinde çalışandaki ruhsal ve bedensel bozukluğu arttırmakta ise iş kazası değil, meslek hastalığı bahis konusu olacaktır. Meslek hastalığı, sigortalının çalıştığı veya yaptığı işin niteliğinden dolayı tekrarlanan bir sebeple veya işin yürütüm şartları yüzünden uğradığı geçici veya sürekli hastalık, bedensel veya ruhsal engellilik halleri olarak tanımlanmaktadır. Meslek hastalıklarını, diğer hastalıklardan ayıran en mühim özellik “üretim” kaynaklı oluşudur.

Meslek hastalıklarının genel özellikleri şunlardır; “*kendine özgü bir klinik tablo, iyi belirlenmiş hastalık etkeni, hastalık etkeni veya metabolitin biyolojik ortamda bulunuşu, hastalığın deneysel olarak oluşturulabilmesi, hastalığın o meslekte çalışanlarda insidansının (görülme sıklığı) yüksek olmasıdır*” (İlman, 2015: s. 23).

D. MESLEK HASTALIĞININ UNSURLARI

Bir sigortalının 5510 sayılı Kanun kapsamında iş kazası ve meslek hastalığına ilişkin hükümlerden yararlanabilmesi için öncelikle kanun kapsamında sigortalı kabul edilmesi gerekmektedir, aksi halde yakalandığı hastalık meslek hastalığı olarak kabul görmeyecektir.

Sigortalının bedensel veya ruhsal engellilik durumuna düşmesi, geçici veya sürekli hastalık, bedensel veya ruhsal engellilik halinin sigortalının çalıştığı veya yaptığı işin sonucu olması kanun kapsamında öngörülen diğer şartlardır.

İş kazasının mesleki nitelikte bulunmayan olayları da içermesine karşın, meslek hastalığı tamamen yürütülen işle ilgili olaylardan meydana gelmektedir. Buna ek olarak iş kazası ani bir hareket sonucu oluşurken, meslek hastalığı zamanla ve tekrarlanan eylemlerle gerçekleşir (Bulut, 2020: s. 38).

E. İŞVERENİN İŞ KAZASINDAN DOĞAN HUKUKİ SORUMLULUĞUNUN KOŞULLARI

1. GENEL OLARAK SORUMLULUK KAVRAMI

Hukuki sorumluluk sözleşmeye dayalı sorumluluk ve sözleşme dışı sorumluluk olmak üzere 2 kolda incelenmekte ve sözleşme dışı sorumluluk ise kusurlu sorumluluk ve kusursuz sorumluluk olarak ikiye ayrılmaktadır. Sorumluluk hukukunda aslolan kusurlu sorumluluk olup sorumluluğun doğabilmesi için her şeyden önce kusurlu bir fiilin bulunması şarttır (Görgöz, 2019: s. 20).

Kusursuz sorumluluk yalnızca hukuki bir düzenlemenin olduğu hallerde bahis konusu olabilir. Kusursuz sorumlulukta olayla zarar arasında sebep-sonuç ilişkisi bulunması şarttır. Bu haldeki sorumlulukta olayın neticesinden sorumlu olunması için kusurlu olunması şartı yoktur. Tazminat hukuku zenginleşmeye sebebiyet veremez. Tazminat uğranılan zararın karşılığı olmalıdır, her zaman zarara eşit olmasa da, zararın üst sınırı olması şarttır. Esasen tazminat her zaman zararı tam tazmin etmeyebilir. Zararın meydana gelmesinde hâkim bilhassa kusurun ağırlığını, durumun gereğini, zarar görenin rızasını, zarar görenin zararın oluşumunda veya artmasındaki etkisini, tarafların sosyal ve ekonomik durumunu değerlendirerek tazminat miktarında indirime gidilebilir ya da tazminat bütünü kaldırılabilir (Görgöz, 2019: s. 20).

İş kazası hâlinde meydana gelen zarardan dolayı işverenin sorumluluğu kusura dayalı ve sözleşmesel sorumluluktur. Sözleşmesel sorumluluk iş akdinin kurulmasıyla başlar. Sorumluluğun niteliği sözleşmesel sorumluluk olduğu için zarar gören işçi işverenin kusurunu ispat etmekle yükümlü olmayıp işveren zararın oluşumunda kusursuzluğunu ispatla yükümlü olacaktır (Görgöz, 2019: s. 20).

Türk Borçlar Kanunu'nun 71. maddesine göre önemli ölçüde tehlike arzeden bir işletmenin faaliyetinden zarar doğduğu takdirde bu zarardan işletme sahibi ve varsa işleten müteselsilen sorumludur.

Ancak bir işletmenin mahiyeti veya faaliyette kullanılan malzeme, araçlar ya da güçler göz önünde tutulduğunda bu işlerde uzman bir kişiden beklenen tüm özenin gösterilmesi durumunda bile sıkça veya ağır zararlar doğurmaya elverişli olduğu sonucuna varılırsa, bunun önemli ölçüde tehlike arz eden bir işletme olduğu kabul edilir. Özellikle herhangi bir kanunda benzeri tehlikeler arz eden işletmeler için özel bir tehlike sorumluluğu öngörülmüşse bu işletmede önemli ölçüde tehlike arzeden işletme sayılır. Önemli ölçüde tehlike arz eden

işletmelerin faaliyetlerinin neticesinde meydana gelen zararlarda kusursuz sorumluluk ilkesi geçerlidir (Görgöz, 2019: s. 20).

Tehlike sorumluluğunun genel hükümlerde düzenlenmesi neticesinde iş kazası ve meslek hastalıklarından doğan sorumluluğun niteliği, TBK m.71’de belirtilen türden “önemli ölçüde tehlike arzeden işletmelerin” işverenleri için tehlike temelinde kusursuz sorumluluk haline gelmiştir (Sevimli, 2023: s. 107-147).

2. İŞVERENİN İŞÇİYİ KORUMA VE GÖZETME BORCU

Mevzuat iş sağlığı ve güvenliği bağlamında (Yargıtay 9. HD. 11.09.2014 gün, 2014/11104 Esas ve 2014/26334 Karar sayılı ilamına göre “...Davacıya verilen uyarılara rağmen iş güvenliği açısından kendisine verilen koruyucu malzemeleri takmaması nedeniyle kendi sağlığını tehlikeye attığı gibi, işvereni de risk altına soktuğu, uyarılara rağmen davacının aynı davranışı tekrarlaması üzerine 4857 sayılı İş Kanunu 17. ve 18.maddeleri uyarınca yapılan feshin geçerli olduğunun kabulü gerekirken yazılı şekilde karar verilmesi hatalıdır...”, Şua, İbrahim Halil, İşçiyi Haksız Bulan Yargıtay Kararları, Ankara, 1. B., 2023, s. 129) işverene bazı yükümlülükler getirmektedir. İşveren ile çalışan arasında iş sözleşmesine dayalı olarak kurulan hukuki ilişki sorumluluklar ve borçlar doğurmaktadır. İşçi, işverene karşı sadakat borcunu yerine getirirken, işveren de çalışanlarının iş sağlığı ve güvenliğini sağlamalı, çalışanı korumalı ve gözetmelidir. İşçinin ruh ve vücut bütünlüğünün bozulmaması için işverenin çalışanı gözetmesi şarttır.

3. İŞVERENİN İŞ SAĞLIĞI VE GÜVENLİĞİ ÖNLEMLERİNİ ALMA BORCUNUN HUKUKİ DAYANAĞI

İşverenin işçiyi gözetme borcundan doğan bu yükümlülüğü mevzuatta açıkça yer almıştır. Anayasada işçi sağlığı ve iş güvenliği önlemlerinin alınmasına ilişkin direkt bir düzenleme olmasa da Anayasanın 49/2. maddesinde düzenlenen “devlet çalışanların hayat seviyesini yükseltmek, çalışma hayatını geliştirmek için çalışanları ve işsizleri korumak, çalışmayı desteklemek, işsizliği önlemeye elverişli ekonomik bir ortam yaratmak ve çalışma barışını sağlamak için gerekli tedbirleri alır” hükmü, 50 inci maddesinde düzenlenen “kimse yaşına, cinsiyetine ve gücüne uymayan işlerde çalıştırılmaz” hükmü ve 56. maddesinde düzenlenen herkes sağlıklı ve dengeli bir çevrede yaşama hakkına sahiptir” hükmünün işverene işçi sağlığı ve iş güvenliği önlemlerini alma yükümlülüğü yüklediği nettir (Taşkın, İrfan, 2022: s. 56).

İşverenin sorumluluğuna dair Türkiye’nin taraf olduğu uluslararası kaynaklardan en önemlisi Avrupa İnsan Hakları Sözleşmesi, ILO’nun çalışmaları neticesinde ortaya çıkan uluslararası sözleşmeler, Avrupa Sosyal Şartı, Avrupa Birliği Direktifleri ve İnsan Hakları Evrensel Bildirgesi’dir. (Kayacan, 2021: s. 60).

İşverenin 6098 s. TBK m. 417 gereğince hizmet akdinden doğan yükümlülükleri arasında sayılan ve hukuki sorumluluğun en temel dayanaklarından biri olan, işçinin kişiliğini “koruma ve gözetme borcu” bulunmaktadır. (Kayacan, 2021: s. 61).

6331 sayılı İş Sağlığı ve Güvenliği Kanunu işverenlerin iş kazası ve meslek hastalığına dair almaları gereken önlemler bakımından en kapsamlı düzenlemeleri içermektedir. 6331 sayılı Kanun ile ilgili sorumluluk yüklenen kişiler kamu hem özel işveren ve işveren vekilleridir (Kayacan, 2021: s. 69).

5510 sayılı Sosyal Sigortalar ve Genel Sağlık Sigortası Kanunu'nda, iş kazası ve meslek hastalığının sosyal güvenlik hukukundaki tanımının yapılmasının ardından Kanun'un 13 ve 14. maddelerinde işverenlere bu olguların bildirim yükümlülüğü getirilmiştir (Kayacan, 2021: s. 76).

III. İŞ KAZASI VE MESLEK HASTALIĞI NEDENİYLE AÇILACAK DAVALAR

İş kazasının meydana gelmesiyle birlikte, çalışanın yaralanması, ölümü hallerinde ilgili kolluk birimi ve Cumhuriyet Savcısı gerekli soruşturmayı yaparak ilgililer aleyhine ceza davası açacaktır. Buna ek olarak çalışan veya mirasçıları (çalışanın ölümü halinde) tarafından da hukuk davaları açılabilir, tazminata yönelik talepler istenebilecektir. Görevli ve yetkili mahkemede açılacak maddi tazminat davası ve manevi tazminat davası gibi davalar, iş kazası temelli olacak ve iş kazası neticesinde çalışanın uğramış olduğu maddi manevi zararı tazmin etme hedefi taşıyacaktır (Kaplan, 2023: s. 720).

Ayrıca iş kazası halinde Sosyal Güvenlik Kurumu tarafından açılacak rücu davaları da söz konusudur. Bu davalarda kusurun işverene ait olması veya üçüncü bir kişiye veya çalışana ait olması hallerinde Kurum, ödemiş olduğu bedeller için rücu edebilecek ve bunu dava konusu yapabilecektir. Esasen iş kazası neticesinde açılacak davalar ceza soruşturması ve ceza davası, maddi ve manevi tazminat davası, destekten yoksun kalma tazminat davası, Sosyal Güvenlik Kurumu tarafından açılacak rücu davalarıdır.

Bir işverenin, işletmesinde gerekli iş güvenliği tedbirlerini almamasından ötürü çalışanın yaralanmasına, sakat kalmasına ya da ölmesine sebebiyet vermesi halinde iş kazası ya da meslek hastalığı neticesinde bedence ya da ruhça arızaya uğrayan sigortalının kendisi ya da sigortalının ölümü durumu gerçekleştiğinde eşi ve çocuklarınca iş mahkemelerine işveren aleyhine destekten yoksun kalma tazminatı ödenmesini mümkün kılmak için dava açılabilmesi mümkündür (Kurt, 2015: s.223).

A. MANEVİ TAZMİNAT DAVASI

1. GENEL OLARAK MANEVİ TAZMİNAT DAVASI

Zarar, mal varlığında veya şahıs varlığında zarar görenin iradesi olmaksızın meydana gelen azalmadır. Zararlandırıcı fiil nihayetinde kişinin mal varlığında meydana gelen azalma maddi zarar, şahıs varlığında oluşan azalma ise manevi zararları meydana getirir. Yani şöyle ifade edilebilir ki, manevi zarar zararlandırıcı olay sonucunda kişinin duyduğu üzüntü, keder, elem ve acı hisleridir (Ruhi/Ruhi, 2022: s. 126).

Manevi tazminatla telafi edilmek istenen “manevi zarar”, cismani zarar neticesi meydana gelen bedensel ve ruhsal ızdıraplar, eylem ve acılardır. Mesela, iş kazası veya meslek hastalığına

uğrayan işçinin saçının dökülmesi, gözünü, kaybetmesine dayanarak, yüzün doğal ifade ve güzelliğini yitirmesi, çirkinleşmesi durumunda hissettiği üzüntü tazmin edilmesi lazım gelen manevi zararı kastetmektedir. Ölüm durumunda manevi tazminat talebi, ölümün, ölenin yakınlarında oluşturduğu üzüntüdür. Bu halde zarar doğrudan zarar değil, yansıma zarar olup, tazmini de destekten yoksun kalma halinde şartların varlığına tabidir (Cengiz, 2018: s. 138).

İş kazasına uğrayan ya da meslek hastalığına tutulan işçi maddi tazminat hariç, TBK m. 56 anlamında manevi tazminat da talep edebilir. İş Kanunu ve diğer iş mevzuatında bu hususta bir hüküm olmasa da Medeni Kanun'da manevi tazminat çeşitleri yer almıştır (Örnek olarak MK m. 25). TBK m. 58 de ise kişilik hakkının zedelenmesinden zarar görenin manevi tazminat talep hakkı düzenlenmiştir (Kaplan, 2023: s. 332).

TBK m. 56'da manevi tazminat talebi için kusurdan söz edilmemiş, fakat olayın özelliklerinin göz önünde tutulacağı öngörülmüştür. Bu halde, hâkim her olayın özelliğine göre zarar görene uygun bir miktar paranın manevi tazminat olarak ödenmesine karar verebilecektir. Olayın özellikleri arasında işverenin kusuru da bulunabilecektir. Fakat, kusurun bulunmaması manevi tazminata hükmetmemek için engel değildir (Kaplan, 2023: s. 334).

TBK m. 56'da kusurdan söz edilmemiş olmasına rağmen, kusur sorumluluğunun genel şartlar TBK m 49'da öngörülmüş olup, kusur, kusur, sorumluluğun bir şartıdır. Aynı ilke evleviyetle TBK m. 56 için de geçerlidir (Eren, 2012: s.791; Kaplan, s. 334)

İşverenin manevi tazminattan sorumlu tutulabilmesi için haksız fiil ya da sözleşmesel sorumluluğa dayanılmalıdır. Bu hallerdeki genel koşulların varlığı zorunludur. Uygun illiyet bağının varlığı da şarttır (Solak, 2020: s. 112,113).

Ayrıca manevi tazminata hükmedilirken işçide sürekli iş göremezlik halinin oluşması da şart değildir (Solak, 2020: s. 111). Yargıtay'a göre işçi sürekli iş göremez hale gelirse de duyacağı acı, elem, ıstırap ve moral bozukluğunun bedeli olarak manevi tazminata hak kazanabilecektir. Bu hususlar da bedensel zarar kapsamında değerlendirilebilecektir (Y. 21. HD. E. 7367, K. 1015, T. 03.02.2016: Yargı Kararına Ulaşılan Kaynak; Solak, 2020: s. 111).

Manevi zararın niteliğine dair iki temel görüş savunulmuştur, bunlara ek olarak karma bir üçüncü görüş mevcuttur. Sübjektif görüş, kişilik hakkı zedelenenin fiziki ve manevi acı duyması, ruhsal dengesinin bozulması, yaşama sevincini yitirmesi halinde, manevi zarara uğrandığını kabul etmektedir. Bu halde, kişilik hakkının ihlal edilmesi (zedeleme aşaması) ile bu ihlal sonrası doğan olumsuz sonuç yani zedelenme aşaması birbirinden ayrılmaktadır. Esasen bu halde, zedelenme birinci aşama, zedelenme sonucu oluşan manevi zarar ikinci aşamadır. İhlal neticesinde duygusal zarar oluşmuş olmalıdır. Bu görüş şu sebeplerle eleştirilmiştir, çünkü kişinin manevi zarara uğramış olduğu net ve kesin bir biçimde tespit edilemez (Antalya, 2016: s. 221-250).

Objektif görüş ise, manevi tazminatın amacını giderim olarak kabul eden görüş olup tazminatın niteliği hususunda objektif görüşü benimsemektedir. Bu görüşü savunan yazarlar, manevi zararı, haksız fiil neticesinde kişisel değerleri ihlal edilen zarar görenin, kişi varlığında oluşan

objektif eksilme ya da kayıp olarak tanımlamaktadır. Bu görüşe göre, manevi zarar kişiden bağımsız olarak değerlendirilmeli, zarar görenin kişilik değerinin zedelenmesini bilmesi gerekli değildir. Hatta kişilik değerlerine saldırının etkisinin ne olduğu önemsizdir. Manevi tazminat taleplerinde bu sebeple özel olarak zararın doğduğunun kanıtlanmasına dahi gerek duyulmaz (Antalya, 2016: s. 228, 229).

Arpacı hem objektif hem de subjektif teorinin birlikte ele alınması gerektiğini savunur. Tercier, kişilikte objektif olarak gerçekleşen azalmanın, kişinin ruhsal dünyasına yansması ve bu yansıma sebebiyle ruhsal huzurunu kaybetmesi, acı ve elem çekmesi gerektiğini ifade etmektedir. Yazara göre, objektif olarak gerçekleşen duygusal azalmanın gerçekleştiğini zarar gören manevi olarak bilincine ulaşmalıdır. Objektif görüşü savunan Eren, bu görüşün olumsuz sonuçlarını yumuşatmak için, haklı olarak, kişilik haklarının ihlali sonucu mağdurun, ayrıca acı, elem ve üzüntü duymuş ve bu duygusal zararların ruhsal bütünlüğü içinde bir eksiklik yaratacak ölçüde ise manevi zarar olarak kabulü gerektiğini bahis konusu yapmıştır (Antalya, 2016: s. 229, 230).

a. MANEVİ TAZMİNAT DAVASININ ŞARTLARI

Manevi tazminat, Türk Borçlar Kanunu'nun 56. maddesinde yer almaktadır. Bu hüküm uyarınca "Hâkim bir kimsenin bedensel bütünlüğünün zedelenmesi halinde olayın özelliklerini göz önünde tutarak, zarar görene uygun bir miktar paranın manevi tazminat olarak ödenmesine karar verebilir. Ağır bedensel zarar ya da ölüm hâlinde zarar görenin ya da ölenin yakınlarına da manevi tazminat olarak uygun bir miktar paranın ödenmesine karar verilebilir. Bu halde kişinin manevi tazminat davası açabilmesi için iş kazasına sebep olan zararlandırıcı olay sonucunda duymuş olduğu elem, keder ve üzüntü nedeniyle manevi zarara uğramış olması gerekir (Ruhi/Canan Ruhi, 2022: s. 126, s. 138).

Sigortalının ölümün dışındaki bedensel zararlarda yakınlarının manevi tazminat talep edebilmesinin ön koşulu uğranılan zararın ağır bedensel zarar olmasıdır. Yargıtay kazalı sigortalının sürekli iş göremezlik oranının %9,3 olarak tespit edildiği iş kazası sebebiyle olayın özelliğine, yaralanmanın niteliğine, meslekte kazanma gücü kayıp oranına ve sigortalının yaralanmasının ağır bedensel zarar teşkil etmemesi nedeniyle davacı eş ve çocukların manevi tazminat taleplerinin reddine karar vermiştir (Y. 21. HD. E. 19227, K. 1232, T. 21.02.2017; Solak, 2020: s.111).

TBK m. 49'a göre kusurlu ve hukuka aykırı bir fiille başkasına zarar veren, bu zararı karşılamak yükümlülüğündedir. Hukuken izin verilmeyen bir davranışta bulunmak hukuka aykırılıktır (Selçok: 2022, s. 57).

b. MANEVİ TAZMİNATIN HESAPLANMASI

Manevi tazminat hesaplanırken zararın ağırlığı, kusur, iş göremezlik oranı, tarafların sosyal ve ekonomik durumu dikkate alınır.

Maddi tazminata dair hükümler kıyas yoluyla manevi tazminatta da uygulama alanı bulur. Fakat manevi zarar maddi zarardan değişik bir biçimde mal varlığında değil kişi varlığı değerlerinde

meydana gelen bir eksilme olduğundan manevi tazminatın miktarını tayinde hâkimin takdiri büyük önem arz eder. TBK m. 56'da yer aldığı üzere hâkim uygun bir miktar paranın manevi tazminat olarak ödenmesine karar verebilir (Cengiz, 2028: s. 138).

Maddi tazminat davalarında olduğu üzere bir hesaplama manevi tazminat davalarında bahis konusu olmaz. Çünkü manevi tazminatın konusu olan zarar, soyut ve rakamsal olarak ölçülmesi mümkün olmayan değerlerdeki eksilmelerden oluşur. Yani manevi tazminatın hesaplanmasında Yargıtay'ın belirlediği özel koşullar dikkate alınacaktır (Kayacan, 2021: s. 116).

Hâkim manevi tazminatı takdir ederken daha önceden değinilen İçtihadı Birleştirme Kararı doğrultusunda paranın satın alma gücü, dava taraflarının kusurları, olayın ağırlığı, davacının sürekli iş göremezlik oranı, zarara uğrayan işçinin yaşı, olay tarihi gibi durumları göz önünde tutacak ve bir yandan da manevi duyguları tatmin etmeye yeterli olmak yanında caydırıcı olabilecek kadar yüksek bir oranda miktara karar verecektir (Süzek, 2016, s. 491; Y. 21. HD., E. 1602, K. 4319, T. 24.03.2009; Kayacan, 2021: s. 116). Öyle Ki Yargıtay'ın Soma'daki maden faciası olayına ilişkin verdiği bir kararında kullandığı ifadelerle manevi tazminatın caydırıcılık unsuru olduğunu işaret etmektedir. “Aslolan insan yaşamıdır ve bu yaşamın yitirilmesinin yakınlarında açtığı derin ızdırabı hiçbir değer telafi etmesi olanaklı değildir. Burada amaçlanan sadece bir nebze olsun rahatlama duygusu vermek; öte yandan da zarar veren yanı da dikkat ve özen göstermek konusunda etkileyecek bir yaptırımla, caydırıcı olabilmektir. Yeraltı maden ocağında meydana gelen yargılamaya konu iş kazasının 301 kişinin ölümüne ve 486 kişinin yaralanmasına yol açtığı, son yüzyılın en büyük iş kazalarından birisi olan bu kazasının yalnızca iş kazasına uğrayanlarda veya kazalılarının yakınlarında değil toplumun tamamında derin bir üzüntü meydana getirdiği, bu kapsamda Soma maden kazası gibi toplumu derinden etkileyen facialarda hüküm altına alınan manevi tazminat tutarları değerlendirilirken manevi tazminatın caydırıcılık unsurunun öne çıkması gerektiği kabul edilmelidir (Y. 21. HD., E. 15802, K. 3195, T. 18.04.2017; Kayacan, 2021: s. 116).”

Görüldüğü üzere uygulamada manevi tazminatın adalete uygun olması gerektiği, zarar gören de manevi huzur sağlayacak tazminata benzer bir fonksiyonu olduğu, maddi zararı karşılamayı amaçladığı, zenginleşme aracı olarak asla görülemeyeceği, asla bir ceza olmadığı fakat günümüzde caydırıcılık fonksiyonunun da bulunduğu kabul gören bir gerçektir (Solak, 2020: s.114).

Manevi tazminat hususunda ilk derece mahkemesinin kararları kimi zaman Yargıtay'ca uygun bulunmamakta bazen yüksek bazen de az bulunmaktadır.

Öyleki, “Gerek mülga BK'nun 47 ve gerekse yürürlükteki 6098 sayılı TBK'nun 56. maddesinde hâkimin bir kimsenin bedensel bütünlüğünün zedelenmesi durumunda, olayın özelliklerini göz önünde tutarak, zarar görene manevi tazminat olarak uygun bir miktar paranın ödenmesine karar verilebileceği öngörülmüştür. Hâkimin manevi zarar adı ile zarar görene verilmesine karar vereceği para tutarı adalete uygun olmalıdır. Hükmedilecek bu para, zarara uğrayan da manevi huzuru doğurmayı gerçekleştirecek tazminata benzer bir fonksiyonu olan özgün bir nitelik taşır. Bir ceza olmadığı gibi mamelek hukukuna ilişkin zararın karşılanmasını da amaç edinmemiştir.

O halde, bu tazminatın sınırı onun amacına göre belirlenmelidir. Takdir edilecek miktar, mevcut halde elde edilmek istenilen tatmin duygusunun etkisine ulaşmak için gerekli olan kadar olmalıdır. 26.06.1966 günlü ve 7/7 sayılı Yargıtay İçtihadı Birleştirme Kararı'nın gerekçesinde takdir olunduğu üzere manevi tazminatın tutarını etkileyecek özel hal ve şartlar da açıkça gösterilmiştir. Bunlar her olaya göre değişebileceğinden hâkim bu konuda takdir hakkını kullanırken ona etkili olan nedenleri de karar yerinde objektif ölçülere göre isabetli bir biçimde göstermelidir. Manevi tazminatın tutarını belirleme görevi hâkimin takdirine bırakılmış ise de hükmedilen tutarın uğranılan manevi zararlar orantılı, duyulan üzüntüyü hafifletici olması gerekir. Hakimin bu takdir hakkını kullanırken, ülkenin ekonomik koşulları tarafların sosyal ve ekonomik durumları, paranın satın alma gücü, tarafların kusur durumu, olayın ağırlığı, olay tarihi gibi özellikleri göz önünde tutması, bunun yanında olayın işverenin işçi sağlığı ve güvenliği önlemlerini yeterince alınmamasından kaynaklandığı da gözetilerek gelişen hukuktaki yaklaşıma da uygun olarak tatmin duygusu yanında caydırıcılık uyandıran oranda manevi tazminat takdir edilmesi gerektiği açıkça ortadadır (Y. 21. HD., E. 876, K. 2751, T. 09.04.2019).”

Öğretide artık maddi tazminatta kullanılan bir ölçüt olan tazminatın zenginleşme aracı olamayacağı anlayışının benimsenmemesi gerektiği, manevi tazminatın caydırıcı olması gerektiği, ayrıca dosyayı ve delilleri daha yakından görme imkânı olan yerel mahkemenin kararının bozulmaması gerektiği anlayışı benimsenmiştir (Solak, 2020: s.116).

c. MANEVİ TAZMİNATIN BÖLÜNMEZLİĞİ İLKESİ

Manevi tazminat alacağı ile ilgili olarak kısmi dava açılması, kalan bölümün ek dava konusu yapılması veya kısmi davada istenilen manevi tazminatın ıslah yoluyla artırılmasının mümkün olup olmadığı doktrinde tartışmalıdır (Güneren, 2019: s. 145).

Bir görüşe göre manevi tazminat yönünden fazlaya ilişkin haklar saklı tutularak kısmi dava açılmasına ve alacağın kalan kısmının ikinci davayla istenilmesine bir engel yoktur (Karahasan: 2001, s. 70-71; Karataş, 2019: s. 145). Başka bir görüşe göre ise manevi tazminat davası kısmi olarak açılmaz. Kısmi dava talep konusunun niteliği itibarıyla bölünebilir olduğu durumlarda, yalnızca bir kısmının dava yoluyla ileri sürülmesidir. (HMK m. 109/1) Ek dava konusu olması mümkün değildir. Islah yoluyla artırılması mümkün değildir (HMK m. 176 vd). Bunun sebebi manevi tazminatın bir bütün olmasıdır, duyulan acı ve üzüntü karşı tarafa dava yoluyla bildirilip daha sonra arttırılması ya da yeni bir dava açılarak istenilmesi olası değildir (Kuru, 2001: s. 1528; Karataş, 2019: s. 145).

Keza Yargıtay da manevi tazminatın bölünmesinin uygun olmadığı görüşündedir. Konuya dair karar da bu husustan şöyle bahsedilmiştir, “Manevi tazminat davaları niteliği gereği bölünemez, yani davacının manevi zararını kısmi dava yoluyla talep etme imkânı yoktur. Davacının zaten derdest olan ilk manevi tazminat davası akabinde ikinci kez manevi tazminat istemesinde korumaya değer bir menfaatin bulunduğundan söz etme imkânı da bulunmamaktadır. Bu değerlendirmeden nihai olarak, mahkemece davacının ikinci kez açtığı manevi tazminat davası

bakımından hukuki yarar yokluğu nedeniyle usulden ret kararı verilmesi gerekir (Y. 21. HD., E. 5538, K. 18817, T. 20.10.2015, Legalbank, s. 145).

Yargıtay “Davalı tarafından bir kısmı maddi tazminata ve bir kısmı manevi tazminata ilişkin olmak üzere ödeme yapılması ve ibraname alınması durumunda, her ne kadar maddi tazminat bakımından yapılan hesaplamayla daha önceki ödeme arasında açık oransızlığın bulunması durumunda maddi tazminata ilişkin ödemeyi kısmi ödemeye dair makbuz kabul etmesine rağmen, kaza sebebiyle duyulan acı ve üzüntünün zamana yayılması suretiyle manevi tazminatın bölünemeyeceği ve yeniden dava konusu yapılarak miktarının artırılmayacağı, bir defada istenilmesinin zorunlu olduğu gerekçeleriyle manevi tazminat talebinin reddine karar vermiştir (Y. 21. HD., E. 24528, K. 8276, T. 29.05.2008; Solak, 2020: s. 116).

d. TBK M. 58’E GÖRE MANEVİ TAZMİNAT DAVASI

TBK m. 58’e göre “Kişilik haklarının zedelenmesinden zarar gören, uğradığı manevi tazminata karşılık manevi tazminat başlığı altında bir miktar para ödenmesini talep edebilir.

Manevi tazminata dair TBK m. 58 genel hükümlere göre, işçi ancak hayatı, fiziki ve ruhsal bütünlüğü, şeref ve haysiyeti, özgürlüğü, gizli ve özel hayat ve mesleki itibarı gibi kişilik hakları işveren tarafından haksız olarak tecavüze uğrarsa, manevi tazminat olarak bir miktar para ödenmesi amacıyla dava açabilir (Kaplan, 2023: s. 337).

TBK m. 58’in kapsamına, TBK m. 56’da düzenlenen ölüm ve beden bütünlüğünün ihlalinden doğan manevi zararları hariç kalan manevi zararlar dahil olur (Kaplan, 2023: s. 337).

Manevi tazminat davasının şartları, öncelikle kişilik haklarının ihlali fiilinden manevi bir zararın doğması şarttır. Buna ek olarak, manevi zararın hukuka aykırı bir fiil sonucunda oluşması ve zarar ile kusur arasında bir illiyet bağının olması gerekir. Haksız fiilin genel şartları TBK m. 49’da düzenlenmiş ve bu şartlar arasında kusur şartı da belirlenmiştir. Madde 58, madde 49’un devamı olduğundan kusur şartına yer verilmemiştir. Fakat bu düzenleme zarar verenin manevi zarardan sorumluluğu için kusur aranmayacağı biçiminde yorumlanmamalıdır. Kusursuz sorumlulukta kusur şartı aranmadığı için, zarar veren kusurlu olmasa dahi manevi zarardan sorumludur (Eren, s. 795; Kaplan, 2023: s. 337).

Yargıtay Hukuk Genel Kurulu’nun 2005/227 Esas, 2005/243 Karar Sayılı, 06.04.2005 Tarihli İlamında ve yine Yargıtay 4. Hukuk Dairesi’nin 2015/6784 Esas, 2015/8465 Karar Sayılı, 24.06.2015 Tarihli İlamında açıkça (Legalbank):

“818 sayılı Borçlar Kanunu’nun 49. (6098 sayılı TBK.m.58) maddesinde hâkimin tazminatın ödenmesi yerine diğer bir yaptırıma veya ilave bir yaptırımı öngören bir karar verebileceği gibi, saldırıyı kınayan bir hüküm de kurabileceği öngörülmüştür.” ifadeleri yer almaktadır.

Yargıtay 4. Hukuk Dairesi’nin 2004/16307 Esas, 2005/12787 Karar sayılı ve 28.12.2005 tarihli ilamında da (Legalbank);

“...davacı, davalının hukuka aykırı olarak yaptığı yayın nedeniyle kişilik haklarının saldırıya uğradığını ileri sürmek suretiyle manevi tazminata ve karar özetinin de yayınına karar

verilmesini istemiştir. Mahkemece istem kısmen kabul edilmiştir. Borçlar Kanunu'nun 49. maddesinde (Yeni Borçlar Kanunu 58.maddesinde) hâkimin tazminatın ödenmesi yerine diğer bir yaptırıma veya ilave bir yaptırımı öngören bir karar verebileceği gibi, saldırıyı kınayan bir hüküm de kurabileceği öngörülmüştür. Medeni Kanun'un 4. maddesinde ise yasanın takdir hakkı tanıdığı durumlarda hâkimin somut olaydaki olguları gözeterek hak ve adalete göre karar vereceği düzenlenmiştir." şeklindeki aynı ifadelere yer verilmiştir.

Yargıtay 4. Hukuk Dairesi'nin 2015/13053 Esas, 2017/4778 Karar sayılı ve 19.09.2017 tarihli ilamında da (Legalbank);

"Türk Borçlar Kanunu'nun 58. maddesinde hâkim manevi tazminatın ödenmesi yerine diğer bir giderim biçimi kararlaştırabilir veya bu tazminata ekleyebilir; özellikle saldırıyı kınayan bir karar verebilir ve bu kararın yayımlanmasına hükmedebilir. Medeni Kanun'un 4. maddesinde ise; kanunun takdir hakkı tanıdığı durumlarda hâkimin somut olaydaki olguları gözeterek hak ve adalete göre karar vereceği düzenlenmiştir." biçimindedir.

Yargıtay 4. Hukuk Dairesi'nin 2014/4393 Esas, 2015/182 Karar Sayılı, 14.01.2015 tarihli ilamında ve yine Yargıtay 4. Hukuk Dairesi'nin 2015/3224 Esas, 2015/5412 Karar sayılı, 30.04.2015 tarihli ilamında ise;

"Zararın tazmin yöntemleri arasında manevi tazminatın yanı sıra, "haksız saldırının kınanması" veya "kınama kararıyla birlikte bu kararın basın yoluyla ilan edilmesi" yöntemlerine başvurulabileceğini, ancak bu yöntemlerin sınırlı olmadığını ve hâkimin takdirine bırakıldığını, bu bağlamda, "özür beyanının", "isnadın geri alınması" vb. bir tazmin şeklinin benimsenmesinin de düşünülebileceği" ifade edilmiştir (Legalbank).

e. İŞ KAZASI VE MESLEK HASTALIĞINDA MANEVİ TAZMİNAT DAVASININ TARAFLARI

Sigortalının ölümü halinde kimlerin manevi tazminat alıp alamayacağı her olayın kendisine göre değerlendirilecektir. Ölüm durumunda manevi tazminat talebinde bulunabilecek yakınları ifadesi, ölen işçinin kan ya da sıhri hısımlarıyla sınırlanmamıştır, işçinin yakınları tabirine onunla duygusal yakınlığı olanlarda dahil edilmiştir. Ölümün meydana gelmesinden derin bir elem ve üzüntü duyabilecek biçimde hayatta iken bağı bulunan kişiler, manevi tazminat talebinde bulunabilecek yakınlarıdır. Bu noktada önemli olan aile hukuku bağlamında değil duygusal yakınlıktır (Y.4. HD., E. 10302, K. 8845, T. 18.10.1973; Cengiz, 2018: s. 137, 138). Ölenin eşi, çocukları ve anne, babasının manevi zarara uğradıkları karine olarak kabul görse de sağ kalan eşle uzun zamandır ayrı yaşanması ve aralarındaki ilişki ve duygusal bağın ortadan kaybolması hâlinde manevi tazminat istenemeyeceği, buna rağmen aralarında nikah olmaksızın birlikte yaşayan kişilerin ise diğer bazı şartların varlığı hâlinde tazminat isteyebileceği görülmüştür (Süzek, age., s.431, Solak, 2020: s. 111).

Yargıtay bir kararında davacılar dede ve babaanne ile sigortalı arasında gerçekleşmiş eylemli bir bağın varlığı kanıtlanamadığından manevi tazminatın reddine karar vermiştir (Y. 21. HD., E. 4601, K. 189, T. 03.10.2017, Solak, 2020: s. 111).

İş kazasına maruz kalan işçinin ve yakınlarının ruhsal bütünlüklerinin ihlali nedeniyle uğramış oldukları manevi zararın tazmini amacıyla SGK tarafından herhangi bir ödeme yapılmayacaktır. Dolayısıyla manevi zararın tazmini talebi doğrudan işverene yöneltilmektedir. Maddi tazminat ve destekten yoksun kalma tazminatındaki üzere, manevi tazminata ilişkin özel bir düzenleme 4857 sayılı İş Kanunu'nda ve 6331 sayılı İş Sağlığı ve Güvenliği Kanununda olmaması sebebi neticesinde 818 sayılı Borçlar Kanunu'nun 47. maddesine dayanılarak yapılan manevi tazminat talepleri, 6098 sayılı Türk Borçlar Kanunu'nun 56. maddesine dayanılarak yapılması yolu sürecelecektir (Baycık, 2013: s. 152).

818 sayılı Borçlar Kanunu zamanında kazaya uğrayan işçi ya da işçinin ölümü durumunda ruhsal bütünlüğü tehlikeye uğrayan yakınlarınca manevi tazminat talep edilebileceği oybirliğiyle kabul edilirken, iş kazası ya da meslek hastalığına maruz kalan işçinin ölmemesi durumunda yakınlarının işçiden ayrı olmak üzere işverenden manevi tazminat talep edip edemeyecekleri tartışmaya sebebiyet vermiştir. Tüm bu tartışmalar neticesinde, normun koruma hedefi teorisi gereğince kazaya uğrayan işçinin yakınlarının da BK m. 47 kapsamında olduğu bu sebeple işçinin ölmemesine rağmen işçide meydana gelen maluliyet nedeniyle yakınlarının da doğrudan manevi tazminat talep edebilecekleri öğretisi ve Yargıtay tarafından kabul görmüştür (Baycık, 2013: s. 153).

Sigortalının ölümü halinde kimlerin manevi tazminat alıp alamayacağı her olayın kendisine göre değerlendirilecektir, ölenin eşi çocukları ve anne babasının manevi zarara uğradıkları karine olarak kabul görse de sağ kalan eşle uzun zamandır ayrı yaşanması ve aralarındaki ilişki ve duygusal bağın ortadan kaybolması hâlinde manevi tazminat istenemeyeceği, buna karşılık aralarında nikah olmaksızın birlikte yaşayan kişilerin ise diğer bazı şartların varlığı hâlinde tazminat isteyebileceği görülmüştür.

Yargıtay'a göre iş kazası sonucunda vefat eden işçinin henüz cenin olan çocuğunun da manevi tazminat davası açma hakkı vardır. Çocuk babasını tanımadan büyüyeceği için manevi zararlar daha sonra oluşacaktır (Ruhi/ Ruhi, 2022: s. 128-129).

İş kazasına uğrayan işçi zararlandırıcı olay nihayetinde manevi tazminat davası açmış ve mahkemece manevi tazminata hükmedilmiş ise de işçinin bu kaza sonucunda sonradan ölmesi üzerine yakınları tekrar manevi tazminat talep edebilir (Ruhi/ Ruhi, 2022: s. 128).

Alt işverenlik ilişkisinin bulunduğu hallerde davalı olarak hem asıl hem de alt işveren gösterilmelidir. Esasen bu halde 5510 sayılı Kanun'un 12. maddesi 6. fıkrası gereğince kanundan doğan bir müteselsil sorumluluk bahis konusudur. Sigortalılar üçüncü bir kişinin aracılığıyla işe girmiş ve bunlarla sözleşme yapmış olsalar dahi asıl işveren 5510 sayılı kanunun işverene yüklediği yükümlülüklerden dolayı alt işverenle birlikte sorumludur. Ödünç ilişkisinin varlığında ise iş kazasına uğrayan işçiyi ödünç veren işveren ödünç alan işveren ile müteselsil sorumludur (Ruhi/ Ruhi, 2022: s. 129).

g. İŞ KAZASI VE MESLEK HASTALIĞI SEBEBİYLE AÇILACAK MANEVİ TAZMİNAT DAVALARINDA GÖREVLİ MAHKEME

İş kazasının tespitinde ve bu sebepten doğan maddi ve manevi zararların giderilmesine dair uyuşmazlıklarda 7036 sayılı Kanun'un 5/1-c hükmünde yer alan, diğer kanunlarda iş mahkemelerinin görevli olduğu belirtilen uyuşmazlıklarda iş mahkemelerinin görevli olması ve 5510 sayılı Kanunun 101. maddesinde bulunan, aksine hüküm bulunmayan hallerde bu Kanun'un uygulanmasından doğan uyuşmazlıkların iş mahkemelerinde görüleceği hükümlerine dayanarak, iş mahkemeleri görevlidir. İş mahkemesi bulunmayan yerlerde ise bu uyuşmazlıklara 7036 sayılı Kanun'un m. 2/III hükmüne göre o yerdeki asliye hukuk mahkemesi tarafından bakılması lüzumludur (Akel, 2019: s. 158).

h. İŞ KAZASI VE MESLEK HASTALIĞI SEBEBİYLE AÇILACAK MANEVİ TAZMİNAT DAVALARINDA YETKİLİ MAHKEME

7036 sayılı İş Mahkemeleri Kanunu, iş mahkemelerinin kuruluş, görev, yetki ve yargılama usulünü tanzim etmektedir. Bu sebeple iş kazasından doğan manevi tazminat davalarında yetkili mahkemenin tespiti için 7036 sayılı İş Mahkemeleri Kanunu'na göre başvurmak lüzumludur. 7036 sayılı İş Mahkemeleri Kanunu'nun 6. maddesine göre, iş mahkemelerinde açılacak davalarda yetkili mahkeme, davalı gerçek veya tüzel kişinin davanın açıldığı tarihteki yerleşim yeri mahkemesi ile işin ya da işlemin yapıldığı yer mahkemesidir. Davalı birden fazla ise bunlardan birinin yerleşim yeri mahkemesi de yetkilidir. İş kazasından doğan tazminat davalarında, iş kazasının veya zararın meydana geldiği yer ile zarar gören işçinin yerleşim yeri mahkemesi de yetkilidir (Ruhi/ Ruhi, 2022: s. 128).

7036 sayılı İş Mahkemeleri Kanunu'nun 6. maddesine aykırı olarak gerçekleşen yetki sözleşmeleri geçersizdir. 7036 sayılı İş Mahkemeleri Kanunu'nun 6. maddesinde yer aldığı biçimde seçimlik yetki mevcuttur. Davacı, davalı gerçek ya da tüzel kişinin davanın açıldığı tarihteki yerleşim yeri mahkemesiyle işin ya da işlemin yapıldığı yer mahkemesinde, iş kazasının ya da zararın meydana geldiği yer mahkemesinde ya da zarar gören işçinin yerleşim yeri mahkemesinde dava açabilir (Ruhi/ Ruhi, 2022: s. 128).

i. İŞ KAZASI VE MESLEK HASTALIĞI SEBEBİYLE AÇILACAK MANEVİ TAZMİNAT DAVALARINDA YARGILAMA USULÜ

7036 sayılı İş Mahkemeleri Kanunu'nun 7. maddesinde yargılama usulü yer almaktadır. Bu husus uyarınca iş mahkemelerinde basit yargılama usulü uygulanır. Esasen iş kazasından doğan manevi tazminat davasında ve basit yargılama usulü geçerlidir. 7036 sayılı iş mahkemeleri kanunlarla arabuluculuk dava şartı olarak düzenlense de Kanun'un üçüncü maddesi uyarınca iş kazası ya da meslek hastalığından kaynaklanan maddi ve manevi tazminat ile bunlarla ilgili tespit, itiraz, rücu davaları hakkında birinci fıkra hükmü uygulanmayacaktır. Maddi ve manevi tazminat davalarında arabulucuya başvurmak dava şartı değildir (Ruhi/ Ruhi, 2022: s. 129).

i. İŞ KAZALARINA DAİR VE MESLEK HASTALIĞINA İLİŞKİN MANEVİ TAZMİNAT DAVALARINDA FAİZ VE FAİZ BAŞLANGIÇ TARİHİ

İş kazaları ve meslek hastalığı nedeni ile açılacak maddi tazminat ve manevi tazminat davalarında, davacı tarafın isteği üzerine davayı gören mahkeme tazminata hükmedecektir. Uygulamada ve Yargıtay içtihatlarında iş kazaları nedeniyle açılan maddi ve manevi tazminat davalarında istem halinde olay tarihinden başlamak üzere faize hükmedilecektir.

j. İŞ KAZASI NEDENİYLE AÇILACAK MANEVİ TAZMİNAT DAVALARINDA ZAMANAŞIMI

İş kazası ve meslek hastalığı nedeniyle açılacak maddi ve manevi tazminat davalarında zamanaşımı genel hükümlere göre belirlenecektir. TBK m. 146 uyarınca zamanaşımı, iş kazasının gerçekleştiği günden itibaren 2 yıl ve herhalde 10 yıldır. Bu sürelerin sona ermesiyle beraber iş kazasına bağlı olarak yapılacak tazminat talepleri zamanaşımına uğrayacaktır. (Hukukumuzda iş kazasında kesin maluliyet raporunun öğrenildiği günden itibaren de 10 yıllık zamanaşımının başlayacağı kabul edilmektedir (Berberoğlu Yenipınar, 2018: s. 18).

V. SONUÇ

Manevi tazminatla telafi edilmek istenen “manevi zarar”, cismani zarar neticesi meydana gelen bedensel ve ruhsal ızdıraplar, eylem ve acılardır. Mesela, iş kazası veya meslek hastalığına uğrayan işçinin saçının dökülmesi, gözünü, kaybetmesine dayanarak, yüzün doğal ifade ve güzelliğini yitirmesi, çirkinleşmesi durumunda hissettiği üzüntü tazmin edilmesi lazım gelen manevi zararı bahis konusu yapmaktadır. Ölüm durumunda manevi tazminat talebi, ölümün, ölenin yakınlarında oluşturduğu üzüntüdür. Bu halde zarar doğrudan zarar değil, yansıma zarar olup, tazmini de destekten yoksun kalma halinde şartların varlığına tabi olması kaçınılmazdır.

İş kazasına uğrayan ya da meslek hastalığına tutulan işçi maddi tazminat hariç, TBK m. 56 anlamında manevi tazminat da talep edebilir. İş Kanunu ve diğer iş mevzuatında bu hususta bir hüküm olmasa da Medeni Kanun’da manevi tazminat çeşitleri yer almıştır (Örnek olarak MK m. 25). TBK m. 58 de ise kişilik hakkının zedelenmesinden zarar görenin manevi tazminat talep hakkı düzenlenmiştir.

Öğretide artık yeni benimsenen ve bizim de katıldığımız anlayışa göre maddi tazminatta kullanılan bir ölçüt olan tazminatın zenginleşme aracı olamayacağı anlayışının sürdürülmemesi gerektiği, manevi tazminatın caydırıcı olması gerektiği görüşü hâkimdir.

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FIKHİ HÜKÜMLERİN TEDVİNİ DÜŞÜNCEİ: GEÇMİŞİ BUGÜNÜ VE GELECEĞİ HAKKINDA BİR ANALİZ

THE IDEA OF EDITING AL-AHKĀM AL-FIQHĪYYA: AN ANALYSIS OF ITS PAST,
PRESENT AND FUTURE

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ÖZET

İslam hukukunda fıkhi hükümlerin tedvin edilmesi düşüncesi, İslam toplumunun değişen çağdaki sorunlarına pratik çözümler üretilebilmesi için bu hükümlerin, hangi ilkelere göre düzenlenmesi gerektiğini belirlemek açısından ilk müdahale edilmesi gereken konulardan biridir. Bu da fıkhi hükümlerin bir düzen içerisinde sınırlandırılmasını, uygulanması için ihtiyaç duyduğu şart ve esasların da çağın gerekleri de göz önüne alınarak belirlenmesini zorunlu kılmaktadır. İnsanların pratik hayatlarında çağın gerçekliği ve buna bağlı olarak sosyal, siyasi ve ekonomik alanlardaki köklü değişiklikler neticesinde meydana gelen birbirinden farklı yaşam biçimleri, fıkhi hükümlerin tedvin düşüncesini; araştırma ve tartışmaya açmada ilk ve temel motivasyon olmuştur. Biz bu düşüncenin bir taraftan, çağımızda ne kadar gerekli olduğunu, günümüz demokrasi yanlısı rejimlerin, uygulayageldikleri hükümlerle, halklarının hayatlarına ve kaliteli yaşam isteklerine ne kadar cevap verdiğini görmek için, öte taraftan şer'î boyutunu, İslam hukukunun temel dinamiklerine uygunluğunu görmek açısından bir boşluğu dolduracağı kanaatindeyiz. Çünkü bu araştırma, bu düşüncenin; destekçileri ve muhalifleri arasında nasıl ortaya çıktığını, delil ve dayanaklarını, müsbet ve menfi taraflarını, uygulama alanı bulup tüm dünyaya nasıl yayıldığının görülmesine olanak sağlayacaktır. İslam hukukunda hükümlerin tedvini düşüncesi, ilk bakışta zor ve karmaşık bir çalışma gibi görünse de aslında İslam hukukçularının halihazırda yaptığından farklı bir işlem değildir. Çünkü karmaşık gibi görünen kadim hukuk kaynakları ve el yazma eserleri, günümüz teknolojisi kullanıldığında kolay bir yöntemle düzenlenerek detaylı olarak bablara ayrılabilir. Asırların birikimi belli bir düzenlemeyle, uzman hukukçular tarafından incelenip gözden geçirilebilir ve yeni ictehadlar ile desteklenerek insanlığın hizmetine sunulabilir.

Anahtar Kelimeler: İslam Hukuku, Hüküm, Tedvin, Zamanın Değişmesi, İctihad.

ABSTRACT

The idea of codifying fiqh provisions in Islamic law is one of the first issues that need to be addressed in order to determine the principles according to which these provisions should be arranged in order to produce practical solutions to the problems of the Islamic society in the changing age. This necessitates the limitation of fiqh provisions in an order and the conditions and principles neede for their implementation to be determined by taking into account the requirements of the age. Reality of this era in the practical lives of in people's and the different lifestyles and the provisions that emerged as a result of fundamental changes in social, political and economic fields, the idea of codification of the provisions; has been the first and main motivation for research and discussion. We think that; On the one hand, to see how necessary it is in our age, to see how much today's pro-democracy regimes respond to the lives of their people and their desire for a quality life, on the other hand, to see it's Shariah dimension and its compatibility with the basic dynamics of Islamic law. We believe it will fill a void. Because this research, this idea; It will allow us to see how it emerged among its supporters and opponents, it's evidence and bases, it's positive and negative sides, and how it spread all over the world by finding a field of application. Although the idea of codifying provisions in Islamic law may seem like a difficult and complex task at first glance, it is actually no different from what Islamic jurist currently do. Because ancient law books and manuscripts that seem complex can be organized and divided into chapters in detail using today's technology. With a certain arrangement, the accumulation of centuries can be examined and reviewed by expert lawyers and supported by new ijtihads and put at the service of humanity.

Keywords: Islamic Law, Judgment, Codification of Provision, Change of Time, Judicial Opinion.

GİRİŞ

FIKİ HÜKÜMLERİN TEDVİNİ ÜZERİNE BİR İNCELEME

Fıkhi hükümlerin tedvini, günümüzde araştırılması ve tartışılması gereken önemli bir konu olarak karşımıza çıkmaktadır. Bu bağlamda, İslam hukuku ve ona öncelik verilmesi gereken dinamikler, en önemli meselelerin başında gelmektedir. Bu durum, İslam hukukçularına ciddi bir çalışma ve sorumluluk yüklemekte; onların, İslam hukukunun, insanların hayatından çıkarılarak yerine Doğu ve Batı odaklı sistemlerden elde edilen karma bir hukukun nasıl, niçin ve hangi şartlarda yerleştirildiğini detaylarıyla araştırmalarını, incelemelerini, olumlu ve olumsuz yönlerini ortaya koymalarını gerektirmektedir.

İslam hukukçularının, fıkhi hükümlerin tedvini düşüncesinin geçmişi, günümüzü ve geleceği üzerinde yapacakları her çalışma, İslam hukukundan ve onun sağladığı adalet, huzur ve güven ortamından koparılan bireylerin ve toplumların yeniden İslam hukukuna dönmeleri ve onu benimsemeleri açısından önemli bir rol üstlenecektir. Özellikle bu konunun kapsamının

genişletilmesi ve tüm insanlığın istifadesine sunulması ayrı bir önem taşımaktadır.¹ Bu sayede, insanlık İslam hukukuyla ve onun üzerine inşa edilen İslam medeniyetiyle tanışacak, zihinlerdeki şüpheler giderilecek ve insanlar yaratılışlarındaki öze dönüş yapacaktır. Bu da insanların kendi istek ve iradeleriyle İslam'a yönelmelerini sağlayacaktır.²

İslam dini, miladi 7. yüzyılda ortaya çıktıktan sonra karşılaştığı tüm zorluklara ve engellemelere rağmen, asırlar boyunca devam eden ve günümüze kadar etkisini sürdüren bir medeniyet inşa etmiştir. Günümüzde, uluslararası toplum tarafından medeniyetin rol modeli olarak sunulan Batılı ülkeler topluluğu, Orta Çağ olarak bilinen 14. ve 16. yüzyıllar arasında, tarihi verilere göre, medeniyetten yoksun bir dönem yaşamıştır. Aksine, bu dönemde Batı, sonraki nesillere kan, gözyaşı, zulüm, cehalet ve bozgunculuktan başka bir miras bırakmamıştır. Oysa İslam medeniyeti, Batı'dan asırlar önce inşa edilmiş; eşitlik ve adalet ilkeleriyle, yargılama sisteminin en adil olanını insanlığa sunmuş ve insanların huzur ve refahını temin etmiştir. Şüphe yok ki bu, insanlığın tanık olduğu ve kıyamete kadar tanık olmaya devam edeceği en adil hukuk sisteminin, evrensel ilkelerle donatılmış tek örneğidir. Bunun nedeni, İslam hukukunun esaslarının Allah (cc) tarafından belirlenmiş ve Hz. Peygamber tarafından uygulanmış olan ilahi kökenli bir hukuk sistemi olmasıdır.³

Birçok Batılı hukukçu, araştırmacı ve akademisyen, eserlerinde, makale ve konferanslarında İslam medeniyetinin önemini ve katkılarını dile getirmişlerdir. Bu bağlamda, sadece birkaç örnek verelim:

1. Doğu, Arap ve İslam medeniyetleri hakkında yaptığı araştırma ve çalışmalarıyla tanınan Fransız doktor ve tarihçi Gustav Lebon (ö. 1931), "Avrupa'yı bugünkü medeniyet seviyesine kavuşturanlar Müslümanlardır" ifadesini kullanmış ve bu gerçeği tüm dünyaya kanıtlamak amacıyla "Hadâretu'l-Arab" (İslam Medeniyeti) adlı bir eser kaleme almıştır. Lebon, bu eserinde; İslam medeniyetinin dinamiklerini, niteliklerini, neden tüm dünya tarafından kabul gördüğünü, evrenselliğini, yüceliğini ve bu yüceliği nasıl kazandığını en ince detaylarına kadar işlemiştir.⁴

2. İtalyan araştırmacı ve şarkiyatçı Doktor Enrico İnabato (ö. 1963), "*el-İslam ve Siyasetu'l-Hulefâi'l-Erbaa*" (İslam ve Dört Halife'nin Siyaseti) adlı eserinde, İslam medeniyeti hakkındaki düşüncelerini şöyle ifade etmiştir: "Geçmişte olduğu gibi gelecekte de insanlığın ihtiyaçlarına cevap verecek olan bu muhteşem bilgi kaynağının korunması ve ona kötü niyetle uzanan ellerin engellenmesi gerekmektedir. Çünkü insanlık şimdiye kadar bu kaynaktan tasarlanan kadar

¹Sabri, Mustafa, *Mevkifu'l-Akli ve'l-İlmi min Rabbi'l-Âlemîn ve ibâdihî'l-Murselîn*, Dâr İhyâ et-Turâsi'l-Arabî, Beyrut, 1402, s.135; er-Reysûni Ahmed, *Nazariyyetu'l-Makâsidi inde's-Şâtibî*, el-Ma'hedu'l-Âlemî li'l-Fikri'l-İslâmî, Dâru'l-Âlemiyye li'l-Kitâbi'l-İslâmî, Riyat, 1412, s.213; Avde, Abdulkadir, *et-Teşri'u'l-Cinâi li'l-İslâm Mukârinen bi'l-Kânûni'l-Ved'i*, Dâru't-Turâs, Kahire, 1977, s.166; el-Kâsım, Abdurrahman, *el-İslâm ve Taknînu'l-Ahkâm*, Dâru'l-Meârif, Kahire, 1977, s.54.

²İsra, 17/81; Nasr, 110/1-2.

³Gazzali, Muhammed, *Hâzâ Huve Dînunâ*, Dâru's-Şurûk, Beyrut, 2016, s.116.

⁴Lebon, Gustaf, *Hadâretu'l-Arab*, terc. Adil Zuayter, Dâr Asîru'l-Kutub li'n-Neşr, Kahire, 1987, s.23.

sağlam ve istikrarlı kanunların benzerini elde edememiştir. Üzülerek söylemeliyim ki bu kanunlar, birçok ayrıntıda çağdaş Avrupa yasalarını aşmaktadır."⁵

3. Fransız düşünür Edvard Lambir (ö. 1836) de İslam hukuku ve onun üzerine inşa edilen İslam medeniyeti ile ilgili düşüncelerini şu şekilde dile getirmiştir: "Bu medeniyetin; hukuk, siyaset, sanat, kültür gibi alanlarda insanlığa armağan ettiği kitaplar, kurumadan akmaya devam eden pırlıl pırlıl bir menba, değer ve güzelliğini koruyan bir hazinedir. Arap bedeviler, insanlıktan yoksun bir yaşam sürdürmüşlerdir. Ancak bu hazineye sahip olduktan sonra insanlığa örnek olmuşlar ve dünyaya hükmeder hale gelmişlerdir. Avrupa'nın da üstesinden gelemediği sorunlarını, bu değerli hazineyle çözebileceğini rahatlıkla söyleyebilirim."⁶

4. Berlin Üniversitesi rektörü Sibrel (ö. 1958), 1926 yılında bir insan hakları konferansında yaptığı konuşmada Hz. Peygamber ve onun kurduğu İslam medeniyeti hakkında şu ifadeleri kullanmıştır: "Beşeriyet, Muhammed adındaki adama ve kurduğu medeniyete intisab etmekten gurur duymalıdır. Çünkü O, ümmiliğine rağmen asırlarca önce, bizim Almanların 2000 yıl sonra bile belki yapamayacağı şeyleri başarmıştır. Renk, ırk, cins ve sınıf ayrımı yapmadan insanlığın tümünü kuşatan bir hukuk sistemi ve aynı değerlere sahip bir medeniyet bırakmıştır."⁷ Sibrel, Hz. Peygamberi ve İslam hukukunu araştırmış, ancak İslam hukukunun esaslarının, Peygamber'e Allah (cc) tarafından vahiy ile bildirildiği ve onun Allah'ın elçisi ve gönderdiği dinin açıklayıcısı olduğu gerçeğini gözden kaçırmıştır.

5. Avrupalı hukukçu yazar David Santillana (ö. 1931) da bu konuda şu görüşleri ifade etmiştir: "Muhammed, dünyanın en büyük hukukçusudur. Dünya, bugüne kadar onun benzerine rastlamamıştır. Onun getirdiği hukuk, en sadık, en eksiksiz ve en mükemmel olan hukuktur. Muhammed'in getirdiği hukukta yaklaşık dört bin bilimsel, sosyal ve yasama ile ilgili mesele bulunmaktadır. Adil davranan hukuk bilginlerine yaraşan, onun mükemmelliğini itiraf etmek ve onu insanlığın hizmetine sunmaktır. Çünkü onun getirdiği hukuk sistemi hem ilâhî kökenli hem de bilimsel gerçeklerle uyumlu değerli bir hazinedir."⁸

İslam, ırk, renk, cinsiyet veya sınıf ayrımı yapmaksızın tüm insanlığa gönderilmiş evrensel bir dindir. Ülkelerin coğrafi ayrılıkları veya birbirine uzaklığı İslam'ın mesajı açısından bir önem arz etmez, çünkü İslam, yeryüzünün tamamının Allah'a ait olduğu ve orada yaşayanların yalnızca O'nun kulu olduğu ilkesi üzerine inşa edilmiştir. Bu evrensel özelliği sayesinde, İslam, insanların hem dünya hem de ahiret hayatları için gerekli olan yaşam şartlarını en uygun şekilde sunmuştur.

⁵ el-Hatîb, Hasan Ahmed, *Mecelletu'r-Risâle, eş-Şeriatu'l-İslâmiyye ve A'lâmu'l-Kânûni fî Hâza'l-Asri*, Merâkiş, 1946, sy. 68.

⁶ el-Hatîb, Hasan Ahmed, *Mecelletu'r-Risâle, eş-Şeriatu'l-İslâmiyye ve A'lâmu'l-Kânûni fî Hâza'l-Asri*, Merâkiş, 1946, sy. 689.

⁷ el-Hatîb, Hasan Ahmed, *Mecelletu'r-Risâle, eş-Şeriatu'l-İslâmiyye*, sy. 689.

⁸Bu hususta daha detaylı bilgi için bkz. Gazzâlî, Muhammed, *Hâzâ Huve Dînunâ*, Dâru's-Şurûk, Beyrut, 2016, s.116; el-Hatîb, Hasan Ahmed, *Mecelletu'r-Risâle, eş-Şeriatu'l-İslâmiyye*, sy. 689; Avvame, Muhammed, *Meâlim İrşâdiyye li sinâati Tâlib'i-İlmi*, Dâr Kurtuba, Beyrut, 2013, s.366; el-Meşhedânî, Buseyne, *Ümemun Emsâlukum*, Mecelletu et-Terbîyeti'l-İslâmiyyeti, Bağdad, 1439, sy.42, s.52.

İslam, hayatın bir yönünü inşa edip diğer yönünü ihmal etmemiş, pratik yaşamı bütüncül ilke ve kurallara göre düzenlemiştir. Aynı zamanda, dini ritüelleri de içtihadı yer bırakmayacak şekilde ayrıntılı hükümlerle belirlemiştir. Bu nedenle, İslam sadece maddi veya sadece manevi, ruhani ve inançla sınırlı bir sistem değildir. Aksine, İslam, insanın hem dünya hem de ahiret hayatı için ihtiyaç duyduğu inanç, din, devlet, çalışma, maddi ve manevi her yönünü kapsayan, onun yükümlülük sınırlarını aşmayacak nitelikte bir evrensel yaşam biçimidir.

İslam hukuku, insanın dünya ve ahiret işlerini, her birinin gereklerine bağlı kalarak iki farklı şekilde ele almıştır. Dünya hayatını düzenlerken, karşılaşılan sorunları çözmeleri için insana genel hükümler belirlemiş ve konuyla ilgili detayları, zamanın gereksinimlerine göre zamanın akışına bırakmıştır. Hz. Peygamber bu hususu, "*Siz dünya işlerinizi daha iyi bilirsiniz*"⁹ şeklinde ifade etmiştir. Ahiretle ilgili olan ibadet meseleleri ise, içtihadı yer bırakmayan ayrıntılı hükümlerle düzenlenmiştir.

Dünya ile ilgili olan hükümler, değişen zaman ve örfelere göre değişebileceğinden, her zaman ve mekânda esnek ve geçerli olabilmek için genel (mücmel) olarak düzenlenmiştir. İslam hukukçuları da müctehidin değişen zamansal, çevresel ve mekânsal koşulları göz önüne alarak, içtihadî hükümlerin değişebileceğini kabul etmişlerdir. Ancak, inanç ve ibadetle ilgili olan hükümler, bakidir; eksilme veya çoğalma kabul etmez.

İslam hukuku, dünya ve ahiret işlerini birbirinden farklı iki yöntemle düzenlemiştir. Bu yöntem farklılığı elbette hikmetten hali değildir. Bu hikmet, daha önce de belirtildiği gibi, yaşam için gerekli olan bu hayatî prensiplerin esaslarının, İslam'ın ortaya çıkışından itibaren hayatın sonuna kadar İslam toplumu için geçerliliğini korumasıdır. Bu da ancak hükümlerin genel (icmâlî) olmasıyla sağlanabilir. Zira hükümlerin detaylı olması, istikrar ve kalıcılık özelliklerinden ziyade, zamanın değişken özelliklerine bağlıdır. Bu nedenle, İslam hukukunun ilkeleri, her zaman, her yer ve her insan için geçerli ve uygun olacak şekilde esnek olarak düzenlenmiştir.¹⁰ Ancak burada durup şu soruyu sormamız gerekir: İslam hukukçularının eserlerinde detaylı olarak ele alınan İslam hukukunun içtihadî meselelerdeki bu esneklik özelliğinden ve avantajından gerçekten yararlandı mı? İnsanlığın ve Müslümanların içerisinde bulunduğu sorunlara bakıldığında, bu soruya olumlu bir cevap vermek pek mümkün görünmüyor. Halbuki İmam Azam, İmam Şâfiî, İmam Mâlik, İmam Ahmed, el-Mâverdî ve eş-Şâtibî gibi İslam hukukçuları, İslam hukukunun içtihadî meselelerdeki esneklik ilkesinin hayata geçirilmesini, fıkhıdaki donukluğun giderilmesini önermiş, bu hususta ciddi çalışmalar yapmış ve her türlü taklitten de şiddetle kaçınılması gerektiğini vurgulamışlardır.¹¹

⁹ Müslim, "Te'bir en-Nahîl", 2363.

¹⁰Karadavî, Yusuf, *Likaât ve Muhaverât Havle Kadâyâ'l-İslami ve'l-Asri*, Mektebetu Vehbe, Kahire, 1992, s.46; Vehbe, Tefik Ali, *el-İslâmü Şerîatu'l-Hayâti*, Dâru'l-Livâ, Riyad, 1401, s.212; et-Tureyfi, Nasır, *Târihu'l-Fıkhi'l-İslâmiyyi*, Şeriketü'l-Ubeykân li'n-Neşr, 1408, s.163.

¹¹Ammare, Muhammed, *el-İslam ve Kadâyâ'l-Asr*, Dâru's-Şuruk, Kahire, 1405, s.165; Şâtibî, İbrahim, *el-İ'tisâm*, Dâru'l-Marife, Beyrut, 1402, s.235; Maverdî, Ali, *el-Ahkâmü's-Sultâniyye ve'l-vilâyâtu'd-Dîniyye*, Dâru'l-Kutubu'l-İlmiyye, Beyrut, 1405, s.178; Karâfi, abu'l-Abbas Ahmed, *el-İhkâm Fi Temyizi'l-Fetâvi ani'l-Ahkâm ve Tasarrufâti'l-Kâdi ve'l-İmâm*, thk.Abdulfettah ebû Ğudde, Mektebetu'l-Matbûati'l-İslâmiyyeti, Halep, 1416, s.322;

Dolayısıyla karşımıza şu gerçek çıkmaktadır: Müslümanların bugün karşı karşıya kaldığı, çağın hızla gelişen ve değişen koşulları karşısında sorunların altında ezilmemesi, inançlarını, düşüncelerini ve eylemlerini olumsuz etkileyecek olumsuz düşünce ve akımların etkisinde kalmaması için, İslam hukukunun içtihadı açık, esnek prensiplerinin, geçmişte olduğu gibi günümüzde de yeniden tedvin edilerek aktifleştirilmesi ve Müslümanların ihtiyaçlarına cevap verecek bir özelliğe kavuşturulması gerekmektedir.

KABUL VE RED AÇISINDAN FIKHİ HÜKÜMLERİN TEDVİNİ DÜŞÜNÇESİ

Hükümlerin tedvini konusu, İslam toplumunun değişen çağdaki sorunlarına pratik çözümler üretebilmek amacıyla bu hükümlerin hangi ilkelere göre düzenlenmesi gerektiğini belirlemek açısından ilk müdahale edilmesi gereken bir meseledir. Bu, hükümlerin belirli bir düzen içerisinde sınırlandırılmasını ve uygulanabilmesi için gerekli şart ve esasların, çağın gerekleri göz önüne alınarak belirlenmesini gerektirmektedir.

Yönetimlerin, hükümlerin düzenlenmesi konusuna bu şartlar altında el atması, yeni bir olgu değildir. Aksine, kadim çağlardan beri farklı yönetim sistemleri tarafından hükümler tedvin edilip bir düzene konmuş ve bu durum, insanlığın gelişimine paralel olarak günümüze kadar devam etmiştir. Ancak, hükümlerin yöneticiler tarafından tedvin ve tertip edilmesi ve insanları bu hükümlere uymaya zorlamaları, hukukçuların tümü tarafından destek görmemiştir. Çünkü en eski çağlardan beri insanlık, tedvin edilip yazıya dökülmeyen örf ve adetlerin gölgesinde yaşamlarını sürdürmüş, bu durum asırlarca devam etmiştir. Günümüzde etkisi sınırlı olsa da birçok toplumda yönetimlerin müdahale ve engellemelerine rağmen örfi kuralların etkisi devam etmektedir.

Hükümlerin tedvin edilmesi ve bu hükümlere uyma zorunluluğunun getirilmesi, İslam hukukçuları arasında ihtilaflara yol açmıştır. Bu hukukçulardan kimisi hükümlerin tedvin edilmesini benimserken, kimisi de bu durumu reddetmiştir. Böylece, hükümlerin tedvini düşüncesi, başladığı andan itibaren hukukçuların tümünün üzerinde ittifak ettikleri ortak bir karar olmamıştır.¹² Kabul edenlerin de reddedenlerin de kendilerine göre gerekçeleri olmuştur. Bu gerekçeleri önemleri nedeniyle özetlemek faydalı olacaktır.

Hükümlerin Tedvinine Karşı Çıkanların Görüşleri

Hükümlerin tedvin edilmesini kabul etmeyenler, eskiden beri uygulanagelen örfi kuralların toplumun ihtiyaçlarını karşıladığını ve bu nedenle hükümlerin tedvinine gerek olmadığını ileri sürmüşlerdir. Bu bakış açısına göre, yönetimlerin toplumun ihtiyaçları doğrultusunda şekillenen örfi kuralları, hükümlerin tedvin edilmesi yoluyla ortadan kaldırması ve bunun yerine, toplumun benimsemeyebileceği ya da sorumluluğunu üstlenemeyeceği yeni kanun ve düzenlemeler getirmesi, toplumda infiale neden olabilir. Ayrıca, örfi kuralların varlığı ve yokluğu, toplumun istek ve iradesine bağlıdır; dolayısıyla toplum, bu kuralların

ebu Zehra, Muhammed, *Târihu'l-Mezâhibi'l-İslâmiyye fi's-Siyâse ve'l-Akâid ve Târihu'l-Mezâhibi'l-Fıkhiyye, Dâru'l-Fikri'l-Arabî, Kahire, 1989, s.11.*

¹²Ebu Zehra; Muhammed, *Târihu'l-Mezâhibi'l-İslâmiyye*, s.11; Zeydan, Abdulkerim, *el-Ferdu ve'd-Devletu fi Şerîati'l-İslâmiyye*, el-Cemaatu'l-İslâmiyye, Kahire, 1978, s.211.

değiştirilmesini, geliştirilmesini ya da tamamen ortadan kaldırılmasını talep edebilir. Tüm bu durumlar, zaman ve zemine göre toplumun kontrolindedir. Ancak hükümlerin yönetimler tarafından tedvin edilmesi ve bunlar doğrultusunda yeni sistem ve kuralların düzenlenmesi, topluma ağır gelebilir. Kabul edilmemesi durumunda, toplum üzerinde baskı uygulanacak ve bu durum, toplum ile yönetim arasında bir kaosa yol açabilecektir.¹³

Hükümlerin Tedvinini Savunanların Görüşleri

Hükümlerin tedvin edilmesi gerektiğini savunanlar, bu yöntemin, toplumda bireylerin işlemlerini karışıklığa mahal vermeden düzenleme, sorunlarını geciktirmeden çözüme gibi ihtiyaçlara cevap verebilmek için kullanılabilecek en pratik yöntem olduğunu belirtmişlerdir. Benzer şekilde, tedvin edilen hükümlerin yürürlüğe konması ve gerektiğinde yürürlükten kaldırılması da aynı pratik özelliğe sahiptir. Bu durum, kamu otoritesinin işleyişini kolaylaştıracaktır. Oysa örfi kuralların hem ortaya çıkması hem de iptali, neredeyse imkânsız denecek kadar meşakkatli bir süreçtir. Bu nedenle, hükümlerin tedvin edilerek yürürlüğe konması, örfi kurallara tercih edilmelidir.

Hükümlerin tedvin edilmesi gerektiğini savunanların bir diğer gerekçesi, bu hükümlerin örfi kurallara göre daha geniş kitlelere daha kısa bir süre içinde yayılabilmesi özelliğine sahip olmasıdır. Örfi kurallar, bir toplumdaki farklı sınıflar sayısınca artış gösterecektir. Çünkü her grup, kendine ait bir örfü benimser ve onun kurallaştırılmasını ister. Buna karşılık, tedvin edilerek yürürlüğe konacak hükümler, ırk, renk, cinsiyet, grup gibi ayrımlar yapmaksızın tüm insanları kapsayıcı olacaktır. Ayrıca, tedvin edilen hükümlerin anlaşılması ve uygulanması daha kolaydır. Öte yandan, örfi kural ve kaidelerin, anlaşılmadıkları takdirde başvurulacak belirli ilkeleri yoktur. Bu durum hem bu kuralların anlaşılmasını zorlaştırmış hem de anlaşmazlık durumunda sorunun çözümsüz kalmasına yol açmıştır.¹⁴

Tüm bu farklılıklara rağmen, iki görüş arasındaki ihtilaf günümüze kadar gelmiş ve varlığını sürdürmeye devam etmektedir. İngiltere, genel hukuk sistemi anlamında içtihat hukukunun yanı sıra örf ve âdet kanunlarına dayanan bir ülke olarak bu tür ülkelerin başını çekmektedir. Bununla birlikte, hükümlerin tedvin edilmesi düşüncesi, dünya ülkelerinin çoğuna yayılmış ve bu görüş birçok destekçi kazanmıştır. Sonuç olarak, dünya devletlerinin büyük çoğunluğunda insan yapımı yasalar ortaya çıkmış ve toplumlar bu yasaları benimsemiştir.

Gelmiş geçmiş ümmetler içerisinde hüküm ve kanunların en saygın ve en medeni olanına sahip Müslüman millet ve devletlerin, günümüzde sosyalist, kapitalist gibi doktrin ve akımlara sahip ülke ve toplumlarla birlikte aynı akımlar içinde sürüklenmeleri anlaşılır bir durum değildir. Bu noktada, İslam hukukçularına ciddi görev ve sorumluluklar düşmektedir. İslam hukukçularının, Kur'an ve Sünnet'te yer alan kapsamlı küllî kaide ve kurallar üzerinde detaylı çalışmalar yapmaları, bu konuda büyük gayret ve çaba sarf etmeleri gerekmektedir. Ayrıca, geçmişten günümüze kadar telif edilen, İslam hukukuyla ilgili her biri birer hazine niteliğindeki kadim

¹³ Ammare, Muhammed, *el-İslam ve Kadâya'l-Asr*, s.178; Cafer, Ali Muhammed, *Târihu'l-Kavânin ve Merâhili't-Teşrii'l-İslâmiyyi*, ed-Dâru'l-Kavmiyyeti li't-Tibâa, Kahire, 1986, s.147.

¹⁴ Ammare, Muhammed, *el-İslam ve Kadâya'l-Asr*, s.179.

eserleri günümüz bilim ve teknolojisinden yararlanarak bir araya getirmeli, incelemeli ve günün şart ve gereklerini de göz önüne alarak yeniden topluma kazandırmalıdır.

Hükümlerin tedvini düşüncesi, ilk bakışta zor ve karmaşık gibi görünse de aslında İslam hukukçularının halihazırda yaptığından farklı bir işlem değildir. Çünkü kadim hukuk kaynakları, günümüz teknolojisi kullanıldığında kolay bir yöntemle detaylı olarak bablara ayrılabilir; asırların birikimi, belli bir düzenlemeyle uzman hukukçular tarafından incelenip gözden geçirilebilir ve yeni içtihatlarla desteklenerek insanlığa sunulabilir.

Hüküm ve hukuk kurallarının tedvini düşüncesi, Müslüman ve Müslüman olmayan tüm dünya ülkelerini etkilemiştir. Gayrimüslim devletler, dini ve gayri dini ayrımı yapmaksızın, arzu ve isteklerini karşılayacak nitelikteki yerel ve sınırlı kanun ve kuralları tedvin etmiş ve etmeye de devam etmektedir. Halklarının çoğunluğu Müslüman olan ülkeler ise, ellerinde bulunan evrensel İslam hukukunu nedenli ve nedensiz olarak görmezden gelmiş; siyasetlerinde, ekonomilerinde, sosyal yaşamlarında, eğitimlerinde ve dahası hayatlarının her alanında, kapitalist ve sosyalist doktrinlerle yönetilen Batılı ve Doğulu ülkelerin izinden gitmişlerdir. Ancak bilimde, teknolojide, eğitimde, siyasette ve diğer alanlarda, ne yazık ki bir türlü bu ülkelerin ulaştığı seviyeye ulaşamamışlardır. Bunun temel nedeni, İslam aleminin, elinde bulunan ve işlendikçe değerlenen ilahi kaynaklı hukuk değerlerini bırakarak, Batı'nın insan ürünü sınırlı hukuk değerlerine öncelik vermesidir.¹⁵

HÜKÜMLERİN TEDVİN EDİLMESİNİN MEŞRUIYYETİ

Hükümlerin tedvin edilmesi, ya da başka bir ifadeyle, bu düşüncenin uygulanmasının İslam hukukunun öğretileriyle tutarlı olup olmadığını belirlemenin yasallığı nedir? Hükümlerin tedvin edilmesi düşüncesi, daha önce de belirttiğimiz gibi, dünya ülkelerinin tamamında farklı boyutlarda uygulama sahasına konmuştur. İslam dünyasında da bazı ülkelerde, Batılı ülkelerin tedvin ettikleri hüküm ve kanunlar, bazı değişikliklerle uygulanmış; bazı ülkelerde ise İslam hukuku adıyla birtakım kanunlar resmî olarak onaylanmıştır. Ancak, bu kanunlar otoriter rejimler tarafından baskı ve zulüm aracı olarak uygulanmıştır.¹⁶

İslam hukukunun ana dinamiklerine döndüğümüzde, fihhi hükümlerin tedvin edilmesini yasaklayan ne lafzi ne de manevi bir nassa rastlanmaktadır. Zaten bu çalışmada ifade etmeye çalıştığımız tedvin, İslami öğretileri dayanak olarak yapılacak olan İslami bir tedvindir. Bu tedvin, İslamî sınırları aşmayacağı gibi, onlarla çelişmeyecektir. Zira bu tedvinin naslarla çelişmesi de mümkün değildir. Çünkü tedvin edilen bu hükümler, nasların lafzi ve manevi çerçevesi dahilinde istinbat edilerek düzenlenmiştir.

İslam hukukunun gaye ve hedeflerini incelediğimizde, bu gaye ve hedeflerden hareketle elde edilecek ve uygulanacak olan İslami bir tedvinin başka amaçlara sapması düşünülemez. Böyle

¹⁵ Ammare, Muhammed, *el-İslam ve Kadâya'l-Asr*, s.179; Cafer, Ali Muhammed, *Târihu'l-Kavânin ve Merâhili't-Teşri'i'l-İslâmiyyi*, ed-Dâru'l-Kavmiyyeti li't-Tibâa, Kahire, 1986, s.149; ebu'l-Vefâ, Ahmed, *Târihu'n-Nuzumi'l-Kânuniyye ve Tatavvurhâ*, ed-Dâru'l-Câmiyye, Beyrut, 1984, s.56

¹⁶ Ticânî, Muhammed, *en-Nazariyyetu'l-Âmmetu li'l-Kadâ ve'l-İsbât fi Şer'iati'l-İslâmiyye*, ed-Dâru'l-Beydâ el-Mağribiyye, Mağrib, 1405, s.198; ez-Zuhaylî, Muhammed Mustafa, *Dâru'l-Fikr*, Dımaşk, 1402, s.231.

bir tedvin, İslam'ın öğretilerine dayanan ve uzman İslam hukukçuları tarafından onaylanarak uygun görülen bir İslam hukuku niteliğinde olacaktır.¹⁷

Fıkhi hükümlerin tedvin edilmesine işaret eden Kur'an naslarından biri, Allah'a (cc), Hz. Peygamber'e ve Müslümanlar arasından kendilerine Müslümanları yönetme işi emanet edilmiş olan yöneticilere itaati emreden ayettir.¹⁸ Hz. Peygamber'in, kendisine itaat edenleri Allah'a itaat etmiş kabul etmesi, isyan edenleri de Allah'a isyan etmiş olarak nitelemesi, atadığı elçisine itaati kendisine itaat, isyanı da kendisine isyan sayması¹⁹ bu ayetin anlamını pekiştirmektedir. Bu ayet ve hadiste geçen "*Ulu'l-Emr*" kavramı, İslam alimleri tarafından; alimler, fakihler, helal ve haram sınırını naslar yoluyla belirleyen İslam hukukçuları, görüş ve düşünce sahipleri ve Müslüman yöneticiler olarak tefsir edilmiştir.²⁰

Naslarda ifade edilen "*Ulu'l-Emr*"e itaattan amaç, iyilikte itaattir. İyilik ise, şer'i bir nassa muhalefet etmeyen, İslam hukukunun gaye ve hedefleriyle çelişmeyen demektir. Bu durumda, "*Ulu'l-Emr*" konumundaki kamu otoritesinin, alim ve hukukçuların ortaya koyduğu hüküm, kanun ve yönetim şekli, İslam şeriatının naslarına muhalefet teşkil ettiğinde veya onların gaye ve amaçlarıyla çeliştiğinde, onlara itaat etmek söz konusu değildir. Çünkü İslam şeriatının temel dinamiklerinden biri, "*Yaratana isyan hususunda yaratılana itaatin olmadığı*"²¹ ilkesidir. İmam Azam, İmam Malik, İmam Şafî, İmam Ahmed, Mâverdî, Ebu Ya'lâ el-Ferrâ, Kadı Ebu Bekir el-Arabî, İbn Kesîr ve daha birçok İslam alimi ve hukukçusu, itaati sadece marufta, yani iyilikte olacağını teyit etmişlerdir.²²

Ancak burada üzerinde durulması gereken bir soru vardır: "*Marufta boyun eğme*" ilkesi sadece naslarla belirlenen hususlar için mi geçerlidir, yoksa bu ilke hem naslarla belirlenmiş hem de nasların hakkında bir hüküm belirtmediği ve sustuğu, onunla çelişmeyen tüm hususlar için mi geçerlidir? Bu soruya doğru ve net bir cevap verebilmek için İslam şeriatının usulüne, esas ve prensiplerine bakılması gerekmektedir. Ehl-i Sünnet mezhep imamlarının ve hukukçularının genel olarak muamelat ve âdetler hakkındaki düşünce ve söylemlerine baktığımızda, "*Eşyada asıl olan mübahlıktır*" ilkesiyle hareket ettiklerini görürüz. Bu durumda, helallığı ve haramlığı hakkında kesin bir nas bulunmayan hususlar mübah/serbest alanlar olarak kabul edilmiştir. "*De ki: Allah'ın kulları için yarattığı güzelliği, rızkını iyisini, temizini yasaklayan kim? De ki: Bunlar*

¹⁷ Ammare, Muhammed, *el-İslam ve Kadâya'l-Asr*, s.182; Cafer, Ali Muhammed, *Târihu'l-Kavânin ve Merâhili't-Teşri'ül-İslâmiyyi*, s.149; Zeydan, Abdulkerim, *el-Ferdu ve'd-Devletu fi Şerîati'l-İslâmiyye*, s.211; el-Kasım, Abdurrahman, *el-İslam ve Taknînu'l-Ahkâm*, s.35, Matbaatu's-Saadete, Kahire, 1977.

¹⁸ Nisa, 4/59.

¹⁹ Müslim, *İmare*, 33; *Fedail*, 140; Buhari, *İ'tisâm*, 2.

²⁰ Bu hususta daha detaylı bilgi için bkz. el-Mâverdî, Ali Muhammed, *el-Ahkâm'us-Sultâniyye ve'l-Vilâyâtud-Dîniyye*, Dâru'l-Kutubi'l-İlmiyye, Beyrut, 1405, s.48; el-Han, Mustafa, *Eseru'l-İhtilâf, Fi'l-Kavâidi'l-Usûliyyeti fi İhtilâfi'l-Fukahâ*, Müessesetü'r-Risâle, Beyrut, 1401, s. 231; el-Akkâd, Abbas, *el-İslâm fi'l-Karni'l-İşrin Hâdiruhu ve Müstakbelühü*, Dâru'l-Hilâl Kahire, 1960, s.163.

²¹ Buhârî, *Ahkâm*, 4; Ahmed bin Hanbel, *İtaat*, 129.

²² Bu hususta daha detaylı bilgi için bkz. İbn Kesîr, ebu'l-Fidâ, *Tefsîru'l-Kur'ânî'l-Azîm*, Dâru'l-Fikr, Beyrut, 1408; el-Mâverdî, *el-Ahkâm'us-Sultâniyye*, s.48; ebu Ya'lâ, ebu'l-Fidâ, *el-Ahkâm'us-Sultâniyye*, Dâru'l-Kutubi'l-İlmiyye, Beyrut, 2007, s.30; İbni Kayyım, Muhammed, *İ'lâmu'l-Muvakkîin an Rabbi'l-Âlemin*, Dâru'l-Fikr, Beyrut, 1397, c.1, s.10.

dünya hayatında imana erenler için meşrudurlar."²³ ve "*Dillerinizin yalan yere nitelendirmesi dolayısıyla şuna helal, buna haram demeyin. Çünkü Allah'a karşı yalan uydurmuş olursunuz ve bu da sizi helak eder*"²⁴ ayetler ve "*Müslüman kişiye yaraşan, hoşuna giden ve gitmeyen her konuda itaat etmesidir. İsyanla emredilmesi müstesna; böyle bir durumda itaat yoktur*"²⁵ gibi hadisler de bu ilkenin meşruiyetine delil olarak gösterilmiştir.

Bu konuda sınırlanamayacak sayıda şer'i delil bulunmaktadır. "*Eşyada asıl olan mübahlıktır*" ilkesi de bu hususu teyit eden şer'i prensiplerdendir. İslam hukukçularının neredeyse tamamı, mübah olan fiil ve davranışların tümünü, başkasına zarar vermemek koşuluyla temel hak ve hürriyetler kapsamında değerlendirmişlerdir. Eşyaların tabiatındaki gerçeklik de haram olduğuna dair bir delil bulunmadıkça, o şeyin haram olmadığı ve bu nedenle günah ve cezaya neden olmayacağıdır. Bu durum, Allah'ın (cc) ilahi buyruğunda bütün insanlara müjdesidir.²⁶ Yani günah ve ceza, emir ve nehiy sınırlaması getirildikten sonra uygulanmaktadır. Bu durumda, İslam hukukuyla çelişmeyen, onun gaye ve amaçlarıyla bir aykırılık içermeyen ve isyan teşkil etmeyen kamu otoritesine ve yöneticilere itaat etme zorunluluğu doğmaktadır.²⁷

Geçmişten günümüze kadar gelen İslam alimleri ve hukukçuları da bu düşünceyi eserlerinde ifade etmişlerdir. Örneğin İbn Kesîr, "Şerîatin öğretilerine muvafakat eden her hususta kamu otoritesine ve devlet başkanına itaat vaciptir" demiştir.²⁸ İbnü'l-Arabî, Hz. Ömer'in hilafeti döneminde Şam'da ortaya çıkan veba salgını olayında, Hz. Ömer ile Ebu Ubeyde el-Cerrâh arasında geçen tartışmayı delil göstererek, hakkında şer'i nas olmayan hususlarda, hak ve hakikat ortaya çıkıncaya kadar kamu otoritesine ve devlet başkanına itaatın gerekliliğini savunmuştur.²⁹ İbn Kayyim, İslam hukukçusu İbn Akîl'in, "Siyaset; hakkında vahiy inmemiş ve Hz. Peygamber'in de bir uygulaması olmayan, ancak insanların kendisiyle uzlaşmaya daha yakın ve bozulma ve fesattan daha uzak olduğu uygulamalar manzumesidir" ifadesini kaynak göstererek, İslam toplumunun faydasına olan, İslam hukukunun gaye ve amaçlarıyla çelişmeyen ve bir isyan içermeyen her uygulamanın şer'i siyaset kapsamında değerlendirilmesi gerektiği sonucuna varmıştır.³⁰ Kurtubî de, "Hakikatin belirtileri ortaya çıkar ve bu belirtiler aklın delilleriyle de kanıtlanırsa, ortaya çıkacak olan, Şârî'in yasası, rızası, onayı ve emri olacaktır"³¹ şeklinde ifade ederek, hangi şekil ve nitelikte olursa olsun, ortaya çıkarılacak olan adalet ve eşitlik dengesinin İslam hukuku kapsamında olacağını teyit etmiştir.³²

Özetle, sivil otoritenin (müctehid) ve siyasi otoritenin (devlet başkanı) dinen korunması şart olan; din, can, mal, namus ve akıl ile ilgili maslahata dayalı içtihadî eylem, karar ve

²³ Araf, 7/32.

²⁴ Nahl,16/116.

²⁵ Müslim, *İtaat*, 1840.

²⁶ İsra, 17/15.

²⁷ Şâtibî, *el-Muvâfakât*, c.2, s.189.

²⁸ İbn Kesîr, *Tefsîru'l-Kur'âni'l-Âzîm*, c.1, s.571.

²⁹ İbn Arabî, Ebu Bekr, *Ahkâmu'l-Kur'ân*, Dâru'l-Kutubu'l-İlmiyye, c.1, s.453.

³⁰ İbn Kayyim el-Cevziyye, Muhammed, *et-Turuku'l-Hikemiyye fi's-Siyaseti's-Şer'iyye*, Mektebetü'l-Medenî, Cidde, 1422.

³¹ Kurtubî, Muhammed, *el-Câmi' li Ahkâmi'l-Kur'ân*, Matbaatu Dâri'l-Kutubi'l-Mısriyye, Kahire, 1364, s.154.

³² Zuhaylî, Vehbe, *et-Tefsîru'l-Munîr*, Dâru'l-Fikri'l-Fikri'l-Muâsir, Beyrut, 1411, c. 4, s. 472.

uygulamaları, şer'i hükümler kapsamında değerlendirilmiştir. Buna binaen, "ulu'l-emre" itaati emreden nasların hükmü gereğince, devlet başkanının zamana, mekâna ve olayların gelişimine bağlı olarak içtihadî bir konudaki kararı, kazâen ve diyaneten bağlayıcı olmaktadır. Buna göre, hükümlerin tedvin edilmesi düşüncesi, İslam hukukunun zamanın ruhuna uygun olarak yaşamın taleplerine cevap verebilen, seçim ve tercih sonrası ilkeler halinde düzenlenen bir kanun taslağı haline getirilmesinden başka bir şey değildir.³³

GEÇMİŞTEN GÜNÜMÜZE İSLAM'DA HÜKÜMLERİN TEDVİNİ

Kur'an'ın Tedvini

Hz. Peygamber (sav), Kur'ân'ı, vahiy yoluyla Allah'tan (cc) almış ve bu vahiyleri sahabeye öğretmiştir. Vahiy katipleri ise bu vahiyleri yazıya dökerek, Kur'ân'ın korunması adına önemli bir görev üstlenmişlerdir. Allah'ın (cc) "*Hiç şüphesiz, Kur'ân'ı biz indirdik; elbette onu yine biz koruyacağız*"³⁴ ayetindeki ilâhî teminatın gereği olarak, Kur'ân'ın nesilden nesile doğru şekilde aktarılabilmesi için yazılı olarak muhafaza edilmesi, ilk koruyucu tedbir olarak hayata geçirilmiştir. Hz. Peygamber'in döneminde, Kur'ân ayetleri farklı yazı malzemeleri üzerine yazılmıştı. Ancak, Peygamber Efendimizin vefatından sonra, Kur'ân'ın tek bir mushaf hâlinde toplanması gereği ortaya çıktı. Bu süreçte, Hz. Ömer'in tavsiyesi ve sahabenin istişaresi neticesinde, Hulefâ-i Râşidîn'in ilki olan Hz. Ebû Bekir (ra) tarafından Kur'ân ayetleri bir araya getirilerek toplandı. Bu derleme, Kur'ân'ın sonraki nesiller için hüccet olmasını ve ümmetin maslahatına uygun şekilde korunmasını sağladı. Bu süreç, İslâm tarihinde şer'î siyaset ve ümmetin geleceği adına atılmış önemli bir adım olarak kabul edilmektedir.³⁵

Ancak bu tedvin sürecinde farklı kıraatların (okuma şekillerinin) bir araya getirilmesi, İslam hukukunun temel kaynağı olan Kur'an etrafında ihtilaflara yol açmıştır. Her bölge halkı, kendi ellerindeki kıraatı esas almış; Şam halkı Ubey ibn Kâb'ın, Irak halkı Abdullah ibn Mesûd'un, diğer bölgelerdeki Müslümanlar ise başka kıraatler üzerine Kur'an'ı okumuşlardır. Bu durum, bazı insanların diğerlerinin elindeki Kur'ân kıraatini reddetmesine kadar varmıştır. Bu tehlikeli durumu fark eden Hz. Osman, ihtilafların büyümesine fırsat vermeden tüm Müslümanları tek kıraat etrafında bir araya toplamış ve farklı kıraatleri yaktırmıştır. Osman kıraatı olarak bilinen ve İmam Mushaf olarak tedvin edilen bu olay, yine Ashabın hüccet olan icmayla gerçekleşmiştir. Şer'î maslahat gereği yeni bir yöntemle icra edilen bu tedvin olayı, içeriği, gerçekliği ve niteliği açısından, çalışmamızın konusu olan hükümlerin tedvin edilmesi düşüncesi/teorisiyle açıklamaya çalıştığımız hususlardan biridir.³⁶

Sünnet'in Tedvini

³³ el-Bağdâdî el-Hatîb, ebû Bekr, *el-Muveddih li evhâmi'l-Cem'i ve't-Tefriki*, Dâru'l-Fikri'l-İslâmî, Beyrut, 1405, s.316; ez-Zuhaylî, Vehbe, *Nazariyyatu'd-Darûreti's-Şer'iyyeti Mukârineten maa'l-Kânûni'l-Vad'i*, Müessesetu'r-Risale, Beyrut, 1402, s.86; er-Raysûnî, Ahmed, *Nazariyyetu'l-Mekâsidi inde's-Şâtibi*, ed-Dâru'l-Âlemî li'l-Kitâbi'l-İslâmî, Riyad, 1412, s.34

³⁴Hicr, 15/9.

³⁵ Derveze, Muhammed İzzet, *Tedvin el-Kur'ân el-Mecîd*, Dâr eş-Şuâ, Dimaşk, 2004, s.36;

³⁶ el-Kardâvî, Yusuf, *el-İctihâd fî Şer'iati'l-İslâmiyye*, Dâru'l-Kalem, Kuveyt, 1985, s.83; Ukle, Muhammed, *el-İslâmu Makâsidihu ve Hasâisuhu*, Mektebetü'r-Risâle, Ürdün, 1405, s.211.

Kur'an ile karışma tehlikesi nedeniyle, ilk dönemlerde sünnetin tedvini Hz. Peygamber tarafından yasaklanmış, ancak daha sonra buna izin verilmiştir. Zamanla, sahabe sayısındaki azalma ve hadislerin kaybolma endişesi, Ashab'ı sünnetin tedvin edilmesine yöneltmiştir. İkinci Halife Hz. Ömer döneminde başlayan bu tedvin düşüncesi, Ömer bin Abdulaziz döneminde yeniden gündeme gelmiş, ancak sistematik olarak ondan daha sonra hayata geçirilmiştir. Bu süreç sonucunda, Kütübü's-Sitte gibi meşhur hadis kaynakları tedvin edilmiştir. Ardından İmam Malik'in Muvatta'sı ve İmam Ahmed ile Humeydi'nin Müsned'i gibi eserler ortaya çıkmıştır. Hz. Peygamber ve halifeleri döneminde olmayan, ancak daha sonra geliştirilen bu tedvin yöntemi, İslam'a ve Müslümanlara olan faydası konusunda hiçbir ihtilafa yol açmamıştır. Bu nedenle, dünyanın dört bir yanında yaşayan Müslümanlar bu faydalı çalışma üzerinde oybirliği sağlamışlardır ki, bu da tedvin yöntemlerinden bir başkası değildir.³⁷

Fıkıhın Tedvini

Kur'an ve Sünnetin tedvinini, fıkıh sahasındaki tedvin çalışmaları izlemiştir. İslam coğrafyası genişledikçe, Müslümanlar yeni problemlerle karşı karşıya kalmış, bu durum İslam hukukçularını bu sorunları çözmek için harekete geçirmiştir. Her yerde dersler başlamış, yeni hukukçular yetişmiş ve bunun sonucunda, birbirinden farklı çözümler sunan yeni eserler yazılmaya başlanmıştır. Bu süreç, araştırmamızın konusu olan farklı düşüncelere sahip müctehidlerin ve buna bağlı olarak farklı mezheplerin eserlerinin tedvin edilmesiyle sonuçlanmıştır. O halde tedvin, çağın insanların ihtiyaçlarına cevap verebilmek ve onların dünya ve ahiret saadetlerine vesile olmak amacıyla, ehil hukukçuların, İslam hukukunun kaynaklarını uygun bir yöntemle taramaları ve çağın şartlarını göz önünde bulundurarak sorunlara çözümler bulmalarınıdır. Nitekim fıkıh sahasında bu tür ilk tedvin çalışmasını, Hz. Hüseyin'in torunu Zeyd bin Ali'nin (75-694) yaptığı tespit edilmiştir. “*El-Mecmû'l-Kebîr*” adı verilen bu eser, klasik sistematığe uygun olarak hazırlanmış ve ibadet, muamelât, ukûbât ve miras gibi fıkhi konuların yanı sıra, Zeyd bin Ali'den gelen hadisleri de içerdiği için hem fıkıh hem de hadis ansiklopedisi olarak kabul görmüştür. Günümüze kadar ulaşan bu çalışmaya birçok şerh de yapılmıştır.³⁸

İmam Malik ve Muvatta: Halife Mansur'un Tedvin Talebi

Abbasi halifesi Ebu Ca'fer el-Mansur, 163 H. yılında hac mevsiminde İmam Malik ile görüşerek, tüm Müslümanların kolayca amel edebileceği bir eser tedvin etmesini istemiştir. Bu isteğini şu sözlerle dile getirmiştir: “*Ey Ebu Abdillah (İmam Malik), İslamî kaynakları gözden geçir ve onlardan bir kitap hazırla. Ancak çalışmada, Abdullah ibn Ömer'in zorlu üslubundan, Abdullah ibn Abbas'ın ruhsatlarından ve Abdullah ibn Mesud'un nadir görüşlerinden kaçın. Orta yolu bul ve Ashabın ve imamların üzerinde birleştiği konuları esas al. Biz de bu eseri tüm*

³⁷ Zehrânî, Muhammed matar, *Tedvin es-Sünne en-Nebeviyye*, Dâr İbn Affân, Kahire, 2005, s.134.

³⁸ Zeydan, Abdülkerim, *el-Madhalu li-Dirâseti's-Şerîati'l-İslâmiyyeti*, Bağdat, 2003; Köse Saffet, *Fıkıh Literatürünün Tartışmalı İki Eseri: el-Mecmû'l-Kebîr ve el-Mehâric fi'l-Hiyel*, İHAD, sy.3, s.289-301, Konya, 2004.

İslam coğrafyasına dağıtım ve Müslümanların bu esere uymalarını isteyelim." İmam Malik, Halifenin bu isteği üzerine Muvatta adlı eserini telif etmiştir.³⁹

Asırlar önce böyle bir çalışmaya ihtiyaç duyulduysa, çağımızda bu tür çalışmalara olan ihtiyaç daha da fazladır. Çünkü günümüzde yapılacak bir tedvinle, hem İslâmî miras koruma altına alınacak hem de çağın sorunlarına uygun çözümler üretilebilecektir.

Osmanlı'da Tedvin: Mecelle'nin Doğuşu

Abbâsîlerden sonra hilafeti devralan Osmanlı Devleti, Asya'dan Afrika'ya ve Avrupa'ya kadar uzanan geniş bir coğrafyada, renk, ırk ve cinsiyet ayrımı yapmadan İslam'a ve Müslümanlara hizmet etmiştir. Bu hizmetler arasında, konumuzla ilgili olan ve günümüzde de birçok İslam ülkesinde hukuk alanında başvuru kaynağı niteliği taşıyan "*Mecelletü'l-Ahkâmi'l-Adliyye*" (Mecelle) adlı tedvin çalışması yer almaktadır. 1293 H. yılının Şaban ayında, yani bir asırdan fazla bir zaman önce gerçekleştirilen bu çalışma, 1851 madde içermekte olup, bir mukaddime ve 16 bölümden oluşmaktadır. Ahmet Cevdet Paşa başkanlığındaki bir komisyon tarafından derlenen bu eser, İslâmî özel hukuk (Medeni hukuk) kurallarını kapsayan bir kodekstir. Uzun süre şer'i mahkemelerde hukuki dayanak olarak kullanılmıştır. İsviçre Medeni Kanunu'nun 17 Şubat 1926'da Borçlar Kanunu'nun ise 22 Nisan 1926'da Türkiye Büyük Millet Meclisi'nde kabul edilmesiyle, her iki kanun 4 Ekim 1926'da yürürlüğe girmiş ve Mecelle-i Ahkâm-ı Adliyye yürürlükten kaldırılmıştır.⁴⁰

Muhammed Kadri Paşa (ö. 1306/1888) ve Tedvin Çalışmaları

Kanunlaştırma alanındaki tedvin çalışmalarıyla tanınan Mısırlı hukukçu ve devlet adamı Muhammed Kadri Paşa, fıkhi konuları güncelleştirme ve sorunları çözme çabasıyla önemli eserler ortaya koymuştur.

- İlk Eser: "*Kitâbu Murşidi'l-Heyrâni İlâ Ma'rifeti Ahvâli'l-İnsân*": Muhammed Kadri Paşa, bu eserde mallar ve onlara ilişkin haklar, mülkiyetin sebepleri, önalım, borçlar, garantiler ve diğer sözleşmelerle ilgili yaklaşık 1045 maddeyi tedvin etmiştir. Hanefî fihına dayanarak hazırladığı her hükmün kaynağını da belirtmiştir. Mısır hükümeti bu eseri 1890 yılında yayımlamıştır.
- İkinci Eser: "*Kitâbu'l-Adli ve'l-İnsâf Fî Halli Meşâkili'l-Evkâf*": Bu eserde, vakıflarla ilgili sorunlara 647 maddede çözümler sunulmuştur. Eser, 1893 yılında yayımlanmıştır.
- Üçüncü Eser: "*Kânûnu'l-Ahvâli's-Şahsiyye*": Bu eserde hibe, vasiyet, hacr ve miras gibi konularda 647 maddelik kanunlar tedvin edilmiştir.⁴¹

³⁹ İbni Kuteybe, *el-İmâme ve's-Siyâse*, Dâru'l-Kutubi'l-İlmiyye, c.2, s.179, Beyrut, 2016.

⁴⁰ Aydın, Mehmet Âkif, *Mecelle-i Ahkâm-ı Adliyye*, DİA, c.28, s. 231-235, Ankara, 2003; Hulusi, Yavuz, *Mecelle'nin Tedvini ve Cevdet Paşa'nın Hizmetleri*, Ahmet Cevdet Paşa Semineri, İstanbul, 1986, s.41-101; Mahmesâni, Subhi, *el-Evdâu't-Teşriyyetu fi'd-Düveli'l-Arabiyyeti*, s.178-338, Dâru'l-Melâyîn Li'l-Kutub, Beyrut, 1962.

⁴¹ Aydın, Mehmet Âkif, *Muhammed Kadri Paşa*, DİA, c.30, s.546, İstanbul, 2005; Heykel, Hüseyin, *Terâcimu Mısriyyetü ve Ğarbiyyetü*, s.96-103, Dâru't-Turâsi'l-Arabî, Kahire, 1980.

Çağdaş Dönemde İslâmî Hükümlerin Tedvini: Yeni Yönelimler ve Öne Çıkan Çalışmalar

Günümüzde İslam coğrafyasındaki bazı âlimler ve hukukçular, İslâmî hükümlerin tedvinine yönelik farklı üslup ve hacimlerde çalışmalar yapmışlardır. Kuveyt, Mısır, Irak, Suriye, Hindistan ve Pakistan gibi ülkelerde bireysel ve komisyonlar tarafından çeşitli çalışmalar yürütülmüştür. Bu çalışmalar sonucunda, fihhi hüküm ve kaidelerle ilgili birçok makale, ansiklopedi ve araştırma sunulmuştur.

Bu çalışmaların en kapsamlı ve dikkat çekici olanlarından biri, günümüz fikhîçilerinden Ahmet Abdullah el-Kârî tarafından 1343 H. yılında tedvin edilen "*Mecelletü'l-Ahkâmu's-Şer'iyye*"dir. Bu Mecelle, Hanbeli fihhi esas alınarak hazırlanmıştır. Müellif, eseri kaleme alırken 1293 yılında Osmanlı Devleti döneminde hazırlanan "*Mecelletü'l-Ahkâmü'l-Adliyye*"yi metot olarak dikkate almış ve ondan faydalanmıştır. Eseri incelendiğinde, ana kaynakları zikrettikten sonra "*Mukârene Beyne Mecelleti'l-Ahkâmi'l-Adliyye el-Osmâniyye ve Mecelleti'l-Ahkâmi's-Şer'iyye alâ Mezhebi'l-İmam Ahmed bin Hanbel*" başlıklı bir karşılaştırma yaptığı görülmektedir. Bu fikhî ansiklopedisi, 21 ana bölüm ve 128 alt bölümde çeşitli maddeler sunarak çözümler üretmiştir. Eser, 1401 yılında Mekke Ümmü'l-Kurâ Üniversitesi Öğretim görevlileri Muhammed İbrahim Ahmet ve Abdulvehhâb İbrahim tarafından tahkik edilerek yeniden basılmıştır.⁴²

SONUÇ

Bu çalışmada, elde edilen sonuçlar şu şekilde özetlenebilir:

Fikhî hükümlerin tedvinine yönelik her çalışma, İslam hukukundan uzaklaştırılan birey ve toplumların yeniden bu hukuka dönmeleri ve sahiplenmeleri için öncelikli bir tedavi işlevi görecektir. Bu sayede insanlık, İslam hukukunun adalet, huzur ve güven ortamıyla tanışacak; zihinlerdeki şüpheler giderilecek ve insanlar, fitratlarına uygun olan özlerine dönecektir.

İslam hukuku, yönetim ve yargılama sisteminin en adil olanını tedvin ederek insanlığa sunmuş ve onların huzur ve refahını temin etmiştir. İslam hukukunun yapısı, kulların dünya ve ahiret maslahatlarını temin etmek üzerine inşa edilmiştir. Bu nedenle, İslam hukukunun ilkeleri tamamen adalet, rahmet ve hikmettir. Adaletten otoriterliğe, rahmetten zulme, maslahattan fesada ve hikmetten cehalete yönelen hiçbir mesele İslam hukukuyla bağdaşamaz.

İslam hukuku, insanın dünya ve ahiret işlerini, her birinin gereklerine bağlı kalarak iki farklı şekilde ele almıştır: Dünya hayatını düzenlerken mücmel hükümler belirlemiş ve detayları zamanın gereksinimlerine göre şekillendirmiştir. Ahiretle ilgili olan ibadet konularını ise ictihada yer bırakmayacak şekilde ayrıntılı olarak düzenlemiştir. Dünya ile ilgili hükümlerin esnekliği, her zaman ve mekânda geçerliliğini koruyacak şekilde mücmel olarak düzenlenmiştir. İslam hukukçuları da zaman, mekân ve çevresel koşullara göre ictihadî hükümlerin değişebileceğini kabul etmişlerdir.

⁴² el-Kâsım, Abdurrahman, *el-İslâm ve Taknînu'l-Ahkâm*, Dâru'l-Meârif, Kahire, 1977, s.56; Mahmesâni, Subhi, *el-Evdâu't-Teşriyyetu fi'd-Düveli'l-Arabiyyeti*, s.178-338, Dâru'l-Melâyîn Li'l-Kutub, Beyrut, 1962.

İmam Azam, Malik, Şafîî, Ahmed, Mâverdî ve Şâtibî gibi İslam ümmetinin büyük alimleri, İslam hukukunun ictihâdî meselelerdeki esneklik ilkesinin uygulanmasını ve fıkhıdaki donukluğun giderilmesini savunmuş, bu konuda ciddi çalışmalar yapmışlardır.

Müslümanlar, bugün hızla değişen bir dünyada yaşamaktadırlar. Bu değişim karşısında, insanların inançlarını, düşüncelerini ve eylemlerini koruyabilmesi için İslam hukukunun ictihada açık, esnek prensiplerinin yeniden tedvin edilmesi ve Müslümanların ihtiyaçlarına cevap verecek şekilde aktifleştirilmesi gerekmektedir.

Hükümlerin tedvini düşüncesi, ilk bakışta zor ve karmaşık gibi görünse de aslında hukukçuların halihazırda yaptıklarından farklı bir işlem değildir. Kadim hukuk kaynakları, günümüz teknolojisi kullanılarak kolayca detaylı olarak bablara ayrılabilir. Asırların birikimi, uzman hukukçular tarafından gözden geçirilip yeni ictihadlarla desteklenerek insanlığa sunulabilir.

İslam hukukunun temel ilkelerine baktığımızda, fıkhi hükümlerin tedvin edilmesini yasaklayan ne lafzî ne de manevî bir nassa rastlanmaktadır. Makalemizde ifade ettiğimiz tedvin, İslamî öğretileri dayanak alarak yapılacak hukuki bir tedvindir.

Sivil ve siyasi otoritenin, dinen korunması şart olan; din, can, mal, namus ve akıl ile ilgili maslahata dayalı ictihâdî eylem, karar ve uygulamaları şer'î hükümler kapsamında değerlendirilmiştir. Buna göre, "ulu'l-emre" itaati emreden naslar gereğince, İslam devlet başkanının zamana, mekâna ve olayların gelişimine bağlı olarak ictihâdî konularda aldığı kararlar kazâen ve diyaneten bağlayıcıdır.

Hükümlerin tedvin edilmesi düşüncesi, İslam hukukunun zamanın ruhuna uygun olarak yaşamın taleplerine cevap verebilen, ilkeler halinde düzenlenen bir kanun taslağı haline getirilmesinden ibarettir.

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İSLAM'IN SİYASET TEORİSİ VEYA İSLAM NİZAMI HAKKINDA BİR ANALİZ AN ANALYSIS OF THE POLITICAL THEORY OF ISLAM OR THE ISLAMIC SYSTEM

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ÖZET

Bu çalışma, İslam siyaset teorisinin veya İslam nizamı düşüncesinin anlaşılabilirliği açısından büyük bir önem taşımaktadır. Bu öneminin yanı sıra günümüz çağdaş siyaset teorileri ve anayasa şekilleri ile de karşılaştırılabilirliği ve insanlığa faydalı hukuki bilgiler sunması yönüyle de ayrıca bir önem taşımaktadır. Bu önemine rağmen İslam'ın siyaset teorisi, İslamî kurum ve kuruluşların işleyiş yapısı ile ilgili geniş kapsamlı çalışmalar yapılmamıştır. Geçmişten günümüze her ne kadar bu sahada, İslam aleminde ve Batı'da bazı çalışmalar yapılmışsa da gayeye ulaşılmıştır denemez. Çünkü yapılan bu çalışmaların hemen hepsi ferdî çalışmalardır ve İslam siyaset teorisinin sadece belli bir alanıyla sınırlıdır. İbn Mukaffa'nın siyasetname türünde kaleme aldığı "*Edebu'l-Kebîr*'i", Gazzâlî'nin siyaset bilimi üzerine yazdığı "*Tibru'l-Mesbûk*'u", Muhammed et-Tartûşî'nin "*Sirâcu'l-Mulûk*'u", İbn Haldûn'un siyaset tarihi ağırlıklı eseri olan "*Mukaaddimesi*" ve Kınalızade'nin siyaset felsefesi alanında kaleme aldığı "*Ahlâk-ı Alâî*" adlı eserleri bu konunun en güzel örnekleridir. Halbuki genelde insanlık için, özelde İslam aleminin için hayati öneme sahip olan böyle bir hususun, teorik olarak bir eserle geçirilmemesi gerekir. Aksine bu düşüncenin detaylarının işleneceği, tartışılacağı üniversiteler gibi müstakil bilimsel araştırma merkezlerinin açılması ve dünya çapında bu hususta uzman bilim adamlarının buralarda biraraya gelerek çalışmaları ve konunun detaylarını günümüzde uygulanabilecek şekilde tüm şeffaflığıyla ortaya koymaları gerekir. Gerçekler, zaman zaman toplumlara kabul ettirmek için efsanelerle örülmüştür. Bu nedenle araştırmacıların ve uzmanların bu sahada son derece titiz bir çalışma yapmaları ve gerçekleri ortaya çıkarmaları gerekir. Böylece insanlık, İslam siyasetinin ve nizamının geçmişte kalan bir efsane değil, her çağda uygulanabilir bir sistem olduğu gerçeğiyle de yüzleşecektir.

Anahtar Kelimeler: İslam Siyaseti, İctihad, Ümmet, Şûra, Hilafet, İcma.

ABSTRACT

This study is of great importance in terms of understanding the Islamic political theory or the idea of Islamic order. In addition to this importance, it is also important in that it can be

compared with today's contemporary political theories and constitutional forms and provides useful legal information to humanity. Despite this importance, no comprehensive studies have been conducted on the political theory of Islam and the functioning structure of Islamic institutions and organizations. Although some studies have been carried out in this field, in the Islamic world and the west from past to present, it cannot be said that the goal has been achieved. Because almost all of these studies are individual studies. And it is limited to only a certain area of Islamic political theory. İbn Mukaffa's "Edebu'l-Kebir'i" written in the form of political book, Gazzali's "Tibru'l-Mesbuk'u" written on political science, Muhammed et-Tartushi's "Siracu'l-Muluk'u", İbn Khaldun's "Mukaddimesi", which is a work focused on political history and Kınalızade's works, "Ahlak-ı Alâi", written in the field of political philosophy are the best examples of this subject. However, this issue, which is of vital importance for humanity in general and the Islamic world in particular, should not be glossed over with a theoretical work. On the contrary, independent scientific research centers such as universities should be opened where the details of this idea will be processed and discussed, and scientists from around the world who are experts on this subject should come together and work in these places and reveal the details of the subject with all transparency in a way that can be applied today. Facts are sometimes woven with legends to be accepted by societies. For this reason, researchers and experts need to carry out extremely meticulous work in this field and reveal the facts. Thus, humanity will face the fact that Islamic politics and order are not a legend of the past, but a system that can be applied in all ages.

Keywords: Islamic politics, İjtihad, Ummah, Shura, Caliphate, İjma.

GİRİŞ

İSLAM'IN SİYASET TEORİSİYLE İLGİLİ ÇALIŞMALAR HAKKINDA GENEL BİR DEĞERLENDİRME

Genel anlamda İslami ilimler ve İslam tarihi alanlarında; ilahiyat, tarih ve hukuk fakültelerinde farklı bölümler altında çalışmalar yapılmıştır. Ancak İslam'ın siyaset teorisi veya İslam nizamı ile ilgili müstakil bölümler açılmamış ve bu alanda detaylı çalışmalar gerçekleştirilmemiştir. Müslüman sosyologlar ve siyaset bilimcileri tarafından da İslam'ın siyaset teorisi, İslami kurum ve kuruluşların işleyiş yapısı ile ilgili geniş kapsamlı çalışmalar yapılmamıştır.

Geçmişten günümüze, İslam aleminde ve Batı'da bu alanda bazı çalışmalar yapılmış olsa da İslam siyaset teorisi ve nizamıyla ilgili geniş kapsamlı ve müstakil çalışmalar yeterli düzeyde gerçekleştirilmemiştir. Örneğin, Mâverdi'nin (972-1058) "*el-Ahkâmu's-Sultaniyye*", İbn Kuteybe'nin (828-889) "*el-İmâmetu ve's-Siyâsetu*", İbn Hişam'ın (ö. 833) "*Târihu's-Sîretu'n-Nebeviyye*", Celâleddin es-Suyûti'nin (1445-1505) "*Târihu'l-Hulefa*", Muhammed Cemâleddîn Surur'un (1912-1999) "*Kıyamu'd-Devleti'l-İslâmiyyeti*", Muhammed Abdullah es-Semmân'ın (1335-1428) "*Mebâdiu'l-Hukmi'l-İslâmî*", Muhammed er-Reyyis'in (1912-1977) "*en-Nazariyye es-Siyâsiyye el-İslâmiyye*", Abdu'l-Vehhâb Hallaf'ın (1888-1956) "*Târih et-Teşri'l-İslâmiyyi*",

İbn Teymiyye'nin (1263-1328) "*es-Siyâsetü's-Şer'iyyetü fî İslâhi'r-Râi ve'r-Raiyyeti*", Muhammed Han Şîrvânî'nin (1938-1984) "*İslam'ın Siyasî ve İdari Düşüncesiyle ilgili Teoriler*", Muhammed Hamidullah'ın (1908-2002) "*İslam'da Devlet İdaresi*", Erwin Rosenthal'ın (1904-1991) "*Ortaçağ'da İslam Siyaset Düşüncesi*" ve Montgomery Watt'ın (1909-2006) "*İslam'ın Siyasî Düşüncesi*" gibi eserler bu sahada önemli katkılar sunmuş olsa da, gayeye tam anlamıyla ulaşılmış değildir. Çünkü bu çalışmaların büyük çoğunluğu ferdi çabalara dayanmaktadır ve dolayısıyla ortaya konan bilgiler yazarların bireysel düşüncelerini veya tasvip ettikleri bazı yazarların görüşlerini yansıtmaktan öteye gidememiştir.

Oysa insanlık genelinde ve İslam alemi özelinde hayati öneme sahip bu konunun, teorik birkaç eserle sınırlı kalmaması gerekir. Aksine, bu düşüncenin detaylarının işleneceği, tartışılacağı üniversiteler gibi müstakil bilimsel araştırma merkezleri ve kurumlarının kurulması, dünya çapında bu konuda uzman bilim insanlarının bu merkezlerde bir araya gelerek aylarca, hatta yıllarca çalışmaları ve konunun tüm yönlerini şeffaf bir şekilde ortaya koymaları gerekmektedir.¹ Özellikle sosyal bilimlerde geliştirilen bilimsel araştırma tekniklerinden yararlanarak, siyasi İslam düşüncesi ve İslam devlet idaresi ile ilgili; cemaat, kavim, millet, ümmet, ahd, akd, mîsak, emânet, velâyet, hilafet, şûra, emri bi'l-ma'rûf ve'n-nehîy anî'l-münker, ictihad ve icma gibi kavram ve terimlerin çağımızda anlaşılabilir bir sadeliğe kavuşturulması elzemdir. Böyle bir çalışma, bu konuyla ilgili tüm yerli ve yabancı araştırmacılara ve bilim insanlarına büyük kolaylık sağlayacak ve İslam siyasetinin ve yönetim şeklinin daha net anlaşılmasına katkı sunacaktır.²

İslam'ın siyasi düşüncesi, yönetim şekli ve gelişimi hakkında en detaylı araştırma imkanlarına ve bilgisine sahip olanlar, hiç şüphesiz İslam hukukçuları ve sosyologlarıdır. Bu sahada çalışan bilim insanları, tarihin derinliklerine inerek geçmiş medeniyetler hakkında detaylı araştırmalar yapmış ve yapmaktadırlar; tarih sayfaları arasında tozlanmış pek çok resmi ve gayri resmî belgeyi gün yüzüne çıkarmışlardır. Ancak burada dikkat edilmesi gereken önemli bir husus vardır: İslam'ın siyasi düşüncesi ve İslami yönetim şekliyle ilgili elde edilen tarihi vesikaların, çağdaş bilimsel araştırma yöntemlerinden de yararlanılarak son derece titiz bir şekilde incelenmesi ve değerlendirilmesidir. Aksi takdirde, gerçekler efsanelerle karıştırılabilir. Çünkü bu vesikalar, toplumsal ve dini hareketler ile evrelerle ilgili gelişmeleri içermektedir. Gerçekler, zaman zaman toplumlara kabul ettirmek için efsanelerle örtülmüştür. Bu nedenle, araştırmacıların ve uzmanların son derece dikkatli bir çalışma yapmaları ve gerçekleri ortaya çıkarmaları gerekmektedir. Böyle bir titizlikle, İslam mirası hakkında objektif çalışmalar yeniden yapılabilir.

Elbette bu oldukça zor bir çalışma olacaktır. Bir yandan, o dönemde yaşayan bazı İslam hukukçularıyla dönemin siyasi akım ve kurumları arasındaki derin duygusal bağlar, diğer

¹ Vehbe, Tefik Ali, *el-İslâm Şeriatu'l-Hayâti*, Dâru'l-Livâ, Riyat, 1401, s.35; Ebu Ubeyd, Arif, *el-Kur'ânü Şeriatü'l-Muctemei*, Mektebetü'l-Menâr, Ürdün, 1987, s.39; el-Bedrî Abdu'l-Azîz, *el-İslâmu Beyne'l-Ulemâi ve'l-Hukkâmi*, el-Mektebetü'l-İlmiyyeti li'n-Neşri, Bağdad, 1977, s.189.

² Karadavî, Yusuf, *Likâât ve Hivârât Havle Kadâyâ'l-İslâm ve'l-Asr*, Mektebetü Vehbe, Kahire, 1992, s.58; el-Hayyât, Abdu'l-Azîz, *el-Müeyyidât et-Teşrîyye*, Dâr's-Selâm li't-Tibâaati ve'n-Neşri, Kahire, 1986, s.11.

yandan dönemin siyasi baskısı bu zorluğun kaynakları arasındadır. Dolayısıyla, İslam hukukçuları, insanlığı yeniden adaletli zamanlarına kavuşturmak amacıyla böyle bir çalışmayı gerçekleştirmek zorundadır. Bu yolla, İslam mirasının insanlığa faydalı olan kısmı korunacak, olumsuz olan kısımlar ise tespit edilerek tekrarından ve dolayısıyla zararından kaçınılması sağlanacaktır.³

HUKUKUN İKİ ANA DİNAMİĞİ: KUR'AN VE SÜNNET

İlk İslam toplumunda ve sonraki dönemlerde, her türlü sorunun çözümünde esas alınan iki temel kaynak, Kur'an ve Peygamber'in (sav) sözlü, fiili ve takriri sünnetidir. Bu kapsamda, Peygamber'in (sav) gazveleri ve siretle ilgili olaylar da yer almaktadır.⁴

Hadis ulemasına göre, hadis ilmi, Resulullah'ın (sav) sözlerinden oluşmaktadır. Bu nedenle, hadislerin tarih açısından değerlendirilmesi bir zorunluluk olarak görülmemiştir. Hadislerin, Kur'an gibi İslam hukukunun iki temel kaynağından biri olduğu kabul edilmiştir.⁵ Hadis ilimleriyle ilgili çalışmaların, Peygamber'in (sav) vefatından sonra yapıldığı konusunda bir fikir ayrılığı bulunmamaktadır. Ancak, Müslümanlar arasında meydana gelen savaşlar ve siyasi hedeflerin gerçekleştirilmesi için zaman zaman hadis uydurulduğu gerçeği de inkâr edilemez. Hadis kaynakları üzerinde yapılan tahkik çalışmalarında bu gerçek ortaya çıkmıştır. Örneğin, bu kitapların "*Menâkıb*" bölümüne bakıldığında, o dönemde yaygın olan siyasi düşüncelerin bu hadislere sızdırıldığı görülmektedir. Aynı durum, hadis külliyatlarının "*el-Fiten ve'l-Havâric*" bölümlerinde de karşımıza çıkmaktadır.⁶

Özellikle vurgulamak gerekir ki, bu durumdaki hadislerde hiçbir fayda yoktur ve dolayısıyla tümüyle reddedilmelidir gibi bir düşünceyi savunmuyoruz. Aksine, bu hadislerin, o dönemin çalkantılı İslami siyasi iklimini ve farklı gelişim evrelerini bize aktardığını söyleyebiliriz. Hatta, bu hadislerin o dönemin olayları için ciddi birer delil niteliği taşıdığını da ifade edebiliriz. Siyasi olaylarla ilgili bazı mevzu hadislerin varlığı, hadislerin ekserisinin Hz. Peygamber'in (sav) sahih olan kavî ve fiilî sünnetlerini bize aktardığına engel değildir.⁷

Buna benzer bir diğer önemli konu, Orta Çağ'da İslam hukukçularının tarih, kanun, siyaset gibi alanlarda kaleme aldıkları eserlerdir. Bu eserlerin, günümüz bilimsel araştırma yöntemleriyle, çağımızın ihtiyaçlarına cevap verebilecek şekilde, alanında uzman ekipler tarafından titizlikle

³el-Aşkar, Ömer, *eş-Şeriatü'l-İslâmiyyetü Lâ el-Kevânînu'l-Ved'iyyetü*, Dâru'd-Da've, Kuveyt, 1982, s.199; Halil, Muhsin, *el-Kanûnu'd-Dustûriyyi ve'n-Nüzümü's-Siyâsiyye*, Munşeatü'l-Meârifî, Dımaşk, 1976, s. 43; Abdül-Mutâl, Hazim, *en-Nazariyyetu'l-İslâmiyyetu fi'd-Devleti*, Dâru'n-Nahdeti, Mısır, 1987, s. 75.

⁴ el-Muttakî, el-Hindî Alau'd-Dîn, *Kenzu'l-Ummâl Fi Süneni'l-Akvâli ve'l-Efâl*, Mektebetu't-Turâsi'l-İslâmiyyi, Haleb, 1968, s.254; Şâkir, Mahmûd, *et-Târîhu'l-İslâmî*, el-Mektebu'l-İslâmî, Beyrut, 1399. S.189.

⁵ Hudari, Muhammed, *İtmâmu'l-Vefâ fi Sireti'l-Hulefâ*, Dâru'd-Da'veti, Haleb, 1986, s.197; Bûtî, Muhammed Saîd, *Fukhu's-Sîre*, Dâru'l-Fikr li'n-Neşr, Beyrut, 1400, s.87.

⁶ Hadis uydurma ve tehlikelerine karşı alınması gereken önlemler hakkında daha geniş bilgi için bkz. el-Makdisi, Ebu'l-Fadl Muhammed, *Tezkiretü'l-Mevdûât*, Mektebetu'l-Külliyâti'l-Ezheriyye, Kahire, 1323, s.321; Suyûtî, Celâlu'd-Dîn, *el-Lâl'iyyu'l-Mesnûatu fi'l-Ehâdisi'l-Mevdûati*, Dâru'l-Ma'rife, Dımaşk, 1395, s.165; Aclûnî, *Keşfu'l-Hafâ ve Muzîlu'l-İlbâsi Ammâ İştehere mine'l-Ehâdis alâ elsineti'n-Nâs*, Dâru İhyâi't-Turâsi'l-Arabî, Beyrut, 1351, 43.

⁷ Karadâvî, Yusuf, *Keyfe Netâmel Maa's-Sünneti'n-Nebeviyyeti*, Dâru's-Şurûk, Kahire, 2002, s. 42; Ba Cem'an Muhammed, *es-Sünnetü'n-Nebeviyye el-Masdaru's-Sânî Li't-Teşri'l-İslâmî ve Mekânetuha min Haysu'l-İhticâc ve'l-Amel*, Müessesetü'r-Reyyan, Medine, s.88; eş-Şâtîbî, *el-Muvâfakât*, III, s.4-7.

incelenmesi ve tahkik edilmesi gerekmektedir. Bu nedenle, çalışmamızın başında vurguladığımız üzere, İslam devlet yapısı ve siyaseti ile ilgili müstakil üniversiteler ve bilimsel araştırma merkezlerinin kurulması ve bu kurumların objektif ve aktif bir şekilde çalışması büyük önem taşımaktadır. Böyle titiz çalışmaların başarısı için ciddi bir maddi desteğin, samimi bir manevi destekle bir arada olması şarttır. Aksi takdirde, yapılan çalışmalar, objektiflikten uzaklaşacak ve grup veya cemaat mantığının öne çıkmasından öteye geçemeyecektir.⁸

Maverdi'nin "*el-Ahkâmü's-Sultâniyye*", Şâtıbî'nin "*el-Muvâfakât*", İbn Haldun'un "*Mukaddime*" gibi eserleri ve İbn Teymiyye, Gazali, Ebu Yûsuf gibi düşünürlerin bu alanda kaleme aldıkları yazılar, İslam toplumunun farklı evrelerdeki gelişme sürecinde karşı karşıya kaldığı sorunları, bu toplumun ve hukukçularının olaylar karşısındaki tutumlarını bize aktarmaktadır. Müslüman bir sosyolog, siyaset bilimci veya hukukçu, bu eserleri titiz bir bilimsel çalışmayla incelediğinde, ilk dönem İslam toplumu ile dönemin devlet ve siyaseti hakkında net bir anlayışa sahip olacaktır. Bu süreçte, Al-i İmran, 3/159 ve Şûra, 42/38 sureleri gibi şûraya⁹ teşvik eden ayetleri de birlikte değerlendirecektir. Böylece, ilk dönem İslam toplumunda hâkim olan; şûra, ictihad ve icmâ dinamikleri üzerine inşa edilen adalet temelli¹⁰ siyasî sistemin, sonraki dönemlerde otoriter rejimlere nasıl dönüştüğünü de rahatlıkla analiz edebilecektir. Elde edilen bu değerli bilgiler, zaman ve mekânın değişmesiyle birlikte bilimsel ortamlarda yeni nesiller tarafından incelendiğinde, İslam toplumunun ve hatta dünya insanlık ailesinin iyiliği için değerlendirilecek ve İslam ümmetinin veya adalet ve huzurun hâkim olduğu toplumların oluşumuna, küçük de olsa bir ivme kazandıracaktır. Çünkü bu bilgilere sahip olan her araştırmacı, ilk dönem İslam toplumunda hâkim olan adalet, eşitlik, huzur, güven, istikrar gibi yaşam dinamiklerini görecektir, bu dinamiklerin neden, kim tarafından ve niçin ortadan kaldırıldığını, otoriter rejimlerin nasıl ve hangi dinamikler üzerine kurulduğunu detaylarıyla öğrenecek, benzer bir akıbetten sakınmaya çalışacak ve toplumu da bu konuda bilinçlendirecektir.

Hız. Muhammed (Sav) Örneği (610-632)

Hız. Muhammed (sav), normal insanî şartlardan yoksun bir halde yaşayan Arap kabilelerinin tümünü bir araya getirerek onlardan bir ümmet oluşturmuştur. Böylece kabilelerin eski gelenek

⁸ Mütevellî, Abdu'l-Hamîd, *el-Vecîz fi'n-Nazariyyâti ve'l-Enzîmeti's-Siyâsiyyeti*, Dârü'l-Meârif, Kahire, 1984, s.87-88; Abdu'l-Kerim Fethi, *ed-Devletü ve's-Siyâdetü fi'l-Fikhi'l-İslâmiyyi*, Mektebetü Vehbe, Dimaşk, 1984, s. 25; Beyyâtî, Munîr Humeyd, *ed-Deletü'l-Kânuniyye ve'n-Nizâmü's-Siyâsi el-İslâmî*, ed-Dârü'l-Arabiyyeti li'-Tibâati, Beyrut, 1979, s.48; Bedevî, Servet, *Usûlu'l-Fikri's-Siyâsiyyi ve'n-Nazariyyâti ve'l-Mezâhibi's-Siyâsiyyeti'l-Kubrâ*, Dârü'n-Nahdeti'l-Arabiyyeti, Kahire, 1967, s. 133.

⁹ Allah'ın (cc) şûra sistemini emredip, niteliği ve işleyişi hakkında net bir bilgi inzal buyurmaması; Hız. Peygamber'in (sav) ve Raşit Halifeler'in de şûrayı farklı şekillerde uygulamaları, bu sistemin insanlığın gelişimiyle orantılı olarak evrileceğinin bir işaretidir. Ayrıca, bu uygulamanın insana bırakılması, Allah'ın kullarının aklına verdiği önemi göstermektedir. Dolayısıyla, İslam hukukçularının, insanlığın otoriter rejimlerden ve sistemlerden kurtulup, yerine özgürlük, hürriyet, eşitlik ve istişarenin hâkim olacağı sistemlerin kurulması için çalışmalar yapmaları gerekmektedir. Vasfî Mustefa Kamâl, *eş-Şûrâ fi'l-İslâm*, Mecelletü'l-Ezher, el-Kahire, 1971, sy.8, s.766.

¹⁰ Şûra ve gerçek manasıyla demokrasi, isim olarak farklılık gösterse de anlam ve içerik açısından birbirine yakın kavramlardır. Abdu'l-Hadi'nin de değerlendirdiği gibi, her iki sistemde de otoriter anlayış reddedilmekte, yönetime ve yöneticiye karşı ayaklanma yasaklanmakta, yönetenlerle yönetilenler karşılıklı görev ve sorumluluklarını bilmekte ve devletin yönetimi için belirli bir sistemin gerekliliği konusunda aynı kriterleri savunmaktadır. Ebu Talip, Abdu'l-Hadi, *ed-Dimukrasîyyetü ve's-Şûrâ*, müessesetü'n-Nidâ, Ürdün, 1984, s.32.

ve göreneklerinin yerini İslam hukukunun esasları almıştır. Kendisi de bu yeni ümmetin genel başkanı olmuştur. Nedve'nin yerini şûra almıştır. Kısacası toplumda siyasî ve sosyal sahada meydana gelen bu köklü değişimin ana dinamikleri; ihtiyaca ve duruma göre nazil olan vahiy, Hz. Peygamber'in (sav) fiilleri ve aktif şûra olmuştur.

Hz. Peygamber (sav), Allah'ın kendisine bahsettiği hikmetle, kanun ve kural tanımayan, sürekli savaş halinde olan Arap kabilelerini medenî bir toplum haline getirmiştir. Peygamber (sav), Mekke ve Medine dönemlerindeki tüm yaşamı boyunca mesaisini böyle bir toplumun inşasına adanmış ve bu süreçte her yönüyle rol model olmuştur.

Hz. Peygamber (sav), ümmetin ihtiyaçlarını dikkate alarak tesis ettiği bu yeni sistemde; sabit bir yönetim şekli oluşturmadığı gibi, siyaset teorisinin detaylarına da yer vermemiştir. Peygamber (sav) bu tutumuyla, kendisinden sonra gelecek toplumlara, şûra yoluyla dönemlerinin değişen şartlarına uygun siyaset teorileri belirleyebilme imkânı sunmuştur. Ayrıca, istenen neticelere ulaşabilmeleri için Müslümanlara sürekli şûra ve istişâre yoluyla "İctihad" ve "İcmâ"nın ehemmiyetini uygulamalı olarak göstermiştir.¹¹

Hz. Muhammed (sav), Kur'an vahyiyle mücmel olarak inzal edilen hükümlerin detaylarını, kendisine bildirilen ilahî öğretilerle Müslümanlara öğretmiştir. Kur'an'ın değinmediği ve daha çok dünyevî hususlarla ilgili sorunları ise kendi reyî doğrultusunda yorumlamıştır. Örneğin, Kur'an namazın farzîyetini bildirmiş, ancak nasıl kılınacağıyla ilgili detayları Peygamber öğretmiştir. İbadetler ve şer'î hükümlerde Peygamber, Ashabıyla istişâre etmemiştir, çünkü bu hususlar nassla belirtilmiştir ve nass olan konularda içtihad söz konusu değildir. Ancak siyasi strateji, savaş, barış, güvenlik tedbirleri, idari sorunlar ve tarım gibi devletin genel siyasetiyle ve işleyişiyle ilgili konular, her toplumun kendi döneminin yaşam koşullarına ve şartlarına göre değişiklik arz eden ve hakkında herhangi bir şer'î hüküm bulunmayan durumlar bağlamında, ümmet için bağlayıcı değildir. Çünkü bu durumlarda Peygamber'in (sav) şahsi görüşleri istişâreye ve tartışmaya açık bırakılmıştır. Örneğin, Medine döneminde hurma ağaçlarının aşılınmamasını önermiş, ancak mahsul miktarı azalınca Ashap rahatsızlığını dile getirmiştir. Bunun üzerine Peygamber, "*Dininiz hususunda size söylediklerimden asla taviz vermeyin ama bunun dışında benden duyduklarınız sadece bir görüştür, dilerseniz onu alırsınız dilemezseniz bildiğiniz gibi yaparsınız.*" buyurmuştur.¹² Bu bağlamda rahatlıkla söyleyebiliriz ki, şûra; ilk İslam toplumuyla birlikte var olmuş ve vahiyde de teyit edilmiştir. Şûra'nın uygulanacağı alan, hakkında Kur'an ve Sünnet naslarının bulunmadığı, devlet ve toplumu ilgilendiren tüm alanlardır.¹³

¹¹ Avâ, Muhammed Selîm, *Fi'n-Nizâmi's-Siyâsiyyi li'd-Devleti'l-İslâmiyyeti*, el-Mektebu'l-Mısriyyu'l-Hadîsu, Amman, 1972, s.131; Ferrâ, ebu Ya'lâ Muhammed, *el-Ahkâmu's-Sultâniyyetu*, Şeriketü Mustafa el-Bâbî el-Halebî, Kahire, 1386, s.233; Esed, Muhammed, *Minhâcu'l-İslâmi fi'l-Hukmi*, Dâru'l-İlmi li'l-Melâyîn, Beyrut, 1985, s.65.

¹² Müslim, Fedâil, 141; Elbânî, Nasîru'd-Dîn, *Sahihuhu'l-Câmi's-Sağîr ve Ziyâdetuh (el-Fethu'l-Kebîr)*, el-Mektebu'l-İslâmî, Beyrut, 1988, s.1423.

¹³ Nedevî Muhammed Ekrem, *en-Nu'mânî Şibli Allâmetu'l-Hindi el-Edîbu ve'l-Muerrihu'n-Nâkidi'l-Erîbi*, Dâru'l-Kalem, Dımaşk, 2009, s.148; el-Hayyât, Abdulaziz, *el-Müeyyidât et-Teşriyye*, s.7; el-Huseyn, Muhammed Hıdr, *eş-Şerîatu'l-İslâmiyyetu Sâlihâtin likulli Zemânin ve Mekân*, el-Mektebetu't-Taâvuniyye, Dımaşk, 1975, s.65; ibnu'l-Esîr, İzzet'd-Dîn, *el-Kâmil fi't-Târih*, Dâru's-Sâdir, Beyrut, 1399, s.187; el-Hatîb, Zekerîyya, *Nizâmu's-Şûra*

Hız. Ebu Bekir (r.a.) Örneđi (632-634)

Hız. Peygamber'in (sav) vefatından sonra İslam ümmeti, vahiyden ve onun içtihadından mahrum kalmıştır. Ancak Kur'an, Sünnet ve şûra sistemi, kıyamete kadar devlet idaresi ve siyaseti konusunda İslam ümmetinin en büyük dayanakları olmuştur. Hız. Peygamber, ashabını karşılaşılan problemler karşısında Kur'an'dan ve sünnetten hüküm çıkarma hususunda yeterince eğitmiştir. Herhangi bir sorun ortaya çıktığında, onu ashabına arz eder, onlardan her biri mesele hakkında görüş belirtir ve nihayetinde ortak bir çözüm üzerinde oy birliğine varırlardı. Bu durum, icma ve icthadın, şûra mekanizmasıyla sıkı sıkıya bađlı olarak uygulanan bir sistem olduğunu göstermektedir.¹⁴

İslam hukukçuları, bu durumu göz önünde bulundurarak, halifede¹⁵ bulunması gereken şartların başında, halifenin veya devlet başkanının icthad yapma yeteneđine sahip olmasını ileri sürmüşlerdir. Çünkü halife, fıkıh, akaid, hadis, tefsir ve diđer ilim dallarında ne kadar geniş bir bilgiye sahip olsa da insanların ortaya çıkacak olan problemlerini Kur'an ve Sünnet perspektifinde çözebilmek için icthad edebilme yeteneđine sahip olmalıdır. Bu hususta Hız. Ebu Bekir (r.a.), Müslümanların biatını aldıktan hemen sonra ilk sınavını vermiştir. Peygamber'in vefatından sonra İslam'ı henüz tam benimsemeyen bazı kimseler irtidat etmiş, bazıları peygamberlik iddiasında bulunmuş ve bazıları da zekât vermekten kaçınmıştır. Onlara göre Peygamber (sav), Allah'ın elçisi olduđu için ona itaat zorunluymdu, ancak halifenin böyle bir vasfı olmadığı için onun emirlerinin bađlayıcılığı yoktu. Bu nedenle Ashab, Kur'an ve Sünnet'te halifeye itaati vacip kılan deliller aramaya başlamıştır. Sonuçta, hilafetin şer'i bir zaruret olduđu ve bu zarureti teyit eden nasların bulunduđu kanaatine varmışlardır. Bu konuda dayandıkları deliller, içerisinde halife ve hilafet kavramları geçen ayetler ve hadisler olmuştur. Müslümanlar da Ashab'ın ayet ve hadislere dayanarak vardıkları bu icmaya itibar etmiş ve halifeye itaatin vacip olduđuna karar kılmıştır. Bu çetrefilli durum, her konuda dirayetli, zeki ve çevik bir şahsiyete ihtiyaç duyuyordu. Hız. Ebu Bekir'in sahip olduđu geniş icthad kudreti, köklü yakîn ve imanı, Ashab'ın da ona olan yardım ve desteđiyle, çözülemeyecek gibi görünen bu sorunun üstesinden gelmiş ve Müslümanları dađılmaktan kurtarmıştır. Özetle, Peygamberin vefatının ardından ortaya çıkan kaosta ve müminlerin Peygamber olmaksızın yeni bir hayata

fi'l-İslâm ve'n-Nüzümü'd-Dimukrâtiyyeti'l-Muâsira, Daru'l-Ma'rife, Ürdün, 1985, s.355; ebu's-Suûd, Muhammed, *İrşâdu'l-Akli's-Selîm ilâ Mezâyâ el-Kur'âni'l-Kerîm*, Matbatu Muhammed Ali, Kahire, 1971, s.111.

¹⁴ Ebu İyd, Arif, *Vazifetu'l-Hâkim fi'd-Devleti'l-İslâmiyyeti*, Dâru'l-Erkam, Kuveyt, 1984, s.86; ebu Tâlib, Abdül-Hâdi, *el-Merci' fi'l-Kanûni'd-Dustûri*, Dâru'l-Kutubi'l-İlmiyyeti, Beyrut, 1989, s.54.

¹⁵ Hız. Muhammed'in (sav) vefatından sonra, Müslümanların oybirliğiyle veya çoğunluğunun desteđiyle İslam devletini siyasi ve idari tüm hususlarda yönetmek üzere seçilen devlet başkanına "halife" denilmektedir. Bu kavram, ilk kez Mescid-i Nebevî'nin kuzeybatısında yer alan ve Benî Sâide kabilesinin acil toplanma yeri olan Sakîfe'de, Müslümanları idare edecek bir yönetici belirlemek üzere bir araya gelen ashab tarafından kullanılmıştır. O toplantıda, ashab Ebu Bekir'e "Allah'ın halifesi" unvanını vermiştir; ancak Ebu Bekir, bu nitelendirmeden sakınarak kendisini "Peygamberin halifesi" olarak tanımlamayı tercih etmiştir. Ömer'in (ra) hilafetiyle birlikte bu unvan yerine "Mü'minlerin emiri" sıfatı kullanılmıştır. Halifeliđinin başında Ömer'e "Peygamberin Halifesi'nin Halifesi" adı verilmişse de gelecekte birçok İslam halifesinin olacađı düşünülerek bu unvandan vazgeçilmiş ve "Mü'minlerin emiri" ismiyle yetinilmiştir. Daha geniş bilgi için bkz. Bellâzûri, Ahmed bin Yahya, *Ensabu'l-Eşraf*, Dâru'l-Cil, Beyrut, 1996, II, s.187; Kettânî, *et-Terâtibu'l-İdâriyyeti*, Müessesetu'r-Risâle, Beyrut, 1987, I, s.2; İbn Hişâm, *es-Siretu'n-Nebeviyye*, Dâru'l-Hayri, Beyrut, 2002, IV, s.299.

uyum sağlamalarında önemli bir rol üstlenmiştir. Bununla da kalmamış, isyancıları dışlamak yerine onları yeniden topluma kazandırmıştır.

Ebu Bekir (r.a.), bu sorunlar karşısında Peygamber'in siyasetini aynen uygulamıştır. Sorunu Ashab'a arz etmiş ve onların tek tek görüşlerini almıştır. Ashabın çoğunluğu, zekât vermeyen ve dinden dönenlere karşı savaşın ertelenmesi gerektiği yönünde görüş belirtmelerine rağmen, Ebu Bekir (r.a.) onlarla savaşıma düşüncesinde kararlı davranmıştır. Bu durum, halifenin şura ehliyle istişare ettikten sonra, eğer onların görüşleri Hz. Peygamber'in söz veya uygulamalarına muhalifse, onların görüşleriyle amel etmek zorunda olmadığının bir kanıtıdır. Ebu Bekir'in (r.a.), bu önemli konuda Ashabın çoğunluğunun görüşüne aykırı davranması, onun ictihad kudretinin ve ilminin genişliğinin bir işaretidir. Çünkü o, böyle hareket ederek, gelecekte zaman ve zeminin değişmesiyle, İslam'ın ayet ve hadislerle belirlenen inanç gibi esas konularında, Müslümanların değişiklik yapabileceği düşüncesine kapıyı tamamen kapatmıştır. Öte yandan, Arap kabileleri arasında yaygın olan ferdiyetçi hareket mantığına da son vermiştir. Çünkü Müslümanlar, Ebu Bekir (r.a.) ile beraber hareket etmiş, fitne ortadan kaldırılmış ve din tamamen Allah'a ait olmuştur.¹⁶

Hız. Ömer (r.a.) Örneđi (634-644)

İslam dünyasında halifeliđi en iyi şekilde icra eden kiři olarak Ömer (r.a.) kabul edilmektedir. Zira o, bir yandan devletin sınırlarını genişletirken, diđer yandan da devletin kurumsallaşması ve her birimin sistemli bir şekilde çalışmasının temellerini atmıştır. İslam hukukçuları, Ömer'in (r.a.) fıkıh, yönetim ve siyaset alanlarında üstün bir yetenek sergilediđini ve bu konularda sayısız içtihatla bulunduđunu belirtmişlerdir.

Hız. Ömer, İslam siyaset teorisini ve nizamını sistemleştirmiş ve her alanda önemli atılımlar gerçekleştirmiştir. Ebu Derda'yı (r.a.) Medine'ye, Suheyb'i (r.a.) Basra'ya ve Ebu Musa el-Eş'ari'yi Kufe'ye kadı olarak atayarak, hukukçu vasfına sahip ilk kadı ve baş kadı atayan halife olmuştur. Ebu Musa el-Eş'ari'ye gönderdiđi yazısında, karşılaştığı problemleri çözmeye nasıl bir hukuki yöntem izleyeceđini detaylı bir şekilde belirtmiştir.¹⁷ Onun döneminde, daha önce bulunmayan düzenli hapisaneler inşa edilmiş, daha sonraları kurulacak olan emniyet biriminin temeli sayılan bekçilik sistemi getirilmiştir. Sınırların genişlemesiyle birlikte, İslami hükümlerin daha düzenli ve sistemli olarak uygulanabilmesi amacıyla topraklar bölgelere, illere ve vilayetlere ayrılmıştır. Kurumlar arasındaki işleyiři kolaylaştırmak için de tüm kurumların kendisine bađlı olduđu "Divan" kurulmuştur. Ayrıca, Hız. Ali'nin tavsiyesiyle ilk hicri takvimi oluşturmuştur. İlk düzenli ordu kurulmuş ve ümmetin vahdeti sağlanmıştır. Hız. Ömer, şura mekanizmasını aktifleştirerek Ashab'ın görüşlerine başvurmuş ve onların oybirliđiyle, devlet başkanı sıfatıyla bu işlerin tümünü düzenlemiştir.

¹⁶ İbn Haldun, Abdurrahman, *Mukaddimetu İbni Haldûn*, Müessesetü'r-Risâle, Dimaşk, 1989, s.54; Zeyn, İbrahim Muhammed, *es-Sultatu fi Fikri'l-Müslimîn*, ed-Dâru's-Sûdâniyye, Hartum, 1989, s.143; Temâvî, Süleyman, *es-Sulutatu's-Selâsu fi'd-Desâtiri*, Dâru'l-Fikri, Beyrut, 1967, s.198; Huveydî, Hasan, *eş-Şûrâ fi'l-İslâm*, Dâru'l-Kutubu'l-İlmiyyeti, Beyrut, 1998, s.19.

¹⁷ Hız. Ömer'in, ebu Mûsa el-Eş'ari'ye hukuk ile ilgili yazdıđı resmi yazısının detayları için bkz. ez-Zer'î Muhammed bin ebî Bekr, *İ'lâmu'l-Muvakkîin an Rabbi'l-Âlemîn*, Dâru'l-Cil, Beyrut, 1973, s.69.

İslam hukukçuları, halifenin bu tasarruflarını şu şekilde değerlendirmişlerdir: Devlet başkanının, İslam hukukunda muteber olarak kabul edilen prensiplere uygun olarak mübah alanla ilgili yaptığı icthadî uygulamalar, dinin temel esas ve hükümlerine uygun olduğu ve günah içermediği sürece "şer'î hüküm" kapsamında sayılmakta ve hukuken bağlayıcı olmaktadır. Devlet yöneticisinin yasama yoluyla belirlediği hükümlerin bağlayıcı olması, bu icthadî hükmün "Sizden olan ulu'l-emre (yetki sahiplerine/yöneticilere) de itaat edin"¹⁸ mealindeki nassın emri gereğince, yöneticilerin sahip oldukları yetkiden kaynaklanmaktadır.¹⁹

H. Osman (r.a.) Örneği (644-656)

H. Osman (r.a.), önceki halifenin siyaset teorisini ve yönetim metodunu aynen devam ettirmiştir. Ancak, Benî Ümeyye'nin devletin her kademesinde artan etkisi, onu önceki halife gibi serbest hareket etmekten alıkoymuş ve şûra sistemi gibi, devletin karar alma sürecinde temel dinamik olarak kabul edilen birçok sistem ya etkisini yitirmiş ya da pasifleştirilmiştir. Hilafetin sınırlarının genişlemesiyle, merkeze uzak vilayetlerde meydana gelen sosyal ve siyasi olaylar hakkında bilgi edinmek zorlaşmıştır. H. Osman, bu gelişmeler karşısında sorunlardan zamanında haberdar olup çözecek aktif bir siyaset teorisi ortaya koyamadığı için zamanla olaylar kontrolden çıkmıştır. Bu duruma, o dönemde Ashabın ileri gelenlerinin çoğunun davet, eğitim, cihad gibi nedenlerle Medine dışındaki bölgelere dağılmaları ve halifeye gerekli desteği zamanında verememeleri de olumsuz bir etki yapmıştır.

Bütün bu olumsuzluklara rağmen, dönemin Suriye valisi H. Muaviye'nin istişare ve desteğiyle, H. Osman döneminde ilk İslam donanması oluşturulmuş ve askeri alanda büyük başarılar elde edilmiştir. Bunun yanı sıra, günümüzdeki Genelkurmay Başkanına benzeyen bir ordular genel komutanı atanmış, her bölgeye has valiler ve ordular tesis edilmiştir. Ayrıca, yollar, mescitler ve yeni yaşam koşullarına uygun dayanıklı evler inşa edilmiştir. H. Osman'ın hilafeti dönemindeki en önemli icraatlarından biri, Kur'an'ın tek mushaf haline getirilmesi ve ona uymayan nushaların imha edilmesidir. H. Osman, sahip olduğu derin ilmiyle sayısız icthatta bulunmuştur. Halifeliğinin başında meydana gelen Hüzmüzan'ın öldürülmesi olayında, "velisi olmayanın velisi hakimdir" hukuk kuralı gereğince Hüzmüzan'ın velisi olduğunu ilan etmiş ve kısas yerine diyeti kabul ederek fitnelerin önünü tıkamıştır.²⁰

¹⁸Nisa, 4/49.

¹⁹ Gazzali, Ebu Hâmid, *el-Mustasfa min ilmi'l-Usûl*, I, 275; Allal el-Fasî, *Mekâsîdu's-Şerîa*, s.45; Türçan, Talip, *İslam Hukukunda Yasamanın Yargı Yoluyla Denetlenmesi*, s.147; el-Huseyn, Elmus, *Takyîdu'l-Mübah*, Merkezi Nemaın li'l-Buhus ve'd-Dirâsât, Beyrut, 2014, s.201; Baltacı, Muhammed, *Menhecü Ömeribni'l-Hattâbi fi't-Teşrii; Dirasetün Mustevibatün li Fıkhî Ömer ve Tanzîmihî*, Dâru'l-Fikri'l-Arabî, Kahire, 1970, s.165.

²⁰Devâlibî, Muhammed, *el-Medhal ilâ İlmi Usûli'l-Fıkhî*, Dâru'l-İlmi li'l-Melâyiini, Beyrut, 1965, s.89; Hallaf, Abdulvahab, *es-Siyasetu's-Şer'iyyetu ev Nizâmu'd-Devleti'l-İslâmiyyeti fi's-Şuûni'd-Dustûriyyeti ve'l-Hâriciyyeti*, el-Matbaatu's-Selefiyyetu, Kahire, 1350, s.321; Köse, Saffet, *İslam'da Hukuk Devleti İlkesinin Dinamikleri*, Çağdaş İlahiyatçılar ve İslam Hukuku, Rağbet Yayınları, İstanbul, 2004, s.151-210; Ebu Faris, Muhammed, *Hukmu's-Şûra fi'l-İslâmi ve Netîcetuhâ*, Dâru'l-Furkan, 1988, s.76; Fethi, Osman, *el-Fikru'l-Kânûniyyi'l-İslâmiyyi beyne Usûli's-Şer'iati ve Turâsi'l-Fıkhî*, Mektebetü Vehbe, Kahire, 1976, s.144.

Hız. Ali (r.a.) Örneđi (656-661)

Hız. Ali (r.a.), hilafete sorunlarla dolu bir dönemde başlamıştır. Aşhabın bir kısmı onun halifeliđini kabul edip biat ederken, diđer bir kısmı onun halifeliđini kabul etmemiş ve siyasi sorunların çözümü için savaşmayı tek yol olarak görmüştür. Hız. Ali'nin hilafet merkezini Medine'den Kufe'ye taşıması ve ehil olmayan kimseleri danışman olarak ataması, siyasi sorunları daha da derinleştirmiştir.

Hız. Ali'den önceki halifeler, Müslümanların biatiyle veya seçimiyle göreve başlamışlardı. Ancak onun seçimi, belli bir grup tarafından yapılmış, geriye kalan çoğunluğun onlara muvafakat edip etmediđi ise bazı tarihçilere göre tartışmalıdır. Hız. Aişe, Talha ve Zübeyr gibi Aşhabın ileri gelenlerinin, Hız. Osman'ın katillerini cezalandırma şartıyla biat edeceklerini bildirmeleri, durumu daha da karmaşık hale getirmiştir.

Devlet yönetimi açısından Hız. Ali, önceki halifelerin yolunu takip etmiştir. Hız. Ömer döneminde Medine'den çıkarılan Yahudiler, Hız. Ali'ye gelerek yeniden evlerine dönmeyi talep etmişlerdir. Kendisini mali ve askerî açıdan destekleyeceklerini bilmesine rağmen, bu teklifi reddetmiştir. Hız. Ali, mali alanda bazı reformlar yapmıştır. Ormanlardan vergi toplamak için bir sistem kurmuş, atların beslenmesini teşvik etmek amacıyla onlardan zekâtı kaldırmış, zimmet ehlinin fakirlerini ve din adamlarını cizyeden muaf tutmuştur. Ancak, kanunları uygulama açısından kendisinden önceki halifelerden daha sert davranmıştır. Kendisine ilahlık nispet eden Haricileri ateşte yakıtırarak öldürtmüştür. İbn Abbas (r.a.), ona bu cezayı meneden hadisi hatırlattığında, Hız. Ali "İbn Abbas doğru söyledi" demiştir. Ayrıca, kendisini öldürmeye teşebbüs eden İbn Mülcem için önce öldürülmesini, ardından yakılmasını emretmiştir.²¹

Özetle şunu söyleyebiliriz: Hız. Ali döneminde, önceki halifeler döneminde olduđu gibi, şûra sistemi üzerinde bazı deđişiklikler yapılmıştır. Bu deđişiklikler hem şekil hem de esas açısından olmuştur. Bu durum, şûra sisteminin ümmetin ihtiyaçlarına cevap verebilecek esneklikte bir yapıya sahip olduđunu göstermektedir. Bu dönemde, şûranın iki temel dinamiđi olan "ictihad" ve "icmâ" birbirinden ayrılmıştır. Karmaşık bir siyaset ortamında, bu iki dinamiđin, özellikle de icmâ'nın sağlanması mümkün olmamıştır.²²

İSLAM TOPLUMUNDAKİ SİYASİ DURAKSAMANIN NEDENİ VE İSLAM SİYASET TEORİSİNİN PASİFLEŞTİRİLMESİ

İslam hukukunu incelediğimizde, "ictihad" ve "icma" kavramlarının birbirini tamamlayarak "şûrâ"yı oluşturan bir bütünün iki parçası olduđunu görürüz. İslam toplumundaki siyasi duraksamanın zamanını araştırdığımızda ise, karşımıza "şûrâ" ve "icma" dinamiklerinin birbirinden koparıldığı bir dönem çıkar. Bu durumla birlikte, bu birbirini tamamlayıcı

²¹ İbn Abdil-Berr, *et-Temhîd*, c.5, s.318; İbn Receb, *Câmiu'l-Ulûm ve'l-Hikem*, c1, s.390.

²² Ebu Zeyd, Mustafa, *Fennu'l-Hukmi fi'l-İslâm*, el-Mekteb el-Mısri el-Hadîs, Kahire, 1976, s.87; Ebu Şeneb, Ahmed Abdulkerim, *Kâidetu's-Şûrâ fi Muctemâin İslâmiyyin Muâsirin*, Menşûrât Dâru'l-Bîrak, Amman, 1982, s.143; Ensârî Abdül-Hamîd, *eş-Şûrâ ve Eseruhâ fi'd-Dîmokrâtiyyeti*, Menşûrâtü'l-Mektebeti'l-Asriyyeti, Beyrut, 1982, s.21; el-Blâzerî, Ahmed bin Yahya, *Futûhu'l-Buldân*, el-Matbaatu'l-Misriyye, Kahire, 1350, s.186; Ebu Zehra, Muhammed, *Ebü Hanîfe*, Dâru'l-Fikri'l-Arabî, Kahire, 1947, s.66.

dinamiklerin ortadan kaldırılması hem ekonomik hem de toplumsal yapının tamamen çökmesine yol açmıştır.²³

Batılı Oryantalistlerin Rolü

19. yüzyılda İslam coğrafyasının Batılı sömürgecilerin nüfuzuna girmesiyle birlikte, İslam dünyasını merak eden Batılı araştırmacı ve bilim adamları, aradıkları fırsatı bulmuşlardır. Bu yüzyılın ortalarından itibaren Batı dünyası hem İslam'ın siyasi düşüncesine hem de devlet yönetim şekline büyük önem vermiş ve bu konuda sayısız araştırmalar yapmıştır. Olaylara objektif ve iyi niyetle yaklaşan bazı araştırmacılar önemli bulgular elde etmiş ve bu bulguları kaleme aldıkları eserlerine yansıtmışlardır. Bu konuda en çok araştırma yapan ve çalışanlar oryantalistler olmuştur. Hatta bu alandaki araştırma ve çalışmalarını hızlandırmak amacıyla, dönemin kısıtlı imkanlarına rağmen, bilgisayar ve internet gibi hızlı bilgi iletişim araçlarının işlevine benzer bir işlevi yerine getirmek için Concordance²⁴ gibi bir kaynak oluşturmuşlardır. Bu kaynak, İslami ilim çevrelerinin hadislerle, ravilerle ve çeşitli şahıs, kabile, fırka, mezhep, din, şehir, ülke, göl, nehir gibi yer adları hakkındaki araştırmalarında sıklıkla başvurdukları bir kaynak olmuştur. Bunlardan bazıları da son derece değerli çalışmalar ortaya koymuşlardır. Dünya çapında değer taşıyan "*İslam siyaset teorisi ve nizami*" hakkındaki bu çalışmaların başında; Von Kremer (1828-1889)²⁵, Ignaz Goldziher (1850-1921)²⁶, Elias John Gibb (1857-1901)²⁷, Christiaan Snouck (1857-1936)²⁸, Gaetani (1858-1941) ve Julios Wellhausen'in

²³ ebu Fâris, Muhammed, *Hukmu's-Şûra fi'l-İslâm ve Netîcetuhâ*, s.17-22; ibni Teymiyye, es-Siyasetü's-Şerîyyetü fi İslâhi'r-Râî ve'r-Raiyyeti, Dâru'l-Kutubi'l-Arabiyyeti, Beyrut, 1987, s.135; Zeydan, Abdu'l-Kerim, *el-Ferdu ve'd-Devletu fi's-Şerîati'l-İslâmiyyeti*, Neşru'l-İttihâdî'l-İslâmiyyi'l-Âlemiyyi Li'l-Munazzamâti't-Tullâbiyye, Kuveyt, 1395, s.36.

²⁴ Fransızca adı: *Concordance et indices de la tradition musulmane'dir*. Hakkında araştırılma yapılacak olan hadisin herhangi bir kelimesinden hareketle Kütübü's-Sitte'de, Dârimi'nin Süneni'nde, İmam Malik'in Muvattası'nda, İmam Ahmed'in Müsnedi'nde nerelerde geçtiğini bilmek için hazırlanmıştır. 1916'da Arent Wensinck, Theodorus Jyunboll ve Jojef Horovitz başkanlığında; birçok akademi ve enstitünün maddi ve ilmi katkılarıyla, beşi müslüman, diğerleri oryantalist olmak üzere toplam altmış dört kişilik bir komisyon tarafından başlatılan çalışma, 1987'de bitirilmiştir. Ansiklopedinin ilk cildi, Kur'an ve hadis ilimleri ve özellikle de indeks çalışmalarıyla tanınan Mısırlı alim Muhammed Fuâd Abdulbâki'ye (1882-1968) tahkik ve tashih için gönderilmiş, yaptığı çalışmaları beğenilince de ansiklopediyi hazırlayan komisyona dahil edilmiştir. Hatipoğlu, İbrahim, *DİA*. İstanbul, 2005, c.30, s.347.

²⁵ Viyana Bilimler Akademisi'nin desteğiyle; İstanbul, Suriye ve Mısır gibi İslam ülkelerindeki tarihi kütüphanelerde yıllarca yazma kitaplar üzerinde araştırmalar yapmış ve elde ettiği bilgileri Biritish Museum'da Batılı araştırmacıların hizmetine sunmuştur. Batılı Şarkiyatçılara göre; Kremer'in yazdıklarıyla İslam'ın ele alınmasında yeni bir başlangıca imza atılmıştır. Beitrage zur Kenntniss der Geschichte und Sitten der Araber vor dem Islam, onun, İslam siyaset teorisi üzerine kaleme aldığı onlarca eserinden biridir. kidega.com. İgnac-goldziher. Erişim Tarihi:30.05.2024.

²⁶ Ezher Üniversitesinin yanı sıra Suriye, Mısır ve Filistinli birçok alimden islami eğitimini tamamlayan Macar asıllı Musevi kökenli bir oryantalisttir. Batı'da modern İslami ilimlerin kurucusu olarak kabul edilmiştir. Goldziher'e göre; Kur'an'a uymayan hadislerin tümü sahih değildir. Daha da ileri giderek; hadislerin helal- haram koyanları toptan yalandır, Peygamber de efendim değil, arkadaşımıdır demiştir. Malesef günümüzde; dini düşüncede reform adı altında, bazı müslüman akademisyenler bunun gibi oryantalistlerin düşüncelerini savunur duruma gelmişlerdir. kidega.com. İgnac-goldziher. Erişim Tarihi:21.04.2024.

²⁷İslam tarihi ve Arap dili ve edebiyatı üzerindeki çalışmalarıyla bilinen İngiliz asıllı bir oryantalist.

²⁸İslam alemine gönderilecek sömürge memurlarını eğiten Hollandalı bir oryantalisttir. 1884 yılında Arabistan'a gitmiş, orada uzun bir süre kaldıktan sonra müslümanlığını ilan etmiş ve Abdulğaffar adını almıştır. İslam ve müslümanlar hakkında derin bir bilgiye sahip olan oryantalistin en büyük hizmeti, Cezayir ve diğer İslam beldelerindeki sömürgeci devletlere, müslümanları nasıl idare edecekleri ve sindirebilecekleri hakkında askeri istihbaratla ilgili bilgi sunmasıdır. *DİA*. İstanbul, c.37, s.340.

(1844-1918)²⁹ gibi isimlerin çalışmaları bulunmaktadır. Ancak, oryantalistlerin tümü bu tür objektif çalışmalara odaklanmamıştır. Birçok oryantalist, İslam'ın siyasi yapısı ve devlet yönetimi gibi konularda elde ettikleri derin bilgileri, askeri istihbarat, misyonerlik gibi amaçlarla Hristiyan dünyasına aktarmıştır. Özellikle Asya ve Afrika kıtalarında Hristiyanlığı yaymakla görevli olan oryantalistler, Müslümanlar arasında ırk, renk, cinsiyet, gelenek ve görenek farklılıklarını sürekli gündeme taşımış, bu konulardaki sürtüşmeleri çarpıtarak kitaplar yazmış ve bu kitapları dağıtarak misyonerlik faaliyetlerini sürdürmüşlerdir. En çok vurguladıkları konu, İslam'ın bir Hristiyan "heretik"³⁰ olduğu iddiasıdır. Bu nedenle oryantalistler, çalışmalarında İslam'ın Yahudi ve Hristiyan kökenli kaynaklara dayandığını ispatlama çabası içine girmişlerdir.

Bu tür tehlikeler karşısında, özellikle Müslüman araştırmacıların oryantalistlerin eserlerini incelerken dikkatli olmaları gerekmektedir. Aksi takdirde, objektif bir araştırma yöntemiyle İslami gerçekleri ortaya koymaya çalışırken, oryantalistlerin ortaya attıkları şüphelere ve hilelere kapılarak İslam'ı karalama kampanyasına istemeden katkı sunabilirler.

Öte yandan, Orta Çağ'dan itibaren bir imparatorluk kurma hayalinde olan Almanya ve diğer sömürgeci Batılı devletlerin, İslam hakkında neden sınırsız araştırmalar yaptığı da mercek altına alınmalıdır. Almanya ve Fransa gibi bazı Avrupa devletleri, şarkiyatçıların şimdiye kadar İslam nizamı ve siyaset teorisiyle ilgili araştırmalarıyla yetinmemiş, günümüzde Müslüman tebalarını eğitmek için ihtiyaç duydukları Müslüman din adamlarını kendi üniversitelerinde yetiştireceklerini, dışarıdan gelen yabancı din adamlarını kabul etmeyeceklerini açıklamış ve bu konuda bazı adımlar atmışlardır.

Yakın komşumuz Rusya ise günümüzde geçmişten çok daha fazla İslami araştırmalar yapmaktadır. Bu bağlamda Moskova'da İslami İlimler Araştırma Akademisi ve Lâhût ve Akide Üniversitesi gibi ciddi atılımlarda bulunmuştur.³¹ Bu çalışmalar, yalnızca teorik bilgi edinme amacı taşımamaktadır. Rus yönetimi, Orta Asya Müslüman topluluklarının kendilerinden uzaklaşmasını istememekte; çünkü bu toplulukların İslam'a yönelmesi, Rusya ile olan maddi ve manevi bağlarını kesmelerine yol açabilir. Bu da Rusya'nın ekonomisi ve siyaseti üzerinde olumsuz etki yapacaktır. Bu nedenle Rus araştırmacı ve bilim adamları, İslam dininin ve Müslümanların doğasını, gelişimlerini ve yönelimlerini araştırmakta, İslam ve sosyalizmi bir noktada buluşturarak "İslam sosyalizmi" düşüncesini ortaya atmaktadırlar. Ne yazık ki, bu düşünce bazı Müslüman çevreler tarafından da benimsenmiştir.

Bu durumun en büyük nedeni, İslam dünyasında toplumsal, siyasi ve iktisadi nedenlerle meydana gelen çalkantılardır. Batı sömürgeciliğinin İslam coğrafyasına uyguladığı kapitalizm,

²⁹ Alman kökenli bir oryantalisttir. En yoğun olarak üzerinde çalıştığı husus, Peygamberimizin Medine döneminde oluşturduğu devlet ve toplum yapısı olmuştur. Jolios; müslümanların tarihini, dini bir teşekkülün sonucu olmaktan çok, bir tür kültür tarihi olarak ele almıştır. De gentibus et familiis Judaeis guae, Göttingen 1870, Doktora tezi.

³⁰ İngilizcesi "Heretic" olan bu kelime, asil olan bir inancın esaslarını, onun bazı kısımlarını inkâr etmek, bazı yeni eklemeler yaparak yeni bir inanç sistemi ortaya koymaktır. Dictionary.cambridge.org. Erişim Tarihi:14.06.2024.

³¹ Fadlallah, Mehdi, *eş-Şûra Tabîatu'l-Hâkimiyyeti fi'l-İslâm*, Dârü'l-Endülüs, Beyrut, 1984, s.108; Kutup, Seyyid, *el-Adâletu'l-İctimâiyatü fi'l-İslâm*, Dârü İhyâi'l-Kutubi'l-Arabiyyeti, Kahire, 1958, s. 96; Esed, Muhammed, *Minhâcu'l-İslâm fi'l-Hukm*, s.88; Fehmi ebu Zeyd Mustafa, *Fennu'l-Hukmi fi'l-İslâm*, s. 202.

İslam alemini yıpratmış ve sosyalizmin pençesine sürüklemiştir. Batının Müslümanlar üzerindeki merhametsiz tutumları ve onları hedef tahtasına koyması durumu daha da vahim hale getirmiştir. Bu gelişmeler, bazı elit çevrelerin bile kurtuluşu sosyalizmde aramasına neden olmuştur. Bu durum, Rusya ve müttefiklerinin iştahını kabartmıştır. Özellikle oryantalist Rus sosyologlar, araştırmalarını sürdürürken, Müslüman toplumlara İslam ile sosyalizmin bir madalyonun iki yüzü gibi yakın tabiatlı ideolojiler olduğunu sürekli gündeme getirmişlerdir.³²

Çağdaş İslamcı Yazar ve Akademisyenlerin Rolü

İslam siyaset teorisinin ve siyasi düzeninin yeniden canlandırılması ve uygulanmasını engelleyen faktörlerden biri, bazı çağdaş Müslüman yazarların bu konuda kaleme aldıkları yazılardır. Bu yazarların bir kısmı, aşırı selefi düşünceleri benimseyen, selef alimlerinin eserlerinden başkasını tamamen reddeden, günümüz yaşantısının geçmişle aynı olması gerektiğini savunan ve çağdaş hayatın dinamiklerini kabul etmeyen bir yaklaşım sergilemektedir. Bu düşünceyi benimseyenlere göre, İslam'ın siyasi hayattan ve gelişmiş medeniyetlerden geri kalmasının nedeni, Müslümanların Batı'dan ve Doğu'dan gelen ve İslam'ın esaslarıyla çelişen olumsuz fikir akımlarının etkisinde kalmalarıdır. Onlara göre tek çözüm, İslam düşüncesinin bu yabancı fikir ve düşüncelerden tamamen arındırılması ve saf İslam düşüncesine geri dönülmesidir. 19. yüzyılda Arap yarımadasında ortaya çıkan Selefilik hareketi ve günümüzde özellikle Ortadoğu'da faaliyet gösteren İhvan-ı Müslimîn, Pakistan'daki el-Cemâatü'l-İslâmiyye ve Endonezya'daki Nedvetü'l-Ulemâ gibi hareketlerin çoğu, bu doğrultuda çalışmalar yürütmektedir. Kendilerini yenilikçi selefi olarak tanıtan bazı çevreler ise, bu düşünceleri olgunlaşmamış fikir ve düşünce adamlarını cezbetmek amacıyla farklı bir üslupla sunmuşlardır. Bu hareketlerin tümü, görünürde İslam devletini kurmayı hedefleyen ve egemenliğin yalnızca Allah'a ait olması gerektiğini savunan siyasi hareketlerdir.³³

İslam coğrafyasında, reformist liberaller ile sekülerist laikler arasında yer alan bir düşünce tarzına sahip İslam savunucuları ortaya çıkmıştır. Hindistan'da eş-Şîr Ahmed ve Mısır'da Muhammed Abduh gibi şahsiyetler, İslam'da reform ve aydınlanma hareketlerinin öncülerinden olmuştur. "*Tehzîbu'l-Ahlâk*" ve "*el-Menâr*" gazeteleri de İslam'ın reforme edilmesi yönünde önemli çalışmalar yürütmüştür. Bu hareketlerin yoğun çabaları neticesinde, "Emîr Ali", "Teşirtâğ Ali", "Selâhuddîn Cevdet Bahş", "Reşîd Rıza" ve "Abdu'r-Râzîk" gibi reformist düşünceye sahip şahsiyetler yetişmiştir. Bu yönelişin savunucularının eserlerine bakıldığında, "*İslam Demokrasisi*" ve "*İslam Sosyalizmi*" gibi kavramların sıkça kullanıldığı görülmektedir. Ancak, bu düşünce savunucularının en büyük ortak kusur ve zaafı, kendi inançlarına yönelik bir eksiklik hissi taşımalarıdır. Zira bu şahsiyetler, İslam'ı "*demokrasi*" ve "*kapitalizm*" gibi kavramlarla ilişkilendirerek, sanki İslam'da bir eksiklik veya kusur olduğunu telâfi etmeye

³² Kutub, Seyyid, *el-Adâletü'l-İctimâiyyatü fi'l-İslâm*, s. 102; Esed, Muhammed, *Minhâcu'l-İslâm fi'l-Hukm*, s.93; Vehbe, Tevfik Ali, *el-İslâm Emâme İftiraâti'l-Müfterîn*, Matbatu Camiati'l-İmam Muhammed, Riyat, 1398, s.76; Vâfi, Ali, *Hukûku'l-İnsan fi'l-İslâm*, Matbatü Vizâretü'l-Evkâf el-Mısriyye, Kahire, 1968, s.189.

³³ Kutub, Seyyid, *Fî Zilâli'l-Kur'an*, Dâru's-Şurûk, Beyrut, 1977, s.501; Abdu'l-Hâlik, Abdu'r-Rahmân, *eş-Şurâ fi Zilli'l-Hukmi'l-İslâmî*, Dâru'l-Kalem, Kuveyt, 1983, s.149; el-Cündî, Muhammed, *Meâlim en-Nizâmi's-Siyâsiyyi fi'l-İslâm Mukârinen bi'n-Nüzümü'l-Vadiyyati*, Dâru'l-Fikri'l-Arabî, Kahire, 1406, s.73.

çalışmışlardır. Bu durum, onların İslam'ı savunma çabalarını zayıflatmıştır, çünkü çalışmalarının çoğu, bu yabancı ideoloji ve düşüncelere bir kılıf bulmaktan öteye geçememiştir. Bu nedenle, İslam siyasi düşünce teorisi veya İslam devlet yapısı ve yönetim şekliyle ilgili derinlemesine bir araştırma ve analiz yapmak isteyen bir araştırmacı, bu konuda karşısına çıkan çok sayıda karmaşık yorum ve te'vil ile yüzleşmek zorunda kalacaktır.³⁴

ARAŞTIRMACIYI AMACINA ULAŞTIRACAK EN İYİ YÖNTEM

İlk İslam toplumunun özünü ve doğasını belirleyecek en etkili yöntem, öncelikle İslam öncesi dönemin temel kaynaklarının incelenmesi, Arap yarımadasındaki siyasi, sosyal ve ekonomik sistemlerin şekil ve yapılarının sınırlarının belirlenmesidir. Bu sistematik bakış açısı, İslam'ın ortaya çıkışından sonra Arap toplumunda meydana gelen değişiklikler hakkında önemli bilgiler sunacaktır. Ne yazık ki, İslam ulemasının çoğu, bu dönemi "cahiliye çağı" olarak nitelendirip, İslam öncesi Arap toplumunun mahiyetine sırtlarını dönmüştür. Onlar için bu dönem, Arap toplumu için bir değişim ve dönüşüm noktasıdır. Bu durum, tarihi gerçeklerin üzerinin örtülmesine yol açmıştır. Bu nedenle, İslam alimleri ve bilim insanlarının sosyoloji, psikoloji, antropoloji ve ekonomi gibi bilim dallarında çağdaş araştırma yöntem ve tekniklerinden yararlanmaları gerekmektedir. Bu sayede, İslam'ın cahiliye dönemi Arap toplumu üzerindeki olumlu etkilerini daha iyi anlayabilir ve gerekli karşılaştırmaları yapabilirler.³⁵

Çağdaş bilimsel araştırma yöntemlerinin toplumsal bilimlere, özellikle de İslam düşüncesi ve devlet yapısı gibi konulara uygulanması, ilk dönemlerde kullanılan İslamî kavramların günümüze uyarlanmasında zorluklar yaratabilmektedir. Örneğin, Avrupalı yazarların sosyal ve kültürel bağlamda sıkça ele aldıkları "Devlet", "Kilise", "Demokrasi", "Sosyalizm" gibi insan ürünü ideolojik kavramların, ilahî bir medeniyet, siyaset ve toplumsal yapıyı temsil eden İslam nizamı çerçevesinde birebir karşılık bulması zordur. Bu nedenle, İslam hukukçuları "Hilafet", "Hükümet", "Ümmet", "Şûra", "Allah", "Millet" ve "Dâru'l-İslâm" gibi siyasî ve dini nitelikli kavramlara uygun karşılıklar bulmakta güçlük çekmişlerdir. Bu sorunun üstesinden gelmenin en iyi yolu, İslam hukukçularının, bu tür hassas konularda, İslamî kavramlara eşdeğer olduğunu düşündükleri İngilizce, Fransızca gibi dillerdeki terimleri kullanmaktan kaçınmalarıdır. Zorunlu hallerde bu kavramlar kullanılacaksa, detaylı ve titiz açıklamalarla bu terimlerin İslamî bağlamdaki anlamları ayrıntılı bir şekilde izah edilmelidir.³⁶

Bu durumda, İslam'ın siyaset teorisi veya İslam düzeni üzerine araştırma yapan bir İslam hukukçusunun, dönemin sistemlerinin yapısını ve düşüncelerini; çevre, toplumsal gerçeklikler ve siyasi konularla olan ilişkilerini objektif bir yöntemle incelemesi gerekmektedir. Hukukçunun, elde ettiği bu bilgileri çağdaş bilimsel araştırma yöntemleriyle değerlendirerek, bu bilgileri diğer komşu kültür ve medeniyetlerin değerleriyle karşılaştırmalı olarak sunması

³⁴ İsmâîl, İbrahim Muhammed, *el-İslam ve'l-Mezâhibu'l-İktisâdiyyeti'l-Muâsıra*, Dâru's-Şurûk, Beyrut, 1984, s.98; Tebbâre, Afif, *Rûhu'd-Dîni'l-İslâmî*, Beyrut, 2001, s.176.

³⁵ Ebu Süleyman, Abdu'l-Vahhâb, *Kitâbetu'l-Bahsi'l-İlmî ve Mesâdiru'd-Dirâsâti'l-İslâmiyyeti*, Dâru'l-Fikri'l-Arabî, Kahire, 1961, s.207.

el-Amrî, Nâdiye, *el-İctihâdu fi'l-İslâm: Usûluhu, Ahkâmuhu, Âfâtuhu*, Müessesetü'r-Risâle, Beyrut, 1984, s. 165; el-Akkâd, Abbâs, *el-İslâm fi'l-Karni'l-İşrin Hâdiruhu ve Müstakbelühü*, Dâru'l-Hilâl, Kahire, 1960, s.89.

önem arz etmektedir. Zira, insanlığa olumlu katkılarda bulunmuş uluslararası medeniyet ve kültürlerin değerlerinin objektif bir şekilde yeni nesillere aktarılması, bilim, teknik ve kalkınma alanlarında yeni atılımların habercisi olacaktır. Bu bağlamda, İslam hukukçusunun bu alanda en cesur kişi olması gerekmektedir. Zira bu yöntemle, insanlık, Kur'an ve Sünnet'in rehberliğinde şekillenmiş olan gerçek İslam medeniyet ve kültürüyle tanışma fırsatı bulacaktır.

Geçmiş çağlarda, modern ve hızlı kitle iletişim araçlarının mevcut olmaması nedeniyle, bilgi, düşünce ve kültürlerin diğer toplumlara ulaşımı oldukça yavaş bir süreç izlemiştir. Bununla birlikte, o dönem toplumlarının temel yaşam ve inanç koşullarına bağlı olarak gerçekleştirdikleri sık sık yer değiştirmeler, özellikle "Hicret" ve ticaret kervanları, yeni bilgi, düşünce ve kültürlerin diğer toplumlara ulaşmasında önemli bir rol oynamıştır. İslam hukukçuları, sınırların genişlemesi, ticaret ve eğitim gibi kaçınılmaz sebeplerle Batı'dan gelen kültür ve medeniyetlerle yüzleşmek zorunda kalmışlardır. İslam toplumunun bu tür bir etkiye maruz kaldığını inkâr etmek, gerçekleri görmezden gelmekten öteye gitmeyecektir. Aksi takdirde, ilk İslam toplumunun yönetim şekli olan şûra'nın, babadan oğula geçen "veraset" krallık ve sultanlıklara dönüşümüne mantıklı bir açıklama bulmak imkânsız hale gelirdi. Bu dönüşümün, Uzakdoğu toplumlarındaki benzer sistemlerin varlığıyla desteklendiği göz önünde bulundurulduğunda, bu düşüncemiz daha da haklılık kazanmaktadır. Bunun yanı sıra, Müslümanlar yönetimle ilgili konularda hem Bizanslılardan hem de Sasanilerden etkilenmiş ve onlardan alıntılar yapmışlardır. Bu nedenle, Müslüman bir araştırmacının İslamî sistem ve kanunlar hakkında net bir anlayışa sahip olabilmesi için, İslam'ın temel felsefesini derinlemesine kavraması gerekmektedir. Bu bilinç, uluslararası sistemlerle İslamî sistemlerin çeliştiği noktalar hakkında ona net bir perspektif sağlayacaktır. Araştırmacı, İslam toplumu ile ilgili şekilsel esnek soyut prensiplerle, İslamî yapının üzerine inşa edildiği temel dinamikler arasındaki farkın bilincinde olmalıdır. Bu bilinç, Kur'an ve Sünnet'te; İslam'ın yönetim şekli ve siyasi nizamıyla ilgili sabit ve değişmez esaslar ile İslam toplumunun zaman ve mekâna göre ihtiyaç duyduğu değişken prensip ve araçlar arasındaki farkı ona gösterecektir.

Zihin dünyamızda netleşmesi gereken bir diğer önemli husus, İslam siyaseti, yönetim şekli, kanunlar ve ahlâk yapısıyla ilgili İslam toplumunda yaygın olan düşüncelerin, İslam nizamının temel taşları değil, dönemin ihtiyaçlarına göre İslam hukukçuları tarafından geliştirilen fikirler olduğudur. Bu durum, Müslüman toplum olarak zihinlerimizde öyle derin bir yer edinmiştir ki, artık Kur'an ve Sünnet naslarının içeriğiyle, bu naslar hakkında zaman ve zemine göre yapılan sayısız yorum ve tefsiri ayırt edemez hale gelmiş durumdayız. Bu ise, ilâhî kökenli İslamî nizam ve siyasî esaslara, beşerî bir bakış açısıyla yaklaşmamıza ve dolayısıyla hayrete düşmemize neden olmaktadır. Beşerî sistemlerin yönetim ve siyasetle ilgili bazı kanun ve kuralları, ilâhî ahkam ve hedeflerle çelişebilir. Bu durum, bu geçici kanun ve kuralların sadece esas gayeye ulaştıran birer araç olarak konumlanmasından kaynaklanmaktadır.³⁷

³⁷ Hafacî, Muhammed, *el-İslâm ve Kadâya'l-Asr*, Dâru's-Şurûk, Kahire, 1405; el-Kardâvî, Yusuf, *Evlviyyâtul-Hareketi'l-İslâmiyyeti fi'l-Merhaleti'l-Kâdimeti*, Mektebetü Vehbe, 1991, s.211.

İslam toplumunu geçmişten günümüze taşıyan bu siyasi sistem, kurum ve kuruluşlar hakkında araştırma yapılırken, bu siyasi teorileri şekillendiren düşünce ve görüşlerin de mutlaka ortaya konulması gerekmektedir. Bu noktada en büyük sorumluluk, şüphesiz İslam hukukçularına düşmektedir. İslam hukukçularının, özellikle ilk dönem İslam hukukçuları ve siyaset düşünürlerinin, İslamî kanun ve sistemler üzerinde fiilen çalışanlarının eserlerini, tarihsel süreç içinde geçirdikleri değişimlerle birlikte titizlikle incelemeleri şarttır. Böyle bir çalışma, günümüz araştırmacılarına İslam siyaset ve yönetim sistemi ile İslam toplumunun mevcut durumu arasındaki farkı net bir şekilde ortaya koyacak ve İslam hukukçularının, İslam'ın siyasi teorisi ile toplumda hâkim olan yönetim şekli arasında köprü olma rolünü anlamalarını sağlayacaktır.

Her neslin İslam düşünürleri ve hukukçuları, İslam'ın temel esaslarını kendi dönemlerinin şartlarına göre yeniden yorumlayarak topluma sunmuşlardır. Örneğin, el-Mâverdî "*el-Ahkâm es-Sultâniyye*" adlı eserini kaleme aldığı anda, İslam toplumunun siyasi yapısında ilk dönemlere kıyasla birçok değişiklik meydana gelmiştir. Şûra tarafından seçilen "halifelik" kurumu, el-Mâverdî'nin ifadesiyle, yerini "*İmâretü'l-İstîla*"ya³⁸ bırakmıştır. Bu durum, eserin başında ifade etmeye çalıştığı İslam'ın yönetim biçimi teorisiyle çelişmektedir. Zira bu yeni kavram, halife ile valiyi ülkeyi yönetme açısından aynı statüde konumlandırmaktadır. El-Mâverdî, ortaya çıkan yeni yönetim birimlerine "*Vizâretü't-Tefvîd*"³⁹ gibi isimler vermiştir.

Gazâlî de kendi döneminde benzer siyasi yeniliklerle karşı karşıya kalmıştır. Abbasi halifesi el-Müstazhir döneminde, halifenin idari yetkilerinin büyük bir kısmı vezirlere devredilmiştir. Gazâlî, hilafet makamını bu çelişkiden kurtarmak ve halifeyi savunmak amacıyla, şayet halife ehliyet şartlarından birini taşıyor ve bu şartı veya şartları vezirler taşıyorsa, o zaman halife ile vezirlerin birlikte halifelik makamını oluşturduğunu savunmuştur.⁴⁰ İslam uleması, hukukçuları ve düşünürleri, bu tür durumlardan etkilenerek günümüze kadar benzer yaklaşımları sürdürmüşlerdir. Hatta günümüzün bazı düşünürleri, "Demokrasi", "Devlet", "Sosyalizm" ve "Faşizm" gibi kavramları da yaptıkları yorumlarla "İslâmî Kavramlar" başlığı altında ele almışlardır. Bu nedenle, araştırmacıların bu ve benzeri şekilsel teorilerin ortaya çıkmasına olanak sağlayan nedenler üzerinde derinlemesine incelemeler yapmaları gerekmektedir.

İslam siyaset teorisi ve siyasi nizamı gibi hassas konularda yapılan İslami çalışmalarda, detaylı analiz yöntemlerinin kullanılması gerekmektedir. Geçmişten günümüze İslam uleması, çalışmalarında kıyas yöntemini tercih etmişlerdir. Yani, cüz'î meseleleri Kur'an ve Sünnet'in genel esaslarına kıyaslayarak sonuca ulaşmaya çalışmışlardır. Bu yöntem, asırlar boyunca gelen nesillere, İslam'ın esaslarına uygun tefsirler yapmada ve bu esaslara ulaşmak için uygun yol ve

³⁸ İslam devletinin topraklarından bir kısmını güç ve kuvvet kullanarak zorla ele geçiren kimseye halife'nin orayı yönetmesi için ona tam yetki vermesidir. Bu durum Bağdat merkezli Abbâsî hilafeti'nin, halife el-Mütevekkil'in 861 yılında öldürülmesi ile zayıflaması sonucu ortaya çıkmıştır. el-Mâverdî, *el-Ahkâm es-Sultâniyye*, s.30.

³⁹ Halife'nin kendisine bağlı olmak koşuluyla yeterli vasıflar taşıyan bir valisini, tam yetki vererek bir bölgenin yerel yöneticisi olarak atamasıdır. el-Mâverdî, *el-Ahkâm es-Sultâniyye*, s.27.

⁴⁰ el-Fâkihî, Abdu'l-Kâdir, *el-Kifâyetü Şerhu Bidâyeti'l- Hidâyeti li Hucceti'l-İslâm Ebi Hâmid el-Ğazâlî*, Dâru'l-Kutubu'l-İlmiyyeti, Beyrut, 1982, s.216.

yöntemler belirlemede yardımcı olmuştur. Kısacası, bu kıyas yöntemi, hüküm çıkarmada, nasların tefsirinde, tertibinde, tanziminde ve uygulamasında aktif bir rol oynamıştır. Ancak, daha önce de ifade edildiği gibi, bu temel prensiplerin yanı sıra, İslam'ın zuhur ettiği dönemin tarihi gerçekleri de ihmal edilmemelidir. Çünkü İslam'ın ortaya çıktığı dönemin tarihi gerçeklerinin hassas bir yöntemle ele alınıp incelenmesi, o dönemde uygulanan İslamî prensip ve yöntemlerin, yani uygulamalı İslam siyasetinin ve nizamının belirlenmesi anlamına gelmektedir.⁴¹

İlk dönemlerden itibaren İslam hukukçuları, bu yöntemler üzerinde detaylı çalışmalar yapmışlardır. Bu nedenle, tarih boyunca bu yöntemlerde birçok değişiklik ve gelişme meydana gelmiştir. Araştırmacılar ve siyaset bilimcileri, bu analiz, sentez, tümevarım ve istinbat (ortaya çıkarma) yöntemleriyle; bir yandan yüzlerce ilâhî emri ortaya çıkarıp ispatlayabilir, öte yandan da İslam toplumunun genel dinamik yapısını koruyabilirler. Aynı zamanda, araştırmacılar ve siyaset bilimcileri, ahlâkî değerler konusunu ve bunların incelenmesini ahlâk alimlerine ve vaizlere bırakarak, bu yöntemle daha objektif veriler elde edebilirler. Aksi takdirde, bir yandan ahlâk bilimcisi gibi ahlâkî değerleri detaylı analiz etmekle uğraşacak, diğer yandan da siyaset teorisi ve nizamının hakikatlerini araştırmakla meşgul olacaklardır. Bu yoğun çaba, onları içinden çıkılması zor, karmaşık bir analiz sürecine sürükleyebilir.⁴²

İslam siyaset teorisinin veya yönetim şeklinin dayanakları hassas bir yöntemle belirlendikten sonra, bu teorileri İslam toplumundaki siyasi değişim ve şartların ışığında analiz etmek gerekmektedir. Bu teoriler, Sünnet olanla bid'at olan şeklinde kategorize edilebilir. Bu ayırım, İslam siyaset teorisinin temel prensipleri ile zamanla ortaya çıkan ve toplumda yerleşen uygulamalar arasındaki farkı net bir şekilde ortaya koymayı amaçlar. Böylece, hangi teorilerin İslam'ın özüne uygun olarak Sünnet'e dayandığı, hangilerinin ise daha sonraki dönemlerde bid'at olarak kabul edilen uygulamalar olduğu daha iyi anlaşılabilir.⁴³

Ehl-i Sünnet ve'l-Cemaat'ın bu konudaki görüşleri, ümmet arasında genel kabul görmüştür. Onlar, İslam toplumunun asırlar boyunca aynı sosyal ve siyasi durumda kalamayacağını, değişim göstereceğini ifade etmişlerdir. Ancak, her dönemde bu görüşe muhalif olan azınlık gruplar var olmuştur. Bu gruplar, aktif olarak siyasete katılmadıkları ve çoğunluk olan İslam toplumu içinde eriyip gitme kaygısı taşıdıkları için rûhi imamete yönelmişlerdir. Bununla birlikte, bu düşünceyi benimseyen bazı çevreler, güç ve şiddet yoluna başvurarak toplumda korku yaymak ve mevcut sistemi değiştirme girişiminde bulunmuşlardır. Rûhi imamete yönelen bu kesimler, zamanla bu tür radikal etkilerin altına girmiş ve nifak, bozgunculuk, illegal ve gizli

⁴¹ Vehbe, Tefvik Ali, *el-İslâm Şerîatu'l-Hayâti*, s.109; ebu Hassân, Muhammed, *Ahkâm el-Cerîmeti ve'l-Ukûbeti fi's-Şerîati'l-İslâmîyyeti*, Mektebetü'l-Menâr, Ürdün, 1987, s.72; Ebîş, Yusuf, *Nusûs el-Fikri's-Siyâsî el-İslâmî*, Dâru't-Talîa, Beyrut, 1966, s. 32.

⁴² İbni Haldun, Abdurrahman, *el-Mukaddime*, Mektebetü'l-Medrese ve Dâru'l-Kitâbi'l-Lübnânî, Beyrut, 1979, s.211; Hilmi, Mahmud, *Nizâmu'l-Hukmi'l-İslâmî*, Dâru'l-Fikri'l-Arabî, Beyrut, 1973, s. 186; Hilmi, Mustafa, *Nizâmu'l-Hilâfeti fi'l-Fikri'l-İslâmîyyi*, Dâru'l-Ensâr, Kahire, 1977, s.244.

⁴³ el-Kardâvî, Yusuf, *Likâât ve Muhâverât Havle Kadâyâ'l-İslâm ve'l-Asr*, s.46; et-Tevbe, Ğâziye, *el-Fikru'l-İslâmî el-Muâsir Dirâse ve Takvîm*, Dâru'l-Kalem, Beyrut, 1977, s.87; Mutevellî, Abdu'l-Hamîd, *Mebâdiu'l-Hukmi fi'l-İslâmî*, Munşeatü'l-Meârifi, Kahire, 1978, s. 102.

yöntemlerle tahrip etme gibi hilelere başvurmuşlardır. Hariciler, Şiiler ve Batniler, bu tarz siyasi yönelimlere en çok sapanan gruplar arasında yer almıştır.⁴⁴

EHL-İ SÜNNET'İN İSLAM SİYASET TEORİSİ VE NİZAMINDAKİ SAPMALARLA KARŞI ALDIĞI TEDBİRLER

Ehl-i Sünnet, fitne ve fesadın yaygın olduğu bu dönemlerde, İslam toplumunda hâkim olan siyasi ve toplumsal dengeyi korumak amacıyla inanç ve fıkıh alanında genel bir çerçeve belirleme yoluna gitmiştir. Hicri 6. asrın başlarına rastlayan bu dönemde, İslam hukukçuları bu konuda önemli çalışmalar yapmış, Kur'an ve Sünnet şerhlerinden de faydalanarak usûl-i fıkıh kaidelerini saptamışlardır. Ümmetin istikrarını sağlamak amacıyla, kanunlarda yapılacak her türlü değişikliği yasaklamış ve içtihad kapısının kapandığını ilan etmişlerdir. Bu süreçle birlikte İslam fıkıhında taklit dönemi başlamıştır. Ahlâk, teşrî ve siyaset alanında sabit ve değişmez ölçülerin belirlenmesi, toplum içindeki parçalanmayı önlemiş ve yanlış inançlara sapmayı engellemiştir. İctihadın durdurulması ve taklit dönemine geçilmesi, İslam toplumunun hemen her alanda olgunlaştığı, istikrar ve güvene kavuştuğu bir döneme denk gelmiştir. Bu nedenle toplum, yabancı siyasi ve toplumsal fikir akımlarına karşı direnç göstermiştir. Ancak, bu durum zamanla toplumda siyasi, toplumsal ve ahlâkî duraklamaya yol açmıştır. Bir süre sonra, toplum içinden yetişen ve siyasi düşünce ile gaye sahibi olan bazı hukukçular, bu duraksamanın tehlikesini fark etmiş ve harekete geçmiştir.

İslam siyaset teorisinin iki temel unsuru; ümmet ve şerîattır ve her iki unsur da Kur'an'da açık bir şekilde belirtilmiştir. Peygamber (sav), bu iki unsurun etrafında şekillenen ana eksen olmuştur. Onun dünyaya veda etmesiyle birlikte nübüvvet sona ermiş ve ümmet ile şerîat kavramları arasında adeta bir boşluk oluşmuştur. Ancak ümmetin icmasıyla bir halifenin seçilmesi, bu açığı kapatmıştır.

İslam hukukçularının, İslam'ın kadim siyaset teorisini yeniden düzenlemekte karşılaştıkları en büyük zorluk, bu düşüncelerin zamanın ihtiyaçlarına ve gereksinimlerine uyarlanmasında yatmaktadır. Örneğin, geniş anlamıyla İslam ümmeti ve hilafet anlayışı gibi kavramlar, günümüzde hayata geçirilmesi zor görünen meselelere örnek teşkil etmektedir. Tek bir yönetim çatısı altında oluşturulacak ve uluslararası bir siyasi birlik anlamına gelen ümmet anlayışı, günümüz koşullarında yararsız ve bir o kadar da hayali bir öneri olarak algılanabilir. Ancak bu düşünce, sınırları aşan Müslüman toplumlar arasında kurulacak genel bir vahdet olarak ele alındığında, daha kabul edilebilir bir öneri haline gelebilir.

Benzer şekilde, Kur'an ve Sünnet'ten çıkarılarak toplumda uygulanacak hükümler anlamına gelen şerîat, günümüzün çoğunlukla beşerî kanunlarla yönetilen İslam toplumları için kabul edilmesi zor bir yapı olabilir. Çünkü bu toplumlar, alıştıkları parlamenter sistemler aracılığıyla kendilerini belli aralıklarla seçimler ve diğer demokratik yollarla ifade etme yetkisine sahiptirler. Oysa İslam'daki hilafet anlayışı, üç temel dinamik üzerine kuruludur: İlk olarak,

⁴⁴ Müttevelli, Abdu'l-Hamîd, *Ezmetü'l-Fikri's-Siyâsiyyi'l-İslâmiyyi fi'l-Asri'l-Hadis*, el-Mektebu'l-Misriyyi'l-Hadîsi li't-Tibâati ve'n-Neşri, Kahire, 1970, s.148; Ebîş, Yûsuf, *Nusûsu'l-Fikri's-Siyâsiyyi'l-İslâmiyyi* s.76.

ehli'l-Hal ve'l-Akd tarafından halifenin seçilmesi; ikinci olarak, Şûra esasına göre hüküm verilmesi ve son olarak, ümmetin sahip olduğu İslâmî değer ve esasların korunması.

Bu açıdan bakıldığında, bir yandan İslam toplumlarını tanımlayan geniş anlamıyla ümmet kavramı ile çağımızda geniş ve farklı toplumları yönetme biçimi olan demokratik sistem arasında, diğer yandan İslam toplumunda yaşayan mü'min fert kavramı ile çağımızdaki vatandaş kavramı arasında bir yakın anlam ilişkisi kurulabilir.⁴⁵

İslam hukukçularının, İslam devletinde devlet başkanına karşı istikrarlı bir siyasi muhalefet teorisi formüle edememelerinin nedeni, İslam siyaset bilimcilerinin dikkatini çeken ve üzerinde yoğun bir şekilde çalıştıkları diğer önemli ve tehlikeli bir sorundur. Yüzyıllar boyunca İslam hukukçuları, toplumu devlet başkanına olumlu itaate yönlendirme geleneğini sürdürmüşlerdir. Bu nedenle, toplum içerisinde devlet başkanına karşı yükselecek eleştirel bir tavır veya karşı duruşa olumlu bakılmayacaktı. Böyle bir tavır sergileyen kişi, dalalet ve sapkınlıkla, hatta belki dinden çıkmakla suçlanacaktı. Bu tür zorluklardan dolayı, İslam hukukçusunun farklı tefsir ve yorumlara girmeden önce, İslam devlet başkanının siyasi yetkisinin sınırlarını kesin bir şekilde belirlemesi gerekmektedir. Çünkü İslam Halifesi, sadece gelenekten gelen ve her durumda ümmetin yöneticisi olarak kalması gereken bir lider değildir. İslam dini, Allah'a itaat ederek adaleti tesis etmesi ve otoriter davranmaması şartıyla yürütme gücünü halifenin eline vermiş ve siyasi etkisini fert ve toplum olarak ümmetin tümü üzerinde genelleştirmiştir.

Bu durumda, devleti yönetme işi bir emanet olarak İslam devlet başkanına tevdi edilmiştir. Ümmet de devlet başkanı Kur'an ve Sünnet'te emredildiği şekilde görevini ifa ettiği; din, can, akıl, mal ve nesli koruduğu sürece ona itaat etmekle yükümlüdür. Ancak, devlet başkanı İslam hukuk kurallarını bir kenara bırakıp otoriter bir şekilde hareket etmeye başladığında, ümmetin ona itaat etmesi söz konusu olamaz. Bu nedenle İslam hukukçularının, Peygamber'in (sav) ve Raşit Halifeler'in devleti yönetim biçimlerini ve İslam siyaset teorisinin o dönemdeki yansımalarını tüm detaylarıyla incelemeleri gerekmektedir. Bu araştırmalar sırasında, geleneksel yorum ve tefsirler konusunda son derece dikkatli olmaları gerekir. Aksi takdirde, İslam toplumuna nefes aldirmayan, hatta İslam hukukuna ve hukukçularına karşı savaş ilan eden otoriter bir devlet başkanına itaatın zorunluluğunu iddia edecek kadar yanlış düşüncelere kapılabilirler.⁴⁶

⁴⁵ Vehbe, Tefvik, el-İslâmu Şeriatu'l-Hayâti, s.39; ebu İyd Arif, *es-Siyâdetü fi'l-İslâmi*, Mektebetü'l-Menâr, Ürdün, 1989, s.94; el-Attâr, Fuat, *en-Nüzüm es-Siyâsiyye ve'l-Kanûn ed-Dustûri*, Dâru'n-Nahdeti'l-Arabiyyeti, Kahire, 1984; el-Mevdûdi, ebu'l-A'lâ, *Nazariyyetü'l-İslâmi ve Hedyuhu*, Müessesetü'd-Da'Ve, Beyrut, 1987, s.76.

⁴⁶ İbni Kuteybe, Abdullah bin Müslim, *el-İmâmetü ve's-Siyâsetü*, Dâru'l-Kutubi'l-İlmiyyeti, Beyrut, 1904, s.214; er-Reyyis, Muhammed Diyâu'd-Dîn, *en-Nazariyyetü's-Siyâsiyyetü'l-İslâmiyyetü*, Mektebetü'l-Enclu el-Mısriyyetü, Kahire, 1960, s.175; Rıda, Muhammed Reşid, *Tefsîru'l-Menâr*, Dâru'l-Ma'rife, Beyrut, 1989, s.76; es-Semmân, Muhammed Abdullah, *Mebâdiu'l-Hukmi'l-İslâmî*, Mektebetü'l-İtisâm, Kahire, 1978, s.241; es-Senhûrî, Abdurrezzak, *Fikhu'l-Hilâfeti ve Tatavvuruhâ Litusbiha Üsbetü Ümem eş-Şerkiyye*, Müessesetü'r-Risâle, Bağdat, 2008, s.198; Surur, Cemalettin, *Kiyâmu'd-Devleti'l-İslâmiyyeti*, Kahire, 1956, s.67; Hallaf, Abdu'l-Vahhâb, *Masâdiru't-Teşri'l-İslâmiyyi Fimâ Lâ Nasse Fihî*, Dâru'l-Kalem, Kuveyt, 1972, s.84; İbni Teymiye, Takiyyu'd-Dîn, *es-Siyâsetu's-Şer'iyyetu fi Islâhi'r-Râi ve'r-Raiyyeti*, s.13; el-Mâverdi, *el-Ahkâmu's-Sultâniyyetu*, Mektebetü Mustafa el-Halebi, Mısır, 1966, s.103; el-Ğazâlî, Muhammed, *el-Vecîz*, Dâru'l-Ma'rife, Beyrut, 1979, s.211; ibn Abdi's-Selâm, İzze'd-Dîn, *Kavâidu'l-Ahkâm fi Masâlihi'l-Enâm*, Dâru'l-Cil, Beyrut, 1980, s.97.

SONUÇ

Bu çalışmada elde edilen sonuçlar şu şekilde sıralanabilir:

Kur'an ve Sünnet'in Temel Rolü: Kur'an ve Sünnet hem ilk İslam toplumunda hem de sonraki dönemlerde, her türlü hukuki sorunun çözümünde esas alınan iki ana kaynak olmuştur. Bu kapsamda, siyerle ilgili olaylar ve Peygamber'in (sav) gazveleri de bu kaynaklara dâhildir.

İslam Siyaset Teorisi Üzerindeki Çalışmalar: İslam siyaset teorisi ve nizamı hakkında yapılan çalışmalar, amaçlarına tam anlamıyla ulaşmış sayılamaz. Bu çalışmaların büyük çoğunluğu bireysel nitelikte olduğundan, bu düşüncenin detaylarının işleneceği, tartışılacağı ve geliştirileceği bağımsız bilimsel araştırma merkezlerine ihtiyaç vardır. Bu merkezlerde, dünya çapında uzman hukukçuların bir araya gelerek uzun süreli çalışmalar yapmaları gerekmektedir.

Tarihî Eserlerin Önemi: Maverdi'nin "*el-Ahkâm es-Sultâniyye*", Şâtıbî'nin "*el-Muvâfakât*", İbn Haldun'un "*Mukaddime*" gibi eserleri, İslam toplumunun farklı evrelerde karşılaştığı sorunları ve bu sorunlar karşısında toplumun ve âlimlerin tutumlarını bize aktarmaktadır. Müslüman sosyologlar ve hukukçular, bu eserleri titizlikle inceleyerek, ilk dönem İslam toplumu ve devlet yönetimi hakkında net bir anlayışa sahip olabilirler.

Kabilelerden Ümmete Geçiş: Hz. Muhammed (sav), Arap kabilelerini bir araya getirerek onları ümmet haline getirmiştir. Böylece kabilelerin eski gelenek ve göreneklerinin yerini İslam hukukunun esasları almıştır. Bu köklü değişimin ana dinamikleri; ihtiyaca göre nazil olan vahiy, Rasulullah'ın (sav) fiilleri ve aktif şûra olmuştur.

Peygamber'in (sav) Yönetim Sistemi: Peygamber (sav), ümmetin ihtiyaçlarını dikkate alarak tesis ettiği bu yeni sistemde, sabit bir yönetim şekli belirlememiştir. Siyaset teorisinin detayları da belirlenmemiştir. Bu, sonraki nesillerin şûra yoluyla kendi zamanlarının ihtiyaçlarına uygun siyaset teorileri geliştirmelerine imkân tanımıştır.

İçtihâdî Uygulamalar ve Şer'î Hüküm: İslam hukukçularına göre, devlet başkanının mübah alanla ilgili içtihâdî uygulamaları, dinin temel esas ve hükümlerine uygun olduğu ve günah içermediği sürece şer'î hüküm kapsamında kabul edilir ve hukuki bağlayıcılığa sahiptir.

Şûra Sistemi ve Gelişim: Allah'ın (cc), şûra sistemini emrederek niteliği ve işleyişi hakkında net bir bilgi vermemesi ve Peygamber (sav) ile Raşid Halifeler'in şûrayı farklı şekillerde uygulamaları, bu sistemin insanlığın gelişimiyle orantılı olarak gelişeceğinin bir işaretidir.

İslam Siyaset Teorisinde Objektif Yaklaşım: İslam siyaset teorisi veya İslam nizamı üzerine araştırma yapan İslam hukukçusunun, dönemin sistemlerinin yapısını ve düşüncelerini, bunların çevre, toplumsal gerçeklikler ve siyasi konularla olan ilişkilerini objektif bir yöntemle ele alması gerekmektedir. Bu bilgileri, çağdaş bilimsel araştırma yöntemleriyle diğer komşu kültür ve medeniyet değerleriyle bir araya getirerek dünya insanlığına sunulmalıdır.

Esnek ve Sabit Prensiplerin Ayrımı: İslam hukukçusu, İslam toplumuyla ilgili esnek soyut prensipler ile İslamî yapının inşa edildiği temel dinamikler arasındaki ayrımı fark etmelidir. Bu bilinç, Kur'an ve Sünnet'teki İslam'ın yönetim şekli ve siyasî nizamıyla ilgili sabit ve değişmez

esaslar ile zaman ve mekâna göre ihtiyaç duyulan deęişken prensipler arasındaki farkı göstermektedir.

Devlet Başkanı ve İtaat: Devleti yönetme işi bir emanet olarak devlet başkanına tevdi edilmiştir. Ümmet, devlet başkanı Kur'an ve Sünnet'te emredildięi şekilde görevini ifa ettięi; din, can, akıl, mal ve nesli koruduęu sürece ona itaat etmekle yükümlüdür. Ancak, devlet başkanı İslam hukuk kurallarını bir kenara bırakıp otoriter hareket ettięinde, ümmetin ona itaat etmesi söz konusu olamaz.

KAYNAKLAR

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**5. SINIF “AY’IN EVRELERİ” KONUSUNUN ŞARKI VE MÜZİK DESTEKLİ
ÖĞRETİMİNİN BAZI DEĞİŞKENLER ÜZERİNE ETKİSİ**
THE EFFECT OF SONG AND MUSIC SUPPORTED TEACHING OF THE “PHASES OF
THE MOON” TO GRADE 5TH ON SOME VARIABLES

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ÖZET

Bu araştırmanın 5. sınıf Fen Bilimleri dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin ortaokul 5. sınıf öğrencilerinin başarılarına, öz-düzenlemelerine, tutumlarına, öz-yeterlilik inançlarına etkisini tespit etmektir. Araştırmada nicel araştırma yöntemlerinden tek grup ön test-son test deneysel desen kullanılmıştır. Araştırmaya Kars ilinin bir ilçesine bağlı bir köy okulunun 5. sınıfında öğrenim gören dokuz öğrenci katılmıştır. Araştırmaya katılan öğrencilere 5. sınıf Fen Bilimleri dersinin “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi yapılmıştır. Enstrüman olarak klasik gitar kullanılmış ve öğrencilere sınıf ortamında gitar eşliğinde şarkı ile “Ay’ın Evreleri” konusu 5E öğrenme modelinin derinleştirme basamağında öğrencilere öğretilmiştir. Araştırmada veri toplama araçları olarak “Fen Bilimlerine Yönelik Öz-düzenleme Ölçeği”, “Ortaokul Öğrencileri İçin Fen Bilimleri Öğrenmeye Yönelik Öz-Yeterlilik İnanç Ölçeği”, “Fen Dersine Yönelik Tutum Ölçeği” ve “Ay’ın Evreleri Konusuna Yönelik Başarı Testi” kullanılmıştır. Ölçme araçları 5E öğrenme modelinin derinleştirme aşamasında “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminden önce ve sonra 5. sınıf öğrencilerine uygulanmıştır. Nicel verilerin analizinde non-parametrik analizlerden Wilcoxon İşaretli Sıralar t-Testi kullanılmıştır. Araştırma sonuçlarına göre; Ay’ın Evreleri konusunun şarkı ve müzik destekli öğretiminin 5. sınıf öğrencilerinin “Ay’ın Evreleri” konusuna yönelik akademik başarılarını, fen bilimlerine yönelik öz-düzenlemelerini ve fen dersine yönelik tutumlarını arttırdığı, fen bilimlerini öğrenmeye yönelik öz-yeterlilik inançlarında ise herhangi bir değişiklik olmadığı belirlenmiştir.

Anahtar Kelimeler: Şarkı, Müzik, Ay’ın Evreleri.

ABSTRACT

The aim of this research is to determine the effect of song and music-supported teaching of the 5th grade Science course "Phases of the Moon" on the achievement, self-regulation, attitudes and self-efficacy beliefs of 5th grade secondary school students. A single group pretest-posttest

experimental design, one of the quantitative research methods, was used in the research. Nine students studying in the secondary school department of a village school in a district of Kars province participated in the research. The students who participated in the research were given science education supported by songs and music on the subject of "Phases of the Moon" in the 5th grade Science course. Classical guitar was used as an instrument and the subject of "Phases of the Moon" was taught to the students in the classroom environment with a song accompanied by a guitar, in the deepening stage of the 5E learning model. "Self-Regulation Scale for Science", "Self-Efficacy Belief Scale for Learning Science for Secondary School Students", "Attitude Scale for Science Lesson" and "Achievement Test for the Phases of the Moon" were used as data collection tools in the research. The measurement tools were applied to 5th grade students before and after the song and music-supported teaching of the "Phases of the Moon" topic in the deepening phase of the 5E learning model. In the analysis of quantitative data, Wilcoxon Signed Rank t-Test, one of the non-parametric analyses, was used. According to the research results; It was determined that song and music-supported teaching of the subject "Phases of the Moon" increased 5th grade students' academic success towards the subject "Phases of the Moon", their self-regulation towards science and their attitudes towards science lessons, and there was no change in their self-efficacy beliefs towards learning science.

Keywords: Song, Music, Phases of the Moon.

GİRİŞ

Ülkemizde fen okuryazarı bireyler yetiştirmek Fen Bilimleri Dersi Öğretim Programı'nın genel amaçları arasındadır (MEB, 2013). Fen okuryazarlığı; "fen, teknoloji, matematik gibi konularda bilgi sahibi olabilme, bu bilgileri günlük hayatta kullanabilme ve uygulayabilme" şeklinde ifade edilebilir (Yaşar, 1998). Fen hayatımızın ayrılmaz parçalarından biridir ve içinde yaşadığımız toplumda hemen hemen her şeyin fen ile mutlaka bir ilişkisi vardır (Gürbüz, 2008). Ülkemizde ve pek çok gelişmiş ülkede birçok bilim insanı fen eğitiminin kalitesini artırma çabası içerisinde (Bayrak & Erden, 2007). Modern ve etkili fen programlarının içeriğine bakıldığında ezbere dayalı ve gereksiz bilgiler yerine bilimsel yöntemleri kullanabilmeyi ilke edinen ders içeriklerinin geliştirildiği görülmektedir (Ergül, 1999). Artık günümüzde öğrencilerin kendi öğrenmelerinden sorumlu tutulduğu feni öğrenme süreçlerinde etkin olarak yer almaları gerektiğine inanılan bir eğitim-öğretim anlayışı yerini almaktadır (Gürbüz, Turgut & Salar, 2013). Etkili bir fen öğretiminde; öğrenciler derste aktiftir, dersi severler, yaparak-yaşayarak öğrenirler, bilgileri kendileri bulurlar ve keşfederler. Bu durum da öğrencileri daha istekli ve hevesli hale getirir. Öğrenciler; bilgileri yorumlayarak öğrenirler, fen öğrenme alanındaki bilgilerini, geçmiş ve günlük hayattaki bilgileri ile ilişkilendirirler. Öğrendikleri bilgileri uygularlar ve bunun sonucunda fene yönelik karşılaştıkları problemleri çözebilirler (Altun & Olgun, 2005). Öğrenciler fen bilimlerini günlük hayatla ilişkilendirebilseler bile bazen fenin karmaşık ve soyut kavramlar içermesi ile anlaşılması noktasında güçlük çekebilirler (Akdeniz, Ayas & Çepni, 1994). Öğretmenlerin fen bilimleri derslerini düz anlatım yöntemi ile

işlemeleri çoğu kez öğrencilerin fen kavramlarını anlayamamalarına, fen derslerini sıkıcı ve zor bulmalarına, derse yönelik olumsuz tutumlar geliştirmelerine neden olmaktadır. Bu bağlamda öğrencilerin fen bilimleri derslerine yönelik olumlu tutumlar geliştirmeleri ve fen konularını öğrenebilmeleri noktasında öğretmenlere büyük sorumluluklar düşmektedir. Öğrenciler, fen derslerini sevdikleri kadar bu derse ilgi duyabilirler ve bu şekilde uzun vadede etkili fen okuryazarı bireyler olarak yetişebilirler (Gürbüz, Çeker & Töman, 2017). Kaliteli ve etkili bir fen eğitimi, öğrencilerin fen kavramlarını anlamlı bir şekilde içselleştirmeleri ve öğrenmeleri sağlanarak gerçekleştirilebilir (Coşkun, Akarsu & Karpier, 2012). Bu noktada öğretmenlerin fen bilimleri derslerine uygun yöntem, teknik ve stratejilerle 5., 6., 7. ve 8. sınıf düzeylerinde ve bu düzeylere uygun özellikler taşıyan öğrencilere hangi hedefleri ve davranışları kazandırabilmeleri gerektiği noktasında ilgili yöntemleri uygun şartlar ve ilkelere dayalı olarak ne şekilde kullanabileceklerini bilmeleri gerekmektedir (Çilenti, 1985). Yani öğrencilerin dersleri öğrenmelerine katkı sağlayabilecek yöntem, teknik ve stratejileri kullanmaları gerekir. Bu tekniklerden en önemli olanlarından birisi de oyun ve eğitsel şarkı teknikleridir. Eğitsel oyun ve şarkılar sayesinde düz anlatım yönteminin getirdiği bazı olumsuzluklar aşarak fen öğretimi çok daha keyifli bir hale getirilebilir. Öğrencilere kazandırılmak istenen becerilerin ve bilgilerin eğitsel oyun ve şarkıların içinde var olduğu ve asıl amacın oyun oynamak-şarkı söylemekten ziyade bu şarkılar ve oyunlar sayesinde öğrencilerin fen konularına yönelik bilgilerinin zihinlerinde kalıcı olması, ilgilerinin konuya odaklanmaları ve güdülenmelerine yardımcı olabileceği söylenebilir (Erdoğan, 2003; Gürbüz, Çeker & Töman, 2017). Buradan eğitsel şarkıların farklı eğitim-öğretim süreçlerinde (okul öncesi, ilkokul, ortaokul, lise) bulunan öğrencilerin farklı disiplinlerde (matematik, fizik, kimya, biyoloji, tarih, coğrafya, fen bilimleri gibi) öğrenmelerini kolaylaştırmak, öğrencilerin kavramlarla günlük hayatlarındaki değerleri içselleştirmeleri, içinde yaşadıkları toplumun kültürünü öğrenmelerini sağlamak amacıyla özel olarak üretilen müzik şeklinde ele alınabilir (Aksu, 2009). Yani müziğin eğitimde eğitici ve öğretici bir nitelik taşıdığı söylenebilir (Uçan, 1996). Farklı disiplinlerde müzik destekli öğretimin öğrencilerin dikkatlerini ilgili disipline odaklamalarına, bilgi düzeylerinin artmasına ve bilgilerinin kalıcılığına destek sağladığı söylenebilir (Gürbüz, Çeker & Töman, 2017). Müzik, öğrencilerde stres düzeyini azaltarak düşünceleri rahatlatır, öğrencilerin hafızalarının gelişmesini sağlar, öğrenme yeteneklerini artırır, bilgilerinin zihinlerinde kalıcı olmasını sağlar, dersleri daha kolay ve eğlenceli hale getirir, öğrencilere dinleme becerilerini kazandırır, öğrencilerin derse odaklanma sürelerinin uzamasına da büyük ölçüde katkı sağlar (Dikici-Sığırtmaç, 2005; Gültek, 2002). Müziğin, öğrencilerin zihinlerinde aktif hale gelen bilgilerin kısa süreli bellekten uzun süreli belleğe aktarılmasında da önemli bir rolü vardır. Zihin şarkı ve müzik desteği ile öğrenilen bilgileri; melodi, ritim, armoni ve müziğin vuruş bileşenleri aracılığıyla daha etkili kodlar ve bu bilgilerin daha hızlı-kolay hatırlanmasını sağlar. Bu şekilde öğrenciler bir şarkının sözlerini herhangi bir konuşmadan daha kolay hatırlayabilirler (Köse, 2012). Müzik bireylerin hayatına; güven, huzur, mutluluk, hareket, kas gelişimi, iletişim, sosyalleşme, paylaşım gibi alanlarda olumlu etkilerde bulunur. Müzik eğitimi aynı zamanda eğlenceli ve zevkli öğrenmenin eğitimidir (Şaktanlı, 2016). Son yıllarda giderek önemi artan

fen eğitiminin amaçlarından biri öğrencilere gelişen dünyada bilimsel ve teknolojik olarak istenen özellikleri kazandırabilmektir. Öğrencilerin fen bilimlerini hayatlarının her aşamasında gerçekleştirebilmelerine yol açmak fen eğitiminin amaçlarındandır. Bu amaçlar ışığında fen eğitiminin birçok basamağında fene yönelik etkinliklerin kullanımı oldukça önemlidir. Fen eğitiminin önemli hedeflerinin başında yaşayarak-yaparak öğrenme ve öğrencilerin bilgileri zihinlerinde kendilerinin yapılandırmaları gelir (Aksakal & Yılayaz, 2019). Fen eğitiminde araştırma yapanlar öğrencilerin fen bilimlerine yönelik kavramları ezberleyerek öğrenmelerinden ziyade daha yaratıcı, anlamlı ve kavramlar arasında ilişki kurarak öğrenmeleri üzerinde yoğunlaşırlar. Öğrencilerin zihinlerinde fene yönelik kavramları yapılandırabilmeleri ve bu kavramlar arasında ilişki kurabilmeleri bu kavramları zihinlerinde canlandırabilme zorunluluğunu da beraberinde getirir (Afacan, 2011). Bu noktada müzik destekli fen öğretiminin önemli olduğu düşünülmektedir. Çünkü müzik dili akademik ve konuşma dili kadar evrensel bir öneme sahiptir. Öğrenciler özellikle küçük yaşlarda öğretilen şarkılarla iyiye ve doğruya yönlendirilebilirler. Şarkılar bünyesinde öğrenciler pek çok engeli aşabilen, zorluklarla mücadele edebilen bir güce sahip olmakla birlikte, seslerini doğru ve etkili kullanmaları, müzikal duyum yeteneklerinin ilerlemesi ile bir toplum içerisinde iş yapabilmeleri sağlanır (Aydoğan, 2007; Şimşek & Bilen, 2019). Ortaokul fen bilimleri derslerindeki ünitelerin ya da konuların şarkılarla ve müzikle desteklenip öğretilerek öğrencilerin fen kavramlarını zihinlerinde yapılandırmaları, yorumlamaları, ilişkilendirebilmeleri ve kalıcı hale getirmelerinin yanında kulak-ritim eğitimi alabilmelerinin sağlanması, fen bilimleri derslerinde severek ve eğlenerek şarkı söylemeleri ve müzikle alakalı enstrümanları (gitar, bağlama, yan flüt, piyano vs.) tanıyabilmelerini olanaklı bir hale getirebilmektedir (Sun, 2006; Serin Özparlak & Sonsel, 2020). Bu nedenlerle ortaokul 5. sınıf öğrencilerinin yine 5. Sınıf Fen Bilimleri Dersi Ay'ın Evreleri konusunun şarkı-müzik destekli öğretiminin bazı değişkenler üzerindeki etkisi merak edilmiş ve bu değişkenlere etkisinin belirlenmesine ilgili alan yazına katkı sağlamak amacıyla gerek duyulmuştur.

YÖNTEM

Araştırmanın Modeli

Araştırmanın amacı, 5. sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin 5. sınıf öğrencilerinin başarıları, fen bilimlerine yönelik öz-düzenlemeleri, fen dersine yönelik tutumları, fen öğrenmeye yönelik öz-yeterlilik inançları şeklindeki değişkenler üzerine etkisini belirlemektir. Araştırmada nicel araştırma yöntemlerinden deneme öncesi deneysel desenlerden tek grup ön test/son test modeli (kullanılmıştır. Ön test – son test gruplu deneysel desende bir grup üzerinde bağımsız değişken etkisi test edilir. Hem deney öncesi, hem deney sonrası ölçmeler içerir. Burada esas olan deney öncesi ve deney sonrası bağımsız değişkenin mevcut durum üzerindeki etkisinin ne olduğudur (Köse, 2013).

Araştırmanın Çalışma Grubu

Araştırmaya 2021-2022 eğitim-öğretim yılında Kars ilinin bir ilçesindeki bir köy okulunun 5. sınıf düzeyinde öğrenim gören altı erkek, üç kız öğrenci olmak üzere toplam dokuz öğrenci katılmıştır. Araştırmanın çalışma grubu rastgele örnekleme yöntemi ile seçilmiştir.

Veri Toplama Araçları

“Ay’ın Evreleri” Konusuna Yönelik Başarı Testi

Araştırmada kullanılan veri toplama araçlarından ilki 5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusuna yönelik altı çoktan seçmeli sorudan oluşan başarı testidir. Araştırmada kullanılan başarı testindeki çoktan seçmeli sorular uygun kazanım ve sınıf düzeyleri doğrultusunda <http://www.isemdijital.com/ogretmen.com> ve <http://www.isleronline.com/ogretmen> sayfalarından alınarak hazırlanmıştır. Sorular ilgili ve güvenilir online kaynaklardan seçildikten sonra fen bilimleri öğrenme alanındaki iki öğretim üyesine kontrol ettirilerek öğretim üyeleri tarafından sorular üzerinde herhangi bir yanlış bilgi ya da kavram yanlışlığının olup olmadığına bakılmıştır. Sorular öğretim üyeleri tarafından kontrol edilmiş ve düzeltilmiştir. 5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusuna yönelik çoktan seçmeli sorulardan oluşan başarı testi 5. sınıf öğrencilerine uygulanmak üzere hazır hale getirilmiştir.

Fen Bilimlerine Yönelik Öz-Düzenleme Ölçeği

Veri toplama araçlarından ikincisi Karaca ve Bektaş (2020) tarafından geliştirilen “Fen Bilimlerine Yönelik Öz Düzenleme Ölçeği” dir. Karaca ve Bektaş (2020) geliştirdikleri bu ölçekten alınabilecek en yüksek puanı 130, en düşük puan ise 26 olarak belirlemişlerdir. Karaca ve Bektaş (2020) tarafından geliştirilen “Fen Bilimlerine Yönelik Öz Düzenleme Ölçeği” varyansın % 48’ini açıklayan, .940 güvenirlik katsayısına sahip olan, 26 maddeden ve üç faktörden (eleştirel düşünme, zaman yönetimi, çaba yönetimi) oluşan beşli likert tipi bir ölçektir. Bu ölçek alan yazında Zimmerman’ın (1986) öz düzenleme modelini koruyan nitelikte bir ölçektir. Üç faktörlü yapısı, doğrulayıcı faktör analizi ile doğrulanmıştır. Karaca ve Bektaş’dan (2020) izin alınarak “Fen Bilimlerine Yönelik Öz Düzenleme Ölçeği” araştırmanın çalışma grubundaki öğrencilere “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin öncesinde ve sonrasında uygulanmıştır.

Ortaokul Öğrencileri İçin Fen Öğrenmeye Yönelik Öz-Yeterlilik İnanç Ölçeği

Veri toplama araçlarından üçüncüsü Yaman (2016) tarafından geliştirilen “Ortaokul Öğrencileri İçin Fen Öğrenmeye Yönelik Öz-Yeterlilik İnanç Ölçeği” dir. Yaman (2016) tarafından geliştirilen bu ölçek ortaokul öğrencilerinin fen öğrenmeye yönelik öz-yeterlilik inanç düzeylerini ölçebilecek, geçerlik ve güvenirlik düzeyi yüksek olan, 17 maddeden oluşan, beşli likert tipinde bir ölçektir. Yaman (2016) geliştirdiği bu ölçeğin açımlayıcı faktör analizi iç tutarlılık ve güvenirlik katsayısını 0,85; doğrulayıcı faktör analizi iç tutarlılık güvenirlik katsayısını 0,83 olarak bulmuştur. Yaman’a (2016) göre faktör analizinin sonuçları, ölçme aracının üç faktör üzerine kurulmasının mümkün olduğunu göstermektedir. Yaman (2016)

ölçekteki üç faktörü “bireysel başarıya yönelik öz-yeterlilik”, “performansa yönelik öz-yeterlilik”, “sonuca yönelik öz-yeterlilik” şeklinde isimlendirmiştir. Yaman’dan (2016) izin alınarak “Ortaokul Öğrencileri İçin Fen Öğrenmeye Yönelik Öz-Yeterlik İnanç Ölçeği” araştırmanın çalışma grubundaki öğrencilere “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin öncesinde ve sonrasında uygulanmıştır.

Fen Dersine Yönelik Tutum Ölçeği

Veri toplama araçlarından üçüncüsü Karabulut ve Çetin (2018) tarafından geliştirilen “Fen Dersine Yönelik Tutum Ölçeği” dir. Karabulut ve Çetin (2018) tarafından geliştirilen “Fen Dersine Yönelik Tutum Ölçeği” 30 maddeden oluşan, beşli likert tipinde bir ölçektir. Bu ölçeğe göre en yüksek tutum puanını alabilecek öğrenci 150 puan, en düşük tutum puanı alabilecek öğrenci 30 puan almaktadır. Karabulut ve Çetin (2018) tarafından geliştirilen “Fen Dersine Yönelik Tutum Ölçeği” için Skewness değeri -1 ile 1 arasında yer almaktadır (Kurtosis=0.87, Skewness=0.07). Ayrıca veri seti için Kolmogorov-Smirnov değerinin anlamlı aralığın dışında yer alması sebebiyle veri seti normal dağılım göstermektedir (Kolmogorov-Smirnov=0.20). Verilerin normal dağılım göstermesinin ardından ölçeğin yapı geçerliliğinin tespit edilmesi amacıyla faktör analizi yapılmıştır. Hazırlanan tutum ölçeği için her bir maddenin faktör yükünün ,300'den büyük olmasına dikkat edilmiştir. Karabulut ve Çetin (2018) tarafından “Fen Dersine Yönelik Tutum Ölçeği” nin Cronbach Alfa değeri 0.91 olarak bulunmuştur. Karabulut ve Çetin’den (2018) izin alınarak “Fen Dersine Yönelik Tutum Ölçeği” araştırmanın çalışma grubundaki öğrencilere “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin öncesinde ve sonrasında uygulanmıştır.

“Ay’ın Evreleri” Konusuna Ait Şarkı Sözleri

Araştırmadaki veri toplama araçlarından beşincisi 5. Sınıf Fen Bilimleri Dersi’nin “Ay’ın Evreleri” konusuna ait şarkı sözleridir. Sonrasında araştırmacı tarafından “Ay’ın Evreleri” konusunun şarkı ve müzikle desteklenerek öğretiminin yapılabilmesi için; araştırmacı ile enstrüman çalan ve müzik konusunda uzman olan bir yardımcı araştırmacı ve fen bilgisi eğitimi alanında uzman olan iki öğretim üyesinin görüşleri ve katkılarıyla konuya ait şarkının sözleri yazılmıştır. Şarkı sözlerinde herhangi bir kavram yanlışlığı ya da bilimsel yanlış olup olmadığı fen bilgisi eğitimi alanında üç öğretim üyesine kontrol ettirilmiş ve öğretim üyeleri şarkı sözleri üzerinde gerekli düzeltmeleri yapmışlardır. Şarkının bestesi şarkıyı besteleyen sanatçıdan izin alınarak araştırmada kullanılmıştır. Şarkı böylece araştırmanın uygulama sürecinde kullanılmak üzere hazır hale getirilmiştir. 5. sınıf Ay’ın Evreleri konusuna ait şarkı sözleri aşağıdaki gibidir.

5. Sınıf Ay’ın Evreleri Konusuna Yönelik Şarkı Sözleri

Güneşe göre konumu değişince

Farklı şekilde görünür Ay

Dördü ana, dördü ara

Tam sekiz evresi var

Yeni Ay, İlk Dördün, Dolunay
Ve Son Dördün ana evre
Dediler bu evreler neymiş?
Dedim felaket felaket
Felaket, bu ay bir afet bir afet
Döner saat yönünün tersine, valla kıyamet kıyamet
Bir hafta sürer ana evreler
Hilal, Şişkin Ay ara evreler
Delirdim yandı tüm devreler, ah felaket
Yeni Ay geldi, Ay tam ortada
Karanlık olur görünmez Ay
Hilalde sağdan aydınlanır, ters “C” harfi haydi bak
Peşinden İlk Dördün gelir
Tıpkı “D” harfi gibidir
Sonra şişkin ay geçiş evresi ay felaket
Felaket, bu ay bir afet bir afet
Döner saat yönünün tersine valla kıyamet kıyamet
Bir hafta sürer ana evreler
Hilal, Şişkin Ay ara evreler
Delirdim yandı tüm devreler ah felaket
Bak yukarı Dolunay geldi her yeri aydınlık
Aydede
Sonra Şişkin Ay, tekrar göründü gökyüzünde
Valla bıktık
Son Dördün geldi
Ayın sol yüzü aydınlık
Ters “D” harfi gibi duruyordu
Hepimiz şaşırдық
En son hilal geldi, “C” harfi belirdi
Türk Bayrağı’ndaki, Hilal’imiz gibi

Dedim felaket felaket

Felaket, bu ay bir afet bir afet

Döner saat yönünün tersine valla kıyamet kıyamet

Bir hafta sürer ana evreler

Hilal, Şişkin Ay ara evreler

Delirdim yandı tüm devreler ah felaket

Araştırmanın Uygulama Süreci

Araştırma uygulama süreci; araştırmanın uygulama öncesi, uygulama esnası ve uygulama sonrası olmak üzere üç şekilde ele alınmıştır.

Araştırmanın Uygulama Öncesi

Araştırmanın uygulama öncesinde İl ve İlçe Milli Eğitim Müdürlükleri'nden ve öğrencilerin velilerinden Kars ilinin bir ilçesine bağlı bir köy okulunun 5. sınıfında "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin yapılabilmesi için ilgili izinler alınmıştır. Araştırmanın uygulama öncesinde öncelikle öğrencilere "Ay'ın Evreleri Konusuna Ait Başarı Testi", "Fen Bilimlerine Yönelik Öz-Düzenleme Ölçeği", "Ortaokul Öğrencileri için Fen Öğrenmeye Yönelik Öz -Yeterlilik İnanç Ölçeği", "Fen Dersine Yönelik Tutum Ölçeği" ön-test şeklinde uygulanmıştır. Fen bilimleri öğretmeni olan araştırmacı ile gitar enstrümanını icra eden yardımcı araştırmacı uygulama öncesinde öğrencilere araştırmanın uygulama süreci hakkında bilgi vermişlerdir. Araştırmanın uygulama öncesinde öğrencilere "Ay'ın Evreleri" konusuna ait şarkı sözleri yazılı olarak öğrenci sayısı kadar çoğaltılarak dağıtılmıştır. Öğrencilerden bu şarkı sözlerine evde çalışmaları istenmiştir. Öğrenciler şarkı sözlerine evde çalışarak aşına olmaları sağlanmıştır. Öğrencilerin fen bilimleri derslerine giren fen bilimleri öğretmeni olan araştırmacı ile klasik gitar enstrümanını icra eden yardımcı araştırmacı öğrencilerin müziğin ritmine uyum sağlamalarını gerçekleştirmek amacıyla Türk Bayraklı balonlar başta olmak üzere değişik renklere sahip balonları uygulama sürecinde kullanıma hazır hale getirmişlerdir. Türk Bayraklı balonların öğrenciler şarkı söylerken onların ellerinde olmalarını sağlanmak amacıyla araştırmaya katılacak öğrenci sayısı kadar bu balonla tedarik edilip şişirilerek öğrencilere uygulama öncesinde dağıtılmıştır. Farklı renklere sahip (lacivert, gri, beyaz, pembe) diğer balonlar ise öğrencilerin uygulama sürecindeki motivasyonlarını artırmak adına sınıfın farklı yerlerine konulmuştur.

Araştırmanın Uygulama Esnası

Araştırmacı olan dersin fen bilimleri öğretmeni ile klasik gitar enstrümanını icra eden yardımcı araştırmacı klasik gitar enstrümanı ile 5. sınıf öğrencilerine "Ay'ın Evreleri" konusunu klasik gitar eşliğinde şarkı ile öğretmek için fen bilimleri dersinin işlendiği saatte sınıfa gitmişlerdir. Öncelikle araştırmacı olan dersin fen bilimleri öğretmeni "Ay'ın Evreleri" konusunu 5E Öğrenme Modeli'ne göre anlatmaya başlamıştır. 5E Öğrenme Modeli'nin "Derinleştirme"

basamağında araştırmacı ile yardımcı araştırmacı öncelikle öğrencilerin heyecanlanmamaları, sürece adapte olmalarını sağlamak için kamera kaydı almadan birkaç kere “Ay’ın Evreleri” konusuna ait şarkıyı klasik gitar eşliğinde şarkı söyleyerek öğrencilere öğretmişler ve öğrenciler ile birlikte şarkıyı söylemişlerdir. Öğrenciler ellerindeki Türk Bayraklı balonları sağ ellerinde bulundurarak müziğin ritmine uyum sağlamak adına yukarı doğru kaldırarak ve sağa sola sallayarak şarkı sözlerini zihinlerinde daha da pekiştirmişlerdir. Sonrasında esas araştırmaya geçilerek aynı uygulama gerçekleştirilmiştir. Sınıfta uygulama yapılırken zaman zaman öğrencilerin dikkatlerini dağıtmadan okulun idarecileri araştırmanın etiği gereği kısa süreli sınıfta kontroller yapmışlardır.

Araştırmanın Uygulama Sonrası

Araştırmanın uygulanma sonrasında öğrencilere “Fen Bilimlerine Yönelik Öz-Düzenleme Ölçeği”, “Ortaokul Öğrencileri için Fen Öğrenmeye Yönelik Öz -Yeterlilik İnanç Ölçeği”, “Fen Dersine Yönelik Tutum Ölçeği” son-testler olarak uygulanmıştır. Ölçeklerin uygulandığı fen bilimleri dersinden sonraki hafta ise “Ay’ın Evreleri” konusuna ait başarı testi son-test olarak uygulanmıştır. Ölçme araçları araştırmacı tarafından kontrol edilmiştir. Ölçme araçları öğrenciler tarafından eksik doldurulmuş ya da yanıtlanmıyorsa ilgili öğrencilere başarı testi ya da ölçekler tekrar verilerek öğrencilerden bu ölçeklerdeki ve başarı testindeki eksik bıraktıkları kısımları yeniden yanıtlamaları ya da doldurmaları istenmiştir. Araştırmanın uygulama sürecinde kullanılan balonlar araştırmanın uygulama sürecinin sonunda öğrencilere hediye olarak verilerek araştırmanın uygulama süreci tamamlanmıştır.

Verilerin Analizi

Araştırmada 5. sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin 5. sınıf öğrencilerinin başarıları, fen bilimlerine yönelik öz-düzenlemeleri, fen dersine yönelik tutumları, fen öğrenmeye yönelik öz-yeterlilik inançları şeklindeki değişkenler üzerine etkisinin tespitine yönelik analizler nicel olarak yapılmıştır. Veriler nicel araştırmalarda kullanılan bir paket programda analiz edilmiştir. Nicel verilerin analizinde Non-parametrik testlerden “Wilcoxon İşaretli Sıralar Testi” kullanılmıştır. “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin 5. sınıf öğrencilerinin başarılarının, fen bilimlerine yönelik öz-düzenlemelerinin, fen dersine yönelik tutumlarının, fen öğrenmeye yönelik öz-yeterlilik inançlarının ön test-son test puan ortalamalarının birbirinden istatistiksel olarak anlamlı bir şekilde farklılaşıp farklılaşmadığını belirlemek üzere “Wilcoxon İşaretli Sıralar Testi” kullanılmıştır. Yapılan nicel analizlerin sonuçları araştırmanın bulgular bölümünde tablolar halinde sunulmuş ve açıklanmıştır.

BULGULAR

5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin fen öğrenmeye yönelik öz-yeterlilik inançları arasında (uygulama öncesi-uygulama sonrası) anlamlı bir farklılık olup olmadığına ilişkin Wilcoxon işaretli sıralar testi sonuçları Tablo 1’deki gibidir.

Tablo 1. Ay'ın Evreleri Konusunun Şarkı ve Müzik Destekli Öğretiminin Öğrencilerin Fen Öğrenmeye Yönelik Öz-Yeterlilik İnançlarına Etkisine Yönelik Wilcoxon İşaretli Sıralar Testi Sonuçları

Sontest-Öntest	n	Sıra Ortalaması	Sıra Toplamı	z	p
Negatif Sıra	5	4.50	22.50		
Pozitif Sıra	3	4.50	13.50	0.631*	0,52
Eşit	0	0	0		

*Negatif sıralar temeline dayalı

Tablo 1'e göre "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin öğrencilerin fen öğrenmeye yönelik öz-yeterlilik inançlarına etkisine yönelik uygulama öncesi ve uygulama sonrası puanları arasında istatistiksel olarak anlamlı bir fark bulunmamıştır ($Z=0.631$, $p<,05$). Fark puanlarının sıra ortalaması ve toplamları dikkate alındığında gözlenen bu farkın negatif sıralar başka bir ifadeyle ön-test lehine olduğu görülmektedir. Yani Tablo 1'e göre 5. Sınıf Fen Bilimleri Dersi "Ay'ın Evreleri" konusunun öğrencilere şarkı ve müzik destekli öğretiminin öğrencilerin fen öğrenmeye yönelik öz-yeterlilik inançlarını değiştirmedeği belirlenmiştir.

5. sınıf öğrencilerine "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin öğrencilerin fen dersine yönelik tutumları arasında (uygulama öncesi-uygulama sonrası) anlamlı bir farklılık olup olmadığına ilişkin Wilcoxon işaretli sıralar testi sonuçları Tablo 2'deki gibidir.

Tablo 2. 5. Sınıf Ay'ın Evreleri Konusunun Şarkı ve Müzik Destekli Öğretiminin Öğrencilerin Fen Dersine Yönelik Tutumlarına Etkisine Yönelik Wilcoxon İşaretli Sıralar Testi Sonuçları

Sontest-Öntest	n	Sıra Ortalaması	Sıra Toplamı	z	p
Negatif Sıra	7	1.00	1.00		
Pozitif Sıra	1	5.00	35.00	2,38*	0,017
Eşit	0	0	0		

*Negatif sıralar temeline dayalı

Tablo 2'ye göre "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin fen dersine yönelik tutumları arasında istatistiksel olarak anlamlı bir fark bulunmuştur ($Z=2,38$ $p<,05$). Fark puanlarının sıra ortalaması ve toplamları dikkate alındığında gözlenen bu farkın pozitif sıralar başka bir ifadeyle son-test lehine olduğu görülmektedir. Yani Tablo 2'ye göre 5. Sınıf Fen Bilimleri Dersi "Ay'ın Evreleri" konusunun öğrencilere şarkı ve müzik destekli öğretiminin öğrencilerin fen dersine yönelik tutumlarını artırdığı tespit edilmiştir.

5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin fen bilimlerine yönelik öz-düzenlemeleri arasında (uygulama öncesi-uygulama sonrası) anlamlı bir farklılık olup olmadığına ilişkin Wilcoxon işaretli sıralar testi sonuçları Tablo 3’deki gibidir.

Tablo 3. 5. Sınıf Ay’ın Evreleri Konusunun Şarkı ve Müzik Destekli Öğretiminin Öğrencilerin Fen Bilimlerine Yönelik Öz-Düzenlemelerine Etkisine Yönelik Wilcoxon İşaretli Sıralar Testi Sonuçları

Sontest-Öntest	n	Sıra Ortalaması	Sıra Toplamı	z	p
Negatif Sıra	8	,00	,00		
Pozitif Sıra	0	4,50	36,00	2,52*	0,012
Eşit	0	0	0		

*Negatif sıralar temeline dayalı

Tablo 3’e göre 5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin fen bilimlerine yönelik öz-düzenlemeleri arasında uygulama öncesi ve uygulama sonrasında istatistiksel olarak anlamlı bir fark bulunmuştur ($Z=2,58$ $p<,05$). Fark puanlarının sıra ortalaması ve toplamları dikkate alındığında gözlenen bu farkın pozitif sıralar yani son-test lehine olduğu görülmektedir. Yani Tablo 3’e göre 5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun öğrencilere şarkı ve müzik destekli öğretiminin öğrencilerin fen bilimlerine yönelik öz-düzenlemelerini artırdığı belirlenmiştir.

5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin başarıları arasında (uygulama öncesi-uygulama sonrası) anlamlı bir farklılık olup olmadığına ilişkin Wilcoxon işaretli sıralar testi sonuçları Tablo 4’deki gibidir.

Tablo 4. 5. Sınıf Ay’ın Evreleri Konusunun Şarkı ve Müzik Destekli Öğretiminin Öğrencilerin Başarılarına Etkisine Yönelik Wilcoxon İşaretli Sıralar Testi Sonuçları

Sontest-Öntest	n	Sıra Ortalaması	Sıra Toplamı	z	p
Negatif Sıra	6	1,00	1,00		
Pozitif Sıra	1	4,50	27,00	2,24*	0,025
Eşit	1	-	-		

*Negatif sıralar temeline dayalı

Tablo 4’e göre 5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi ile öğrencilerin akademik başarıları arasında (uygulama öncesi-uygulama sonrası) istatistiksel olarak anlamlı bir fark bulunmuştur ($Z=2,24$ $p<,05$). Fark puanlarının sıra ortalaması ve

toplamları dikkate alındığında gözlenen bu farkın pozitif sıralar başka bir ifadeyle son-test lehine olduğu görülmektedir. Yani Tablo 4'e göre 5. Sınıf Fen Bilimleri Dersi "Ay'ın Evreleri" konusunun öğrencilere şarkı ve müzik destekli öğretiminin öğrencilerin akademik başarılarını artırdığı belirlenmiştir.

SONUÇ VE TARTIŞMA

Araştırmanın sonuçlarına göre; 5. Sınıf Fen Bilimleri Dersi "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin ortaokul 5. sınıf öğrencilerinin fen öğrenmeye yönelik öz-yeterlilik inançlarını değiştirmedeği belirlenmiştir. "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin öğrencilerin fen dersine yönelik tutumlarını, fen bilimlerine yönelik öz-düzenlemelerini ve konuyla ilgili akademik başarılarını artırdığı tespit edilmiştir. Alan yazın incelendiğinde bu araştırmanın sonuçlarını destekleyen bazı çalışmaların olduğu görülmektedir. Kahyaoğlu (2005) ilköğretim 6. sınıf dolaşım ve sindirim sistemi konusunda şarkı ve şiirin başarıyı, hatırlamayı ve derse karşı tutumu arttırdığını tespit etmiştir. Çevik (2011) yaptığı çalışmada sınıf öğretmeni adaylarına müzik destekli öğretimin onların öz-yeterlilik, cinsiyet, sınıf düzeyi ve yaşlarına etkisini incelemiştir. Çevik (2011) araştırmasının sonucunda müzik destekli öğretim neticesinde kadınların erkeklerden daha yüksek öz-yeterliliğe ulaştıklarını, öğrencilerin sınıf düzeyleri arttıkça öz-yeterliliklerinin yükseldiğini, son olarak 22-24 yaş aralığındaki öğrencilerin müzik destekli öğretim sonucunda öz-yeterliliklerinin daha fazla arttığını tespit etmiştir. Bedir ve Akkurt (2012) yapmış oldukları çalışmalarında, coğrafya dersinin şarkılarla işlenmesi sonucunda öğrencilerin derse yönelik tutumlarının arttığını tespit etmiştir. Uzunoğlu Yegül (2014) çalışmada sınıf öğretmenliği, okul öncesi öğretmenliği ve müzik öğretmenliğinde öğrenim gören öğretmen adaylarının müzik destekli yapılan öğretim sonucunda cinsiyetleri, sınıf düzeyleri ve öz-yeterlilik algılarında bir değişiklik olmadığı, müzik öğretmenliğinde öğrenim gören öğretmen adaylarının okul öncesi ve sınıf öğretmenliğinde öğrenim gören öğretmen adaylarından, okul öncesinde öğrenim gören öğretmen adaylarının ise sınıf öğretmenliğinde öğrenim gören öğretmen adaylarından daha başarılı oldukları sonucuna ulaşmıştır. Küçük (2015), müzik öğretmenliği öğrencilerinin piyano eşliğinde yapılan öğretimin onların öz-yeterlilik algılarında bir değişiklik olup olmadığını incelemiştir. Küçük (2015) öğretmen adaylarının öz-yeterlilik algılarının sınıf, yaş ve mezun olunan okul türüne etkisini de araştırmıştır. Küçük (2015) birçok üniversitenin eğitim fakültelerinin müzik öğretmenliği bölümünde öğrenim gören öğrencilerle yaptığı çalışmasının sonucunda, piyano eşliğinde yapılan öğretimin cinsiyet ve sınıf değişkenine bağlı olmadığını tespit etmiştir. Ayrıca 18-22 yaşlarında olan öğretmen adaylarının diğer yaş gruplarına göre öz-yeterlilik algılarının yüksek olduğunu belirlemiştir. Küçük (2015) çalışmada, öğretmen adaylarının mezun oldukları lise türüne göre güzel sanatlar lisesi mezunlarının piyano eşliğinde yapılan müzikle öğretimin onların öz-yeterlilik algılarını daha fazla arttırdığını da tespit etmiştir. Duru Gün, Gün ve Demirtaş (2016) yaptıkları çalışmalarında, erken okul dönemi çocuklarının müzik ve enstrüman öğrenmelerinin akademik başarılarını ve bilişsel düzeylerini pozitif yönde etkilediğini tespit etmişlerdir. Koca (2016) ise yapmış olduğu çalışmada, okul öncesi öğretmen adaylarının müzik etkinliklerine yönelik başarıları ile öz-yeterlilik algılarını

incelemiştir. Koca (2016) yaptığı araştırmasının sonucunda ise öğretmen adaylarının mezun oldukları lise türü ile üniversite öncesi müzik eğitimi görmelerinin onların müzik dersine yönelik başarıları ile öz-yeterlilik inançlarını değiştirmedeğini tespit etmiştir.

ÖNERİLER

Araştırmadan elde edilen sonuçlara göre şu önerilerde bulunulabilir.

1. 5. sınıf “Ay’ın Evreleri” konusu dışındaki 5. Sınıf Fen Bilimleri Dersi ünitelerine-konularına ya da ortaokul 6., 7., 8. sınıf düzeylerindeki fen bilimleri derslerinin ünitelerine-konularına şarkı ve müzik destekli öğretimler yapılabilir.
2. Araştırmada enstrüman olarak klasik gitar kullanılmıştır. Farklı enstrümanlar (piyano, akordeon, bağlama, yan flüt, kukule vb.) kullanılarak konularının ya da ünitelerinin öğrencilere öğretimleri çok daha kapsamlı bir örneklem grubu ile yapılabilir. Bu sayede müziğe karşı ilgili olan öğrencilerin istihdamları sağlanabilir.
3. Tüm okullarda akıllı tahta ve internet bulunduğu için derslerin müzikle desteklenerek işlenmesinin maliyetinin düşük olduğu ve çok daha öğretici olduğu konusunda öğretmenler teşvik edilerek müzikle öğretimi yapılan konu, ünite ve ders saati sayısı artırılabilir.
4. Fen Bilimleri dersi öğrenciler açısından çoğunlukla zor kabul edilen bir ders olduğu için bu dersin müzikle desteklenerek öğretilmesinin olumlu etkiler yaratabileceğinden hareketle bu ders işleme biçimi tüm fen bilimleri öğretmenleri tarafından kullanılabilir.
5. Bilgi ne kadar fazla duyu organı tarafından algılanırsa o kadar kalıcı olmasından hareketle, fen bilimleri üniteleri ve konuları müzik ve şarkılar eşliğinde öğrencilerle klip yapılarak öğretilbilir ya da yapılmış hazır klipler öğrencilere izlettirilebilir.

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**5. SINIF “AY’IN EVRELERİ” KONUSUNUN ŞARKI VE MÜZİK DESTEKLİ
ÖĞRETİMİNE YÖNELİK ÖĞRENCİLERİN GÖRÜŞLERİ**
STUDENTS OPINIONS ON SONG AND MUSIC SUPPORTED TEACHING OF 5TH
GRADE “PHASES OF THE MOON”

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ÖZET

Bu araştırmanın 5. sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik öğrencilerin görüşlerini tespit etmektir. Araştırmada nitel araştırma yöntemlerinden durum çalışması kullanılmıştır. Araştırmaya 2021-2022 eğitim-öğretim yılında Kars ilinin bir ilçesine bağlı bir köy okulunun 5. sınıfında öğrenim gören toplam dokuz öğrenci katılmıştır. Araştırmaya katılan öğrencilere 5. sınıf Fen Bilimleri dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi bir öğretim yöntemi olmadığı için 5E öğrenme modelinin derinleştirme aşamasında yapılmıştır. Enstrüman olarak klasik gitar sınıf ortamında kullanılmış ve klasik gitar eşliğinde şarkı ile 5E öğrenme modelinin derinleştirme basamağında Ay’ın Evreleri konusu öğrencilere öğretilmiştir. Araştırmada veri toplama araçları olarak yapılandırılmış sorulardan oluşan görüşme formu kullanılmıştır. Görüşme formu “Ay’ın Evreleri” konusunun 5E öğrenme modelinin derinleştirme aşamasındaki şarkı ve müzik destekli öğretiminden sonra öğrencilere uygulanmıştır. Öğrenciler tarafından yazılı olarak doldurulan görüşme formunun nitel verilerin analizinde kullanılan içerik analizi yapılmıştır. Araştırmanın sonucunda; “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik öğrencilerin görüşlerine bakıldığında genel olarak; fen bilimleri dersini daha iyi anladıkları, fen bilimleri dersini daha eğlenceli ve kolay buldukları, dersi daha fazla sevdikleri, kendilerini heyecanlı, mutlu ve çalışkan hissettikleri, şarkının çok güzel, eğlenceli ve öğretici olduğu, konuyu daha iyi öğrenmelerinde şarkı ve müzik destekli öğretimin çok etkili olduğu şeklinde görüş bildirdikleri tespit edilmiştir.

Anahtar Kelimeler: Şarkı, Müzik, Ay’ın Evreleri.

ABSTRACT

The aim of this research is to determine student opinions regarding song and music supported teaching of the subject "Phases of the Moon" in the 5th grade Science Course. Case study, one of the qualitative research methods, was used in the research. A total of nine students studying in the 5th grade of a secondary school in a village school in a district of Kars province

participated in the research in the 2021-2022 academic year. Since music and song-supported teaching of the subject "Phases of the Moon" in the 5th grade Science course is not a teaching method for the students participating in the research, this teaching was carried out in the deepening phase of the 5E learning model. Classical guitar was used as an instrument in the classroom environment, and the subject of the "Phases of the Moon" was taught to students in the deepening stage of the 5E learning model with a song accompanied by classical guitar. An interview form consisting of structured questions was used as data collection tools in the research. The interview form was applied to the students after the song and music-supported teaching of the "Phases of the Moon" subject in the deepening phase of the 5E learning model. The content analysis of the interview form filled out by the students in writing was used to analyze the qualitative data. As a result of the research; When we look at the opinions of the students regarding the song and music supported teaching of the subject "Phases of the Moon", in general; They understood the science lesson better, they found the science lesson more fun and easy, they liked the lesson more, they felt excited, happy and hard-working, the song was very beautiful, entertaining and instructive, and song and music-supported teaching was very effective in helping them learn the subject better. It was determined that they expressed their opinions as follows.

Keywords: Song, Music, Phases of the Moon.

GİRİŞ

Eğitim arařtırmacıları son yıllarda "Öğrencilerin öğrenmelerini artırabilmek için neler yapabiliriz?" sorusuna cevap aramaktadırlar. Bu nedenler bu zamana kadar çok sayıda öğretim yöntem, teknik, strateji geliştirilmiş ve geliştirilmeye devam etmektedir. Fakat bugünün en önemli öğretim stratejileri müziğin eğitim-öğretimde ve özellikle de sınıf ortamlarında kullanılmasını kapsar (Yağışan, Köksal & Karaca, 2014). Müzik, insanlar arasındaki iletişimde ortak bir dil ile güçlü olan, insanların iletişim kurabilmelerinde duygularına yaklaşabilmelerinde, hissedebilmelerinde, rahatlamalarında ruhsal dengelerini yeniden kurabilmelerinde, çevrelerine uyum sağlayabilmelerinde oldukça önemli bir araçtır (Özçevik, 2007). Müzik, bireylerin bilişsel gelişim süreçlerinde de oldukça etkilidir (Jensen, 1998). Örneğin; şarkı söylemek çocukların motor gelişimlerini, sözlü anlatım becerilerini, kavramsal düşünmelerini, yaratıcılık ve koordinasyon becerilerini geliştirmektedir. Yani müziğin çocukların ve yetişkinlerin bilişsel gelişim süreçlerinde de etkili ve önemli olduğu söylenebilir (Kalmar, 1982). Müzik ve okuma birliktedir. Çünkü şarkı söylemek dilin kutlamasıdır. Her öğrencinin dilinde doğal olarak bir melodi ve ritim vardır. Öğrenciler müzik dilini anlamayı, okumayı öğrenerek ve şarkı söylemeyi kullanarak yaparlar (Harp, 1988; Kolb, 1996). Müzik, kendine has özel bir alan olarak düşünülmesine rağmen diğer öğrenme alanlarından ayrı değildir. Diğer öğrenme alanları ile de iç içedir. Mesela öğretmenler müziği fen ve matematik kavramları ile örüntülendirerek disiplinler arası etkinlikler tasarlayabilirler (Rogers, 2004). Müzik dersleri feni ve matematiği öğrenme noktasında öğrencilerin zihinlerini açar ve bu

öğrenme alanları için gerekli zekayı geliştirmeye katkıda bulunur (Kahyaoğlu, 2005). Çeşitli öğrenme ve öğretim süreçlerini geliştirebilmek adına müziğin bilinçli ve hedeflenen amaçlara yönelik olarak derslerde kullanılması çok etkili ve farklı bir öğrenme atmosferi yaratır. Çünkü müzik öğrenmeye yardımcıdır. Müzik; öğrencilerde arzu edilen pozitif öğrenmeleri teşvik eder, derse konsantre olmayı sağlar, dikkati artırır, hafızayı geliştirir, öğrenme aktiviteleri için enerji verir, derse yönelik istek ve motivasyonu artırır, sınıf ortamında eğlenerek öğrenmeyi sağlar, beyin dalgalarının durumunu değiştirir (Brewer, 1995). Müzik ve onun alt bileşenleri olan vurgunun, melodinin, ses renginin ve ritmin insan beyninin farklı alanlarını harekete geçirmesi, bilgileri uzun süreli belleğe kodlamada etkin olması gibi nedenler müziğin etkin bir eğitim aracı olarak kullanılmasını gündeme getirmektedir. İngilizce, Matematik, Sosyal Bilgiler, Türkçe, Fen Bilimleri gibi derslerin müzik destekli işlenmesinin, öğrencilerin kavram öğrenimlerini, kelime kazanımlarını ve konu alan bilgilerini zihinlerinde daha iyi yapılandırabilmelerine yönelik olumlu etkiler sağladığını tespit eden araştırmalar alan yazında mevcuttur (Akgül & Öztosun Çaydere 2008; Cheek & Smith, 1999; Yılmaz & Sığırtmaç, 2006; Yağışan, Köksal & Karaca, 2014). Bu nedenlerle 5. sınıf fen bilimleri dersinin öğrencilerde en fazla kavram karmaşası yaratan konularından olan “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminin yapılmasının ve bu öğretim sonrasında öğrencilerin konuyu ne kadar etkili öğrendikleri noktasında görüşlerinin tespit edilmesinin alan yazına katkı sağlayabileceği düşünülmektedir.

YÖNTEM

Araştırmanın Modeli

Araştırmanın amacı 5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik öğrencilerin görüşlerini tespit etmektir. Araştırmada öğrencilerden “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik yapılandırılmış sorulardan oluşan formunu uygulama sonrasında yazılı olarak doldurmaları istenmiştir. Yapılandırılmış görüşme sorularından birkaçı aşağıdaki gibidir.

- 1- Şarkı ve müzikle desteklenen bu konuyu öğrendikten sonra konuyu anlayıp anlamadığına dair performansını değerlendirebilir misin? Kendini nasıl buldun?
- 2- Bu konuyu şarkı ve müzik ile öğrendiğine dair kendine ne kadar güveniyorsun?
- 3- Bu konunun şarkı ve müzikle desteklenerek öğretilmesi hakkında neler hissediyorsun?
- 4- Daha önce böyle şarkı ve müzik eşliğinde sınıfınızda başka derslerde farklı konuları öğrenmeye yönelik uygulamalar yapıldı mı?

Birkaç örneği yukarıda verilen yapılandırılmış görüşme sorularından oluşan form öğrencilere araştırmanın uygulama sonrasında yani konunun şarkı ve müzik destekli öğretimi sonrasında dağıtılarak öğrencilerden bu sorulara yazılı olarak cevap vermeleri istenmiştir.

Araştırmanın Çalışma Grubu

Araştırmaya 2021-2022 Eğitim-Öğretim yılında Kars ilinin bir ilçesindeki bir köy okulunun 5. sınıfında öğrenim gören altı erkek, üç kız öğrenci olmak üzere toplam dokuz öğrenci katılmıştır. Araştırmanın çalışma grubu rastgele örnekleme yöntemi ile seçilmiştir.

Veri Toplama Araçları

“Ay’ın Evreleri” Konusunun Şarkı ve Müzik Destekli Öğretimine Yönelik Görüşme Formu

Araştırmadaki veri toplama araçlarından ilki “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik yapılandırılmış görüşme formudur. Bu form 15 tane yapılandırılmış görüşme sorusundan oluşmaktadır. Sorular araştırmacı ile fen bilgisi eğitimi alanında çalışmaları olan bir öğretim üyesi ile birlikte hazırlanmıştır. Görüşme formu, “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi sonrasında 5. sınıf öğrencilerine uygulanmıştır. Formdaki yapılandırılmış sorulara öğrenciler yazılı olarak yanıt vermek suretiyle konunun şarkı ve müzik destekli öğretimine yönelik görüş ve düşüncelerini ifade etmişlerdir. Öğrenciler görüşme formunu 50 dakikalık bir sürede uygun ve rahat olan bir sınıf ortamında tamamlamışlardır.

“Ay’ın Evreleri” Konusuna Ait Şarkı Sözleri

Araştırmadaki veri toplama araçlarından beşincisi 5. Sınıf Fen Bilimleri Dersi’nin “Ay’ın Evreleri” konusuna ait şarkı sözleridir. Sonrasında araştırmacı tarafından “Ay’ın Evreleri” konusunun şarkı ve müzikle desteklenerek öğretiminin yapılabilmesi için; araştırmacı ile enstrüman çalan ve müzik konusunda uzman olan bir yardımcı araştırmacı ve fen bilgisi eğitimi alanında uzman olan iki öğretim üyesinin görüşleri ve katkılarıyla konuya ait şarkının sözleri yazılmıştır. Şarkı sözlerinde herhangi bir kavram yanılgısı ya da bilimsel yanlış olup olmadığı fen bilgisi eğitimi alanında üç öğretim üyesine kontrol ettirilmiş ve öğretim üyeleri şarkı sözleri üzerinde gerekli düzeltmeleri yapmışlardır. Şarkının bestesi şarkıyı besteleyen sanatçıdan izin alınarak araştırmada kullanılmıştır. Şarkı böylece araştırmanın uygulama sürecinde kullanılmak üzere hazır hale getirilmiştir. 5. sınıf Ay’ın Evreleri konusuna ait şarkı sözleri aşağıdaki gibidir.

5. Sınıf Ay’ın Evreleri Konusuna Yönelik Şarkı Sözleri

Güneşe göre konumu değişince

Farklı şekilde görünür Ay

Dördü ana, dördü ara

Tam sekiz evresi var

Yeni Ay, İlk Dördün, Dolunay

Ve Son Dördün ana evre

Dediler bu evreler neymiş?

Dedim felaket felaket
Felaket, bu ay bir afet bir afet
Döner saat yönünün tersine, valla kıyamet kıyamet
Bir hafta sürer ana evreler
Hilal, Şişkin Ay ara evreler
Delirdim yandı tüm devreler, ah felaket
Yeni Ay geldi, Ay tam ortada
Karanlık olur görünmez Ay
Hilalde sağdan aydınlanır, ters “C” harfi haydi bak
Peşinden İlk Dördün gelir
Tıpkı “D” harfi gibidir
Sonra şişkin ay geçiş evresi ay felaket
Felaket, bu ay bir afet bir afet
Döner saat yönünün tersine valla kıyamet kıyamet
Bir hafta sürer ana evreler
Hilal, Şişkin Ay ara evreler
Delirdim yandı tüm devreler ah felaket
Bak yukarı Dolunay geldi her yeri aydınlık
Aydede
Sonra Şişkin Ay, tekrar görüldü gökyüzünde
Valla bıktık
Son Dördün geldi
Ayın sol yüzü aydınlık
Ters “D” harfi gibi duruyordu
Hepimiz şaşırдық
En son hilal geldi, “C” harfi belirdi
Türk Bayrağı’ndaki, Hilal’imiz gibi
Dedim felaket felaket
Felaket, bu ay bir afet bir afet
Döner saat yönünün tersine valla kıyamet kıyamet

Bir hafta sürer ana evreler

Hilal, Şişkin Ay ara evreler

Delirdim yandı tüm devreler ah felaket

Araştırmanın Uygulama Süreci

Araştırma uygulama süreci; araştırmanın uygulama öncesi, uygulama esnası ve uygulama sonrası olmak üzere üç şekilde ele alınmıştır.

Araştırmanın Uygulama Öncesi

Araştırmanın uygulama öncesinde İl ve İlçe Milli Eğitim Müdürlükleri'nden ve öğrencilerin velilerinden Kars ilinin bir ilçesine bağlı bir köy okulunun 5. sınıfında "Ay'ın Evreleri" konusunun şarkı ve müzik destekli öğretiminin yapılabilmesi için ilgili izinler alınmıştır. Fen bilimleri öğretmeni olan araştırmacı ile gitar enstrümanını icra eden yardımcı araştırmacı uygulamanın öncesinde öğrencilere araştırmanın uygulama süreci hakkında bilgi vermişlerdir. Araştırmanın uygulama öncesinde öğrencilere "Ay'ın Evreleri" konusuna ait şarkı sözleri yazılı olarak öğrenci sayısı kadar çoğaltılarak dağıtılmıştır. Öğrencilerden bu şarkı sözlerine evde çalışmaları istenmiştir. Öğrencilerin şarkı sözlerine evde çalışarak aşina olmaları sağlanmıştır. Öğrencilerin fen bilimleri derslerine giren fen bilimleri öğretmeni olan araştırmacı ile klasik gitar enstrümanını icra eden yardımcı araştırmacı öğrencilerin müziğin ritmine uyum sağlamalarını gerçekleştirmek amacıyla Türk Bayraklı balonlar başta olmak üzere değişik renklerdeki balonları uygulama sürecinde kullanıma hazır hale getirmişlerdir. Türk Bayraklı balonların öğrenciler şarkı söylerken onların ellerinde olmalarını sağlanmak amacıyla araştırmaya katılacak öğrenci sayısı kadar bu balonla tedarik edilip şişirilerek öğrencilere uygulama öncesinde dağıtılmıştır. Farklı renklere sahip (lacivert, gri, beyaz, pembe) diğer balonlar ise öğrencilerin uygulama sürecindeki motivasyonlarını artırmak adına sınıfın farklı yerlerine konulmuştur.

Araştırmanın Uygulama Esnası

Araştırmacı olan dersin fen bilimleri öğretmeni ile klasik gitar enstrümanını icra eden yardımcı araştırmacı klasik gitar enstrümanı ile 5. sınıf öğrencilerine "Ay'ın Evreleri" konusunu klasik gitar eşliğinde şarkı ile öğretmek için fen bilimleri dersinin işlendiği saatte sınıfa gitmişlerdir. Öncelikle araştırmacı olan dersin fen bilimleri öğretmeni "Ay'ın Evreleri" konusunu 5E Öğrenme Modeli'ne göre anlatmaya başlamıştır. 5E Öğrenme Modeli'nin "Derinleştirme" basamağında araştırmacı ile yardımcı araştırmacı öncelikle öğrencilerin heyecanlanmamaları, sürece adapte olmalarını sağlamak için kamera kaydı almadan birkaç kere "Ay'ın Evreleri" konusuna ait şarkıyı klasik gitar eşliğinde şarkı söyleyerek öğrencilere öğretmişler ve öğrenciler ile birlikte şarkıyı söylemişlerdir. Öğrenciler ellerindeki Türk Bayraklı balonları sağ ellerinde bulundurarak müziğin ritmine uyum sağlamak adına yukarı doğru kaldırarak ve sağa sola sallayarak şarkı sözlerini zihinlerinde daha da pekiştirmişlerdir. Sonrasında esas araştırmaya geçilerek aynı uygulama gerçekleştirilmiştir. Sınıfta uygulama yapılırken zaman zaman

öğrencilerin dikkatlerini dağıtmadan okulun idarecileri araştırmanın etiği gereği kısa süreli sınıfta kontroller yapmışlardır.

Araştırmanın Uygulama Sonrası

Araştırmanın uygulanması sonrasında 5. sınıf öğrencilerine “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik yapılandırılmış görüşme sorularından oluşan form verilerek öğrencilerin bu formdaki soruları yazılı olarak yanıtlamaları istenmiştir. Öğrenciler bu formları doldurduktan sonra formlarda herhangi bir eksiklik olup olmadığı araştırmacı tarafından tekrar kontrol edilmiştir. Eğer herhangi bir eksiklik olmuşsa ilgili öğrencilere doldurdukları yapılandırılmış görüşme sorularından oluşan form tekrar verilerek eksik yerleri doldurmaları sağlanmıştır. Araştırmanın uygulanması esnasında kullanılan balonlar araştırmanın uygulama sürecinin sonunda öğrencilere hediye verilerek araştırmanın uygulama süreci tamamlanmıştır.

Verilerin Analizi

Araştırmadan toplanan nitel verilerin içerik analizleri yapılmıştır. Yapılandırılmış görüşme sorularına öğrencilerin verdikleri yanıtlar doğrultusunda birbirine benzeyen temalar tekrarlı olarak kodlama yapılarak bir araya getirilmiş, okuyucunun anlayacağı bir biçimde ve araştırmanın amacına uygun olarak düzenlenerek yorumlanmıştır (Karaca, Bektaş & Armağan, 2015; Yıldırım & Şimşek, 2020). Yapılan kodlama sonucunda kodlayıcıların verdikleri kodlar arasındaki tutarlılık %83 olarak bulunmuştur. Tutarsız veri kesitleri üzerinde araştırmacı ile ilgili konuda yeterli bilgiye sahip olan bir öğretim üyesi tutarsız olan veri kesitleri üzerinde ortak bir fikir benimseyene kadar fikir alışverişi yapmışlar ve uzlaşmaya varmışlardır. “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik 5. sınıf öğrencilerinin görüşlerinden elde edilen verilerin nitel analizlerinin sonuçları tablolar haline getirilerek araştırmanın bulgular kısmında sunulmuştur.

BULGULAR

5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimine yönelik ortaokul 5. sınıf öğrencilerinin görüşlerinin nitel analizlerinin sonuçları aşağıdaki tablolarda sunulmuştur.

“Ay’ın Evreleri” konusunun zorluk derecesi hakkında neler düşünüyorsunuz?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 1’deki gibidir.

Tablo 1. Öğrencilerin Konunun Zorluk Derecesi Hakkındaki Görüşleri

Sınıf Düzeyi	Çok Zor	Zor	Orta Zorlukta	Kolay	Çok Kolay
5. Sınıf				1	8

Tablo 1 incelendiğinde Ay’ın Evreleri konusunun şarkı ve müzik destekli öğretimi sonucunda 5. sınıftan 8 öğrencinin konuyu “Çok Kolay” olarak değerlendirdikleri, 1 öğrencinin de “Kolay” olarak değerlendirdiği belirlenmiştir.

“Ay’ın Evreleri” konusunu şarkı ve müzikle öğrendiğine dair kendine ne kadar güveniyorsun?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 2’deki gibidir.

Tablo 2. Öğrencilerin Konunun Şarkı ve Müzikle Öğretimine Yönelik Kendilerine Güvenme Dereceleri

Sınıf Düzeyi	Hiç Güvenmiyorum	Güvenmiyorum	Orta Derecede Güveniyorum	Güveniyorum	Çok Güveniyorum
5. Sınıf				2	7

Tablo 2 incelendiğinde “Ay’ın Evreleri” konusunun şarkı ve müzikle öğretimi sonucunda 5. sınıftan 7 öğrencinin kendilerine çok güvendikleri, 2 öğrencinin de kendilerine güvendikleri şeklinde görüş bildirdikleri tespit edilmiştir.

“Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi hakkında neler hissediyorsun?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 3’deki gibidir.

Tablo 3. Öğrencilerin Konunun Şarkı ve Müzikle Öğretimi Hakkında Hissettikleri

Temalar	Frekans (f)
Konuyu daha iyi öğrendim	5
Şarkı söyleyerek bu konuyla ilgili soruları daha iyi çözdüğümü hissettim	1
Tatlı bir öğretmen olması	1
İyi ve mutlu hissediyorum	1
Daha iyi anladığımı hissettim	1
Müzikle öğretmek beni heyecanlandırdı	1
Müzik aletini tanıdık, öğrendik	1
Şarkı çok güzel ve gitarı çok güzel çalıyor	1

“Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretimi hakkında ne hissediyorsun sorusuna 5 öğrencinin konuyu daha iyi öğrendikleri, 1’er öğrencinin de şarkı söyleyerek konuyla ilgili soruları daha iyi çözdüklerini hissettikleri, öğretmenlerinin tatlı olduğu, iyi ve mutlu hissettikleri, konuyu daha iyi anladıkları, şarkı ve müzikle konuyu öğrenmenin onları heyecanlandığı, müzik aletini tanıdıkları, öğrendikleri şarkının çok güzel olduğu ve gitarın çok güzel çalındığı şeklinde görüş bildirdikleri belirlenmiştir.

“Daha önce böyle şarkı ve müzik eşliğinde başka derslerde konuları öğrenmeye yönelik uygulamalar yapıldı mı?” sorusuna 5. öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 4’deki gibidir.

Tablo 4. Öğrencilerin Şarkı ve Müzik Eşliğinde Başka Derslerde Uygulama Yapıp Yapmadıkları

Sınıf Düzeyi	Evet	Hayır
5. Sınıf		9

Tablo 4 incelendiğinde 9 öğrencinin daha önce şarkı ve müzik eşliğinde başka derslerde konuları öğrenmeye yönelik uygulamalar yapılmadığı şeklinde görüş bildirdikleri tespit edilmiştir.

“Şarkı ve müzikle bu konuyu öğrendikten sonra konuyu anlayıp anlamadığına dair performansını değerlendirebilir misin? sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 5’deki gibidir.

Tablo 5. Öğrencilerin Şarkı ve Müzikle Konuyu Öğrendikten Sonra Anlayıp Anlamadıklarına Yönelik Görüşleri

Sınıf Düzeyi	Çok Kötü	Kötü	Orta	İyi	Çok İyi
5. Sınıf				3	6

Tablo 5 incelendiğinde 6 öğrencinin “Ay’ın Evreleri” konusunun şarkı ve müzikle öğretimi sonucunda konuyu “Çok İyi” düzeyde, 3 öğrencinin de “İyi” düzeyde anladıkları belirlenmiştir.

“Şarkı ve müzik eşliğinde bu konunun anlatılması seni memnun etti mi?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 6’daki gibidir.

Tablo 6. Şarkı ve Müzik Eşliğinde Konunun Anlatılmasının Öğrencileri Memnun Edip Etmediğine Yönelik Görüşler

Sınıf Düzeyi	Hiç memnun etmedi	Memnun etmedi	Orta Derecede Memnun Etti	Memnun etti	Çok memnun etti
5. Sınıf				1	8

Tablo 6 incelendiğinde şarkı ve müzik eşliğinde konunun anlatılmasının öğrencileri memnun edip etmediğine dair görüşlerine bakıldığında; 8 öğrencinin “Çok Memnun Etti”, 1 öğrencinin de “Memnun Etti” şeklinde görüş bildirdikleri belirlenmiştir.

“Şarkı ve müzikle bu konuyu öğrenmenin zor bir kısmı var mıydı? Yani şarkı ve müzikle konuyu öğrenirken zorluk yaşadın mı?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 7’deki gibidir.

Tablo 7. Öğrencilerin Konuyu Şarkı ve Müzikle Öğrenirken Zorluk Yaşayıp Yaşamadıklarına Dair Görüşleri

Sınıf Düzeyi	Evet	Hayır
5. Sınıf	1	8

Tablo 7 incelendiğinde 8 öğrencinin şarkı ve müzikle konuyu öğrenirken zorluk yaşamadığı, 1 öğrencinin zorluk yaşadığı şeklinde görüş bildirdikleri tespit edilmiştir.

“Şarkı ve müzikle desteklenen bu konuyu öğrenirken ne zaman zorluk yaşadın?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 8’deki gibidir.

Tablo 8. Şarkı ve Müzikle Konuyu Öğrenirken Zorlanan Öğrencilerin Görüşleri

Temalar	Frekans (f)
Başta müziği öğrenirken	1

Tablo 8 incelendiğinde 1 öğrencinin konuyu şarkı ve müzik eşliğinde öğrenirken başlangıç aşamasında zorluk yaşadığı şeklinde görüş bildirdiği belirlenmiştir.

“Bu konunun şarkı ve müzik eşliğinde öğretilmesi hakkında ne düşünüyorsun? Sence konuyu anlamak için etkili mi?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 9’daki gibidir.

Tablo 9. Öğrencilerin Şarkı ve Müzik Eşliğinde Konunun Öğretilmesine Dair Görüşleri

Temalar	Frekans (f)
Konuyu daha iyi öğrenmede çok etkilidir	1
Derste çalışkan olduğumu hissediyorum	1
Konu aklımda daha çok kaldı	1

Tablo 9 incelendiğinde “Ay’ın Evreleri” konusunun şarkı ve müzik eşliğinde öğretilmesi hakkında ne düşündüklerine dair 1’er öğrencinin konuyu daha iyi öğrenmelerinde çok etkili olduğu, derste çalışkan olduklarını hissettikleri ve konunun akıllarında daha çok kalıcı olduğu şeklinde görüş bildirdikleri tespit edilmiştir.

“Şarkı ve müzikle konuyu öğrenirken neler hissettin? Yani şarkı ve müzikle konuyu öğrenmek sende hangi duyguları uyandırdı?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 10’daki gibidir.

Tablo 10. Öğrencilerin Konuyu Şarkı ve Müzikle Öğrenirken Neler Hissettiklerine Dair Görüşleri

Temalar	Frekans (f)
Heyecan hissettim	2
Mutluluk-Sevinç	2
Daha kolay öğrendim	2
Daha çalışkan hissettim	1
İyi hissettim	1
Dersi daha iyi dinledim, dikkatimi verdim.	1

Tablo 10 incelendiğinde öğrencilerin şarkı ve müzikle konuyu öğrenirken neler hissettiklerine dair 2’şer öğrencinin heyecan, mutluluk, sevinç hissettikleri, konuyu daha kolay öğrendikleri, 1’er öğrencinin ise kendilerini daha çalışkan hissettikleri, dersi daha iyi dinledikleri ve dikkatlerini derse verdikleri şeklinde görüş bildirdikleri belirlenmiştir.

“Şarkı ve müzikle bu konunun öğretimine başlamadan önce (konunun zorluk derecesi, konuyu anlayıp anlamayacağın, hissettiklerin vb.) ile ilgili düşüncelerin / hislerin konunun şarkı ve müzikle öğretiminden sonra değişti mi? Nasıl? Ne yönde?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 11’deki gibidir.

Tablo 11. Konunun Şarkı ve Müzikle Öğretimi Sonucu Öğrencilerin Düşünceleri, Hissettiklerine Dair Görüşleri

Temalar	Frekans (f)
Değişti	6
Konunun adını duyduğumda zor olduğunu düşündüm ama şarkıyı söyleyince fikrim değişti.	3
Müzik konuyu daha iyi anlamı sağladı	2
Müzikle konuyu daha iyi öğrendik	1
Önce müzikle yapamam dedim ama sonra çok iyi öğrendim	1

Tablo 11 incelendiğinde “Ayın Evreleri” konusunun şarkı ve müzikle öğretimi sonucunda 6 öğrencinin öğrencilerin düşüncelerinin değiştiği, 3 öğrencinin konunun adını duyduklarında zor olduğunu düşündükleri ama müzikle şarkı söyleyince fikirlerinin değiştiği, 2 öğrencinin şarkı ve müzikle konunun öğretiminin konuyu daha iyi anlamalarını sağladığı, 1’er öğrencinin de şarkı ve müzikle konuyu daha iyi öğrendikleri ve daha önce yapamam dedikleri konuyu şarkı ve müzikle daha iyi öğrendikleri şeklinde görüş bildirdikleri tespit edilmiştir.

“Şarkı ve müzikle konunun öğretimine başlamadan önce düşündüğün şeyler, duygular konunun öğretiminden sonra değişti mi? Nasıl değişti?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 12’deki gibidir.

Tablo 12. Öğrencilerin Konunun Şarkı ve Müzik Destekli Öğretiminden Sonra Düşüncelerine Dair Görüşleri

Temalar	Frekans (f)
Değişti	6
Müziği daha fazla sevdim	3
Bu kadar çabuk öğrenebileceğimi bilmiyordum	1

Tablo 12 incelendiğinde “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminden sonra 6 öğrencinin düşüncelerinin olumlu yönde değiştiği, 3 öğrencinin şarkı ve müziği daha fazla sevdikleri, 1 öğrencinin de konuyu çok çabuk öğrendiği şeklinde görüş bildirdikleri belirlenmiştir.

“Bu konuyu şarkı ve müzikle destekli öğrenmek, anlamak ya da öğrenememek anlayamamak sende ne gibi hisler/ duygular uyandırdı? /ne gibi hislere/ duygulara neden oldu?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 13’deki gibidir.

Tablo 13. Öğrencilerin Konuyu Şarkı ve Müzikle Öğrenmelerinin Onlarda Neler Uyandırdığına Dair Görüşleri

Temalar	Frekans (f)
Güzel hisler uyandırdı	2
Dersi daha iyi anladım	2
Mutlu ve iyi hissettim	2
Hızlı ve çabuk öğrendim	1
Heyecanlandım	1
Müziği sevdim	1
Daha çalışkan hissettim	1

Tablo 13 incelendiğinde 2’şer öğrencinin dersi daha iyi anladıkları, mutlu ve iyi hissettikleri, şarkı ve müzikle konuyu öğrenmelerinin onlarda güzel hisler uyandırdığı, 1’er öğrencinin de konuyu hızlı ve çabuk öğrendiği, heyecanlandığı, şarkı ve müziği sevdiği, daha çalışkan hissettiği şeklinde görüş bildirdikleri tespit edilmiştir.

“Sence daha başka hangi konu ya da üniteler şarkı ve müzikle desteklenerek öğretilmeli? Neden?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 14’deki gibidir.

Tablo 14. Öğrencilerin Daha Başka Hangi Konu Ya Da Ünitelerin Şarkı ve Müzikle Desteklenerek Öğretilmesi Gerektiğine Dair Görüşleri

Temalar	Frekans (f)
Canlılar	2
Matematik dersi	1
Hal değişimi	1

Tablo 14 incelendiğinde 5. sınıf düzeyindeki 2 öğrencinin Biyoloji öğrenme alanındaki “Canlılar” konusunun, 1 öğrencinin Kimya öğrenme alanındaki “Hal Değişimi” konusunun, 1 öğrencinin de Matematik derslerindeki konuların şarkılarla ve müzikle desteklenerek öğretilmesi gerektiği şeklinde görüş bildirdikleri belirlenmiştir.

“Konunun şarkı ve müzikle desteklenerek öğretimi sonrasında fen bilimleri dersine olan tutumun, hislerin neler oldu?” sorusuna 5. sınıf öğrencilerinin verdikleri yanıtlar ve frekansları Tablo 15’deki gibidir.

Tablo 15. Öğrencilerin Konunun Şarkı ve Müzik Destekli Öğretimi Sonrasında Fen Bilimleri Dersine Olan Tutumları ve Hissettiklerine Dair Görüşleri

Temalar	Frekans (f)
Dersi çok iyi anladım	4
Çok güzel hissettirdi	1
Çok eğlenceli	1
Heyecan getirdi	1
Çok güzel bir melodi	1

Tablo 15 incelendiğinde konunun şarkı ve müzik destekli öğretimi sonrasında 5 öğrencinin konuyu çok iyi anladıkları, 1'er öğrencinin şarkı ve müziğin çok güzel hissettirdiği, dersin çok eğlenceli olduğu, derse heyecan getirdiği ve şarkının melodisinin çok güzel olduğu şeklinde görüş bildirdikleri tespit edilmiştir.

SONUÇ VE TARTIŞMA

Araştırmanın sonuçlarına göre 5. Sınıf Fen Bilimleri Dersi “Ay’ın Evreleri” konusunun şarkı ve müzikle desteklenerek 5. sınıf öğrencilerine öğretilmesinden sonra öğrencilerin; 5 sınıf öğrencilerinin “Ay’ın Evreleri” konusunun şarkı ve müzik destekli öğretiminden sonra öğrencilere konunun kolay ve çok kolay geldiği, konunun şarkı ve müzik destekli öğretiminden sonra kendilerine çok güvendikleri, konunun şarkı ve müzikle öğretimi sonrasında konuyu daha iyi öğrendikleri, şarkı söyleyerek konuya dair soruları daha iyi çözdükleri, iyi ve mutlu hissettikleri, şarkı ve müzikle konuyu öğrenmenin onları heyecanlandığı, müzik aleti olan gitar ile ilk kez tanıştıkları, şarkının çok güzel olduğu ve gitarın çok güzel icra edildiği, şarkı ve müzik eşliğinde başka hiçbir derste böyle bir uygulama yapmadıkları, konunun şarkı ve müzikle desteklenerek öğretilmesinden sonra konuyu çok iyi anladıkları, şarkı ve müzik eşliğinde konunun anlatımının onları çok memnun ettiği, konuyu şarkı ve müzikle öğrenirken zorluk yaşamadıkları, konunun şarkı ve müzik destekli öğretiminin konuyu öğrenmelerinde çok etkili olduğu, derste çalışkan hissettikleri, konunun akıllarında kaldığı, konuyu şarkı ve müzikle öğrenirken heyecanlı, mutlu, sevinçli hissettikleri, konuyu daha kolay öğrendikleri, derste kendilerini daha çalışkan, daha iyi hissettikleri, dersi daha iyi dinledikleri ve derse dikkatlerini verdikleri, konunun şarkı ve müzikle öğretimi sonucunda fen bilimleri dersine ve “Ay’ın Evreleri” konusuna dair düşüncelerinin olumlu yönde değiştiği, zor olduğunu düşündükleri bir konuyu şarkı ve müzikle söyleyince fikirlerinin değiştiği, şarkı ve müzikle konuyu çok daha iyi anladıkları, şarkı ve müzikle konuyu daha iyi öğrendikleri, müziği daha fazla sevdikleri, bu konuyu bu kadar çabuk öğrenebileceklerini tahmin bile edemedikleri, şarkı ve müzikle konuyu öğrenmelerinin onlarda güzel hisler uyandırdığı, mutlu ve iyi hissettikleri, hızlı ve çabuk öğrendikleri şeklinde görüş bildirdikleri belirlenmiştir Ayrıca öğrencilere “Ay’ın Evreleri”

konusu dışında başka hangi konu ya da ünitelerin şarkı ve müzikle desteklenerek öğretilmesi gerektiği sorusuna Biyoloji öğrenme alanından “Canlılar” konusu, Kimya öğrenme alanından “Hal Değişimi” konusu ile Matematik dersinin konularının şarkı ve müzik destekli onlara öğretilmesi gerektiği şeklinde görüş bildirdikleri tespit edilmiştir. Ayrıca konunun şarkı ve müzik destekli öğretimi sonrasında öğrencilerin fen bilimleri dersini çok daha iyi anladıkları, fen bilimleri dersini çok eğlenceli ve heyecanlı buldukları, şarkının da çok güzel bir melodi olduğu şeklinde görüş bildirdikleri belirlenmiştir. Alan yazında fen bilimleri ve farklı öğrenme alanlarındaki konuların şarkı ve müzik destekli öğretilmeye yönelik çalışmalar mevcut olsa da (Kahyaoğlu, 2005; Çevik, 2011; Bedir Akkurt, 2012; Koca, 2013; Koca, 2016; Uzunoğlu Yegül, 2014; Küçük; 2015; Öztutgan, 2018) bu araştırmalar nicel olup yapılan bu şarkı ve müzik destekli öğretimlerin ne kadar etkili olduğuna dair öğrenci görüşlerini tespit eden nitel araştırmalara rastlanmamıştır.

ÖNERİLER

1. Öğrenciler ders esnasında müzik dersleri haricinde kavramlara ve ritimlere yabancı oldukları için öncesinde şarkılar hakkında öğrencilere bilgi verilebilir.
2. Müzikle işlenen fen bilimleri dersleri öğrencilerin fen bilimleri konularına ve ünitelerine yönelik yanlış bilgileri ile kavram yanılgılarının tespit edilmesini belirlemede bir araç olarak kullanılabilir.
3. Ders kitaplarında eğlenceli ve akılda kalması açısından konu anlatım kısımlarında şarkı sözlerine yer verilebilir. Bunlar karikatür veya resimlerle desteklenebilir.
4. Fen bilimleri konularının ya da ünitelerinin müzikle desteklenerek öğretilmesinin 5E öğrenme modeli gibi modellerle yapılmasından ziyade “Müzikle Fen Öğretimi” şeklinde bir öğretim yönteminin olabileceği ve kabul görebileceği alan uzmanları tarafından dikkate alınabilir ve bu öneri ilgili fen öğretimi alanındaki uzmanlar tarafından değerlendirilebilir.

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**BEDEN EĞİTİMİ VE SPOR ÖĞRETİMİNDE WEB 2.0 ARAÇLARININ
KULLANIMI VE ÖNEMİ**
USE AND IMPORTANCE OF WEB 2.0 TOOLS IN PHYSICAL EDUCATION AND
SPORTS TEACHING

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ÖZET

Bu çalışmanın amacı, beden eğitimi ve spor öğretiminde web 2.0 araçlarının kullanımı ve önemini ortaya koymaktır. Çalışmada doküman incelemesi yönteminden yararlanılmıştır. Web 2.0 araçlarının beden eğitimi ve spor eğitiminde kullanımı ile ilgili çalışmalar incelenerek araştırmanın sonuçları ortaya çıkmıştır. Araştırma sonuçları, beden eğitimi ve spor öğretiminde web 2.0 araçlarının kullanımı, öğrencilerin motivasyon ve ilgilerini arttırdığını göstermektedir. Ayrıca, kaliteli bir eğitim için yeniliklerin sürekli olarak takip edilmesi gerekmektedir. Beden eğitimi ve spor dersleri gösterip yaptırma şeklinde gerçekleştiği için teknoloji, öğretmene bu konuda yardımcı olmaktadır. Ancak, teknolojinin kullanımı derslerin amacına uygun ve dengeli bir şekilde yapılmalıdır. Teknoloji, dersin etkinliğini artırmak için bir araç olarak kullanılmalı ve öğrencilerin sporun temel prensiplerini öğrenmelerini desteklemelidir. Ayrıca, teknolojinin kullanımıyla öğrencilerin dikkati dağılmamalı ve fiziksel etkinliklerin önemi göz ardı edilmemelidir. Özellikle teorik olarak işlenmesi gereken derslerde web 2.0 araçlarından faydalanmak gerekmektedir. Öğretmenlerin yeniliklere ayak uydurarak bu yeni teknolojileri yakından takip etmesi ve derslerinde uygulaması eğitim öğretime olumlu şekilde yansımaktadır. Bu bağlamda öğretmenlerin ve öğretmen adaylarının yeni nesil teknolojiler ve web 2.0 araçları ile ilgili eğitimler alması gerekebilir.

Anahtar Kelimeler: Eğitim, Spor, Web 2.0

ABSTRACT

The aim of this study is to reveal the use and importance of web 2.0 tools in physical education and sports teaching. The document review method was used in the study. The results of the research were revealed by examining studies on the use of Web 2.0 tools in physical education and sports education. Research results show that the use of web 2.0 tools in physical education and sports teaching increases students' motivation and interest. In addition, innovations must be constantly followed for a quality education. Since physical education and sports lessons are

taught by demonstration, technology helps the teacher in this regard. However, the use of technology should be done in a balanced manner and in accordance with the purpose of the lessons. Technology should be used as a tool to increase the effectiveness of the course and support students in learning the basic principles of sports. Additionally, students should not be distracted by the use of technology and the importance of physical activities should not be ignored. It is necessary to benefit from web 2.0 tools, especially in courses that need to be taught theoretically. The fact that teachers keep up with innovations, follow these new technologies closely and apply them in their lessons has a positive impact on education. In this context, teachers and teacher candidates may need to receive training on new generation technologies and web 2.0 tools.

Keywords: Education, Sports, Web 2.0

GİRİŞ

Bilim ve teknolojideki hızlı değişimler ve toplumun evrilen ihtiyaçları, bireylerin beklenen rollerini doğrudan etkilemektedir. Bu durum, bireylerin bilgi üretebilme, işlevsel kullanabilme, problem çözebilme, eleştirel düşünebilme, girişimci olabilme, kararlılık gösterebilme, iletişim becerilerine sahip olabilme, empati yapabilme ve topluma katkı sağlayabilme gibi nitelikleri içeren bir profil oluşturmaktadır. Bu niteliklere sahip bireylerin yetişmesine odaklanan öğretim programları, salt bilgi aktarımından ziyade bireysel farklılıkları göz önünde bulunduran, değer ve beceri kazandırmaya yönelik, sade ve anlaşılır bir yapıda tasarlanmıştır (MEB, 2018).

Geleceğin toplumsal altyapısını internete dayalı dördüncü sanayi dönemi şekillendirecektir. Diğer sanayi dönemlerinde olduğu gibi bu yeni dönem de eğitime önemli derecede etki edecektir. Dünyadaki bu gelişmelere paralel olarak 21.yüzyıl becerileri olarak kabul edilen, eleştirel düşünme, problem çözme, yenilikçi üretim, etkili iletişim, uluslararası arenada rekabet edebilme gibi özellikleri olan nesiller yetiştirilmesi amaçlanmaktadır. Bu amaçlar doğrultusunda öğretmen niteliklerinin tartışılıp yeniden tanımlanmasına neden olmuştur (MEB, 2017).

21. yüzyıl öğretmenleri, teknolojiye ayak uydurmalıdır. Öğretmen, güncel olmadığı takdirde öğrencileriyle sağlıklı bir iletişim kuramaz ve onların ihtiyaçlarını karşılayamaz. Dijital yerli nesil olarak adlandırılan bugünkü öğrenciler için, öğretmenin etkili bir şekilde çalışması, gelecek kuşakların daha iyi yetişmesini sağlar. Teknolojiye yabancı olan öğretmenler, bu eksikliği gidermek için teknolojiyi daha iyi anlamalıdır. Bu sayede, öğretmenler mesleklerinde uzun süre etkili bir şekilde çalışabilirler. Geleceğin liderlerini hazırlamak sadece öğretim tekniklerini bilme ve teknolojiyi takip etmeyle sınırlı değildir. Önemli olan, teknolojiyi müfredatla bütünleştirme becerisine sahip olmaktır (Karakuş ve Er, 2021:180). Bilgi ve teknoloji çağında, nitelikli ve başarılı gençlerin yetiştirilmesi, teknolojiyle olan etkileşimlerinin etkin ve doğru bir şekilde oluşturulmasına bağlıdır. Bu da eğitim ortamlarında teknolojinin aktif

kullanımını veya teknoloji temelli eğitim yöntemlerinin benimsenmesini gerektirir. Bu sayede gençler, alanlarında başarılı olmak için gerekli becerilere sahip olabilirler (Eyüp, 2022:311).

Web 2.0 araçları, kullanıcıları bilgiyi üreten, düzenleyen, değiştiren, kullanıcının aktif olmasını sağlayan araç gereç ortamları olarak tanımlanabilir. Herhangi bir kodlama ve programlama bilgisi gerektirmediği için kolaylıkla kullanılabilir. Hatta oluşturulan içeriklerin paylaşılması, bu içeriklere farklı dijital ortamlarda erişime imkan verilmesi açısından kolaylık sağlamaktadır (Gündüzalp, 2022). Web 2.0 araçları, kullanıcıların toplanmasını ve kendi ihtiyaçlarına göre özelleştirmelerini sağlayarak, telefon ve medya yayınlarının gelişimiyle eş zamanlı olarak evrim geçirir. Bu durum, bu araçların gelecekte daha fazla popülerlik kazanabileceğini işaret etmektedir (Karakuş ve Er, 2021:181). Bu araçlar, eğitim sistemindeki teknolojik gelişmeleri destekleyen ve yeniliklere uyum sağlamayı kolaylaştıran araçlar olarak kullanılabilir. Web 2.0 araçlarıyla öğrenciler, sınıf ortamında aktif hale gelmektedir. Bilgiyi üreten, sorgulayan ve yeni bilgiler üreten öğrenci tipi ortaya çıkmaktadır (Elmas ve Geban, 2012). Son zamanlarda, web 2.0 teknolojilerinin çeşitliliği ve eğitimde kullanılabilecek araçların sayısı artmıştır. Bu durum, benzer özelliklere sahip araçların belirli kategorilere ayrılmasını ve bu kategorizasyonun sürekli olarak gelişmesini sağlamıştır (Pehlivan ve ark, 2023:1603).

Öğretmen, ders verdiği her sınıf düzeyinde içerik geliştirebilmelidir. Ancak öğretmenin bu süreçte ciddi bir zaman harcadığı söylenebilir. Her geçen gün daha da basit kullanıma sahip olan web 2.0 araçları bu noktada çok büyük kolaylık sağlamaktadır. Her sınıf düzeyinin öğrenme becerileri veya düzeyleri farklılık gösterdiğinden bu duruma uygun içeriklerin hazırlanmasında da katkı sağlamaktadır (Eser, 2020). Öğretmenlerin öğrencilerin öğrenme hedeflerine ve amaçlarına uygun ders planları oluşturmak için web 2.0 araçlarını kullanmalarının önemi açıktır. Bu araçları düzenli ve etkin bir şekilde entegre etmek, sınıf içinde öğrenciler ve öğretmenler tarafından hızla fark edilen olumlu sonuçlara yol açabilir (Elmas ve Geban, 2012).

Beden eğitimi ve spor dersi yeni nesillerin beden ve fikren sağlıklı olmasını özel amaç olarak belirlemiştir ve fiziksel aktiviteyle beraber psikomotor, bilişsel, sosyal ve duyuşsal gelişimi desteklemektedir. Sporun yaşam tarzı olarak belirlenmesine ve okul dışı zamanlarda da serbest zamanlarını sportif etkinliklerle değerlendirilmesine katkı sağlaması beklenmektedir (MEB, 2018:10). Beden eğitimi ve spor, kişiye ve topluma birçok faydası bulunması sebebiyle eğitimin önemli bir parçası haline gelmiştir. Ülkeler, bu durumu göz önünde bulundurarak beden eğitimi ve spor dersini zorunlu hale getirmiştir (Uğraş, 2013:6). Beden eğitimi ve spor dersi gerekli bilgi ve becerileri öğretmenin yanında sağlıklı toplumlar yetiştirme amacı olması sebebiyle diğer branşlardan farklılık gösterir. Bunun için beden eğitimi ve spor öğretmeninin nitelikleri önemlidir. Beden eğitimi ve spor öğretmeninin diğer öğretmenlerden farklı görülmesi ve öğrenciler üzerinde etkisinin daha farklı olduğu ifade edilebilir (Uğraş, 2013:12). Beden eğitimi öğretmeninin kalitesi ise yetiştiği kurumlarla ilişkili bir durumdur (Güllü ve Uğraş, 2019).

Teknolojik uygulamaların beden eğitimi derslerindeki kullanımı, öğrenci öğrenmesine olumlu katkılar sağlamak ve öğretmenlerin eğitim stratejilerini zenginleştirmektedir. Ayrıca, bu

teknolojiler engelli öğrencilerin derse katılımını artırmakta, öğretmenlerin mesleki gelişimine katkı sağlamakta ve öğrenci-öğretmen etkileşimini güçlendirmektedir. Online kurslar ve objektif ölçme-değerlendirme yöntemleri, adım sayma ve fiziksel uygunluk ölçümleri gibi uygulamalar, beden eğitimi derslerinde öğrenmeyi bireyselleştirmeye olanak tanıyarak öğrenci merkezli bir eğitim ortamı oluşturmaktadır. Bu bağlamda beden eğitimi ve spor derslerinde teknoloji kullanımına yönelik araştırmalar literatüre önemli katkılar sunabilir (Yılmaz ve ark., 2022).

Beden eğitimi ve spor öğretmenleri, öğrencilerini daha etkili bir şekilde motive etmek, öğrenmeyi desteklemek, öğrenci katılımını teşvik etmek, iş birliği ve iletişimi artırmak ve ders içeriğini daha çekici hale getirmek için web 2.0 araçlarını kullanabilir. Özellikle animasyon, oyunlaştırma, interaktif simülasyonlar ve dijital testler uygulayarak öğrenme ortamları daha dikkat çekici hale getirilebilir. Bu nedenlerden dolayı, beden eğitimi ve spor öğretmenleri, öğrencilerine daha etkili bir öğrenme deneyimi sunmak ve onların potansiyellerini en üst noktaya çıkarmak için Web 2.0 araçlarını kullanmalıdır.

WEB 2.0 ARAÇLARI

1. Çevrimiçi Sınıf Uygulamaları

1.1. Google Classroom

Öğretmenlerin öğrenci ödevlerinin oluşturulmasını ve toplanmasını tek bir platformda yönetmelerine yardımcı olur. Kağıtsız bir ortam sunan bu platform, temel olarak Google Dokümanlar, Drive ve diğer uygulamaların entegrasyonunu sağlar. Bu sayede öğretmenler, öğrencileriyle daha fazla etkileşim halinde olurken evrak işleriyle daha az zaman harcarlar. (Iftakhar, 2016).

1.2. ClassDojo

ClassDojo, öğretmenlere öğrenci davranışlarını kaydetmelerine ve yönetmelerine yardımcı olan çevrimiçi bir sınıf yönetimi uygulamasının iyi bir örneğidir. Araştırmacılar, bu uygulamanın davranış gelişimini desteklediğini ve kişiselleştirilebilir olduğunu belirtmektedirler. Ayrıca öğrencilere hedefler belirleme ve motive etme konusunda yardımcı olduğu, öğretmenlerin, velilerin ve öğrencilerin birbirleriyle bağlantılı bir şekilde ilerlemeyi takip etmelerine olanak tanıdığı ifade edilmektedir. Oyunlaştırmayı ve çevrimiçi araçlarla davranışları izlemeyi tercih edenler ClassDojo'yu kullanmaktadırlar. Bu platform, her iki unsuru etkili bir şekilde bir araya getirerek hedeflere ulaşmada yardımcı olmaktadır (Robinson, 2021).

1.3. LearningApps.org

LearningApps.org, etkileşimli modüller kullanarak öğrenmeyi ve öğretmeyi destekleyen bir Web 2.0 uygulamasıdır. Bu platform, doğrudan eğitim içeriğine entegre edilebilen ve anında değiştirilebilen veya oluşturulabilen modüller sunar. Ayrıca, etkileşimli bloklardan oluşan bir koleksiyon oluşturabilir ve bunları kamuya açık hale getirebilme yeteneği sunar. LearningApps.org sitesi, popülerlik kazanan ve belirli konu alanlarına göre sistematikleştirilmiş

hazır etkileşimli alıştırmalar içerir. Bu alıştırmalar, ilkokul, ortaokul ve lise seviyelerine uygun olarak tasarlanmıştır. Bu platformu kullanarak, öğretmenler çeşitli türlerde kendi görevlerini oluşturabilirler, bu görevler arasında hafıza oyunları, bulmacalar, çoktan seçmeli testler, bulmacalar, bir çift bulma oyunları ve uyumlu eşleştirme bulunur. Bu yöntem, öğrencilerin konuya yönelik motivasyonunu artırmaya yardımcı olur (Kochetkova, 2015).

2. Çevrimiçi Quiz, Yarışma, Anket Araçları

2.1. Quizizz

Quizizz, öğrencilere pratik yapma imkanı sunan eğlenceli ve çok oyunculu bir çevrimiçi değerlendirme aracıdır. Bu platform, bilgisayarlar, akıllı telefonlar ve tablet gibi çeşitli cihazlarla erişilebilir (Ju ve Adam, 2018).

2.2. Socrative

Socrative, öğrencilerin öğretmen tarafından sorulan soruları bilişsel olarak işlemelerine ve katılımlarını artırmalarına yardımcı olan bir araçtır. Bu platformu kullanan öğretmenlerin sınıflarında önemli değişiklikler yapmaları gerekebilir. Öğrencilerin fikir alışverişinde bulunmaları, eleştirel düşünceleri ve bakış açılarını tartışmaları teşvik edilmelidir. Socrative, öğrencilerin bilgi üretme sürecine aktif olarak katılmalarını sağlar, böylece kendi öğrenmelerine daha fazla dahil olabilirler (Awedh ve ark., 2015).

2.3. Kahoot

Öğrencilerin bilgilerini gözden geçirmek için kullanılan oyun tabanlı bir öğrenme platformudur (Wang ve Tahir, 2020). Eğitimcilerin sınıfta kullanabilecekleri ve öğrencileri problem çözme, eleştirel düşünme ve bilgisini gözden geçirebilme fırsatı tanıyan bir uygulamadır. Öğretmenlere ilgi çekici testler, anketler ve tartışma oluşturma gibi konularda yardımcı olur (Dellos, 2015).

2.4. Google Form

Bu platform, farklı soru tiplerinin hazırlanması ve cevaplanmasına olanak sağlar. Ayrıca, çevrimiçi formların oluşturulması ve sunumu konusunda da destek sağlar. Sonuçları grafikler ve tablolar şeklinde sunma imkanı da sunar (Yılmaz ve Yaşar, 2023).

2.5. Pixton

Pixton ile öğrenciler dijital hikayeler oluşturabilir. Grup çalışmasını, yaratıcılığı, eleştirel düşünmeyi destekler ve hayal güçlerinin gelişmesine yardımcı olur. Öğrenciler eğlence ve etkileşim içerisinde etkinlikler düzenleyebilir. Örneğin, öğrenciler Pixton ile dijital hikayeler oluşturabilir ve bu hikayeleri yazılı olarak tamamlamaları istenebilir. Hikayelerin anlatımını desteklemek için konuşma balonları da eklenebilir ve öğrencilerin boş bırakılan bölümleri hikayenin bağlamına göre doldurmaları teşvik edilebilir. Bu tür etkinlikler, öğrencilerin yaratıcılığını ve hayal gücünü artırabilir (Kır, 2024).

2.6. WordWall

Wordwall uygulaması, sınav şablonları, çoktan seçmeli sorular, gizemli çapraz bulmacalar, sıralama kartları veya eşleşen resimler gibi çeşitli formatlarda mevcuttur. Bu uygulama ayrıca, doğru yanıtları eşleştirme gibi öğrenci değerlendirme araçlarını da içerir. Hem günlük değerlendirme hem de dönemlik değerlendirme için kullanılabilir, böylece öğretmenler öğrenci ilerlemesini izlemek ve değerlendirmek için geniş bir yelpazede araçlardan yararlanabilirler (Agusti ve Aslam, 2022).

2.7. Mentimeter

Öğrencilerin dijital olarak yanıt vermesini sağlayan bir öğrenci yanıt sistemi aracıdır. Öğrenciler, mobil cihazlarını kullanarak sorulara yanıt verebilirler. Bu platform, sınıf ortamını daha etkileşimli, ilgi çekici ve kapsayıcı hale getirme potansiyeline sahiptir (Mohin ve ark. 2022).

3.Görsel Oluşturma, Sunum ve İnfografik Araçlar

3.1. Canva

Kullanıcıların grafik tasarım yapmalarına olanak tanıyan bir araçtır. Avustralyalı girişimci Melanie Perkins tarafından 2012 yılında kurulmuştur. Bu platform, sürükle ve bırak yöntemini kullanarak kullanıcıların kolayca tasarım yapmasını sağlar. Canva, yazı tipleri, grafikler, vektörler ve şablonlar gibi çeşitli özellikler sunar. Ayrıca Canva, fotoğraf filtreleri, milyonlarca görsel, ücretsiz simgeler, şekiller ve yüzlerce yazı tipi gibi çeşitli özellikler sunar (Locker, 2018).

3.2. Popplet

Zihin haritalama araçları, bilgi toplama sürecini kolaylaştırır ve öğrenme materyallerini birbirine bağlamaya yardımcı olur. Bu araç sayesinde öğrenciler, görsel olarak kavram haritaları oluşturabilir ve inceleyebilirler, bu da yeni bilgileri eleştirel olarak analiz etmelerine yardımcı olacak bir temsil aracı sağlar. Popplet, öğrenen bilgileri desteklemek için çekici bir seçenek görsellik sunar (Lai, 2020).

3.3. Emaze

PowerPoint sunumlarının yapımı, teknolojinin ilerlemesiyle daha da kolaylaşıyor. Emaze, çevrimiçi PowerPoint alternatifleri arasında tercih edilebilecek bir seçenektir. Emaze, HTML5 teknolojisiyle oluşturulmuş bir çevrimiçi sunum yazılımıdır ve öğretmenler sunumlarını bulut tabanlı sistemde oluşturabilirler. Bu, öğretmenlerin sunum yapma sürecini kolaylaştırır. Ayrıca, Emaze'in çevrimiçi erişilebilirliği sayesinde öğretmenler, öğrencilere materyalleri gönderirken karmaşık süreçlerle uğraşmak zorunda kalmazlar (Setyansah ve ark., 2022).

3.4. Prezi

Prezi, çeşitli hesap türleri ve oluşturma seçenekleri sunan bir çevrimiçi sunum hizmet sağlayıcısıdır. Geleneksel sunum yazılımlarının aksine, Prezi doğrusal bir hikaye çizgisi

oluşturmak yerine hem doğrusal hem de serbest akışlı bir yapıya izin verir. Kullanıcılar, geniş ve boş bir çalışma alanı olan "tuval" üzerinde bir sunum oluştururlar ve ardından bu öğeleri düzenleyerek bir hikaye çizgisi oluştururlar. Prezi, metin, resim, animasyon, ses ve diğer öğeleri entegre etme yeteneğine sahiptir ve bu unsurları birbirine bağlamak için çeşitli araçlar kullanır. Bu platform, sunumunuzu sorunsuz bir şekilde tek bir sunum haline getirmenize olanak tanır (Perron ve Stearns, 2010).

4. Animasyon ve Video Araçları

4.1. Powtoon

Bu platform, "çevrimiçi iş sunumu yazılımı" olarak tanımlanır ve kullanıcılara mevcut videolara alternatif olarak ücretsiz animasyonlu videolar oluşturma imkanı sunar. Ayrıca, gömülü videolarla slayt gösterileri oluşturabilir veya animasyonlu sunumlar yapabilirsiniz. Ayrıca, PowToon'u sınıfta kullanmak isteyen öğretmenler için ücretsiz deneme sürümü mevcuttur (Chandler, 2015).

4.2. 4D Anatomy

Anatomik yapıları tanımlamak için eğme, döndürme ve katman katman soyarak benzersiz ve pratik bir öğrenme deneyimi sunar. Geleneksel animasyonlu 3D anatomi bilgisayar modellerinden farklı olarak 4D Interactive Anatomy ile kullanıcılar, taramaları gözden geçirme, örnekleri seçme ve detaylı bir inceleme sürecine katılma şansına sahiptir. Bu özellikler, öğrencilere derinlemesine anlayış kazanma fırsatı sağlar (<https://www.4danatomy.com/>).

4.3. Animoto

Animoto, sunum veya slayt gösterisi oluşturmak için kullanılacak basit bir platformdur. Kullanıcılar, sadece fotoğraflarını seçip düzenleyerek hızlıca profesyonel görünümlü bir sunum hazırlayabilirler. Öğrenciler ve öğretmenler Animoto'nun sunduğu olanaklardan kolayca yararlanabilirler. Platform, video oluşturmayı, fotoğraf yükleme işlemlerini ve müzik seçimini basit hale getirir, böylece kullanıcılar sadece içeriğini ekleyip sonuca ulaşabilirler. Bu sayede öğrenciler, sadece birkaç dakika içinde etkileyici bir video hazırlayabilirler (Lestari ve Chasanatun, 2018).

4.4. Magic School

Birden fazla yapay zeka aracını içerisinde barındıran uygulama öğretmenlere bir çok kolaylık sağlıyor. Farklı branşlara özgü içerikler bulunmaktadır. Özellikle ders planı, soru ve öğrenciye özel plan hazırlama gibi özellikleri bulunmaktadır (<https://www.magicschool.ai/>).

ARAŞTIRMA SONUÇLARI

Farklı Branşlarda Web 2.0 Araçlarının Kullanımına Dair Çalışmalar

Bilişim teknolojileri, son yıllarda eğitim sektöründe devrim niteliğinde bir değişim başlatmış, eğitim yaklaşımını tamamen yeniden şekillendirmiştir (Talan ve Batdı, 2022). Öğrenmenin uzun süreli ve etkili olmasının, bireyin beş duyusunu ne kadar kullandığıyla doğrudan ilişkili

olduğu gözlemlenmektedir. Eğitimde çoklu zeka teorilerinin önemi artmış ve bu teorilerin öğrenme süreçleri, bireyin gelişimi ve başarısı üzerinde olumlu etkileri olduğu fark edilmiştir. Ayrıca, çoklu uyaranların kullanımıyla eğitimin verimliliği konusunda önemli bulgular elde edilmiş ve bu durum teknolojinin bu alanlara yönelik ilgisini artırmıştır (Curacı, 2021). Erden ve Uslupehlivan (2020)'ın yaptığı araştırmada öğretmen adayları, öğrenme ve öğretme süreçlerinde teknoloji kullanımının gerekli olduğunu, bu ihtiyacı öğrenme kolaylığı, kalıcılık, görsel ve işitsel destek, çağın gereksinimleri, zaman tasarrufu, derslerin çekiciliği gibi nedenlerle dile getirmektedirler. Yılmaz (2012) ise öğretmenlerin genel olarak eğitimde teknoloji kullanımına olumlu bir yaklaşım sergilediğini ifade etmektedir. Teknolojinin eğitimde gerekli ve öğrenmeyi destekleyici bir araç olduğunu kabul ettikleri, bu doğrultuda kendilerini teknoloji konusunda geliştirmeye çalıştıkları ve derslerde teknolojik araçların kullanımının sınıf yönetimini olumsuz yönde etkilemediği sonucuna varmıştır.

Dünya genelinde eğitim sistemleri, yapay zekâ uygulamalarını kullanarak sürekli bir yenilenme sürecindedir. Ülkemizde de Millî Eğitim Bakanlığı'nın 2023 yılı hedefleri doğrultusunda eğitimde iyileştirmeler yapmak amacıyla yapay zekâ teknolojilerinin kullanılması hedeflenmektedir (İşler ve Kılıç, 2021). Dijital öğrenme ve öğretme araçları, öğrencilerin ders materyallerini ilgi çekici yollarla öğrenmelerine ve etkileşimde bulunmalarına olanak tanır. Bu araçlar, öğrencilerin projeler ve ürünler oluşturup paylaşımlarını sağlayan dijital programlardır. Öğrencileri işbirliği yapmaya ya da bireysel çalışmalarını oluşturup paylaşmaya teşvik eden, etkileşimli, çok amaçlı ve kullanımı kolay dijital platformlardır (Aras ve Kocasaraç, 2022). Fatih Projesi ile ülkemizde sınıf ve okullarda teknolojinin kullanımını artırmak amaçlanmaktadır. Bu projenin başarıya ulaşması, her okul ve sınıfta bilişim teknolojilerinin etkin bir şekilde kullanılabilmesi, öğretmenlerimizin ve öğrencilerimizin teknolojik okuryazarlıkları açısından büyük önem taşımaktadır. Bu bağlamda, öğretmenlerin teknolojik destek alması ve materyal hazırlarken çeşitli tasarımlar ve farklı araçları kullanmaları gerekmektedir. Web 2.0 araçları, bu süreçte önemli bir rol oynamaktadır. Öğretmenlerin ders tasarımlarında bu araçları belirli ölçülerde kullanabilmeleri için desteklenmeleri ve eğitilmeleri önemlidir (Elmas ve Geban, 2012). Dolayısıyla, geleneksel sınıf içi öğrenme ortamlarına alternatif sunan Web 2.0 araçları gibi teknolojik gelişmeler, içerik oluşturma, yenilikleri takip etme, bilgiye erişim kolaylığı, eğitim materyallerinin etkili bir şekilde hazırlanması, kontrol etme ve paylaşma gibi birçok olanak sunmaktadır. Bu araçlar, çeşitlilik ve sayılarındaki artışla birlikte öğretim sürecinde sürekli olarak kullanılabilir ve öğrencilerin etkili bir şekilde katılımını teşvik edebilir (Genç, 2010; Hamlı ve Hamlı, 2021 ve Özcan ve ark, 2023). Talan ve Batdı (2022), yaptığı araştırmada web 2.0 araçlarıyla eğlendirici ve etkili dersler hazırlama, öğretmenlik mesleki yetkinliklerinin artırılması, dersin akıcı ve anlaşılır hale getirilmesi, kalıcı öğrenmelerin sağlanması, öğrenciyle etkili iletişim ve etkileşim kurma, çeşitli duysal organlara hitap etme, motivasyonu artırma, daha fazla öğrenci katılımını teşvik etme, deneyimleyerek öğrenme ortamları oluşturma, öğrencilerin ilgisini çekme, değerlendirme becerilerini geliştirme, bilgi ve yetenekleri iletme gibi alt konular belirgin bir şekilde ortaya çıkmaktadır. Gündoğdu (2017), web 2.0 teknolojileri ile desteklenen işbirliğine dayalı

uygulamalar, öğrencilerin problem çözmeye yönelik yansıtıcı düşünme becerilerini ve derse olan motivasyonlarını artırdığını tespit etmiştir. Greenhow ve ark (2009) öğrencilerin web 2.0 teknolojilerinin hem okul içinde hem de okul dışında kullanılabileceği sonucuna varmıştır. Öğrenci katılımı, yaratıcılık ve çevrimiçi kimlik oluşumu gibi konularda yenilikler ortaya koymaktadır. Altunkaynak ve Sarıkaya (2024), 5.sınıf müzik dersinde web 2.0 araçlarının kullanımının öğrencilerin başarı, tutum ve motivasyonları üzerinde olumlu yönde değişim meydana geldiği sonucuna varmıştır. Bülbül ve Taş (2023) ise web 2.0 araçlarıyla zenginleştirilmiş öğrenme ortamlarının problem çözme becerisi üzerine yaptığı araştırmada öğretmen adaylarının ön test – son test sonuçları arasında anlamlı sonuçlar ortaya çıkmıştır. Muslu ve ark. (2022) yaptığı araştırmada, 14 hafta boyunca ardışık etkinlikleri içeren web 2.0 uygulamaları gerçekleştirilmiş ve öğretmen adaylarının ders planlarına web 2.0 araçlarını nasıl entegre ettikleri incelenmiştir. Farklı branşlardan öğretmen adaylarının web 2.0 araçlarını ilgi çekme, ön bilgileri belirleme, içerik öğretimi, içerikle etkileşim ve değerlendirme olmak üzere beş temel tema altında ders planlarına dahil ettiklerini göstermiştir. Öğretmen adayları, toplamda 21 farklı web 2.0 aracını ders planlarında kullanmışlardır. Powtoon, Word Art, Canva, Quizizz, Learning App, Kahoot, Google Form, Thinglink, Animoto ve Nearpod gibi araçlar, öğretmen adayları tarafından daha çok tercih edilmiştir ve birden fazla amaçla ders planlarına entegre edilmiştir. Özellikle Powtoon gibi araçlar, öğretmen adayları tarafından daha kullanışlı bulunmuş ve derslere entegre edilmiştir. Bu bulgular, web 2.0 uygulamalarını içeren ardışık etkinliklerin, öğretmen adaylarının bu araçları ders planlarına entegre etmelerini desteklediğini göstermektedir. Mete ve Batıbay (2019) Türkçe eğitimi üzerinde yaptıkları araştırmada, Kahoot uygulamasıyla yapılan öğretimin ders süresince motivasyonu artırdığı ve derse olan ilginin arttığı sonucuna varılmıştır. Almalı ve Yeşiltaş (2020) ise sosyal bilgiler eğitiminde web 2.0 teknolojileri kullanımının akademik başarıya olumlu yönde etki ettiğini ve derse karşı öğrenci tutumlarında olumlu yönde değişimler olduğu sonucuna varmıştır. Maraşlı ve Değirmencioğlu (2023) tarafından yapılan araştırmada, müzik derslerinde web 2.0 araçlarının kullanımının, öğrencilerin müzik dersine olan motivasyonları üzerinde olumlu etkiler yarattığı sonucuna varılmıştır. Hamlı ve Hamlı (2021), ilköğrencilerinin akademik başarısı üzerindeki etkisini incelediği çalışmasında, araştırmacılar web 2.0 araçlarını ve buna uygun materyalleri bir tema çerçevesinde kullanmışlardır. Yapılan çalışma, web 2.0 araçlarının öğrenme ortamına entegre edilmesinin öğrencilerin akademik performansını olumlu yönde etkilediğini ortaya koymuştur. Chang ve ark. (2012) web 2.0 araçlarının, öğrenme sürecini artıracığı, öğrencilerin geleneksel ders planlarından daha fazla ilgi gösterdiği sonucuna varmıştır.

Web 2.0 araçları, eğitimciler ve öğrenciler arasında giderek daha yaygın hale gelmektedir. Bu araçları etkili bir şekilde kullanabilmek için hem eğitimcilerin hem de öğrencilerin bu konuda yetkin olmaları büyük önem taşımaktadır (Işık ve Karal, 2023). Işık ve Karal (2023) sınıf öğretmenleri üzerinde yaptığı araştırmada öğretmenlerin, web 2.0 araçlarını ilköğretim seviyesinde kullanmaya olumlu baktıkları ancak, bazı öğretmenler teknolojik imkânların yetersizliği ve bu araçlar hakkında yeterli bilgi ve beceriye sahip olmadıkları için bu araçları kullanamadıklarını ifade etmişlerdir. İbrahimova ve Alimgerey (2022), öğretmenlerin

wordmint, edmodo, educandy, kahoot gibi sınırlı sayıda araçları kullandıkları, bazı web 2.0 araçlarının isimlerini hiç duymadıklarını belirtmişlerdir. Öğretmenlerin web 2.0 araçlarını kullanma potansiyellerinin yüksek olduğu ancak tam olarak donanım sahibi olmadıkları sonucuna varmıştır. Şengür ve Anagun (2021), sınıf öğretmenlerinin bilişim teknolojilerini yüksek düzeyde kullandıklarını ve web 2.0 uygulamalarına önem verdiklerini ortaya koymuştur. Ancak, öğretmenlerin web 2.0 uygulamaları konusunda kavramsal bilgi eksiklikleri olduğunu da tespit etmiştir. Usta ve ark. (2020) öğretmen adaylarının web 2.0 araçları hakkında bilgi sahibi olmalarına rağmen, bu araçları öğrenme ortamlarına entegre etmekte zorluk çektikleri tespit etmiştir. Bu nedenle, öğretmen adaylarına lisans eğitimleri süresince web 2.0 araçlarının öğrenme ortamında kullanılmasına yönelik fırsatlar sunulması ve web 2.0 araçlarının öğretilmesi yeterli olmayıp, aynı zamanda bu araçları kullanırken uygun öğretim yaklaşımlarını ve araçların etkili kullanımını da tecrübe etmeleri sağlanması gerekliliğini ifade etmiştir. Boulton ve Hramiak (2014) öğretmenliğin ilk yıllarından itibaren web 2.0 teknolojilerindeki yeniliklerin mesleki gelişim olarak devam ettirilmesi gerektiği sonucuna varmıştır. Sever ve ark. (2023) öğretmenlerin web 2.0 araçlarına yönelik görüşlerini incelediği araştırmada, öğretmenlerin web 2.0 araçlarına yönelik farkındalıklarını artırmak için gerekli eğitimlerin verilmesinin önemini ifade etmektedir. Ayrıca, öğretmenler bu araçları kullanmanın karmaşıklığından bahsettiklerini ve Türkçe materyal ve programların yaygınlaştırılması gerektiğini vurgulamışlardır. Üniversitelerde, web 2.0 araçlarına ilişkin teorik ve uygulamalı dersler verilerek öğretmen adaylarına bu araçların nasıl kullanılacağı konusunda detaylı ve uygulamalı eğitimler sağlanması gerektiği sonucuna varmıştır.

Beden Eğitimi ve Sporda Web 2.0 Araçlarının Kullanımına Dair Çalışmalar

Ülkemizde beden eğitimi ve spor dersleri, okulların sunduğu teknolojik imkanlar doğrultusunda yürütülmektedir. Ancak, öğrencilerin sportif becerileri daha verimli ve kolay bir şekilde kazanabilmesi ve kavramsal bilgilerin aktarılabilmesi için teknolojik imkanlardan daha fazla faydalanmak gerekmektedir. Dünya genelinde, teknolojik ilerlemelere bağlı olarak harekete duyarlı sensörlerle çalışan oyunlar ve uygulamalar geliştirilmeye başlanmıştır. Adım ölçer, akıllı saatler, hız ve ivme ölçerler, enerji ve kalori ölçerler bu uygulamalardan bazılarıdır. Yapılan çalışmalar, bu tür uygulama ve oyunların ilerleyen yıllarda ülkemizde de beden eğitimi ve spor derslerine entegre edilebileceğini göstermektedir (Uslu, 2023). Teknoloji, beden eğitimi ve spor öğretmenlerinin sınıflarında öğretim stratejilerini daha etkin bir şekilde kullanmalarına olanak tanır. Öğretmenlerin öğretim tarzı, ders programının amaçları ve hedefleri, öğrenci seviyeleri, ders saatleri, dersin gerçekleştiği ortam ve okuldan sağlanan teknik destek gibi faktörler, hangi teknolojinin kullanılacağını belirler. Her öğretmen kendi koşullarına en uygun teknolojiyi seçebilir ve kullanabilir (Ünlü, 2022).

Teknoloji beden eğitimi sınıflarına dahil edilmesiyle birlikte Beden Eğitimi dersinde öğrencilerin tutkulu olmasını sağlar. Beden eğitimi, öğretmenin gösteri hareketlerini taklit ederek gerçekleşmektedir. Eğer öğretmen hareket gösterimi uygun değilse öğrencinin hata yapmasına neden olacaktır. Teknoloji sayesinde öğretmenin bu durum asgari düzeye

indirilebilir (Hai ve ark., 2023). Beden eğitimi ve sağlığa yönelik alanlarda web siteleri ve mobil uygulamalara ulaşılabilir. Ayrıca eğitimciler için tasarlanmış, faydalı olabilecek web 2.0 araçları bulunmaktadır (Edwards, 2020). Sümer (2020), 7. ve 8. sınıf öğrencilerinin teknolojinin hentbolda pas, top sürme, 7 metre atışı, şut ve aldatma performanslarına etkisini incelediği araştırmada, öğrenme ve öğretme ortamında kullanılan mobil teknolojinin öğrenciler üzerinde olumlu etkileri olduğu sonucuna varmıştır. Ayrıca mobil uygulama teknolojisi öğrencilerin motivasyonlarının ve derse olan ilgilerinin arttığı ifade edilmiştir.

Can ve Kerkez (2022) tarafından yapılan araştırmaya göre, Beden Eğitimi ve Spor öğretmenlerinin web 2.0 araçlarını kullanma yeteneklerinin orta düzeyde olduğu belirlenmiştir. Ayrıca, lisansüstü eğitim almış ve teknoloji ile ilgili kurslara katılan öğretmenlerin, bu yetenekler konusunda avantajlı oldukları tespit edilmiştir. Öğretmenler, Beden Eğitimi ve Spor derslerinde çeşitli web 2.0 araçlarından yararlanarak öğrencilere ders materyallerini sunmaktadır. Teorik bilgi aktarımında genellikle Padlet, Prezi, Popplet ve Pixton gibi araçları tercih etmektedirler. Pratik becerilerin uygulama kısmında ise YouTube platformunu sıklıkla kullanmaktadırlar. Ölçme ve değerlendirme faaliyetlerinde ise Wordwall ve Kahoot gibi interaktif araçlara başvurumaktadırlar. Ancak, öğretmenlerin zaman kısıtları nedeniyle web 2.0 araçlarını kullanarak ders materyallerini hazırlamakta zorlandıkları görülmektedir. Edwards (2020)'ye göre Beden Eğitimi ve Spor Öğretmenlerinin Kahoot, Quizzizz, Flipgrid, Team Shake, Remind gibi uygulamaları kullanabilir.

Uğraş ve Keskin (2022) COVID-19 Sürecinde Beden Eğitimi ve Spor Öğretmenlerinin web 2.0 Araçlarını Kullanma Öz Yeterliliklerinin İncelenmesi adlı araştırmada COVID-19 sürecindeki uzaktan eğitimde kullanılan web 2.0 araçları değerlendirilmiştir. Beden eğitimi ve spor öğretmenlerinin bir kısmı web 2.0 araçlarını faydalı bulurken bir kısmı ise ders için uygun olmadığı görüşündedir. Çalışma hayatlarının ilk yıllarında olanlar ve lisansüstü eğitim alan öğretmenlerin web 2.0 araçlarını daha etkin kullandığı sonucuna varılmıştır. Katılımcıların web.2.0 araçlarının kullanımı konusunda lisans eğitimlerinde yeterince eğitim alamadıkları ifade edilmiştir.

Uslu (2023) yaptığı araştırmanın sonuçları incelendiğinde beden eğitimi öğretmenlerinin öğretim kademelerine göre kullandıkları web 2.0 araçlarının yüzdelerine bakıldığında, ortaokul seviyesinde en çok fotoğraf ve resim hazırlama araçlarını, lise seviyesinde ise yine en çok fotoğraf ve resim hazırlama araçlarını kullandıkları anlaşılmaktadır. Genel olarak ise beden eğitimi öğretmenlerinin en sık fotoğraf ve resim hazırlama araçlarını tercih ettikleri görülmektedir. Bunun yanında, slayt ve sunum hazırlama, video ve müzik hazırlama ile sınıf yönetimi araçlarını da yüksek oranda kullandıkları saptanmıştır. Ortaokul kademesinde en az günlük tutma araçlarını, lise kademesinde ise en az 3D tasarım araçlarını kullandıkları belirlenmiştir. Genel olarak bakıldığında ise, en az kullanılan araçların günlük tutma ve 3D tasarım araçları olduğu anlaşılmaktadır. Bu durumun, beden eğitimi öğretmenlerinin web 2.0 araçlarını yeterince tanımamaları ve genellikle ihtiyaç duydukları araçları kullanmalarının bir sonucu olduğu düşünülmektedir. Can ve Kerkez (2022) teknoloji okuryazarlığı düzeyinin

yalnızca lisansüstü eğitim almış öğretmenler arasında farklılaştığı belirlenmiştir. Bu bulgular ışığında, yüz yüze eğitimi kesintiye uğratabilecek durumlar karşısında Beden Eğitimi ve Spor öğretmenlerinin teknolojik yetkinliklerini artırmak amacıyla hizmet içi eğitim faaliyetlerinin ve eğitsel teknoloji ile ilgili kursların sayısının ve kalitesinin artırılması önerilmektedir.

Bulca ve Demirhan (2020) yaptığı araştırmada, deney grubu öğrencilerine 6 hafta boyunca Beden Eğitimi ve Spor dersinin ilk saatini bilişim dersliğinde işlemiştir. Fiziksel uygunluk kavramları Edmodo aracı ile öğretilmiştir. İkinci ders saatinde ise bu kavramların uygulanmasına yönelik egzersizler spor salonunda yaptırılmıştır. Kontrol grubu öğrencilerine bu kavramlar spor salonunda sözlü olarak anlatılmıştır. Araştırma sonuçlarına göre Edmodo ile oluşturulan öğrenme ortamlarının olumlu etkisinin olduğu ve öğrenmenin daha kalıcı olduğu sonucuna varılmıştır. Sonuç olarak; öğrenme ve öğretme süreçlerinde yaşanan dönüşümü yakalayabilmek ve süreçleri tüm paydaşlar açısından verimli şekilde yürütmek için yenilikçi teknolojilerin takip edilerek kullanılması gerektiği aşıkardır (Diren ve Horzum).

SONUÇ

Kaliteli bir eğitim için yeniliklerin sürekli olarak takip edilmesi gerekmektedir. Hızla gelişen teknoloji ile eğitim ortamları da yenilenmektedir. Öğretmenler ise teknolojik gelişmeleri eğitim ortamlarında kullanmayı uygun görmekte-dirler. Web 2.0 araçlarıyla öğrenciler, kendi içeriklerini oluşturabilir, paylaşabilir, işbirliği yapabilir ve eğitim öğretim süreçlerinde daha aktif şekilde rol alabilir. Eğitim öğretim süreçlerinde öğrenciler derslere karşı daha motive olmakta ve farklı içeriklerle öğrenme daha etkin hale gelmektedir.

Web 2.0 araçlarının kullanılması öğrencileri birçok yönden olumlu şekilde etkilemektedir. Öğretmenlerin yeniliklere ayak uydurarak bu yeni teknolojileri yakından takip etmesi ve derslerinde uygulaması eğitim öğretime olumlu şekilde yansımaktadır. Ancak öğretmenlerin ve bütün eğitim paydaşlarının web 2.0 araçlarını kullanma noktasında daha yetkin olmaları beklenmektedir. Bu bağlamda öğretmenlerin ve öğretmen adaylarının yeni nesil teknolojiler ve web 2.0 araçları ile ilgili eğitimler alması gerekmektedir. Hatta üniversitelerin öğretmen yetiştiren programlarına web 2.0 araçları dersleri eklenerek öğrencilerin mesleğin güncel metotlarına uygun şekilde eğitilmesi gerekmektedir.

Teknoloji, özellikle modern ekipmanlar ve uygulamalar aracılığıyla öğrencilere daha etkileyici ve çeşitli aktiviteler sunma imkanı sağlar. Beden eğitimi ve spor dersinde web 2.0 araçları kullanılarak planlanan derslerde öğrencilerin motivasyonları artmaktadır. Ayrıca, video analiz sistemleri, öğrencilerin teknik becerilerini görsel olarak değerlendirme ve geliştirme konusunda öğretmenlere ve öğrencilere yardımcı olmaktadır. Sanal gerçeklik teknolojisi ise öğrencilere farklı spor dallarını deneyimleme ve antrenman yapma imkanı sunmaktadır. Beden eğitimi ve spor dersleri gösterip yaptırma şeklinde gerçekleştiği için teknoloji, öğretmene bu konuda yardımcı olmaktadır. Ancak, teknolojinin kullanımı derslerin amacına uygun ve dengeli bir şekilde yapılmalıdır. Teknoloji, dersin etkinliğini artırmak için bir araç olarak kullanılmalı ve öğrencilerin sporun temel prensiplerini öğrenmelerini desteklemelidir. Ayrıca, teknolojinin kullanımıyla öğrencilerin dikkati dağılmamalı ve fiziksel etkinliklerin önemi göz ardı

edilmemelidir. Özellikle teorik olarak işlenmesi gereken derslerde web 2.0 araçlarından faydalanmak gerekmektedir.

Sonuç olarak; günümüz eğitim anlayışı teknolojiyle uyumlu olmalıdır. Ders ortamlarına entegre edilen teknoloji, öğretmen ve öğrencileri olumlu yönde etkilemektedir. Web 2.0 araçları ile oluşturulan eğitimlerin fayda sağladığı görülmektedir. Beden Eğitimi ve Spor Öğretmenlerinin de web 2.0 araçlarıyla ders içeriklerini zenginleştirmesi ve eğitim ortamlarını daha dikkat çekici hale getirmesi gerekmektedir.

ÖNERİLER

- Beden Eğitimi ve Spor Öğretmeni adaylarının lisans eğitimleri sürecinde teknoloji ve Web 2.0 araçları ile ilgili derslerin müfredata alınması önerilmektedir.
- Beden Eğitimi ve Spor Öğretmenleri temel kavramlar ve teorik bilgiler için sunum, video, animasyon ve çevrimiçi sınıf gibi uygulamaları kullanabilir.
- Beden Eğitimi ve Spor Öğretmenleri sınıf içi etkileşimi artırma ve işbirliği ortamı oluşturmak için online test araçları kullanabilir.
- Beden Eğitimi ve Spor Öğretmenleri gösterim için uygun ortamların olmadığı veya imkansızlıkların olduğu spor dalları için artırılmış gerçeklik uygulamaları, animasyon ve oyun uygulamaları kullanabilir.
- Beden Eğitimi ve Spor dersinde Web 2.0 araçlarının etkililiğini araştıran nitel çalışmalar yapılabilir.
- Beden Eğitimi ve Spor dersinde Web 2.0 araçlarının kullanımının öğrenci ve öğretmenlerin tutumlarındaki değişimleri inceleyen akademik araştırmalar yapılabilir.

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**CİNSİYET FAKTÖRÜ VE METİNSEL İŞLEVLERE BAĞLI BİÇEMBİLİM
ANALİZİ: ATEŞTEN GÖMLEK VE YABAN ROMANLARI**
CORPUS STYLISTIC ANALYSIS OF GENDER AND TEXTUAL FUNCTIONS: THE
SHIRT OF FLAME AND THE WILD

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ÖZET

Bu çalışmada, Milli Edebiyat döneminde cinsiyete bağlı farklılıkların ve metinsel işlevlerin ne ölçüde etkin olduğu, Halide Edip Adıvar'ın Ateşten Gömlek ve Yakup Kadri Karaosmanoğlu'nun Yaban adlı romanları üzerinden inceleme yapılmıştır. Derlemler, bu iki romanın elektronik ortamdaki metinlerinden oluşturulmuştur. Edebi metinlerin çözümlenmesi, dilbilgisi tabanlı ve tematik unsurları içeren analiz yöntemleriyle gerçekleştirilmiştir. Dilbilgisi tabanlı çözümlenme, her bir metindeki sözcük türlerine odaklanırken, tematik unsurlar ise cümlelerdeki sözcüklerin kullanımlarıyla ilişkili dizin satırlarını ortaya koymuştur. Aynı dönemde iki farklı yazarın romanları karşılaştırılarak, metinsel işlevler temelinde cinsiyet farklılıkları çözümlenmiştir. Derlem ve biçembilim analizine dayalı olarak, nicel ve nitel yöntemlerin birleşimi ile çalışmanın edebi derlemleri karşılaştırmasına olanak sağlanmıştır. Bu yöntemlerin kullanılmasıyla log-olasılık ve frekans değerlerinin derlemlerdeki dilsel örüntüleri ortaya çıkardığı istatistiksel ölçüm yapılmıştır. İstatistiksel ölçümler, dilsel kalıpların ve sözcük frekanslarının detaylı analizine olanak tanımıştır. Edebi derlemlerin karşılaştırması sonucunda metinsel ve tematik işlevlerin analizi yoluyla cinsiyet farklılıklarının bulunmadığı ortaya çıkmıştır. Yazarlar, aynı sözcük türlerinin ve aynı bağlamlarda dilsel kalıpların kullanımında benzerlik göstermiştir. Çalışma, edebi eserlerde cinsiyete dayalı metinsel işlev farklılıklarının belirgin olmadığını ortaya koymaktadır. Bu durum, her iki yazarın da romanlarındaki dil kullanımında benzer dilbilgisel ve biçembilimsel özellikleri paylaştığını ortaya koymuştur. Bulgular, Milli Edebiyat dönemi eserlerinde cinsiyete dayalı belirgin bir farklılık olmadığını ve yazarların dil kullanımında ortak özelliklere sahip olduğunu göstermektedir.

Anahtar Sözcükler: Derlem, Biçembilim, Dil bilgisi, Cinsiyet, Tematik unsurlar, Sketch Engine

ABSTRACT

The present study regards the question of to what extent gender-related differences and textual functions in the period of National literature by focusing on two literary texts. The corpora

were compiled as Adivar's *The Shirt of Flame* and Karaosmanoğlu's *The Wild* which were collected electronically. The analysis of the literary texts included both grammar-based textual analysis and thematic focus to reveal hidden linguistic features in the literary context. The grammar-based text analysis focused on parts of speech in each text while the thematic focus demonstrated concordance lines which provided thematic features related to semantically the usage of words in the sentences. In addition, the gender differences were analyzed on the basis of textual functions by comparing the two different authors and their novels. The combination of quantitative and qualitative approaches enabled the study to compare the literary corpora. The approach followed statistical measurement that log-likelihood and frequency values uncovered the linguistic patterns in the corpora. The statistical measurement enabled the study to discover grammatical and textual functions in the corpora. As a result of the comparison of literary corpora, it was revealed that there were no gender differences through the analysis of textual and thematic functions. The authors showed similarity in the use of the same word types and linguistic patterns in the same contexts. The study revealed that there were no significant differences in textual functions based on gender in literary works. This situation revealed that both authors shared similar grammatical and stylistic features in the use of language in their novels. The findings show that there were no significant differences based on gender in the works of the National Literature period and that the authors had common characteristics in the use of language.

Keywords: Corpus stylistics, Grammar, Gender, Thematic focus, Sketch engine

1. INTRODUCTION

Corpus linguistics is a branch of linguistics that involves the systematic analysis of large collections of authentic language data which includes language patterns, usage, and structure. Corpus comprises examples of real-life language use through written or spoken texts by focusing on the usage patterns of language and linguistic features (Biber, Conrad & Reppen, 1998). The central role of corpora is conducting empirical linguistic research to uncover patterns of language use and structure. Also, the field of corpus linguistics aims to reveal patterns of use on the basis of electronically collected texts (McEnery & Wilson, 2001). On the other hand, corpus stylistics is an approach to stylistic analysis that combines the principles of corpus linguistics. The large collections of textual data enable researchers to analyze language use, stylistic features, and literary devices based on genres, authors, and periods. The field of corpus stylistics is related to the techniques of corpus linguistics to study style, and it uses computer-based methods to explore literary phenomena (Toolan, 1998). Due to the fact that corpus stylistics is an interdisciplinary approach, it offers a data-driven approach to studying the style of literary texts in a systematic and empirical manner. The use of computer software indicates the identification of linguistic patterns like lexical choices, syntactic structures, and discourse features on the basis of stylistic effects (Semino, 2014). Besides, the corpus stylistics approach enables researchers to study gender differences in

language from the perspective of authorial styles. Gender differences can manifest in various aspects of language, including vocabulary, grammar, syntax, conversational style, and pragmatic strategies. Gender differences in language are related to linguistic behavior and communication style based on gender in terms of societal norms, cultural expectations, and socialization processes (Holmes, 1995). Also, gender differences cause variations in vocabulary, syntax, discourse patterns, and communicative styles which are related to gender (Eckert & McConnel-Ginrt, 2003). Social and cultural expectations influence language usage based on different cultural and social backgrounds. The linguistic behavior and communication styles between men and women differ in regard to gender roles, identities, individual variation, and situational factors (Cameron, 2007). The study of gender differences and corpus stylistic approach highlights how language reflects and reinforces gender norms, identities, and power dynamics in society.

The present study aimed to analyze Halide Edip Adivar's *The Shirt of Flame* and Yakup Kadri Karaosmanoğlu's *The Wild* to uncover gender and textual functions through grammar-based text analysis and the thematic focus. The research questions can be stated as follows:

Are there gender-related differences between Halide Edip Adivar's *The Shirt of Flame* and Yakup Kadri Karaosmanoğlu's *The Wild*?

What are the textual functions of the analysis of grammar-based and thematic focus?

What are the implications of the gender aspect in the period of National Literature?

This study uses a corpus stylistic approach to analyze grammatical functions and thematic focus. The procedure of analysis involves the interpretation of findings by using a quantitative approach in Halide Edip Adivar's *The Shirt of Flame* and Yakup Kadri Karaosmanoğlu's *The Wild*. Besides, Sketch Engine software which is an innovative corpus tool is used to conduct the present study on the basis of grammatical functions and thematic focus. First of all, the background information is given about Halide Edip Adivar's *The Shirt of Flame* and Yakup Kadri Karaosmanoğlu's *The Wild*. Secondly, the previous studies are mentioned below. Then, the method of study and corpus data are cited by giving information about the data. The part of data analysis and discussion involves grammar-based both text analysis and thematic focus. Lastly, there are concluding remarks on the corpus stylistic analysis of Gender and Textual Functions Based on Halide Edip Adivar's *The Shirt of Flame* and Yakup Kadri Karaosmanoğlu's *The Wild* in the Period of National Literature. The present study combines both qualitative and quantitative methods by contributing to the field of corpus stylistics.

1.1 HALİDE EDİP ADIVAR'S THE SHIRT OF FLAME

Halide Edip Adivar was nationalist author who wrote the *Shirt of Flame* by illustrating war of independence and a nation's struggle. The novel published in 1922 ,and Halide Edib Adivar's 2006 edition of *Fire Shirt* begins with an open letter to Yakup Kadri Karaosmanoglu, Anatolian historian of life during the Turkish War of Independence. Adivar who metaphorically conveys her feelings to Anatolia with the experssion of 'the *Shirt of Flame*',

tells the stories of Peyami, İhsan and Ayşe as protagonists in the novel (Albay, 2020). The events are told from the perspective of foreign affairs officer Peyami, who was injured during the war and hospitalized, and whose memories come to mind while he waits for surgery to remove the bullet in his head (Atalay, 1991). The novel reflects the ideas of Mustafa Kemal as well as the traces of the republican philosophy. It is emphasized that modernization and nation building will be achieved and the disconnection between the people and the intellectuals will be ended. The novel has the feature of a realistic novel that tells about the War of Independence, in which the Turkish nation fought for its independence, and the troubled process of those days (Şahin, 2019).

Just as the novel represents the period of National Literature, there are particular stylistic features related to this period and the notion of nationality. The transition process from the Ottoman Empire to the Republic of Turkey has encouraged the new nation to take shape in interaction with modernization, westernization and secularization movements. Also, nationalism has served the purpose of improving the conditions of women and expanding their rights. In the nationalistic perspective, women have roles as participants of nationalist struggles. The three women featured in the novel, Selime, Ayşe and Kezban, symbolize the mobilization of femininity for the liberation of a country or the creation of a new nation (Albay, 2020). The character of Ayşe is a patriot from Izmir who recklessly sacrifices her life for the independence of the homeland and the independence of the nation compared to typical housewife. Besides, Adivar presents Ayşe as the ideal Turkish woman who can help save the country and forge a new nation. The *Shirt of Flame* embodied the struggle for the re-existence of a nation in the dilemma of love and lawsuit, both social and national, and the struggle for freedom from fire in the likeness of shirt and flame (Albay, 2020). Halide Edib Adivar, who portrayed the struggle of the Turkish nation to become a nation state in a realistic way in the early twentieth century, tried to show that the nationalism of women who identified with their homeland was the motivation behind the nationalism of men.

Halide Edib, who brought the voice of women to the male-dominated nationalist literature, proved that nationalism is not something exclusive to men and that women can also take an active role in the national struggle (Albay, 2020). Adivar emphasized the importance of women's contribution to the national struggle, as well as the importance of men's power. In particular, the novel shows that Adivar narrated the Turkish War of Independence by creating a new nation and a new woman in the novel. The *Shirt of Flame* describes the national struggle for regaining national independence, national values and language.

1.2 YAKUP KADRI'S THE WILD

Yakup Kadri Karaosmanoğlu is a Turkish intellectual who witnessed the last periods of the Ottoman Empire and the founding years of the Republic of Turkey. Karaosmanoğlu wrote his observations about the Turkish War of Independence in his work titled *The Wild*. Ahmet Celâl returns from World War I, in which he participated as an officer, having lost one of his

arms. When Istanbul was occupied by the British, she decided to go to Mehmet Ali's village on the banks of the Porsuk stream upon his invitation. He aimed to show flaws in society by building a nation. In the novel, Karaosmanoğlu narrates the conflict of culture and ideas between the Turkish intellectual Ahmet Celal and the Anatolian villagers. Ahmet Celal who is the protagonist of the novel follows the news about the Turkish War of Independence while he tries to raise national consciousness in the village. In this novel, Yakup Kadri Karaosmanoğlu shows the negative aspects of society and attempts to build a nation (Dündar, 2014). Besides, the novel reflects the ideology of Kemalist which is embraced by Ahmet Celal. The character tries to deal with the conflict between intellectuals and peasants by conveying the ideology of Kemalists these days. *The Wild* is a manifesto, a confession of the painful conditions of the peasants, who are glorified as the masters of the nation (Karaömerlioğlu, 2002). Karaosmanoğlu indicates intellectuals to deal with peasants' problems in Anatolia. He reminds the value of the villagers who are the most populous segment of society and the Kemalist regime by criticizing the intellectuals who turn a blind eye to all these issues (Karaömerlioğlu, 2002).

In the novel, the character Ahmet Cemal experiences loneliness along with alienation because he is incompatible with the village. His alienation is related to both miscommunication and the notion of intellectual by setting boundaries with peasants (Balcı, 2002). In fact, Ahmet Celal hopes to make Anatolia his home, but he is alienated from the village (Şenderin, 2011). At the end of the novel, the village is occupied by enemies and the villagers face a painful disaster.

2.LITERATURE REVIEW

Corpus stylistics is an interdisciplinary approach that combines insights from corpus linguistics with the study of stylistics to analyze language patterns, stylistic features, and literary devices in texts. Thus, researchers have conducted corpus-stylistic studies by employing both corpus and stylistic approaches. Well-known authors have conducted the study of corpus stylistics to uncover authorial styles as well as linguistic patterns in literary texts. Mahlberg and McIntyre (2011) investigated both keywords and key semantic domains by describing the fictional world and thematic signals in Fleming's *Casino Royale* which is characterized as text-centered and reader-centred. On the other hand, Jane Austen's style is quite distinct to compare her literary texts and thematic focuses. Jane Austen's novels were represented by providing Austen's language in her texts which were applied to a corpus-driven approach in interpreting and evaluating results from the quantitative data (Wijitsopon, 2013). Joseph Conrad who is one of the well-known authors is studied depending on stylistic analysis and corpus studies. A stylistic analysis of Conrad's *Heart of Darkness* was examined by exploring the frequencies and distributions of individual words which are based on quantitative stylistic methods and linguistic features (Stubbs, 2005). In the same way, Thomas Harris's novel conducted the analysis concerning both computational methodologies and corpus stylistic methods that focus on keywords and key semantic domains to investigate n-

grams in the novel (Jaafar, 2017). In the corpus stylistic method, the narrative style was utilized by looking at a systematic analysis of the stylistic devices that represented the representation of a character's speech and thought in James Joyce's *Dubliners* (Ajmal & Afsar, 2021). Other stylistic effects are the analysis of clusters to show linguistic features in corpus data. Sun (2020) revealed both high-frequency three-word clusters and their stylistic effects in *The Great Gatsby* which is a popular novel while clusters were categorized as labels, speech clusters, clusters, body part clusters, and time clusters to provide a new perspective on the analysis of corpus stylistics. Fang (2023) studied H.G. Wells's book *The Time Machine* by focusing on the level of punctuation and vocabulary through innovative corpus tools such as Sketch Engine and AntConc software. Another corpus stylistic analysis of *The Time Machine* was analyzed in terms of lexical and rhetorical features by using the corpus tools WordSmith and AntConc (Mao, 2022).

In addition, Charles Dickens's style is quite unique and appealing to study his literary texts. Mahlberg (2007) argued the concept of local textual functions and five functional groups that include clusters and repeated sequences of words through a descriptive tool for Dickens' texts. Segundo (2016) revealed the use of direct thought presentation of Charles Dickens in terms of a corpus-based approach, and the meaningful patterns were extracted through Corpus Linguistics in Cheshire and WordSmith Tools7. The different perspective of corpus stylistics analysis is conducted as a function of textual interpretation. Textual analysis of *Great Expectation* was analyzed in terms of norms, free indirect speech, and comparisons through the CliC web app (Mahlberg & Wiegand, 2018). Comparative studies are also quite common in the field of corpus stylistics depending on stylistic perspective and linguistic features. Moustafa (2021) researched a comparative corpus stylistic analysis of thematization and characterization in Gordimer's *My Son's Story* and Coetzee's *Disgrace* to uncover the thematic foci and characterization aspects. Besides, the comparison of *Silent Spring* and *To Kill a Mockingbird* which are two different women authors uncovered based on registers, relative clauses, and linguistic features as analytic negation and subordinators (Lin, 2023). In particular, Liang and Chen (2023) conducted a corpus-based stylistic study of *Jane Eyre* and *Wide Sargasso Sea* by comparing the type/token ratio, mean word length, mean sentence length, and keywords that present the different stylistic features in each text.

In particular, some novels need to be studied by using significant stylistic terms and linguistic devices. A corpus-assisted stylistic analysis of Woolfian parallelism into the *Lighthouse* was examined to discover specific lexical and syntactic structures such as lexical bundles, juxtaposed propositional phrases, and oppositional structures that are related to authorial styles (Zhao, 2012). Translation studies also use a corpus stylistic approach to compare with the original text and corpus stylistic methods enlighten the studies by contributing to the field. Johnson (2016) focused on the Italian translation of Julian Barnes' *Il Senso di una Fine* and the original text *The Sense of an Ending* while it compares stylistic elements like keywords and key clusters in both source and target texts. In particular, each literary genre is studied on the basis of corpus stylistic approaches, and this research expands the area to interpret the

literary text from different perspectives. Can and Cangır (2021) analyzed the First World War poetry that adopted a top-down corpus-driven approach while key semantic domains are the main focus of the study in the face of traumatic war experience. Besides, short stories give big corpus data to uncover stylistic and linguistic features based on corpus stylistic approaches. Singh (2024) aimed to study free indirect thought and grammatical anomalies in a story which encompasses the subsequent feelings like surprise and suspense.

Nevertheless, gender differences in language use are a significant factor in conducting the analysis of corpus stylistics based on literary texts and corpus data. Gender representation in *A Thousand Splendid Suns* was studied by demonstrating frequencies of adjectives, verbs, and taboos between male and female characters using AntConc (Qayyum & Fatima, 2023). Furthermore, author gender and text characteristics in Swedish fiction were revealed by examining text property measures targeting grammatical and lexical aspects of language use in contemporary fiction among women and men authorial styles (Dahllöf, 2023).

3.METHODOLGY

3.1.THE CORPUS AND CORPUS TOOL

In the peresent study, there are particular steps for the research procedure: First, the literary texts were collected to build corpus data. Next, the texts were submitted for analysis of grammatical and thematic functions. Then, the frequencies of linguistic features were listed based on LL values and relative frequencies. Finally, quantitative and qualitative analysis revealed the gender and textual functions in the literary texts with reference to grammar-based text analysis and thematic focus. The analysis was carried out by using of Sketch Engine corpus tool which enables researchers to examine linguistic patterns for different purposes of studies. The compiled corpus data and the corpus information are shown in Table 1. Besides, the literary text is referred to by the abbreviation TSF (The Shirt of Flame) and TW (The Wild). The methods qualitative and quantitative are the main factors in this study, and the corpus tool provides a comprehensive suite of tools for working with large collections of text to analyze language patterns and other linguistic features.

Table 1: Attributes of TSF and TW

Corpus	Year of Publication	Language	Number of Words
TSF	1922	Turkish	56,287
TW	1932	Turkish	53,140

In addition, the analysis of gender and textual functions is the main purpose of the study while literary texts are the objects of the study by revealing the gender differences in language use as authorial styles. Each author is an expression of the unique authorial style in their books, so the textual functions are quite significant to present the stylistic features. In fact, the comparison of the books and authors shows the representation of individual authors. The

compiled corpus was analyzed by means of grammatical functions which are categorized as adjectives, nouns, pronouns, and verbs. These five grammatical categories were extracted from the corpus data by comparing both two authors and two novels. The frequencies of grammatical categories were measured as LL values and relative frequencies. The statistical measure log-likelihood (LL) helps determine whether the observed frequency differences are statistically significant, thereby identifying words or phrases that are particularly characteristic of one corpus compared to another.

In the analysis of thematic focus, the concordance lines were listed based on the main theme in each novel. Gender differences in language use can be also determined based on the findings of thematic focus. This analysis involves identifying and analyzing the dominant topics, motifs, and concerns that are recurrently addressed by the authors. Thematic focus refers to the specific themes or subjects that a text consistently addresses, highlighting the primary concerns and messages (Toolan, 2001). Thematic focus was examined by means of concordance lines in the present study.

4. DATA ANALYSIS AND DISCUSSION

4.1. GRAMMAR-BASED TEXT ANALYSIS

This study discovered to uncover grammatical functions by comparing *The Shirt of Flame* and *The Wild*. Grammatical functions were categories as part of speech like adjectives, nouns, pronouns, and verbs. The frequencies of part of speech are listed while statistical measure LL is used to reveal the relation of differences in the corpora. Grammar-based text analysis represents differences in grammar usage and authorial styles in each literary text. Besides, table 2 shows the type/token ratio of TSF and TW which reflects lexical richness in the corpus.

Table 2. Type/token ratio of the Corpus

Novels	Type	Tokens	Type /token ratio
TSF	16,753	70,889	0,736
TW	17,522	67,877	0,258

Top ten adjectives are listed compared to TSF and TW depending on log-likelihood (LL) values in Table 3.

Table 3. Top ten adjectives in TSF and TW

Adj. TSF	Freq.	Adj. TW	Freq.	LL Values
ak	115	bütün	210	11405.35
genç	99	doğru	98	9909.03
biraz	98	küçük	87	9823.46
siyah	97	yalnız	81	9731.11
küçük	95	başka	80	9529.41
ilk	93	ilk	66	9349.21
bütün	82	tek	64	8233.50
uzun	82	büyük	62	8236.84
beyaz	82	biraz	59	8241.98
yalnız	73	uzun	53	7336.55

The corpus data revealed adjectives that are used more by authors in Turkish novels. In general, adjectives provide additional information about the characteristics, qualities, or quantities of the noun or pronoun they describe. The first adjective is ‘ak’ with 115 frequencies in TSF while the ‘bütün’ adjective is used with 210 frequencies in TW. Interestingly, there are many same adjectives that two different authors used in their literary texts. For instance, the adjectives ‘bütün’, ‘küçük’, ‘yalnız’, ‘ilk’, ‘biraz’ and ‘uzun’. The only differences are frequencies, so the relations of words show LL values which also present the differences among adjectives. As ‘bütün’ is used most in TW, it has 82 frequency values in TSF. Besides, the adjective ‘küçük’ has a close relation among two corpora, and ‘ilk’ is in the same line in both categories. TSF includes descriptive adjectives such as ‘ak’, ‘genç’, ‘siyah’, ‘küçük’, ‘ilk’, ‘uzun’, ‘beyaz’, and ‘yalnız’ which provide specific information about what the noun is like. Nevertheless, the descriptive adjectives ‘doğru’, ‘küçük’, ‘yalnız’, ‘başka’, ‘tek’, ‘ilk’, ‘büyük’ and ‘uzun’ are used in TW. Adivar and Karaosmanoğlu have the same amount of descriptive adjectives in their literary works, and the descriptive adjectives ‘küçük’, ‘ilk’, ‘uzun’, and ‘yalnız’ are written in their novels. In addition, Adivar prefers to use the colors and synonyms like ‘ak’ (115) and ‘beyaz’ (82). The antonym of beyaz which is the descriptive adjective ‘siyah’ is mentioned in the sentences too. The adjective ‘yalnız’ is quite significant for authorial styles because it represents the thematic focus in their novels. In TW, the descriptive adjective ‘yalnız’ has 81 frequency values while it has 73 frequency values in TSF. The difference isn’t important because of the frequency and LL values. Eventually, the word relation occurs in two literary works. Likewise, the quantitative adjectives are mostly mentioned like ‘biraz’ in TSF and TW which indicate the quantity or amount of the noun. Adivar used the quantitative adjective more than Karaosmanoğlu’s novel which contains 59 frequency values.

Table 4. Top ten nouns in TSF and TW

N. TSF	Freq.	N. TW	Freq.	LL Values
ayşe	436	köy	285	43874.83
ihsan	344	kadın	233	34601.91
göz	300	gün	207	30169.23
baş	207	baş	204	20720.15
gün	196	yer	203	19605.54
iç	184	yaban	192	18403.28
el	181	göz	163	18139.86
ateş	162	ses	152	16226.68
ses	138	insan	143	13803.80
yüz	135	türk	139	13504.93

Table 4 illustrates the top ten nouns in each corpus above. The noun ‘ayşe’ is the first one which has 436 frequency values in TSF, but the first noun is ‘köy’ in TW with 285 frequency values. The LL value is high among these nouns, and it reveals that there isn’t a close relation for first nouns in novels. The characters’ names and proper nouns are frequently mentioned like ‘ayşe’ and ‘ihsan’ who are protagonists in Adivar’s novel. Additionally, particular body parts are used such as ‘göz’ (300), ‘baş’ (207), ‘el’ (181), and ‘yüz’ (135). The highest noun which is related to body parts is ‘göz’ in TSF. The common nouns are preferred to indicate a thing as ‘ateş’, ‘ses’, and ‘iç’ which contain authorial preferences in the novel. In the same way, the common nouns are used frequently in TW as ‘kadın’, ‘yer, and ‘yaban’. These common nouns identify particular linguistic functions in the sentences or the context. The nouns ‘göz’ (163) and ‘baş’(204) refer to body parts in TW similar to the TSF corpus. However, Adivar’s writing style presents more usage of body parts than Karaosmanoğlu’s novel. Besides, the first noun is ‘köy’ with 285 frequency values that connect to the place in the novel. The other noun ‘yaban’ is called for the main character in the literary text TW while the noun ‘ateş’ is a symbol and relation for the title and the main topic in TSF. The nouns ‘kadın’ (233), ‘insan’(143), and ‘türk’(139) are other common nouns which are referring any character or society in TSF. Moreover, the noun ‘gün’ is used in both literary texts that refer to time. While the noun ‘gün’ is more frequently used in TW with 207 frequency values, TSF includes the noun ‘gün’ with 196 frequency values.

Table 5. Top five pronouns in TSF and TW

Pron. TSF	Freq.	Pron. TW	Freq.	LL Values
ben	581	ben	762	57918.38
o	335	o	445	33388.92
biz	191	bu	308	18980.23
sen	111	biz	219	10994.85
siz	72	sen	133	7139.42

Five pronouns are extracted from corpora by sorting in Table 5 above. The top five pronouns are almost the same in TSF and TW. As the pronoun ‘ben’ has 581 frequency values in TSF, it is frequently used 762 times in TW. The LL values also indicate the close relation of this pronoun, but the frequency values are different compared to each corpus. The second pronoun is also the same as ‘o’. Thus, LL values are low due to the fact that the frequency isn’t high enough to show the close relation of pronouns. Even though the other pronouns ‘biz’ and ‘sen’ are third in TSF, the other coprus has 219 frequency values for ‘biz’ and ‘sen’. The other pronoun ‘siz’ has the lowest frequency values (72) in TSF.

Table 6. Top five verbs in TSF and TW

Vb. TSF	Freq.	Vb. TW	Freq.	LL Values
ol	325	ol	447	32375.31
de	290	de	362	28930.53
gel	172	gel	195	17182.83
git	148	gör	169	14783.70
bak	138	git	158	13784.27

The top five verbs are shown in Table 6 above. The corpora are similar to each other, so the only difference is the frequency values in each corpus. For instance, the verb ‘ol’ is frequently used 325 times in TSF, but TW indicates 447 frequency values for the verb ‘ol’. The second verb is ‘de’, and the verb ‘gel’ is also the third verb in both literary texts. The last verb in TW ‘git’ has higher frequency values than TSF, but the order is different among corpora. Interestingly, the noun ‘gör’ which is written in TW is a synonym of the verb ‘bak’ in TSF. The literary texts reveal the usage of synonyms between TSF and TW.

4.2.THEMATIC FOCUS

Adivar and Karaosmanoğlu wrote their novels in the Period of National Literature, so the themes represent this particular time in Turkey and different authorial styles. Grammar-based text analysis explained grammatical functions by sorting adjectives, nouns, pronouns, and verbs above. Thus, the grammatical categorization indicated significant thematic focuses in both literary texts. In the analysis of thematic focus, the concordance lines are revealed to concern particular linguistic patterns in the context. For instance, the adjective ‘yalnız’ was written in TSF and TW in the top ten adjectives. It is illustrated TSF corpus in the concordance lines below.

Belki başım dakileri çıkarıp beni **yalnız** bırakmamak için kafamdaki kurşna dokunmuyorlar.

Yalnız annemin alafranga salonunda eşyanın yerini bozacak kadar yerimi değiştirdim, dolaştım.

Yalnız Nezaret'ten çıkan ve bize doğru gelen genç ve şık bir zabiti beklemek için durduk.

Bu ameliyattan da korkuyorum. Ya iyi olursam. Dünyada **yalnız** ne yapacağım?

Concordance 1. Occurences of yalnız in TSF

The concordance line reveals two different meanings of the adjective ‘yalnız’. The first one is about being alone, and the other one means just or only in the sentences. The meaning of being alone was predictable since it is related to the period of Turkish National Literature. On the other side, TW is shown the same adjective below.

Yalnız , içlerinden biri, yaşı belirsiz küçük ve sıska bir adam, döndü: -Dee, sizin gibi yabannı biriydi, dedi.

Bütün vücudunda canlı **yalnız** bir yeri kalmış. O da gözleri imiş.

Fakat ben, buraya **yalnız** düşman zulmünden masun kalmağa gelmedim.Kendi kafamın cevrenden kurtulmak için de geldim.

Türk entelektüli Türk aydını, Türk ülkesi denilen bu engin ve ıssız dünya içinde bir garip **yalnız** kişidir.

Concordance 2.Occurrences of yalnız in TW

Likewise, TW includes the same meanings that convey the meaning of being alone and just /only in the concordance lines. Especially, the last sentence emphasizes that Turkish wise people are alone in this world. The sentence highly highlights the feeling of loneliness in those times. The other meaning ‘just/ only’ is quite the same as Adıvar’s preference for to use of the adjective ‘yalnız’.

Benim bu yeni hayata girişim de unutam ayacağım bir **gün** var.

Seninle Beyazıt'a kadar yürüyelim, hava açık... dedi. O **gün** som urtkandı.

Mütarekeden birkaç **gün** sonra üçümüz Babİâli'den beraber indik.

Concordance 3. Occurences of gün in TSF

Besides, the occurrences of the noun ‘gün’ are cited in both corpora. The concordance line includes TSF corpus to show the noun ‘gün’ below. The usage of noun ‘gün’ is mostly used with adjectives like demonstrative function and numeral function.

Bu, benim son süsüm, son gösterişim, son çalımımdı. Beş on **gün** içinde o da gitti.

Bir **gün** , bir öğle üstü idi. Kahvenin çardağı altında oturuyorduk.

Üç **gün** , üç gece süren bu tören esnasında, bana en acıklı görünen insan, Mehmet Ali'nin bizzat kendi oldu.

Concordance 4.Occurrences of gün in TW

Concordance 4 shows the occurrences of gün in TW, and the noun is mostly mentioned with numbers as one and three. The usage of the noun ‘gün’ in the corpus of TW is also the same in the corpus of TSF. The only difference is that Karaosmanoğlu didn’t prefer to use the noun with demonstrative adjectives in the sentences. Nevertheless, the other noun ‘ses’ is written in each literary text. The concordance line of TSF indicates the usage of the linguistic pattern below.

İster iki kişilik küçük bir oda, ister yüz kişilik bir içtima salonu olsun daima aynı vaziyet, aynı ses.

Kısık bir ses haykırdı: – Yere yatın, tüfekleri beriye atın!

Küçük bir kız çocuğu ağlar gibi tatlı ve nazlı bir ses ağlıyordu.

Concordance 5. Occurance of ses in TSF

The noun ‘ses’ is used with numbers like ‘bir’ in TSF. The adjectives ‘aynı’ and ‘bir’ describe the noun ‘ses’ in the context. In comparison, TW is indicated below by showing the usage of the noun ‘ses’.

Dünyada bundan yanık, bundan elemli bir ses daha bilir misiniz?

İçerisinde tok tok vuran bu ses , onun incecik göğüs tahtasını hurdahaş etmeğe kafiydi.

Sonra gene içimizden bir ses : -Artık imkan kalmadı der.

Concordance 6. Occurance of sses in TW

The corpus of TW also reveals the same usage of the noun ‘ses’ which is used with numbers mostly as adjectives in TSF. In this case, there are the same linguistic patterns in the sentences in two literary texts. Then, the two different nouns are indications of the title and main theme of the novels. Whereas TSF includes the noun ‘ateş’ in the title, the noun ‘yaban’ is a reference to the protagonist and main theme in TW. The concordance line 7 shows the pattern of the noun ‘ateş’ in the corpus below.

Onun için kendimi de bazan bu ateş ve kan hikâyesine karıştırmaktan korkarak başlıyorum .

Niçin ruhumun bu ateş gömleği sırtımdan canıma geçiyor?

Yanaklarında aynı humret, gözlerinde aynı ateş ve ümit vardı.

Benim ateş gömleğim o an azıcık serinledi zannettim.

Concordance 7. Occurance of ateş in TSF

The noun ‘ateş’ is written with the demonstrative adjective ‘bu’ in the first and second concordance lines. However, the third sentence shows both indications of different meanings and usage of nouns in the context. The usage of ‘ateş’ in the third line means that someone has passion or courage about something in his/her eyes. The last line also indicates the possession with the pronoun ‘benim’ in the direction of the noun ‘ateş’. The adjective ‘ateş gömleğim’ is used metaphorically to imply the situation in the literary context. Additionally, the corpus of TW has the same linguistic function as the noun ‘yaban’ that is mentioned in Concordance 8 below.

-**Yabansınız** da ondan, beyim. Bu yaban lafı, beni, önce çok kızdırdı.

Anadolu köylüleri tıpkı eski Yunanlıların kendilerinden başkasına barbar lakabını vermesi gibi her yabancıya **yaban** diyorlar.

Bir gün... bir gün, onlara, ispat edebilecek miyim ki, ben bir **yaban** değilim?

Evvvela bir şehirli, köylülere **yabancı**, hülasa bir **Yaban** olduğu, sonra memleket, adalet sevgisi telkin etmek istediği için.

Concordance 8. Occurance of yaban in TW

The noun ‘yaban’ has a reference to the protagonist in the novel, and the concordance lines directly illustrate the function of this word in the context. For instance, it is like a nickname or name for the person in the first sentence. The noun ‘yaban’ indicates the alienation from the village, and the protagonist hates the name ‘yaban’ which may be understood as the hatred of the name in the line. In the second concordance line, the first-person narrator explains the reason for the name ‘yaban’ to readers. The next sentence points out the rejection and anger for the noun ‘yaban’ which also carries negative meaning for both readers and the protagonist. Thus, the last concordance line reveals that the protagonist implies the goodness of being the wild ‘yaban’ in the village.

5.CONCLUSION

The present study addressed the question of to what extent gender-related differences and textual functions are revealed through the analysis of grammar-based and thematic focus. The literary corpora were compiled to achieve the purpose of the study on the basis of two different novels and gender in the period of National Literature. The methods of qualitative and quantitative were used in terms of corpus stylistic techniques through the Sketch Engine corpus tool. The technique enabled the study to uncover hidden textual meanings and linguistic features in the corpora. Besides, the grammar-based text and thematic focus analysis were carried out depending on frequencies of linguistic features, LL values, and type-token ratio in the literary corpus data. In the grammar-based text analysis, the literary texts were compared by sorting parts of speeches in each corpus. The second part of the analysis was concerning thematic focus to uncover concordance lines which includes key thematic functions in the contexts. Thus, the findings showed that Adıvar and Karaosmanoğlu have similar authorial styles and usage of linguistic features reference to part of speeches and thematic focus. Additionally, there weren't any gender-related differences in the literary texts. Even if Adıvar is a woman author, woman-related words or occurrences weren't directly involved in the context. Thematic focus provided distinct factors for each novel and author, so the usage of metaphor was common in Adıvar's novel with the noun ‘ateş’. On the other hand, the noun ‘yaban’ illustrates the man who is alienated from the village. Other thematic focuses like the words ‘yalnız’, ‘ses’, and ‘gün’ were semantically almost the same usage of the word in the sentences. Eventually, comparable analysis of literary texts emphasized that the thematic and grammatical functions don't involve gender-related differences. Their authorial styles aren't also distinctive from each other's literary texts. For further studies, it is suggested that the period of National Literature may be a factor in describing the events by using similar textual functions in the context. As a whole, the present study hopes to provide a

new perspective and insight that focuses on gender and textual functions in literary texts for the field of corpus stylistics.

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IMPROVING LANGUAGE LEARNING THROUGH AUTHENTIC ASSESSMENT: INVESTIGATING THE EFFICACY OF REAL-WORLD TASKS IN ASSESSING ORAL, WRITTEN, AND INTERACTIVE LANGUAGE SKILLS

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ABSTRACT

This study aims to examine the effectiveness of authentic assessment tasks in assessing language proficiency in a foreign language and provide recommendations for integrating these tasks into foreign language teaching practices improving language learning and assessment outcomes. This study made use of quantitative methods using a questionnaire with four sections to collect data from foreign language teachers: (1) the role of authentic assessment tasks, specifically oral presentations, in assessing oral language proficiency; (2) the advantages and difficulties of utilizing authentic assessment tasks, such as role-plays, in evaluating written language skills; and (3) the efficacy of authentic assessment tasks, particularly written language tasks. The findings indicated that oral presentations offered students a chance to demonstrate communicative competence, linguistic accuracy, and fluency, while realistic assessment activities are recognized as helpful tools in assessing a student's oral language proficiency. Authentic materials help to boost students' motivation and engagement and writing assignments using real-world scenarios are used as an efficient tool for assessing students' abilities in writing, using suitable language registers, and enhancing critical thinking and problem-solving abilities. This relates to how well-written language competence is assessed using real-world assessment tasks, which are crucial in optimizing assessment practices incorporating accurate assessment criteria and constructive feedback. Finally, the findings emphasize the need to integrate real-world assessment tasks into educational methodologies, using significant language learning experiences, and strengthening students' linguistic competence in real-world tasks.

Keywords: Language Learning, Authentic Assessment, Real-World Tasks, Oral, Written, Interactive Language Proficiency.

1. INTRODUCTION

In foreign language teaching, the assessment of language proficiency plays a crucial role in evaluating learners' progress and guiding instructional practices. Traditional assessment methods often focus on discrete language skills and fail to capture learners' ability to effectively communicate in real-world contexts. To address this limitation, the use of authentic assessment tasks has gained considerable attention as a means of assessing language proficiency that reflects real-life language use.

The objective of this study is to investigate the effectiveness of authentic assessment tasks in assessing language proficiency in a foreign language and to provide recommendations for integrating these tasks into foreign language teaching practices to optimize language learning and assessment outcomes. By examining the benefits and challenges of utilizing authentic assessment tasks, such as oral presentations, role-plays, and writing tasks based on real-life scenarios, this study seeks to shed light on their contribution to assessing different aspects of language proficiency. One key focus of this research is on assessing oral language proficiency. Oral presentations, for example, provide an opportunity for learners to demonstrate their ability to express ideas, engage in meaningful conversations, and showcase their pronunciation and fluency. By analysing the impact of authentic assessment tasks on oral language proficiency, this research aims to identify effective strategies for evaluating learners' speaking skills in a foreign language.

Furthermore, the study will explore the benefits and challenges associated with utilizing authentic assessment tasks, such as role-plays, in evaluating written language skills. Role-plays offer learners the opportunity to apply their knowledge of grammar, vocabulary, and discourse patterns in context, simulating real-life situations. By investigating the effectiveness of such tasks in assessing written language proficiency, this research aims to provide insights into their potential as authentic assessment tools. Additionally, the study will assess the effectiveness of authentic assessment tasks, such as writing tasks based on real-life scenarios, in evaluating written language proficiency. These tasks prompt learners to produce written texts that reflect the demands of real-world communication, including coherence, cohesion, and appropriate language use. The research will examine the efficacy of these tasks in accurately assessing learners' writing skills in a foreign language.

Ultimately, this research study seeks to inform foreign language teaching practices by providing recommendations for integrating authentic assessment tasks into instructional settings. By optimizing the alignment between assessment and instruction, language educators can create meaningful learning experiences that enhance students' language proficiency and promote their ability to communicate effectively in real-world contexts.

Research Questions

1. How do authentic assessment tasks, such as oral presentations, contribute to assessing oral language proficiency in a foreign language?
2. What are the benefits and challenges of utilizing authentic assessment tasks, such as role-plays, in evaluating written language skills in a foreign language?
3. How effective are authentic assessment tasks, such as writing tasks based on real-life scenarios, in assessing written language proficiency in a foreign language?
4. What are the recommendations for integrating authentic assessment tasks into foreign language teaching practices to optimize language learning and assessment outcomes?

2. LITERATURE REVIEW

2.1 Exploring the Role of Authentic Assessment Tasks: Evaluating the Contribution of Oral Presentations in Assessing Oral Language Proficiency in a Foreign Language

Assessing oral language proficiency in a foreign language is a complex task that requires the use of appropriate assessment methods. One approach gaining recognition is the integration of authentic assessment tasks, such as oral presentations, which offer a valuable means of evaluating learners' oral language skills in real-life contexts. This section reviews relevant literature on the contribution of authentic assessment tasks, specifically oral presentations, to the assessment of oral language proficiency in a foreign language. Authentic assessment tasks, including oral presentations, have been widely acknowledged as effective tools for evaluating oral language proficiency (O'Sullivan & Chambers, 2016; Wigglesworth, 2017). Oral presentations provide learners with an opportunity to demonstrate their communicative competence, linguistic accuracy, and fluency in a foreign language (Cheng, 2017). They require learners to organize their thoughts, articulate ideas, engage in interactive discourse, and demonstrate their ability to adapt language use to different contexts (Lin & Lu, 2019).

Studies have shown that authentic assessment tasks, such as oral presentations, promote learner engagement and motivation (Boud, 2017; Cheng, 2017). Learners perceive oral presentations as meaningful tasks that mimic real-world communication situations, making them more invested in the learning process (Lin & Lu, 2019). This heightened engagement can positively influence their language production and overall oral language proficiency. Furthermore, authentic assessment tasks like oral presentations provide rich opportunities for assessing a range of language skills beyond mere vocabulary and grammar (Boud, 2017). They allow for the evaluation of learners' discourse management, coherence, organization, and ability to convey meaning effectively (O'Sullivan & Chambers, 2016). Oral presentations also encourage learners to employ strategies such as negotiation of meaning, clarification, and repair, showcasing their communicative competence (Wigglesworth, 2017).

It is important to note that the effectiveness of assessing oral language proficiency through authentic assessment tasks is influenced by various factors. For instance, assessment criteria and rubrics play a significant role in ensuring fair and reliable evaluations (Cheng, 2017). Clear and well-defined criteria can guide assessors in evaluating learners' performance consistently and objectively. Additionally, providing constructive feedback and opportunities for self-reflection can support learners in improving their oral language skills (Lin & Lu, 2019).

The literature demonstrates that authentic assessment tasks, particularly oral presentations, contribute significantly to assessing oral language proficiency in a foreign language. They offer learners opportunities to showcase their communicative competence, linguistic accuracy, and ability to adapt language use in real-life contexts. Incorporating clear assessment criteria and providing constructive feedback is essential for optimizing the effectiveness of these tasks. Overall, the use of authentic assessment tasks like oral presentations enhances the assessment of oral language proficiency and promotes meaningful language learning experiences.

2.2 Benefits and Challenges of Utilizing Authentic Assessment Tasks, Specifically Role-Plays, in Evaluating Written Language Skills in a Foreign Language

Assessing written language skills in a foreign language poses unique challenges, and educators strive to utilize effective assessment tasks to evaluate learners' written proficiency. One approach gaining attention is the integration of authentic assessment tasks, such as role-plays, to evaluate written language skills. This literature review examines relevant studies that highlight the benefits and challenges of utilizing authentic assessment tasks, specifically role-plays, in evaluating written language skills in a foreign language.

Authentic assessment tasks, including role-plays, have been shown to offer several benefits in evaluating written language skills (Brindley, 2017; Khan, 2019). Role plays provide learners with an authentic context to demonstrate their ability to write in a foreign language, as they simulate real-life communication scenarios (Brindley, 2017). By engaging in role-plays, learners are required to apply their knowledge of grammar, vocabulary, and discourse patterns to construct written responses that reflect genuine communication situations.

Research has indicated that authentic assessment tasks, like role-plays, can enhance learners' motivation and engagement (Tang & Xu, 2018). Learners perceive role-plays as meaningful and relevant, which increases their investment in the writing task (Khan, 2019). This heightened motivation can positively influence their language production and overall written language proficiency. Moreover, role-plays offer opportunities for assessing multiple dimensions of written language skills beyond grammar and vocabulary (Brindley, 2017). They provide insights into learners' ability to construct coherent and cohesive written texts, apply appropriate register and tone, and convey meaning effectively (Tang & Xu, 2018). Role-plays also allow for the evaluation of learners' creativity, critical thinking, and problem-solving skills, as they respond to specific scenarios or prompts (Khan, 2019). However, there are certain challenges associated with utilizing authentic assessment tasks like role-plays in evaluating written language skills. One key challenge is the need for clear and consistent assessment criteria (Tang & Xu, 2018). Assessors must establish well-defined criteria and rubrics to ensure fair and reliable evaluations of learners' written responses. This can help maintain consistency across different assessors and ensure that the evaluation focuses on the desired aspects of written language proficiency.

Another challenge lies in providing effective feedback to learners based on the assessment of role-plays (Khan, 2019). Constructive feedback plays a crucial role in guiding learners' improvement in written language skills. It is essential to provide specific feedback that highlights strengths and areas for improvement, while also offering suggestions for further development. To sum up the benefits and challenges of utilizing authentic assessment tasks, particularly role-plays, in evaluating written language skills in a foreign language. Role-plays offer authentic contexts for learners to demonstrate their written proficiency, enhance motivation, and assess various dimensions of writing beyond grammar and vocabulary. Clear assessment criteria and effective feedback are crucial for optimizing the assessment process.

By considering these factors, educators can harness the potential of authentic assessment tasks, specifically role-plays, to evaluate and enhance learners' written language skills effectively.

2.3 Impact of Authentic Assessment Tasks, Specifically Writing Tasks Based on Real-Life Scenarios, in Assessing Written Language Proficiency in a Foreign Language.

Assessing written language proficiency in a foreign language requires the use of effective assessment tasks that capture learners' ability to communicate effectively in written form. Authentic assessment tasks, specifically writing tasks based on real-life scenarios, have gained attention as a means of evaluating written language proficiency. This literature review examines relevant studies that explore the effectiveness of authentic assessment tasks, such as writing tasks based on real-life scenarios, in assessing written language proficiency in a foreign language. Authentic assessment tasks, particularly writing tasks based on real-life scenarios, are effective in evaluating written language proficiency (Alderson, 2019; Fulcher, 2018). These tasks present learners with authentic situations and prompts that mirror real-world communication demands. By engaging in writing tasks based on real-life scenarios, learners are required to demonstrate their ability to write effectively, using appropriate language registers, conventions, and discourse patterns (Fulcher, 2018).

Studies have demonstrated the positive impact of authentic assessment tasks on learners' motivation and engagement (Hamp-Lyons & Condon, 2016; Knoch, 2017). Learners perceive writing tasks based on real-life scenarios as meaningful and relevant, which enhances their investment in the writing process. This increased motivation can positively influence their writing production and overall written language proficiency. Furthermore, authentic assessment tasks offer opportunities to evaluate various dimensions of written language skills beyond grammar and vocabulary (Weigle, 2018). Writing tasks based on real-life scenarios assess learners' ability to organize ideas coherently, use appropriate rhetorical structures, employ effective strategies for text cohesion, and convey meaning effectively (Alderson, 2019). These tasks also provide insights into learners' critical thinking, problem-solving skills, and ability to adapt language use to specific communicative contexts (Knoch, 2017). However, it is important to consider certain factors that can influence the effectiveness of authentic assessment tasks in assessing written language proficiency. One such factor is the need for clear assessment criteria and rubrics (Fulcher, 2018). Well-defined criteria are essential to ensure fair and consistent evaluations of learners' written responses. Clear guidelines help maintain consistency across different assessors and ensure that the evaluation focuses on the desired aspects of written language proficiency.

Additionally, providing constructive feedback is crucial for supporting learners' improvement in written language skills (Weigle, 2018). Effective feedback should highlight strengths and areas for improvement, offering specific suggestions for further development. This feedback encourages learners to reflect on their writing and make targeted improvements in subsequent writing tasks. Authentic assessment tasks, particularly writing tasks based on real-life scenarios, are effective in assessing written language proficiency in a foreign language. These tasks

provide learners with meaningful contexts, enhance motivation, and evaluate various dimensions of writing beyond grammar and vocabulary. Clear assessment criteria and effective feedback are crucial for optimizing the assessment process. By considering these factors, educators can harness the potential of authentic assessment tasks to effectively evaluate and enhance learners' written language proficiency.

3. METHODOLOGY

3.1 Participants

The participants in this study were high school teachers from Durres district. The selection of participants was based on convenience sampling, whereby 167 teachers who were easily accessible and willing to participate were included in the study. Convenience sampling allowed for a practical approach to recruiting participants, considering the logistical constraints of reaching a diverse pool of high school teachers within the specified district. The inclusion criteria were limited to teachers who were actively involved in teaching foreign languages at the high school level in the Durres district.

3.2 Sample

The sample size was determined based on the feasibility of data collection and the resources available for analysis. The study aimed to gather responses from high school teachers to ensure representation across different schools Durres district. The sample likely comprised a diverse group of teachers with varying levels of experience and expertise in teaching foreign languages.

3.3 Method

The methodology employed in this study primarily relied on the administration of a questionnaire to gather data from the participating high school teachers. The questionnaire was designed to explore the effectiveness of authentic assessment tasks in assessing oral and written language proficiency in foreign languages. Before the main data collection phase, the questionnaire underwent a pilot test to assess its reliability and validity. This pilot phase involved a smaller group of teachers to identify and address any issues related to clarity, comprehensibility, and appropriateness of the questionnaire items.

3.4 Data collection

Data collection occurred through an online survey platform, providing a convenient and efficient means of reaching a larger number of participants while ensuring anonymity and confidentiality. The questionnaire collected both quantitative and qualitative responses, allowing for a comprehensive analysis of the effectiveness of authentic assessment tasks. Descriptive and inferential statistical analyses were conducted on the gathered data to examine relationships and differences between variables, providing insights into the benefits, challenges, and recommendations for integrating authentic assessment tasks into teaching practices. Ethical considerations were carefully observed throughout the study, ensuring participant anonymity and confidentiality of responses.

4. RESULTS

4.1 Assessment of Oral Language Proficiency

The study found that oral presentations are highly effective in assessing oral language proficiency in a foreign language. These presentations provide students with opportunities to demonstrate their communicative competence, linguistic accuracy, and fluency. Additionally, the use of realistic assessment activities, such as oral presentations, was identified as beneficial for evaluating students' oral language proficiency. Furthermore, the integration of authentic materials in assessment tasks was found to enhance students' motivation and engagement, ultimately contributing to more effective language learning outcomes.

4.2 Evaluation of Written Language Skills

The research revealed that role-plays are valuable tools for evaluating written language skills in a foreign language. By providing authentic contexts for learners to apply their knowledge of grammar, vocabulary, and discourse patterns, role-plays enhance the effectiveness of writing tasks. Moreover, they were found to increase learners' motivation and engagement, making the writing process more meaningful. However, clear assessment criteria and effective feedback were identified as crucial components for optimizing the assessment process and ensuring fair and reliable evaluations.

4.3 Assessment of Written Language Proficiency

The study demonstrated that writing tasks based on real-life scenarios are effective in assessing written language proficiency. These tasks offer learners meaningful contexts to demonstrate their writing skills and enhance their motivation. Additionally, they allow for the evaluation of various dimensions of writing, including coherence, cohesion, and appropriate language use. To ensure the effectiveness of such tasks, clear assessment criteria and constructive feedback were highlighted as essential elements for supporting learners' improvement in written language skills.

4.4 Recommendations for Integration into Teaching Practices

Based on the findings, the study provided recommendations for integrating authentic assessment tasks into teaching practices to optimize language learning and assessment outcomes. It emphasized the importance of incorporating significant language learning experiences into educational methodologies and strengthening students' linguistic competence in real-world tasks. Moreover, the study underscored the need for clear assessment criteria, constructive feedback, and well-defined rubrics to facilitate effective assessment practices and promote students' language proficiency development.

5. CONCLUSIONS

In conclusion, the study highlights the effectiveness of oral presentations in assessing oral language proficiency in a foreign language. Oral presentations serve as valuable assessment tools by providing students with opportunities to demonstrate communicative competence,

linguistic accuracy, and fluency. The integration of realistic assessment activities, coupled with the use of authentic materials, enhances student engagement and motivation, ultimately contributing to more meaningful language learning outcomes. Moving forward, educators should consider incorporating oral presentations into their assessment practices to accurately evaluate students' oral language proficiency and promote effective communication skills in real-world contexts.

In summary, the study underscores the significance of role-plays in evaluating written language skills in a foreign language. Role-plays offer learners authentic contexts to apply their language knowledge and skills, thereby enhancing the effectiveness of writing tasks. The increased motivation and engagement resulting from role-plays contribute to more meaningful language learning experiences. However, to optimize the assessment process, educators need to establish clear assessment criteria and provide effective feedback to support learners' improvement in writing skills. Integrating role-plays into teaching practices can lead to more comprehensive assessments and better outcomes in written language proficiency.

To conclude, the research demonstrates the effectiveness of writing tasks based on real-life scenarios in assessing written language proficiency. These tasks provide learners with meaningful contexts to showcase their writing skills and foster motivation and engagement. Furthermore, they allow for the evaluation of various dimensions of writing, beyond grammar and vocabulary, including coherence, cohesion, and appropriate language use. Clear assessment criteria and constructive feedback are crucial for guiding learners' improvement in written language skills. Therefore, integrating writing tasks based on real-life scenarios into instructional practices can enhance language learning outcomes and promote students' proficiency in written communication.

In conclusion, the study provides valuable recommendations for integrating authentic assessment tasks into foreign language teaching practices to optimize language learning and assessment outcomes. By incorporating significant language learning experiences and strengthening students' linguistic competence through real-world tasks, educators can create more meaningful learning environments. Additionally, clear assessment criteria, constructive feedback, and well-defined rubrics are essential for effective assessment practices. Integrating authentic assessment tasks into teaching practices aligns assessment with instructional goals, promoting students' language proficiency development across various communicative contexts. Thus, implementing these recommendations can lead to more comprehensive and impactful language learning experiences for students.

6. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed for integrating authentic assessment tasks into foreign language teaching practices to optimize language learning and assessment outcomes:

6.1 Incorporate Authentic Assessment Tasks

Integrate authentic assessment tasks, such as oral presentations, role-plays, and writing tasks based on real-life scenarios, into foreign language teaching practices. These tasks provide meaningful contexts for learners to apply language skills and enhance their motivation and engagement.

6.2 Provide Clear Assessment Criteria

Establish clear and transparent assessment criteria and rubrics for authentic assessment tasks. Clearly defined criteria help maintain consistency in evaluation and ensure that assessments focus on the desired language proficiency outcomes.

6.3 Offer Constructive Feedback

Provide timely and constructive feedback to learners based on their performance in authentic assessment tasks. Feedback should highlight strengths and areas for improvement, guiding learners in their language proficiency development.

6.4 Promote Self-Reflection

Encourage learners to reflect on their performance in authentic assessment tasks and set goals for improvement. Self-reflection enhances metacognitive skills and empowers learners to take ownership of their language-learning journey.

6.5 Integrate Technology

Explore the use of technology to facilitate authentic assessment tasks, such as video recordings for oral presentations or online platforms for collaborative writing tasks. Technology-enhanced assessments offer flexibility and accessibility while providing valuable insights into learners' language proficiency.

6.6 Provide Professional Development

Offer professional development opportunities for language educators to enhance their understanding and implementation of authentic assessment practices. Training sessions, workshops, and collaborative discussions can support educators in effectively integrating authentic assessment tasks into their teaching practices.

6.7 Foster Collaboration

Encourage collaboration among educators within and across language departments to share best practices, resources, and assessment strategies. Collaborative efforts promote continuous improvement and innovation in language teaching and assessment.

6.8 Adapt to Learner Needs

Tailor authentic assessment tasks to meet the diverse needs and preferences of learners. Consider learners' proficiency levels, interests, and learning styles when designing and implementing assessment activities.

6.9 *Evaluate and Adjust*

Regularly evaluate the effectiveness of authentic assessment practices and adjust as needed based on feedback from learners and educators. Continuous improvement ensures that assessment practices remain relevant and responsive to evolving language learning needs.

6.10 *Promote Cultural Authenticity*

Incorporate authentic materials and cultural contexts relevant to the target language into assessment tasks. Cultural authenticity enhances learners' understanding of language use in real-world settings and promotes intercultural competence.

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ENHANCING AGRITOURISM EFFICIENCY IN SHKODRA REGION THROUGH GIS AND ROUTE OPTIMIZATION: A QGIS AND ORS TOOLS APPROACH

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ABSTRACT

Agritourism is a good opportunity for economic development in rural areas and to help sustainable tourism. Our study aims to support this sector using Geographic Information Systems (GIS) and some routing algorithms. Using the QGIS application we mapped some agrotourism points in the region of Shkodra. In this application, we have loaded all the possible roads of the area in the .shp format supported by QGIS, which enables us to highlight all the possible road connections between the points. Then QGIS ORS (OpenRouteService) Tools were used to calculate the shortest and fastest routes between the agritourism points providing us with accurate distances and estimates of the time needed to reach the destination. From the results obtained, we presented in tabular form the access times and distances of all other points starting from each point. The map shows the points of agrotourism and the trajectories that must be traveled to reach them. This study is a good way to highlight on the map the agrotourism points, drawing the trajectory traveled to reach them and other informative data using GIS technology and QGIS application. These maps help tourists in finding the shortest routes, and in planning trips, and help agritourism points to be identified and accessed more easily even though they are located in rural areas. Our study presents practical examples and methods that can be followed by policymakers and stakeholders in the agritourism industry. By integrating the digital map and presenting the travel times, we aim to provide an easy and pleasant travel experience for tourists, thus helping to increase and sustain agritourism in the Shkodra region.

Keywords: QGIS, geographical analysis, agrotourism, OpenRouteService (ORS), shortest path, rural zone.

INTRODUCTION

Agrotourism during the last few years is being watched with interest since such attractions are increasing every year. They help as an additional option to the tourist offer of our country, but also greatly help the economy of the area (Ammirato and Felicetti,2013). They are developed mainly in rural areas where we have a commitment of farmers who produce food products and entrepreneurs who provide service and accommodation. The region of Shkodra has several such

agrotourism points scattered in different geographical locations and sometimes difficult to access from difficult rural roads. To help this problem, in this study, we used Geographic Information Systems (GIS) and routing algorithms to increase the efficiency and accessibility of agro-tourism destinations in Shkodër. Using QGIS we mapped a network of agritourism points along with the road connections between them and the city center of Shkodra where the bus station is located. This was achieved after loading all possible routes of our country and using the OpenRouteService (ORS) extension by which we calculated the shortest and fastest routes between these points thus presenting accurate measurements of distances and times of travel (Zielstra and Hochmair, 2012; Zhou and Tian, 2018).

The main goal is to provide a detailed geospatial analysis that can help design routes to agritourism spots, thus optimizing travel plans and improving the tourist experience. We aim for the agritourism sites to be easily accessible and well-connected with possible routes.

In this paper, we present some results of journeys between agrotourism points near the Shkodra region as well as some results and recommendations at the end that we think are of interest to agrotourism points, the surrounding community, and other interested parties. We have also done other previous research regarding Agrotourism and the impact of GIS (Deda and Zaka, 2024).

LITERATURE REVIEW

Agrotourism is a very good option for the economic recovery of rural areas and offers a diversified option in the tourist market (Barbieri, 2013). Various information technologies are used by agritourism businesses (Deda and Zaka, 2024). GIS technology helps us to place geospatial data as well as other data on maps (Deda and Zaka, 2024). This data make it easy to find information about routes and waypoint locations, as well as to find additional information about them. The locations of destinations as well as the connections between roads and these points can be located and studied very well with the help of GIS maps. OSM (open street maps) is a map that shows us the surface where we want to add information (Neis et al. 2011). All points are connected to each other by roads. These roads are of different qualities (Satheeshkumar et al. 2022). Some roads are interurban and are of better quality and the walking speed is higher, some others are urban, rural or even paths where the speed is also lower. QGIS uses the Dijkstra algorithm (Cormen et al. 2001) to find the shortest path. (Liu and Zhu. 2004) has done a study of the road network of Guwahati city in India using GIS technology. It has addressed the importance of measuring the accessibility of different points and the importance this has for transport planning. He suggests the use of GIS for road and accessibility measurements. Other researchers have analyzed how GIS comes in handy for creating road maps for various purposes. We have also referred to other articles that study GIS, routing algorithms, road categories, etc. (Das et al. 2019; Omar et al. 2022; Jiang et al. 2021; OSM, 2023; Ferster et al. 2020; Hochmair et al. 2015; Ford et al. 2015).

METHODOLOGY

To create the QGIS map and collect the data we analyzed we followed these steps. First, we installed the QGIS application from its website <https://qgis.org/>. We integrated OSM (open street maps) which serves us to present the base map according to the geographical positioning of the region of Shkodra. We imported the shapefile which contains all the roads of different categories and the possible paths in the ".shp" format. Through Vector path => Data management tools => Split Vector layer, we divided the roads according to categories (interurban, urban, paths, etc.) and imported them as a separate layer to distinguish and differentiate them on the map using colors and symbols. With the help of geographical coordinates imported from (Deda and Zaka, 2024), we marked the points of agrotourism in the region of Shkodra and the bus station in the center of the city. Then we installed the ORS tool plugin which will help us calculate the shortest routes and the duration of the trip. We get an API key from <https://openrouteservice.org/dev/#/signup> through which we can use the free options offered by ORS. This tool, using the Dijkstra graph algorithm, allows us to calculate the distances from point to layer or point to point, as well as the duration of the trip according to the type of roads and the allowed speed. We have downloaded the data to Excel to make calculations and comparisons.

RESULTS

To build the maps, we must first install the QGIS application, which is free and can be downloaded from the link <https://qgis.org/>. The version of this application that we have used is 3.38.0-Grenoble which is the last in this version. To start work, we need a basic map on which we will place all the following details, which are: The points of agritourism according to the coordinates of their location, the names of the villages, and the city center where the bus station is. Another element that we will add is the roads that we will categorize and put in different colors to distinguish them. For this reason, from the XYZ Tiles menu, we have selected the OpenStreetMaps option. After choosing this option, the basic map will appear on the work page and we will see OpenStreetMaps as a layer located in the Layers window. Next, we need all the possible roads and paths that are located around the Shkodra area. These data will be downloaded as shapefiles from the official sites that provide them for all countries. The downloaded file that we need to import as a layer in our application has the suffix .shp. This file has the graphs of all the roads which also have some attributes that we need such as category (main road, secondary road, etc.). They have the walking speed which we will need later for distance and time calculations as well as other data. We will divide this shapefile into other shapefiles so that we have separate road categories. We will divide according to the category column and all other attributes will be attached to the corresponding values. To do this, go to Vector => Data management tools => Split Vector layer and then select the division by category. We save the obtained data in a folder in the .shp format. Then we import them all into our application and color them to highlight them. Coloring and other visual characteristics, as desired, are done by clicking with the right mouse button on the layer we want to modify and

selecting properties. In orange we have shown the national roads that connect the cities, in blue we have shown the interurban roads and city rings, while in purple we have shown the unpaved paths. Other roads are left with thin lines and are more numerous (see Figure 1).

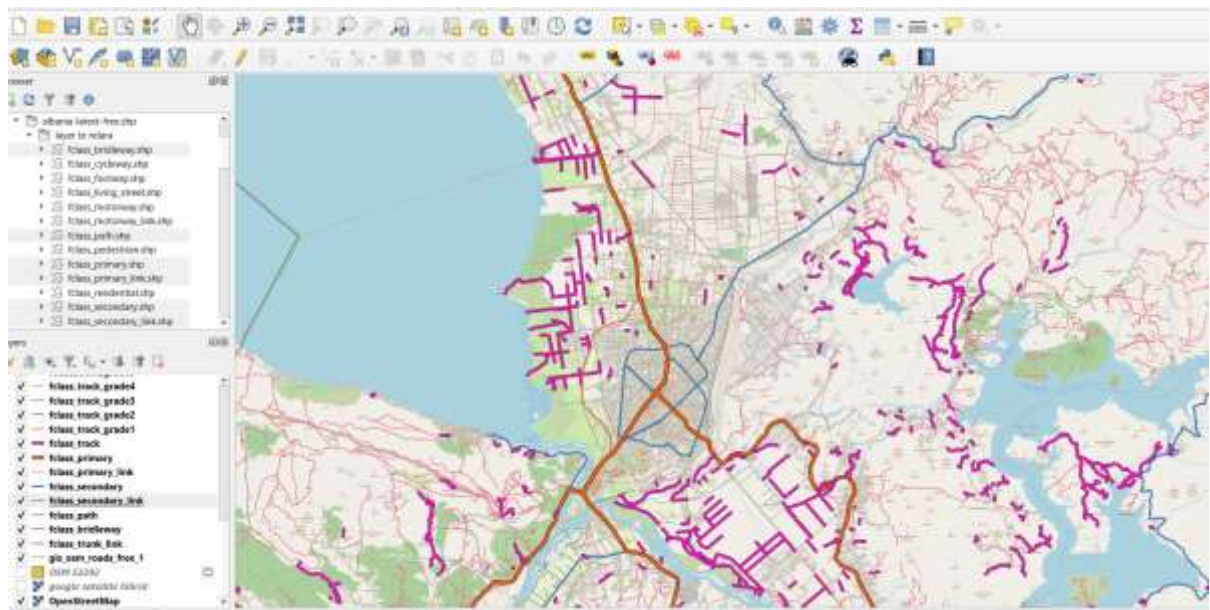


Figure 1. Map of Shkodra. Routes are divided by categories.

After we have built the basic map with the roads, we will continue with the identification of some points of agrotourism as well as the center of the city of Shkodra, which is also used as a public transport station to go to these destinations. We get the geographic coordinates of the agro-tourist points that we will add (Deda and Zaka, 2024) and save them in an Excel table in .csv format. Coordinates consist of latitude and longitude. In the columns, we will place the id column which has the id number that we assigned to the point, the designations column which has the designation of the agrotourism point, and the geographic coordinates which will be two columns with latitude and longitude. Then from Open Data Source Manager => Delimited Text, we import the file we created in .csv. We will be shown the points marked on the map, and we then make visual modifications of shapes, points, and colors as desired (see Figure 2).

There are several ways to go from one point to another, especially those within the city. These roads are connected directly or through other roads. These roads also have their characteristics according to the category, which we colored with different colors to distinguish them. Being different categories, the time of their passage is also different. Graph Theory helps us find the most optimal route to get from one destination to another. QGIS automatically calculates the shortest path from the road network we uploaded.

From all the possible routes that are available to access these agrotourism points, which we have marked in green, in Figure 3, using the Dijkstra algorithm (Cormen et al. 2001), through the program, we have calculated the shortest distances concerning the length of the road and duration starting from any point to go to any other point.

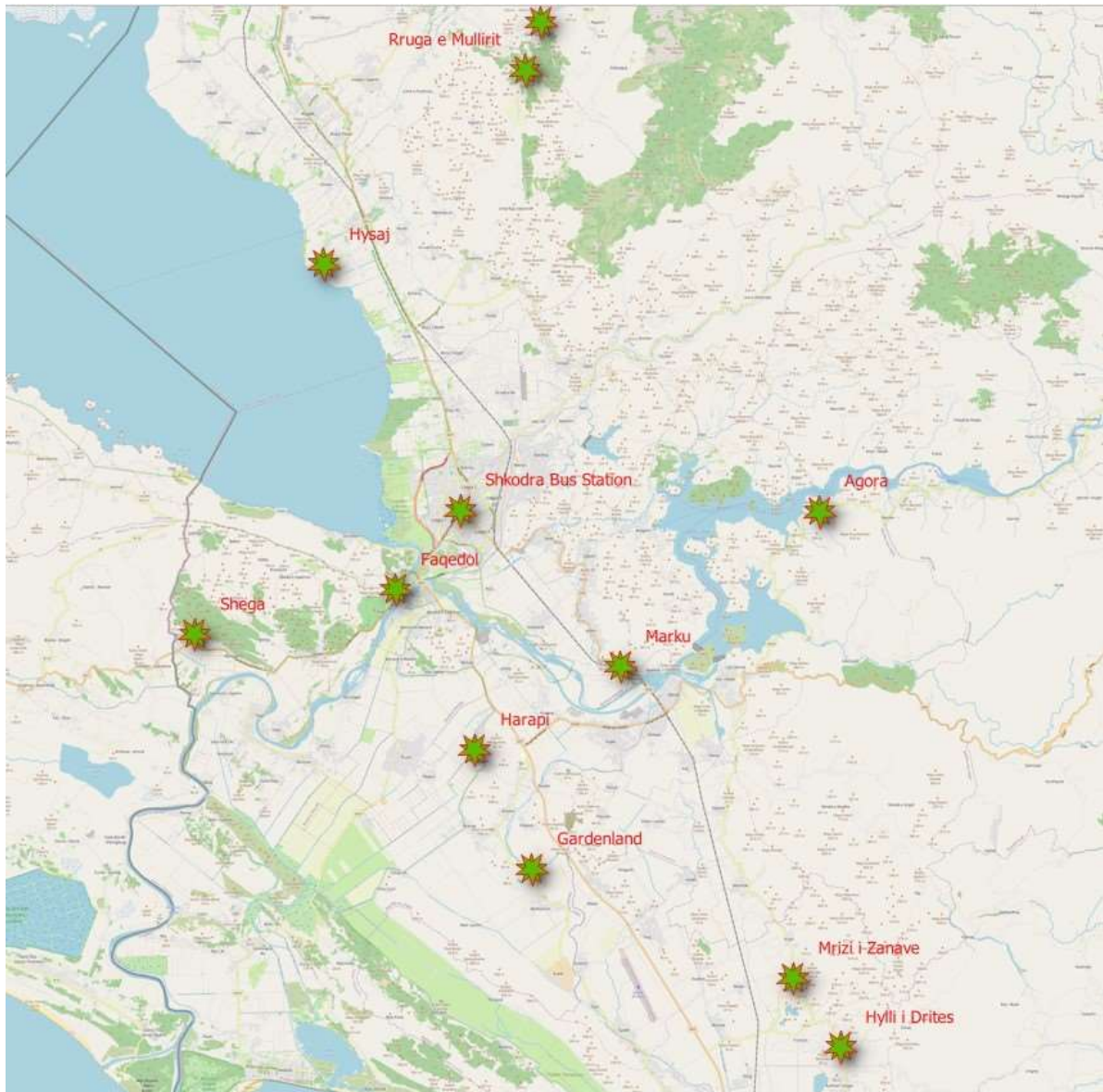


Figure 2. The locations of the agrotourism points and the station in the center of Shkodra.

The Dijkstra algorithm used by QGIS to solve the graph has the following form:

DIJKSTRA (G, ω, s)

```

1 INITIALIZE-SINGLE-SOURCE ( $G, s$ )
2  $S = \emptyset$ 
3  $Q = G.V$ 
4 while  $Q \neq \emptyset$ 
5      $u = \text{EXTRACT-MIN}(Q)$ 
6      $S = S \cup \{u\}$ 
7     for each vertex  $v \in G.\text{Adj}\{u\}$ 
8         RELAX( $u, v, \omega$ )

```

Following this algorithm, our application will begin testing the graph from the starting node to all other nodes until it finds the shortest path. To call this procedure in QGIS we do this.

We install plugins or tools which after being installed, ask us to create an account at <https://openrouteservice.org/dev/#/signup>. This account is free and can be created in a few steps. It gives us a user code (API key) to use this function in QGIS and more precisely from ORS tools. In search, we search for the shortest path and the variants point to point, point to layer, and layer to point are displayed. Point in our case represents a special agritourism site that we have placed on the map, while the "Agritourism Points" layer in our case, represents all the agritourism points that we have memorized there. New layers are created from these calculations and are added to the application in the layer section. In Figure 3, the entire road network is shown in blue.

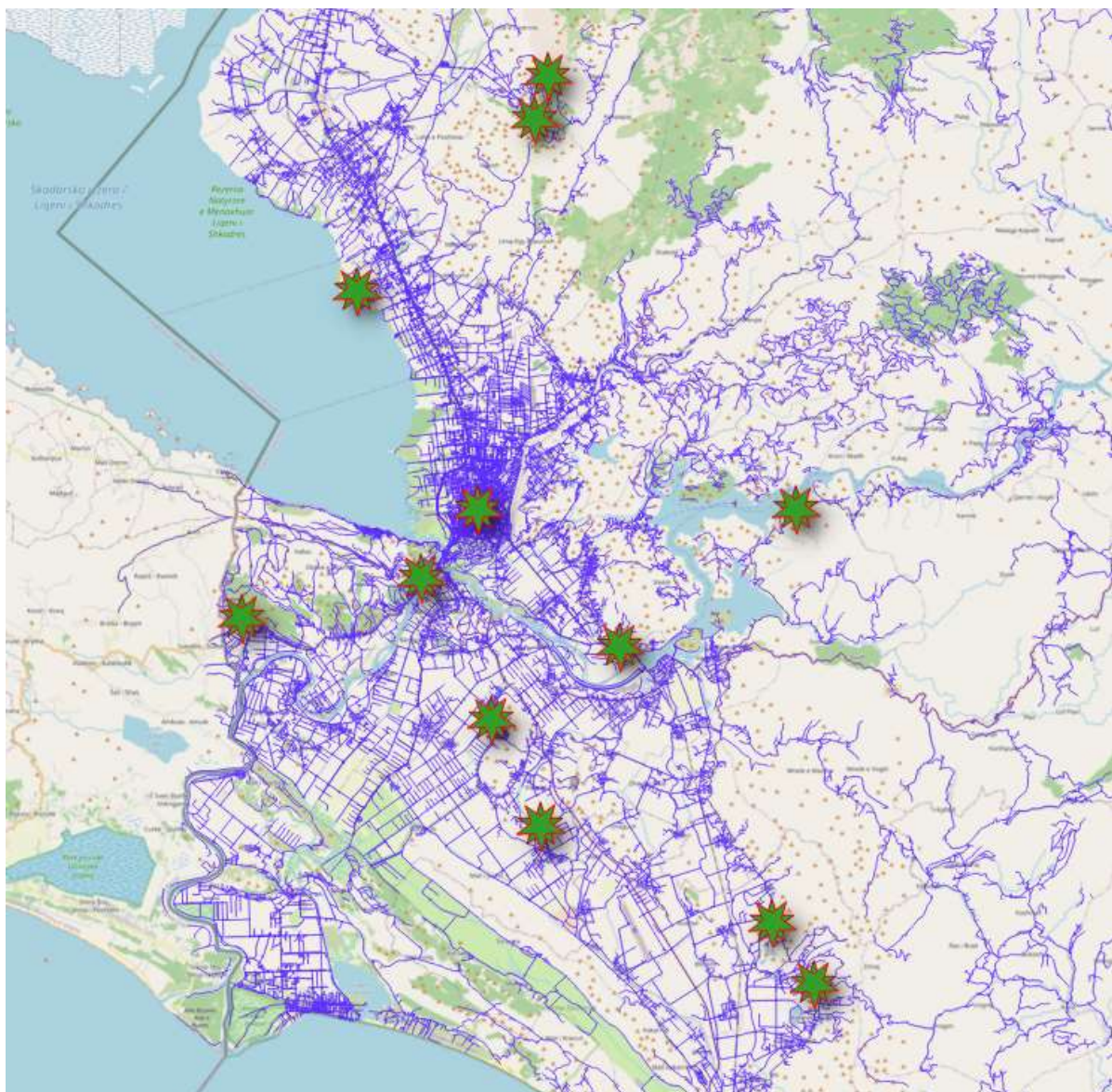


Figure 3. All the possible road networks for the connection between the agro-tourist points that we have chosen.

In Figure 4 shows with thick brown lines and more distinct, the shortest connecting routes of the agritourism points taken in the study, extracted after the execution of the Dijkstra algorithm by the application on the shortest routes.

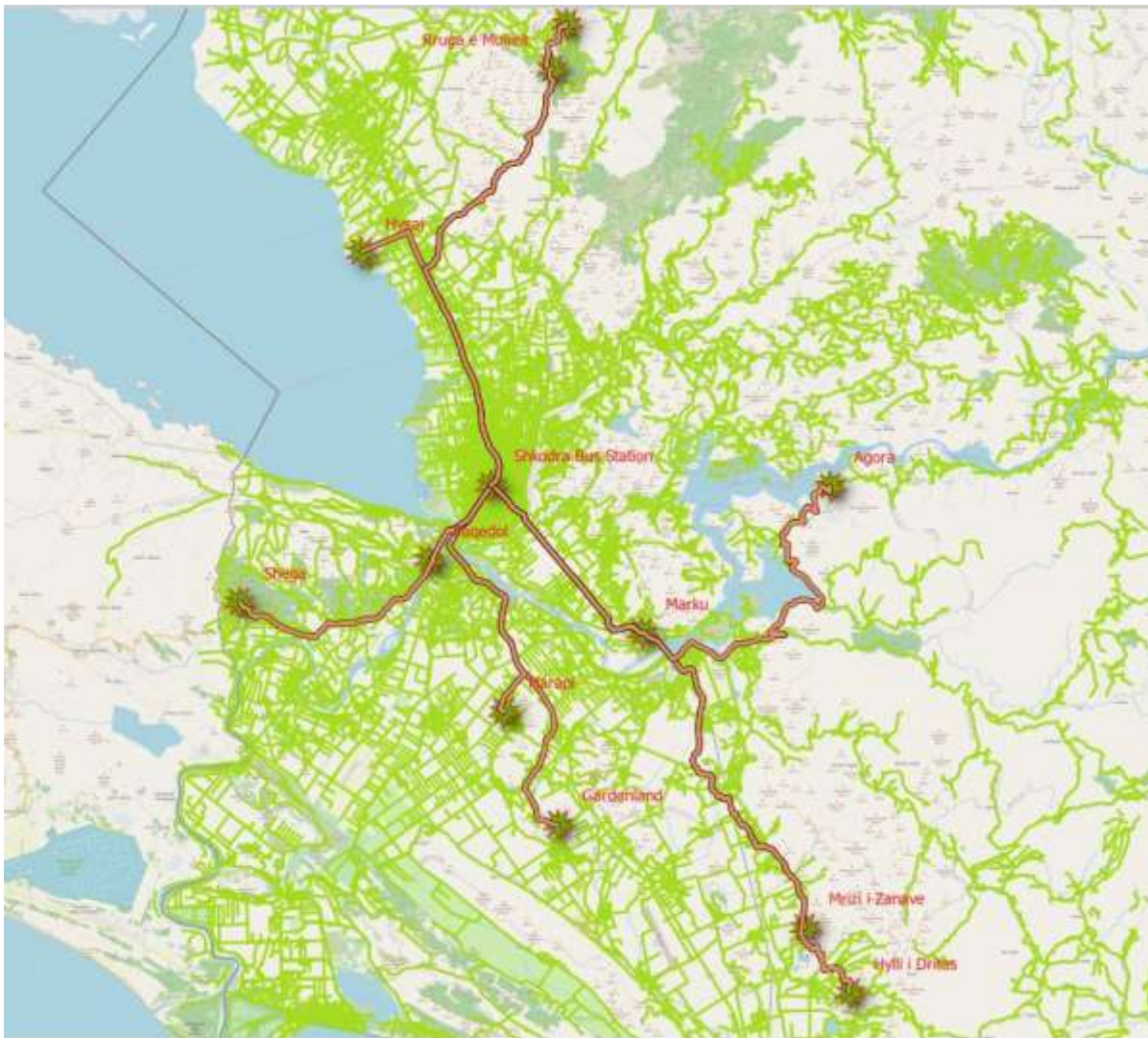


Figure 4. Representation of the shortest connecting routes between agritourism points: all possible routes are shown in green and the shortest routes between points are colored in brown.

From the already created layers of distances, we can export to Excel in tabular form any of the extracted results. We right-click on the layer of each of the selected paths and then click on Export. After that select the type of file we want to save, which we have selected in Excel with the suffix .csv. The parameters we receive in tabular form are the names of the departure point and the arrival point as we have assigned them at the beginning of the application during the data transfer and the mutual distances together with the duration of the trip.

In Table 1, the data on the distances from the center of Shkoder, where the bus station is, and all other points that we have considered are presented. The duration of the journey from one point to another is presented in hours and in the last column we have displayed the distances in kilometers.

Table 1. Distances and time from the bus station with all points.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Shkodra Bus Station	Mrizi i Zanave	0.789413889	28.00028
Shkodra Bus Station	Hylli i Drites	0.889863889	33.7752
Shkodra Bus Station	Gardenland	0.513886111	18.15852
Shkodra Bus Station	Harapi	0.377633333	12.243
Shkodra Bus Station	Marku	0.302855556	9.99908
Shkodra Bus Station	Faqedol	0.168194444	4.70734
Shkodra Bus Station	Shega	0.453408333	15.21236
Shkodra Bus Station	Agora	1.018644444	31.23792
Shkodra Bus Station	Shkodra Bus Station	0	0
Shkodra Bus Station	Hysaj	0.422094444	14.01431
Shkodra Bus Station	Baresha	0.810469444	29.17172
Shkodra Bus Station	Rruga e Mullirit	0.672913889	22.49184

Table 2 shows the route from Agora to any other agrotourism point, as well as the center of Shkodra, where the buses depart. If we notice the distance from Shkodra Bus Station to Agora in Table 1, it was 31.24km, while returning to Table 2, we have 31.49km. The duration also changes from 1.01 hours to 1.03. This happens because of the longest or shortest line traveled during a journey because of a major turn, roundabout, etc., even though we are traveling the same road.

Table 2: Distances and travel time from Agora to any point

FROM_ID	TO_ID	DURATION_H	DIST_KM
Agora	Mrizi i Zanave	0.990666667	29.67271
Agora	Hylli i Drites	1.1303	34.27155
Agora	Gardenland	0.967480556	31.17547
Agora	Harapi	0.916683333	28.89551
Agora	Marku	0.717938889	21.27108
Agora	Faqedol	1.063525	35.25051
Agora	Shega	1.348741667	45.75554
Agora	Agora	0	0
Agora	Shkodra Bus Station	1.027663889	31.4894
Agora	Hysaj	1.4184	44.9861
Agora	Baresha	1.806775	60.1435
Agora	Rruga e Mullirit	1.669219444	53.46363

In Tables 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, the distances and duration of the trip are presented, taking an agrotourism point as the starting point and any of the other points as the destination. Using graph theory and the Dijkstra algorithm our application built in QGIS gives us the shortest path length as well as its duration. The small differences that are seen in time and distance from the way to the return come because of any small deviation that is made on the road due to a turn, roundabout, etc. The distances are shown in km and are the sum of the lengths of all the selected routes and joined in the graph to give the shortest route. Duration is the time

we need to drive from one point to another, calculating the speed allowed on these roads as well as the quality of the terrain. This time is shown in hours.

Table 3: Distance and time from Baresha to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Baresha	Mrizi i Zanave	1.577513889	56.91514
Baresha	Hylli i Drites	1.6624	63.12424
Baresha	Gardenland	1.286419444	47.50756
Baresha	Harapi	1.150169444	41.59205
Baresha	Marku	1.090955556	38.91394
Baresha	Faqedol	0.940727778	34.05638
Baresha	Shega	1.225944444	44.5614
Baresha	Agora	1.806744444	60.15278
Baresha	Shkodra Bus Station	0.813727778	29.29748
Baresha	Hysaj	0.641847222	19.50063
Baresha	Baresha	0	0
Baresha	Rruga e Mullirit	0.184280556	2.96497

Table 4: Distance and time from Faqedoli to any other Point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Faqedol	Mrizi i Zanave	0.767675	28.73617
Faqedol	Hylli i Drites	0.835372222	32.03452
Faqedol	Gardenland	0.459391667	16.41784
Faqedol	Harapi	0.323141667	10.50233
Faqedol	Marku	0.437536111	14.05701
Faqedol	Faqedol	0	0
Faqedol	Shega	0.323694444	11.08222
Faqedol	Agora	1.060033333	35.21777
Faqedol	Shkodra Bus Station	0.204636111	6.13808
Faqedol	Hysaj	0.551783333	19.00915
Faqedol	Baresha	0.940161111	34.16655
Faqedol	Rruga e Mullirit	0.802605556	27.48668

Table 5: Distance and time from Gardenland to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Gardenland	Mrizi i Zanave	0.461505556	15.97011
Gardenland	Hylli i Drites	0.529202778	19.26847
Gardenland	Gardenland	0	0
Gardenland	Harapi	0.227880556	7.35271
Gardenland	Marku	0.413955556	15.02863
Gardenland	Faqedol	0.465530556	16.47032
Gardenland	Shega	0.750747222	26.97535
Gardenland	Agora	0.969286111	31.18256
Gardenland	Shkodra Bus Station	0.548083333	19.56083
Gardenland	Hysaj	0.895233333	32.4319
Gardenland	Baresha	1.283608333	47.5893
Gardenland	Rruga e Mullirit	1.146055556	40.90943

Table 6: Distance and time from Harap to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Harapi	Mrizi i Zanave	0.601538889	20.61243
Harapi	Hylli i Drites	0.669236111	23.91079
Harapi	Gardenland	0.227880556	7.35271
Harapi	Harapi	0	0
Harapi	Marku	0.361838889	12.74887
Harapi	Faqedol	0.327119444	10.54237
Harapi	Shega	0.612333333	21.0474
Harapi	Agora	0.917169444	28.90281
Harapi	Shkodra Bus Station	0.409672222	13.63288
Harapi	Hysaj	0.756822222	26.50395
Harapi	Baresha	1.145197222	41.66135
Harapi	Rruga e Mullirit	1.007644444	34.98148

Table 7: Distance and time from Hylli i Drita to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Hylli i Drites	Mrizi i Zanave	0.156530556	4.93682
Hylli i Drites	Hylli i Drites	0	0
Hylli i Drites	Gardenland	0.529513889	19.27943
Hylli i Drites	Harapi	0.669547222	23.92175
Hylli i Drites	Marku	0.628341667	22.63229
Hylli i Drites	Faqedol	0.839775	32.05928
Hylli i Drites	Shega	1.124991667	42.5643
Hylli i Drites	Agora	1.1303	34.27155
Hylli i Drites	Shkodra Bus Station	0.922330556	35.14979
Hylli i Drites	Hysaj	1.269477778	48.02085
Hylli i Drites	Baresha	1.657855556	63.17826
Hylli i Drites	Rruga e Mullirit	1.5203	56.49838

Table 8: Distance and time from Hysaj to any other point

FROM_ID	TO_ID	DURATION_H	DIST_KM
Hysaj	Mrizi i Zanave	1.187966667	41.75241
Hysaj	Hylli i Drites	1.272852778	47.96151
Hysaj	Gardenland	0.896875	32.34483
Hysaj	Harapi	0.760625	26.42931
Hysaj	Marku	0.701408333	23.75121
Hysaj	Faqedol	0.551183333	18.89365
Hysaj	Shega	0.8364	29.39867
Hysaj	Agora	1.417197222	44.99005
Hysaj	Shkodra Bus Station	0.424180556	14.13475
Hysaj	Hysaj	0	0
Hysaj	Baresha	0.641463889	19.50711
Hysaj	Rruga e Mullirit	0.556236111	15.07263

Table 9: Distance and time from Marku to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Marku	Mrizi i Zanave	0.488708333	18.03344
Marku	Hylli i Drites	0.628341667	22.63229
Marku	Gardenland	0.41215	15.02153
Marku	Harapi	0.361352778	12.74157
Marku	Marku	0	0
Marku	Faqedol	0.441369444	14.14817
Marku	Shega	0.726586111	24.6532
Marku	Agora	0.717938889	21.27108
Marku	Shkodra Bus Station	0.311875	10.25056
Marku	Hysaj	0.702611111	23.74726
Marku	Baresha	1.090986111	38.90466
Marku	Rruga e Mullirit	0.953430556	32.22478

Table 10: Distance and time from Mrizi i Nave to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Mrizi i Zanave	Mrizi i Zanave	0	0
Mrizi i Zanave	Hylli i Drites	0.156530556	4.93682
Mrizi i Zanave	Gardenland	0.461505556	15.97011
Mrizi i Zanave	Harapi	0.601538889	20.61243
Mrizi i Zanave	Marku	0.488708333	18.03344
Mrizi i Zanave	Faqedol	0.771766667	28.74996
Mrizi i Zanave	Shega	1.056983333	39.25499
Mrizi i Zanave	Agora	0.990666667	29.67271
Mrizi i Zanave	Shkodra Bus Station	0.798433333	28.25176
Mrizi i Zanave	Hysaj	1.189166667	41.74845
Mrizi i Zanave	Baresha	1.577544444	56.90586
Mrizi i Zanave	Rruga e Mullirit	1.439988889	50.22598

Table 11: Distance and time from Rruga e Mullir to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Rruga e Mullirit	Mrizi i Zanave	1.440430556	50.24188
Rruga e Mullirit	Hylli i Drites	1.525316667	56.45098
Rruga e Mullirit	Gardenland	1.149338889	40.8343
Rruga e Mullirit	Harapi	1.013086111	34.91879
Rruga e Mullirit	Marku	0.953872222	32.24068
Rruga e Mullirit	Faqedol	0.803644444	27.38312
Rruga e Mullirit	Shega	1.088861111	37.88814
Rruga e Mullirit	Agora	1.669661111	53.47952
Rruga e Mullirit	Shkodra Bus Station	0.676644444	22.62422
Rruga e Mullirit	Hysaj	0.555372222	15.07204
Rruga e Mullirit	Baresha	0.184280556	2.96497
Rruga e Mullirit	Rruga e Mullirit	0	0

Table 12: Distance and time from Shega to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Shega	Mrizi i Zanave	1.052891667	39.2412
Shega	Hylli i Drites	1.120586111	42.53955
Shega	Gardenland	0.744608333	26.92287
Shega	Harapi	0.608358333	21.00735
Shega	Marku	0.722752778	24.56204
Shega	Faqedol	0.323694444	11.08222
Shega	Shega	0	0
Shega	Agora	1.34525	45.72279
Shega	Shkodra Bus Station	0.48985	16.64311
Shega	Hysaj	0.837	29.51417
Shega	Baresha	1.225375	44.67158
Shega	Rruga e Mullirit	1.087822222	37.9917

CONCLUSIONS AND RECOMMENDATIONS

This study presents the use and implementation of the QGIS application in finding and displaying on the map the shortest routes to agrotourism points around the city of Shkodra. Using the spatial data analysis and advanced routing techniques that QGIS offers we have achieved some key findings. Finding the shortest route that takes us from destination to destination using QGIS and ORS Tools. With their help, we found and marked the distances on the map and calculated the durations of the roads that connect the city of Shkodra with agrotourism points around it. We have also presented the types of roads separated by color starting from interurban, and urban roads, paths, and alleys. Through graph theory and the Dijkstra algorithm, the application gives us the shortest routes that increase accessibility and minimize travel time. This is valuable for transport logistics and helps in planning itineraries for visitors. Through maps, users know the quality of the road they will travel. We recommend that the studies of the routes be further deepened and other variants of the routes for a certain destination are also presented which can come in handy in cases of evacuation of the area for various reasons such as fires or even the intervention of ambulances and firefighters and other necessary tools. We aim to continue the study of these agro-tourist points and the interconnection of their routes using graph theory. We will also study specific points of agritourism and use the techniques offered by GIS for the identification of farms around the point, different attractions that belong to that agritourism, the relevant paths to pass, etc. We will also look at the integration of height above sea level. This is important for those agrotourism points that are located on a hill or other area with broken relief, and it is of interest to know the difficulties of the roads and paths.

DISCUSSIONS

The agritourism points around the region of Shkodra are mainly located in rural areas. Being like that, the road to get there sometimes became even more difficult due to the use of village roads. Sometimes these parts of the road are unpaved and narrow to pass. QGIS is a free application that helps us create comprehensive maps in the service of accessing agro-tourist

points. Thanks to the plugins that this application offers us, we can differentiate the road categories. A representation of the quality of the route to the destination, duration, and distance can help the tourist to make the most optimal choice for him. Sometimes we look at a point on Google Maps that doesn't seem far away, but when we often go to rural areas, we can be delayed a lot due to the quality of the road or even turn around and choose another route due to road damage or works. In rural areas, the quality of the Internet is poorer and navigation on the Internet becomes more difficult, so preliminary offline maps can be of great help to users. We think that stimulating the use of GIS and different trainings can bring benefits in improving access and increasing the number of visitors to agrotourism sites.

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HIGH TECHNOLOGY: IMPORTANCE OF CLOUD TECHNOLOGIES

YÜKSƏK TEXNOLOGİYALAR: BULUD TEXNOLOGİYALARININ ƏHƏMİYYƏTİ

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ABSTRACT

The main purpose of the article is to study digital development, the role of high technology, cloud technologies and the internet.

The article explains the concept of high technology, Digital Development, Technological innovations, High Technology, cloud services and their application in various fields are examined.

High-tech is technology that is advanced, the highest form of existing technology. Applied science and technology, including high-tech computing and electronics, is broadly defined as special technical innovation of high complexity. It can be defined as the most sophisticated or newest technology in the market. The opposite of high-tech is low-tech, which often means simple, traditional or mechanical technology. For example, a logarithmic ruler is a low-tech calculating tool.

On February 13, 2017, guided by Article 109, Clause 7 of the Constitution of the Republic of Azerbaijan, with the aim of improving the public administration structure in the Republic of Azerbaijan, as well as adapting the state policy and regulation in the fields of transport, communication and high technologies to the requirements of the modern era and increasing the efficiency of the Republic of Azerbaijan The President issued an order on the establishment of the Ministry of Transport, Communications and High Technologies.

Cloud technologies have already penetrated many areas due to its several advantages. Cost savings, scalability, flexibility, high availability and other advantages have made cloud technologies interesting for e-government. Cloud technologies have already become the priority directions of the state policy of many countries. Most countries around the world recognize the benefits of cloud technologies for public services and have already established their own cloud systems. In addition, many countries have included this technology in their national IT strategy with the aim of using cloud technologies in the future.

The importance of cloud technologies for the public sector has also been highlighted in the guidelines of a number of European institutions. For instance, the European Commission has included the application of cloud technologies in its digital action plan for 2020. It states that "all the countries included in the European Union should adopt a "cloud technologies" strategy,

especially for government and scientific research." In addition, ENISA (European Union Agency for Network and Information Security) in the document adopted in 2010 listed cloud technologies in the first position among the 5 important areas where scientific research should be conducted.

These guidelines show once again that cloud technologies are already part of the main action plan of the state policy and will be part of it in the future.

For this reason, analyzing the current state of application of cloud technologies in the public sector is considered an important issue.

Key words: Azerbaijan, high technology, cloud technology, internet, digital development

Özet

Təqdimatın məqsədi: Rəqəmsal inkişafın, yüksək texnologiyalar, bulud texnologiyaların əhəmiyyətini tədqiq etməkdir. Məqalədə yüksək texnologiya anlayışının izahı verilir, Rəqəmsal İnkişaf, Texnoloji yeniliklər, bulud xidmətləri və onların müxtəlif sahələrdə tətbiqi araşdırılmışdır.

Yüksək texnologiya — qabaqcıl olan, mövcud texnologiyanın ən yüksək forması olan texnologiyadır. Yüksək texnologiya hesablama texnikası və elektronika daxil olmaqla tətbiqi elm və texnika, geniş anlamda yüksək mürəkkəbliyə malik xüsusi texniki yeniliyə deyilir. O, bazarda ən mürəkkəb və ya ən yeni texnologiya kimi müəyyən edilə bilər. Yüksək texnologiyanın əksi sadə, çox vaxt ənənəvi və ya mexaniki texnologiyaya mənasını daşıyan aşağı texnologiyadır. Məsələn, loqarifmik xətkəş aşağı texnologiyalı hesablama alətidir.

2017-ci il 13 fevral tarixində Azərbaycan Respublikası Konstitusiyasının 109-cu maddəsinin 7-ci bəndini rəhbər tutaraq, Azərbaycan Respublikasında dövlət idarəetmə strukturunu təkmilləşdirmək, habelə nəqliyyat, rabitə və yüksək texnologiyalar sahələrində dövlət siyasətini və tənzimlənməsini müasir dövrün tələblərinə uyğunlaşdırmaq və səmərəliliyi artırmaq məqsədi ilə Azərbaycan Respublikasının Prezidenti Nəqliyyat, Rabitə və Yüksək Texnologiyalar Nazirliyinin yaradılması haqqında sərəncam vermişdir.

Bulud texnologiyaları özünün bir sıra üstünlüklərinə görə artıq çoxsaylı sahələrə nüfuz etmişdir. Xərclərə qənaət, miqyaslanma imkanının olması, çeviklik, yüksək əlçatanlıq və digər üstünlükləri bulud texnologiyalarını e-dövlət üçün də maraqlı etmişdir. Artıq bulud texnologiyaları bir çox ölkələrin dövlət siyasətinin prioritet istiqamətlərinə çevrilmişdir. Dünyanın əksər ölkələri bulud texnologiyalarının dövlət xidmətləri üçün faydasını qəbul edir və artıq özlərinin bulud sistemlərini yaratmışdır. Bundan əlavə bir çox ölkələr bulud texnologiyalarından gələcəkdə istifadə etmək məqsədi ilə bu texnologiyaları özlərinin milli IT strategiyasına daxil etmişdir.

Bulud texnologiyalarının dövlət sektoru üçün mühümlüyü həmçinin bir sıra Avropa qurumlarının təlimatlarında da vurğulanmışdır. Məsələn, Avropa Komissiyası bulud

texnologiyalarının tətbiqi məsələlərini 2020-ci il üçün qəbul etdiyi rəqəmsal tədbirlər planına daxil etmişdir. Orada göstərilir ki, “Avropa Birliyinə daxil olan bütün ölkələr xüsusən dövlət və elmi tədqiqatlar üçün nəzərdə tutulmuş “bulud texnologiyaları” strategiyası qəbul etməlidir”. Bundan əlavə, ENISA (European Union Agency for Network and Information Security) 2010-cu ildə qəbul etdiyi sənəddə elmi tədqiqatların aparılması lazım gələndə 5 vacib sahənin sırasında bulud texnologiyalarını birinci mövqedə göstərmişdir.

Bu təlimatlar bir daha onu göstərir ki, bulud texnologiyaları artıq dövlət siyasətinin başlıca tədbirlər planının tərkib hissəsini təşkil edir və gələcəkdə də təşkil edəcəkdir.

Bu səbəbdən bulud texnologiyalarının dövlət sektorunda tətbiqinin müasir vəziyyətinin analiz edilməsi vacib məsələ hesab olunur.

Anahtar kelimələr: Azərbaycan, bulud, texnoloji, internet, dijital inkişaf

Introduction

Cloud Computing refers to providing computing and communications-related services with the aid of remotely located, network-based resources without a user of such resources having to own these resources. The network in question typically, though not necessarily, is the Internet. The resources provisioned encompass a range of services including data, software, storage, security, and so on. For example, when we use a mail service such as Gmail, watch a movie on YouTube, shop at Amazon.com, or store files using DropBox, we are using cloud-based resources (The Google Chrome Team, 2010). In this chapter, the authors examine the evolution of Cloud Computing from its early roots in mainframe-based computing to the present day and also explain the different services rendered by Cloud Computing in today's business and personal computing contexts. This chapter provides a comprehensive view of the rapidly flourishing field of Cloud Computing and sets the stage for more in-depth discussions on its security, trust, and regulatory aspects elsewhere in this compendium.

The Internet, originally conceived as the ARPANET in the late 1960s by the US Department of Defense, was a P2P system (Minar and Hedlund, 2001). Its goal was to facilitate the sharing of computing resources around the U.S. using a common network architecture that would allow every host to be an equal player. Whereas early, widely-used applications like Telnet and FTP were Client-Server applications, the system as a whole was P2P as every Internet host could Telnet or FTP any other host and hosts were not associated in master-slave relationships. The widespread deployment of PCs, first in businesses and then in homes, fueled the rapid proliferation of P2P computing in the 80s and after [1].

Another concept underlying Cloud Computing is Virtualization. Virtualization refers to the simulated creation of something – a computer, an operating system, a storage device, or any other computing or communication resource (such as a wide network) – without having a physical/actual instance of it. This concept dates back many decades and was pioneered beginning in the early 1960's by entities like GE, IBM, MIT, and Bell Labs. Following a few

years of experimenting with one-off, laboratory versions of the concept, the IBM CP-67 mainframe, launched in 1968 and running the CP-CMS operating system, was the first commercial computer to support Virtualization and was installed at eight customer sites [3].

There are several kinds of Virtualization in the computing world. A discussion encompassing all of these kinds is beyond the present scope. Hardware or Platform Virtualization is a common instance that we describe next. In general, Hardware Virtualization results in the creation of one or more “guest” or “virtual” machines (VM) running within a “host” or “actual” machine. This may be accomplished with the aid of software generally called a Hypervisor or Virtual Machine Monitor (VMM). Examples of VMMs include Microsoft’s Virtual Server, VMWare’s GSX, and IBM’s VM/ESA. To each of many guest users supported by a single host, it appears as if an isolated, self-contained computer is available for his/her use although each of these is a virtual machine and not an actual/physical computer. The extent of virtualization in Hardware Virtualization could also differ. There are three levels of Hardware Virtualization called Full Virtualization (near-complete hardware environment simulation to allow guest applications to run un-modified), Partial Virtualization (some hardware environment elements, but not all, are simulated permitting some applications to run un-modified), and Para Virtualization (absolutely no hardware environment simulation but guest applications run in isolated domains and must be modified).

Two common forms of Hardware Virtualization are Server Virtualization and Desktop Virtualization. Thus a single, physical (i.e., host) server could support multiple virtual servers, resulting in fewer physical server instances, energy savings, and maintenance ease. Desktop Virtualization (also called Desktop as a Service (DTaaS), Virtual Desktop, or Hosted Desktop Services) allows users to access an entire computing environment via a remote client device such as a smartphone, tablet, or laptop by running desktops as Virtual Machines on a provider’s server where all desktop user environments are managed and secured. Further, DTaaS allows sharing of virtual desktops among multiple users. By outsourcing Desktop Virtualization, issues such as resource provisioning, load balancing, networking, back-end data storage, backup, security, and upgrades are handled by DTaaS providers such as Citrix [3].

Note that Hardware Virtualization is distinct from Time Sharing. Traditional Time Sharing devotes an entire host computer to multiple users but at different times -- we do not create multiple, self-contained machines, all concurrently available to multiple users. With Virtualization [2], there is the potential for more efficient use of resources (i.e., fewer physical machines, better space efficiency, better energy efficiency (reduced electrical consumption and reduced cooling costs), better security (each user could be running a separate operating system and not sharing one), and increased reliability (a single user could not crash the entire system, only his/her Virtual Machine). However, Virtualization also exacts a toll – the more VMs that are deployed, the greater the potential degradation in performance of each VM and there still are privacy and security risks to the multiple users sharing a single physical host. Even so, as

we shall see subsequently in this chapter, Virtualization is being harnessed as a key enabler of modern Cloud Computing.

Conclusion. While the outlook for migration to cloud services looks bullish according to the cloud pundits, incidents such as these should cause prospective clients to pause, re-consider, and proceed with caution. At the very least, mission-critical applications may not be ready for the cloud without extensive and expensive failsafe measures in place. Moreover, clients must be willing to accept possible cloud-services failures as an integral part of running business on the cloud, much as they must be willing to accept inevitable services outages for their non-cloud-deployed services.

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CHAOTIC ZEBRA OPTIMIZATION ALGORITHM FOR CEC_C06_2019 FOR TEST FUNCTIONS

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ABSTRACT

In recent years, optimization techniques based on swarm intelligence have attracted the attention of many researchers. Zebra Optimization Algorithm (ZOA) is a herd intelligence algorithm created by imitating the social lifestyle of zebra herds. It was created by imitating the movements of zebras searching for food and escaping from predators. When the literature was examined, it was noticed that the R parameter value used in ZOA was not analyzed. In addition, ZOA's success on CEC 2019 test functions has not been presented in the literature. A detailed R parameter analysis was carried out in this study. The most appropriate R value has been determined. Additionally, the effect of population size on ZOA was also examined. In addition, an enhanced Chaotic ZOA algorithm (ChZOA) has been suggested by obtaining the S parameter value, which affects the escape movements of zebras, from chaotic maps. Ten different ChZOA variations were obtained by using ten different chaotic maps frequently used in the literature to obtain the S parameter value. The most successful ChZOA variation was determined by testing on ten different benchmark functions. According to the results, the most successful ChZOA mutation was determined as ChZOA8. By comparing the results with ZOA, the effect of chaotic maps on ZOA was determined. According to the results, obtaining randomly generated parameter values from chaotic maps has a positive effect on the results.

Keywords: Zebra, optimization, chaotic, benchmark

1. INTRODUCTION

Optimization is a technique that aims to optimize the function of input variables in the maximum or minimum direction. Algorithms based on swarm intelligence have been frequently used in optimization techniques in recent years. Swarm intelligence algorithms are generally created by imitating the behavior of social creatures that live in flocks. Many swarm intelligence algorithms have been proposed in the literature. The most important of these are: Particle Swarm Optimization algorithm (PSO) (Wang et al., 2018), Gray Wolf Algorithm (GWO) (Li et al., 2021), Artificial Bee Colony algorithm (ABC) (Karaboga et al., 2014), Ant Colony Optimization (ACO) (İnkaya et al., 2015), Genetic Algorithm (GA) (Mirjalili and Mirjalili, 2019), etc.

Zebra Optimization Algorithm (ZOA) is also a heuristic algorithm based on intelligent herd intelligence. Trojovská et al. proposed ZOA in 1922 (Trojovská et al., 2022). ZOA was created by imitating the foraging and escape movements of zebras against predators. ZOA mimics three different behaviors of zebras. These movements include searching for food, escaping from lions, and escaping from other predators. ZOA's success has been tested in different studies in the literature. Pazhanimuthu et al. used zebra optimization algorithm based on PID controller to improve the voltage profile in the AVR system (Pazhanimuthu et al., 2023). Bui and Duong proposed an improved zebra optimization algorithm for solving transmission expansion planning problem (Bui and Duong, 2024). Zare et al. proposed a maiden application of zebra optimization algorithm for design PIDN-TIDF controller (Zare et al. 2023). Elymany et al. proposed a hybrid optimized-ANFIS based MPPT for hybrid microgrid using zebra optimization algorithm and artificial gorilla troops optimizer (Elymany et al., 2024). Rana et al. proposed a zebra optimization algorithm search for improving localization in wireless sensor network (Rana et al., 2022).

In this study, the ZOA algorithm was developed using chaotic based maps (ChZOA). The S parameter value used for escape movement from predator behavior in ZOA was obtained with ten different chaotic maps and chaotic-based ZOA was proposed. Ten different ChZOA variations created according to chaotic maps were tested on ten different test functions. The benchmark functions are a benchmark function group that includes 10 different benchmark functions, which are frequently used in the literature and whose optimum results are known. In this study, the development of ZOA according to chaotic maps and its success on ten different benchmark functions were examined for the first time. The success of ChZOA was observed from the results obtained. In addition, R parameter analysis for ZOA, which was not presented in the original paper, was performed in this study. The R value for nine different values was run on ten different test functions and the most successful parameter value was determined. Additionally, a population size analysis for ten different values on the ten different test functions for ZOA is suggested in this study. The fact that chaotic-based ZOA is proposed for the first time in this study constitutes the originality of the study. Additionally, R parameter analysis has also been presented to the literature.

This study is organized as follows: In Section 2, the structure of the Zebra Optimization Algorithm, chaotic maps, and ten different benchmark functions definitions are explained. In Section 3, the tests performed for Chaotic ZOA (ChZOA) and ZOA are presented and the results are interpreted. In the last section, the results are explained and future studies are presented.

2. ZEBRA OPTIMIZATION ALGORITHM (ZOA)

Zebras are animals from the horse breed and generally live in eastern and southern Africa. The body feathers of these animals are black and white striped. Their most charismatic features come from this fur structure. Zebras are social living creatures. They exhibit two types of characteristic behaviors in social life. These are: food search and defense behaviors against predators. A zebra leads the zebras in their search for food. Lead zebras are responsible for

guiding other zebras in the herd towards food sources. Zebras exhibit two behaviors to escape predators. The first of these is to escape with a zigzag movement pattern. The second is to come together and try to confuse or scare the predator (Trojovská et al., 2022).

Zebra Optimization Algorithm (ZOA) was created inspired by the behavior of zebras in social life.

Mathematical model of ZOA:

Initialization: The zebra population in ZOA is defined mathematically as candidate solutions searching the search space. Zebras are initially placed randomly in the search space, that is, on the plain where the food sources are located. The position of each zebra is a matrix of decision variables. The number of decision variables varies depending on the problem size. When the population matrix is first created in ZOA, it is randomly generated according to Equation 1 (Trojovská et al., 2022).

$$X = \begin{bmatrix} X_1 \\ \vdots \\ X_i \\ \vdots \\ X_{pop} \end{bmatrix}_{pop \times dim} = \begin{bmatrix} x_{1,1} & \cdots & x_{1,j} & \cdots & x_{1,dim} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{1,i} & \cdots & x_{i,j} & \cdots & x_{i,dim} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{pop,i} & \cdots & x_{pop,j} & \cdots & x_{pop,dim} \end{bmatrix}_{pop \times dim} \quad (1)$$

where X is zebra population, X_i is the i^{th} zebra, $x_{i,j}$ is position for the j^{th} dimension of the i^{th} zebra, pop is the population size of the zebra, and dim is the dimension of the problem.

Each zebra individual represents one candidate solution. By using the size values of each zebra individual, the function values of the target zebras are calculated. Values from the objective function of the zebra population are stored in a matrix. This matrix structure is shown in Equation 2 (Trojovská et al., 2022).

$$Fitness = \begin{bmatrix} Fit_1 \\ \vdots \\ Fit_i \\ \vdots \\ Fit_{pop} \end{bmatrix}_{pop \times 1} = \begin{bmatrix} Fit(X_1) \\ \vdots \\ Fit(X_i) \\ \vdots \\ Fit(X_{pop}) \end{bmatrix}_{pop \times 1} \quad (2)$$

where $Fitness$ is the matrix of the objective function values.

The values obtained with the objective function are compared with the individuals in the population and the leader zebra in the best position is determined. Depending on the type of problem, the zebra with the lowest fitness value or the zebra with the highest fitness value is determined as the best leader zebra. In each iteration, the positions of the zebras and their fitness values in their new positions are updated. Two types of behavior of zebras are used when determining new positions of the zebra population (Trojovská et al., 2022).

These behaviors are: (a) searching for food and (b) defending against predators.

(a) *Foraging behavior:* Zebras spend most of their time eating food. Generally, their food sources are grasses and sedges. One of the zebras is defined as the plains zebra and this zebra leads the population. In ZOA, the best member of the population is considered the lead zebra and leads the other population members towards its position in the search area. Mathematical modeling of this stage is shown in Equations 3 and 4 (Trojovská et al., 2022).

$$x_{i,j}^{new1} = x_{i,j} + rand. (Zebra_j^{Best} - I. x_{i,j}) \quad (3)$$

$$X_i = \begin{cases} X_i^{new1}, & Fit_i^{new1} < Fit_i; \\ X_i, & else, \end{cases} \quad (4)$$

where X_i^{new1} is the new position of the i^{th} zebra based on foraging behavior, $x_{i,j}^{new1}$ is the j^{th} dimension position of the i^{th} new zebra, Fit_i^{new1} is the fitness value of the i^{th} new zebra, $Zebra_j^{Best}$ is the pioneer zebra, $rand$ is a random number in interval $[0, 1]$, and $I = round(1 + rand)$ (Trojovská et al., 2022).

(b) *Defense strategies against predators:*

At this stage, the defense strategies of zebras against their enemies were modeled mathematically in order to update their positions in the search space of the zebra population. Zebras' defense strategies vary depending on the type of their enemies. They escape against their main enemies, the lions, in a zigzag pattern and with a random side-turning movement. They act in a confusing and frightening manner towards other enemies. These two defensive strategies are assumed to be similarly likely. In Equation 5, the defense strategy of zebras against lions is modeled in M1, and the defense strategy of zebras against other predators is modeled in M2. The position of the zebras is updated in Equation 6 (Trojovská et al., 2022).

$$x_{i,j}^{new2} = \begin{cases} M1: x_{i,j} + R. (2. rand - 1). \left(1 - \frac{Iter}{Iter_{max}}\right). x_{i,j}, & S \leq 0.5; \\ M2: x_{i,j} + rand. (Zebra_j^{Attack} - I. x_{i,j}), & else, \end{cases} \quad (5)$$

$$X_i = \begin{cases} X_i^{new2}, & Fit_i^{new2} < Fit_i; \\ X_i, & else, \end{cases} \quad (6)$$

where X_i^{new2} is the new position of the i^{th} zebra based on defense strategies behavior, $x_{i,j}^{new2}$ is the j^{th} dimension position of the i^{th} new zebra, Fit_i^{new2} is the fitness value of the i^{th} new zebra, $Zebra_j^{Attack}$ is the attack zebra, $rand$ is a random number in interval $[0, 1]$, and $I = round(1 + rand)$, $Iter$ is current iteration number, $Iter_{max}$ is maximum iteration number, R is a constant value ($R=0.01$). S is the probability of choosing one of the defense strategies for randomly

generated zebras in the range [0, 1]. Figure 1 shows the flowchart of the ZOA (Trojovská et al., 2022).

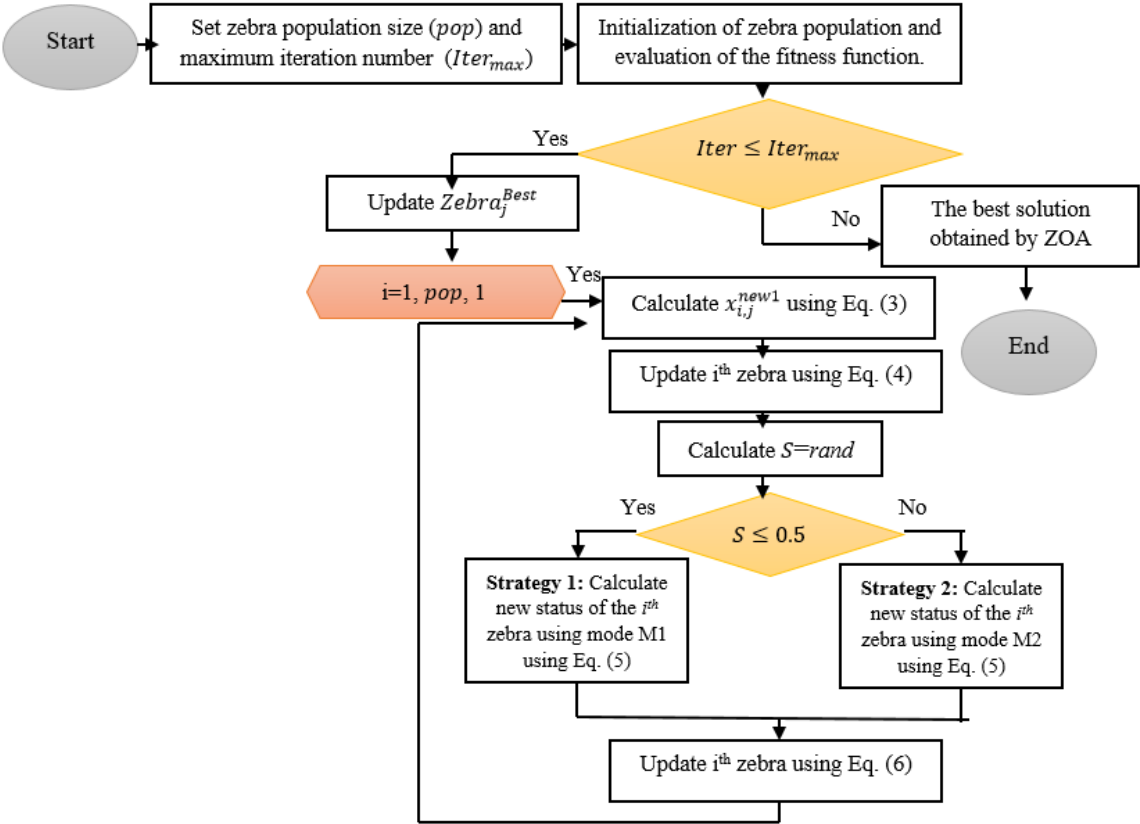


Figure 1. The flowchart of the ZOA (Trojovská et al., 2022).

2.1. Chaotic Zebra Optimization Algorithm (ChZOA)

In this section, the ZOA algorithm has been updated using chaotic maps. Thus, the Chaotic ZOA (ChZOA) algorithm was obtained. In the ZOA algorithm, the randomly generated *S* value used in the search space exploration phase was produced with the help of chaotic maps. In ZOA, the *S* value was used to select any of the defense strategies of the zebra population. There are two defense strategies adopted by the zebra population. At the same time, these defense strategies also improve the zebra population's ability to explore the search space. A zebra individual has an equal right to choose one of these two strategies, depending on the *S* value. Generating the *S* value using chaotic maps instead of generating it randomly improves the ability of zebras to explore the search space. There are 10 chaotic maps frequently used in the literature. In this study, each map was tested on ZOA and the most successful one was selected. Chaotic maps frequently used in the literature are shown in Table 1.

Table 1. Chaotic maps (Li et al., 2022; Aydemir, 2023)

ID	Name	Chaotic map
1	<i>Chebyshev</i>	$x_{k+1} = \cos(k \cos^{-1}(x_k))$
2	<i>Circle</i>	$x_{k+1} = \text{mod}(x_k + b - \frac{a}{2\pi} \sin(2\pi x_k), 1)$
3	<i>Gauss/mouse</i>	$x_{k+1} = \begin{cases} 1, & x_k = 0 \\ \frac{1}{\text{mod}(x_k, 1)}, & \text{otherwise} \end{cases}$
4	<i>Iterative</i>	$x_{k+1} = \sin\left(\frac{a\pi}{x_k}\right)$
5	<i>Logistic</i>	$x_{k+1} = ax_k(1 - x_k)$
6	<i>Piecewise</i>	$x_{k+1} = \begin{cases} \frac{x_k}{P}, & 0 \leq x_k < P \\ \frac{x_k - P}{0.5 - P}, & P \leq x_k < 0.5 \\ \frac{1 - P - x_k}{0.5 - P}, & 0.5 \leq x_k < 1 - P \\ \frac{1 - x_k}{P}, & 1 - P \leq x_k < 1 \end{cases}$
7	<i>Sine</i>	$x_{k+1} = \frac{a}{4} \sin(\pi x_k)$
8	<i>Singer</i>	$x_{k+1} = \mu(7.86x_k - 23.31x_k^2 + 28.75x_k^3 - 13.302875x_k^4)$
9	<i>Sinusoidal</i>	$x_{k+1} = ax_k^2 \sin(\pi x_k)$
10	<i>Tent</i>	$x_{k+1} = \begin{cases} \frac{x_k}{0.7}, & x_k < 0.7 \\ \frac{10}{3}(1 - x_k), & x_k \geq 0.7 \end{cases}$

2.2. Test Benchmarks

In this study, CEC 2019 benchmark functions, consisting of 10 test functions, were determined as fitness functions (Price et al., 2018; Abdullah and Rashid, 2019). Table 2 shows these benchmarks functions definitions.

Table 2. The Definitions of the CEC 2019 Benchmarks Test Functions (Price et al., 2018; Abdullah and Rashid, 2019)

ID	Dimension	Range	f_{min}
Cec1	9	[-8192, 8192]	1
Cec2	16	[-16384, 16384]	1
Cec3	18	[-4, 4]	1
Cec4	10	[-100, 100]	1
Cec5	10	[-100, 100]	1
Cec6	10	[-100, 100]	1
Cec7	10	[-100, 100]	1
Cec8	10	[-100, 100]	1
Cec9	10	[-100, 100]	1
Cec10	10	[-100, 100]	1

3. ANALYSIS ON EXPERIMENTAL RESULTS

In this section, the performance of the ZOA algorithm was tested on benchmark functions. All implemented applications were tested on a machine with Intel Core i5 1.19 GHz processor with 12 GB RAM and Windows 10 (64-bit) Operating System.

First, parameter analysis was carried out for nine different values of the R value ($R=\{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9\}$), which was set as a constant parameter on ZOA. The zebra population size was determined as 30, the maximum number of iterations was determined as 500, and a detailed R analysis was performed. The results are shown in Table 3. In the ZOA original paper, the R value was taken as 0.1. When Table 3 is examined, the most appropriate values for the R value are seen as 0.1, 0.2, and 0.3.

As a second parameter analysis, population size (pop_N) was analyzed on ZOA. The success of ZOA was examined for 10 different population sizes ($pop_N=\{10, 20, 30, 40, 50, 60, 70, 80, 90, 100\}$). The R parameter value was determined as 0.1 and the maximum number of iterations was determined as 500. The results are shown in Table 4. When Table 4 is examined, the most appropriate values for the *population size* (pop_N) value are seen as 90, 80, and 100. As the population size increased, the success of ZOA also increased.

After the most appropriate parameter settings for ZOA were determined, the randomly generated S parameter, which plays an active role in ZOA's ability to explore the search space, was obtained from chaotic maps. The ChZOA algorithm was obtained by integrating ten

different chaotic maps, which are most commonly used in the literature, into ZOA. Ten different ChZOA variations were run on the benchmark functions and the most successful ChZOA variation was determined. In the test of ChZOA variations, the population size was determined as 30, the maximum iteration was 500, and the R parameter value was 0.1. The results are shown in Table 5. Figure 2 shows the sum of mean and std results of ChZOA variations and Figure 3 shows the sum of time results of ChZOA variations. Figure 4 shows the convergence graphs of ChZOA variations and ZOA on benchmark functions. When Table 5 is examined, the most successful ChZOA variations are ChZOA1, ChZOA2, ChZOA3, ChZOA7, ChZOA9 and ChZOA10. When Figure 2 is examined, the most successful ChZOA variation is ChZOA8. According to Figure 3, the fastest working ChZOA variation was ChZOA3. Table 6 shows the comparison results of the ChZOA8 and ZOA on benchmark functions. According to Table 6, ChZOA8 achieved superior results according to the total mean results.

Table 3. R parameter analysis on CEC 2019 benchmark functions

F_No		R=0.1	R=0.2	R=0.3	R=0.4	R=0.5	R=0.6	R=0.7	R=0.8	R=0.9
Cec01	<i>Best</i>	3.90E+11	9.34E+11	2.79E+11	8.52E+11	2.50E+11	8.02E+11	7.45E+11	1.07E+12	1.65E+12
	<i>Worst</i>	2.39E+13	1.42E+13	1.09E+13	2.64E+13	1.82E+13	1.19E+13	1.83E+13	2.44E+13	2.31E+13
	<i>Mean</i>	6.39E+12	5.83E+12	4.53E+12	6.52E+12	5.84E+12	5.69E+12	5.87E+12	7.52E+12	6.36E+12
	<i>Std</i>	6.22E+12	4.30E+12	3.03E+12	5.84E+12	4.55E+12	3.83E+12	4.41E+12	5.51E+12	4.99E+12
	<i>Time</i>	13.60	14.96	12.60	8.89	9.25	8.89	8.95	8.88	8.87
Cec02	<i>Best</i>	4672,6	4155,58	5415,65	8495,98	8244,26	13909,49	10284,55	5391,30	9052,19
	<i>Worst</i>	28994,7	20479,56	24954,69	23040,81	23185,85	24356,17	29155,20	24168,94	25746,86
	<i>Mean</i>	16158,3	14056,93	14623,42	15220,85	15602,66	16946,53	16480,23	15686,08	18188,14
	<i>Std</i>	6033,6	4256,85	4837,80	4478,88	4010,20	2934,03	4278,09	5339,89	3891,42
	<i>Time</i>	0.19	0.11	0.11	0.11	0.13	0.12	0.17	0.23	0.21
Cec03	<i>Best</i>	12,7	12,70	12,70	12,71	12,70	12,70	12,70	12,70	12,70
	<i>Worst</i>	12,7	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Mean</i>	12,7	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Std</i>	0,0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	<i>Time</i>	0.60	0.24	0.26	0.33	0.39	0.40	0.45	0.40	0.38
Cec04	<i>Best</i>	10305,7	17689,74	14272,81	11468,30	12941,21	15079,86	15452,83	10675,07	13710,12
	<i>Worst</i>	53200,0	49319,94	50927,18	43569,54	74143,83	40483,98	52943,27	42875,61	54404,18
	<i>Mean</i>	30539,9	29370,60	29858,20	28801,10	30112,12	28880,14	32580,90	28529,37	29585,99

	<i>Std</i>	10158,3	7838,47	8724,59	9006,61	13311,13	6977,57	10956,95	7188,71	11496,74
	<i>Time</i>	0,25	0,18	0,18	0,25	0,33	0,28	0,21	0,21	0,30
Cec05	<i>Best</i>	4,4	6,22	3,42	4,13	4,36	4,31	4,92	5,90	5,62
	<i>Worst</i>	11,8	12,52	10,83	11,94	10,62	11,43	14,81	11,37	10,60
	<i>Mean</i>	7,5	8,09	7,88	8,03	8,27	8,04	8,61	8,20	7,97
	<i>Std</i>	1,7	1,34	1,79	1,93	1,60	1,86	2,34	1,57	1,41
	<i>Time</i>	0,35	0,24	0,24	0,46	0,42	0,42	0,41	0,40	0,40
Cec06	<i>Best</i>	13,1	13,89	13,53	13,46	11,80	13,97	13,04	12,38	12,97
	<i>Worst</i>	17,6	19,19	17,16	18,65	18,99	17,90	18,15	17,65	18,07
	<i>Mean</i>	15,5	15,95	15,32	15,87	15,60	15,73	15,60	15,53	15,68
	<i>Std</i>	1,2	1,41	1,01	1,43	1,54	1,11	1,15	1,38	1,28
	<i>Time</i>	2,90	4,33	4,43	4,83	4,56	4,85	4,84	4,79	4,44
Cec07	<i>Best</i>	1199,4	1465,52	1154,23	1454,60	1230,14	1252,59	1570,19	1685,81	1441,50
	<i>Worst</i>	2814,8	2999,23	2981,50	3139,61	2832,81	3085,53	2867,55	2792,87	3102,55
	<i>Mean</i>	2144,9	2252,00	2177,83	2348,66	2166,69	2242,83	2262,87	2249,27	2311,92
	<i>Std</i>	452,3	373,50	540,87	471,83	428,14	412,67	330,93	285,85	374,76
	<i>Time</i>	0,43	0,25	0,25	0,24	0,24	0,25	0,24	0,24	0,25
Cec08	<i>Best</i>	7,4	6,94	7,39	7,18	7,01	7,58	7,87	7,24	6,98
	<i>Worst</i>	8,8	8,83	8,83	8,83	8,83	8,69	8,83	8,83	8,83
	<i>Mean</i>	8,3	8,16	8,45	8,38	8,26	8,19	8,48	8,36	8,15
	<i>Std</i>	0,4	0,54	0,49	0,49	0,49	0,28	0,33	0,43	0,55
	<i>Time</i>	0,39	0,32	0,45	0,47	0,44	0,46	0,43	0,45	0,48
Cec09	<i>Best</i>	3744,2	3423,52	3509,08	2345,61	4832,35	3347,38	3269,94	4572,57	2929,06
	<i>Worst</i>	9629,9	9409,41	9712,48	10277,62	10477,51	12065,70	9449,40	10746,66	10120,45
	<i>Mean</i>	6091,7	6536,69	6787,64	5972,27	6929,41	6587,44	5848,84	6750,05	6336,96
	<i>Std</i>	1470,7	1776,77	1585,90	1962,15	1345,63	2144,60	1989,18	1449,13	1804,15
	<i>Time</i>	0,30	0,16	0,17	0,18	0,28	0,34	0,32	0,30	0,29

Cec10	<i>Best</i>	20,6	20,63	20,85	20,66	20,97	20,70	20,75	20,96	20,87
	<i>Worst</i>	21,3	21,34	21,34	21,34	21,34	21,34	21,34	21,34	21,34
	<i>Mean</i>	21,1	21,13	21,11	21,10	21,18	21,18	21,16	21,16	21,16
	<i>Std</i>	0,2	0,18	0,16	0,17	0,12	0,16	0,15	0,12	0,14
	<i>Time</i>	0.26	0.27	0.27	0.31	0.42	0.41	0.41	0.42	0.40

Table 4. Population size parameter analysis on CEC-C06 2019

F_No		popN=10	popN=20	popN=30	popN=40	popN=50	popN=60	popN=70	popN=80	popN=90	popN=100
Cec01	<i>Best</i>	7.86E+11	1.71E+12	3.90E+11	7.80E+11	7.55E+11	4.81E+11	1.44E+11	5.69E+11	2.72E+11	3.81E+11
	<i>Worst</i>	5.17E+13	2.58E+13	2.39E+13	1.51E+13	1.43E+13	6.64E+12	1.11E+13	7.23E+12	4.26E+12	5.22E+12
	<i>Mean</i>	1.50E+13	9.18E+12	6.39E+12	4.21E+12	4.01E+12	3.06E+12	3.69E+12	3.06E+12	2.15E+12	2.61E+12
	<i>Std</i>	1.38E+13	5.98E+12	6.22E+12	3.50E+12	3.14E+12	1.62E+12	2.99E+12	1.51E+12	1.13E+12	1.51E+12
	<i>Time</i>	3.01	9.23	13.60	11.85	14.81	17.73	20.72	23.68	26.65	29.56
Cec02	<i>Best</i>	12129,86	11380,84	4672,65	5632,75	7732,61	8140,36	6063,48	5572,68	4164,45	7143,00
	<i>Worst</i>	31048,42	27133,77	28994,71	22008,33	22694,45	19603,89	22627,49	18868,03	20529,86	20217,62
	<i>Mean</i>	21656,15	19532,36	16158,31	14214,23	15584,15	13136,66	13946,13	13719,94	11149,01	11401,07
	<i>Std</i>	5055,95	4504,75	6033,59	4248,50	4216,79	3533,58	4019,20	3594,91	4014,49	3196,50
	<i>Time</i>	0.05	0.12	0.19	0.39	0.39	0.33	0.37	0.43	0.46	0.54
Cec03	<i>Best</i>	12,71	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	<i>Worst</i>	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Mean</i>	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Std</i>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	<i>Time</i>	0.09	0.24	0.60	0.66	0.52	0.60	0.71	0.79	0.88	0.96
Cec04	<i>Best</i>	25140,94	24199,60	10305,69	7831,41	14878,21	8218,31	9264,44	6105,44	5869,00	13783,22
	<i>Worst</i>	71548,51	57943,71	53199,95	36930,31	36725,56	32630,02	31888,04	34034,15	33879,28	32362,48
	<i>Mean</i>	42780,12	38227,40	30539,90	24907,89	22924,53	21738,74	22106,39	21124,18	21853,59	21757,04
	<i>Std</i>	12983,79	11185,02	10158,27	7731,57	5863,78	6165,67	6135,37	6732,00	7435,81	5608,97
	<i>Time</i>	0.07	0.18	0.25	0.69	0.79	0.87	0.95	1.07	1.17	1.28

Cec05	<i>Best</i>	6,98	6,04	4,37	5,47	4,54	4,72	3,31	5,12	4,96	3,91
	<i>Worst</i>	13,47	11,82	11,84	10,42	9,06	9,69	9,41	9,43	8,27	9,25
	<i>Mean</i>	9,91	8,19	7,55	7,56	6,72	7,53	6,34	7,08	6,19	6,38
	<i>Std</i>	1,82	1,76	1,66	1,23	1,21	1,37	1,51	1,07	0,93	1,36
	<i>Time</i>	0,08	0,18	0,35	0,53	0,81	0,90	0,96	1,00	1,11	1,28
Cec06	<i>Best</i>	14,04	12,88	13,12	12,79	12,91	12,45	13,35	11,40	12,24	12,51
	<i>Worst</i>	20,42	18,21	17,56	17,19	18,10	16,65	16,70	16,58	15,82	15,90
	<i>Mean</i>	17,35	15,81	15,48	15,23	15,32	14,80	15,25	14,46	14,48	14,42
	<i>Std</i>	1,75	1,38	1,19	1,28	1,17	1,19	0,96	1,46	0,89	0,96
	<i>Time</i>	0,92	1,89	2,90	6,04	7,93	9,76	10,74	12,65	12,87	15,82
Cec07	<i>Best</i>	2178,41	1369,69	1199,39	1517,82	1407,35	1734,21	1569,97	1682,77	1354,72	1271,85
	<i>Worst</i>	3318,82	3007,37	2814,76	2775,93	2583,09	2463,21	2545,30	2302,57	2490,34	2225,09
	<i>Mean</i>	2824,23	2259,73	2144,89	2166,44	2013,80	2089,50	2023,27	2005,40	1857,71	1832,31
	<i>Std</i>	363,81	455,86	452,33	310,05	323,45	204,68	300,94	143,02	361,50	272,41
	<i>Time</i>	0,10	0,19	0,43	0,70	0,84	0,93	1,08	1,25	1,57	1,59
Cec08	<i>Best</i>	7,59	7,50	7,43	7,53	7,10	7,68	7,30	6,80	7,17	6,75
	<i>Worst</i>	8,83	8,83	8,83	8,83	8,83	8,83	8,62	8,82	8,72	8,59
	<i>Mean</i>	8,60	8,38	8,34	8,35	8,15	8,18	7,97	8,05	7,94	7,99
	<i>Std</i>	0,34	0,43	0,42	0,37	0,47	0,38	0,36	0,43	0,43	0,48
	<i>Time</i>	0,10	0,23	0,39	0,58	0,65	0,84	1,14	1,21	1,51	1,56
Cec09	<i>Best</i>	2212,93	2465,00	3744,20	1593,35	3046,84	1874,67	3193,37	1895,76	1767,29	1879,63
	<i>Worst</i>	14680,21	10219,46	9629,91	10528,24	9381,78	7861,75	7436,75	7411,52	6455,81	6591,09
	<i>Mean</i>	8531,08	6788,92	6091,74	5327,17	5710,16	5297,82	4961,47	4770,39	4630,45	4856,69
	<i>Std</i>	3202,72	2186,64	1470,66	1903,54	1751,76	1445,55	1162,29	1355,69	1142,56	1173,09
	<i>Time</i>	0,07	0,16	0,30	0,40	0,65	0,89	0,99	1,02	1,16	1,32
Cec10	<i>Best</i>	20,92	20,67	20,59	20,88	20,85	20,68	20,80	20,63	20,73	20,59
	<i>Worst</i>	21,34	21,34	21,34	21,26	21,21	21,34	21,25	21,25	21,27	21,24

	<i>Mean</i>	21,25	21,15	21,11	21,09	21,06	21,04	21,07	21,01	21,04	20,99
	<i>Std</i>	0,14	0,19	0,17	0,11	0,10	0,17	0,14	0,16	0,16	0,15
	<i>Time</i>	0.09	0.21	0.26	0.35	0.43	0.56	0.93	1.13	1.23	1.26

Table 5. The test results of the ten different ChZOA variation on CEC-C06 2019

F_No		ChZOA1	ChZOA2	ChZOA3	ChZOA4	ChZOA5	ChZOA6	ChZOA7	ChZOA8	ChZOA9	ChZOA10
Cec01	<i>Best</i>	7.58E+11	1.09E+12	4.26E+11	4.73E+11	1.73E+12	1.16E+12	1.09E+12	7.42E+11	8.05E+11	6.81E+11
	<i>Worst</i>	1.64E+13	1.41E+13	1.61E+13	2.33E+13	2.49E+13	2.26E+13	2.25E+13	1.03E+13	2.08E+13	1.22E+13
	<i>Mean</i>	6.58E+12	4.86E+12	6.78E+12	7.17E+12	6.48E+12	8.91E+12	8.30E+12	4.44E+12	5.32E+12	4.05E+12
	<i>Std</i>	4.35E+12	3.59E+12	4.08E+12	5.65E+12	5.27E+12	5.68E+12	6.06E+12	2.61E+12	4.53E+12	2.94E+12
	<i>Time</i>	13.722	14.060	14.000	14.991	14.904	14.890	15.123	15.114	14.923	14.136
Cec02	<i>Best</i>	9209,82	13028,50	7000,79	6333,47	8717,61	3099,52	7214,01	4921,35	9537,96	10189,30
	<i>Worst</i>	24918,86	27001,80	24017,13	29963,98	25436,50	22511,67	24057,65	23370,28	24764,71	25097,57
	<i>Mean</i>	17805,62	18770,92	17322,02	15820,58	17245,57	16394,86	14891,31	15082,20	15921,26	16866,79
	<i>Std</i>	4159,79	3680,33	4596,19	6049,44	4591,66	4704,62	4894,19	4726,18	4238,11	4201,28
	<i>Time</i>	0.120	0.126	0.129	0.130	0.136	0.121	0.120	0.120	0.126	0.135
Cec03	<i>Best</i>	12,70	12,70	12,70	12,70	12,71	12,71	12,70	12,70	12,71	12,70
	<i>Worst</i>	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Mean</i>	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71	12,71
	<i>Std</i>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	<i>Time</i>	0.259	0.361	0.417	0.429	0.430	0.427	0.466	0.447	0.449	0.409
Cec04	<i>Best</i>	11197,85	15812,06	12320,54	3998,79	16955,83	19504,99	17608,80	12615,27	19246,87	9542,81
	<i>Worst</i>	45389,01	44328,62	49739,69	40670,91	54234,67	44934,15	49315,63	47965,19	55143,21	43971,34
	<i>Mean</i>	23184,84	29837,94	29290,22	24499,71	33824,05	31790,60	30403,66	29638,41	28268,06	29536,95
	<i>Std</i>	8505,74	7149,17	10298,05	9036,39	9181,78	7065,15	8201,43	9953,37	7328,06	9249,96
	<i>Time</i>	0.181	0.188	0.178	0.208	0.318	0.290	0.293	0.320	0.269	0.279
Cec05	<i>Best</i>	5,19	3,29	4,49	5,14	4,54	5,70	3,47	4,09	3,63	4,32
	<i>Worst</i>	13,18	11,78	11,44	11,15	12,00	12,82	11,22	11,07	11,10	11,60

	<i>Mean</i>	9,03	8,36	7,89	7,71	7,87	8,99	8,26	7,85	7,63	8,32
	<i>Std</i>	1,74	1,82	2,03	1,53	1,78	1,70	1,74	1,80	2,06	1,65
	<i>Time</i>	0.225	0.264	0.230	0.219	0.210	0.206	0.209	0.221	0.205	0.204
Cec06	<i>Best</i>	13,92	14,44	12,68	14,71	13,39	13,90	12,57	13,67	10,99	11,57
	<i>Worst</i>	17,55	17,88	18,60	18,02	17,91	17,99	18,24	17,29	17,41	17,04
	<i>Mean</i>	15,94	16,23	15,67	16,06	16,21	15,58	15,90	15,48	15,54	15,22
	<i>Std</i>	0,99	0,84	1,37	0,83	1,20	1,18	1,38	1,14	1,31	1,50
	<i>Time</i>	4.381	4.444	2.853	2.705	2.718	2.711	2.722	2.728	2.703	2.710
Cec07	<i>Best</i>	1287,32	1481,59	1525,48	1262,79	1566,37	1458,21	1478,12	1475,73	1481,27	1660,05
	<i>Worst</i>	2855,65	2653,23	2614,62	3032,09	2897,97	2822,81	3177,55	2882,31	2752,00	2929,51
	<i>Mean</i>	2235,75	2200,55	2221,54	2219,03	2196,24	2370,93	2315,72	2214,33	2076,42	2340,28
	<i>Std</i>	328,03	322,78	286,33	397,09	370,00	371,20	388,33	361,21	362,97	314,07
	<i>Time</i>	0.284	0.334	0.362	0.444	0.467	0.439	0.442	0.469	0.425	0.427
Cec08	<i>Best</i>	7,29	7,19	6,46	7,05	7,64	7,55	7,12	7,58	6,82	7,43
	<i>Worst</i>	8,83	8,83	8,83	8,83	8,83	8,83	8,83	8,83	8,83	8,83
	<i>Mean</i>	8,39	8,24	8,07	8,13	8,36	8,41	8,41	8,44	8,22	8,24
	<i>Std</i>	0,45	0,55	0,65	0,49	0,41	0,36	0,41	0,37	0,55	0,40
	<i>Time</i>	0.356	0.480	0.413	0.398	0.524	0.513	0.503	0.522	0.472	0.746
Cec09	<i>Best</i>	4202,28	2392,51	4608,91	2139,59	4230,02	3252,63	3121,07	3627,58	2743,03	2260,78
	<i>Worst</i>	11815,25	9791,98	9137,65	9276,81	9669,62	11091,49	9708,63	9952,56	9626,42	10163,02
	<i>Mean</i>	7274,07	6030,66	6624,62	6389,00	6792,91	7166,65	6666,80	6184,42	6566,32	6868,30
	<i>Std</i>	1953,13	1790,37	1342,66	1825,52	1383,60	2161,53	2056,82	1704,51	1642,46	1800,84
	<i>Time</i>	0.189	0.189	0.197	0.255	0.301	0.286	0.329	0.280	0.320	0.371
Cec10	<i>Best</i>	20,79	20,53	20,75	20,82	20,89	20,81	20,90	20,92	20,61	20,91
	<i>Worst</i>	21,34	21,34	21,34	21,34	21,34	21,34	21,32	21,34	21,34	21,34
	<i>Mean</i>	21,13	21,13	21,14	21,09	21,18	21,18	21,13	21,20	21,17	21,16
	<i>Std</i>	0,14	0,23	0,17	0,16	0,12	0,15	0,11	0,13	0,17	0,13

<i>Time</i>	0.256	0.281	0.347	0.508	0.474	0.485	0.446	0.424	0.443	0.443
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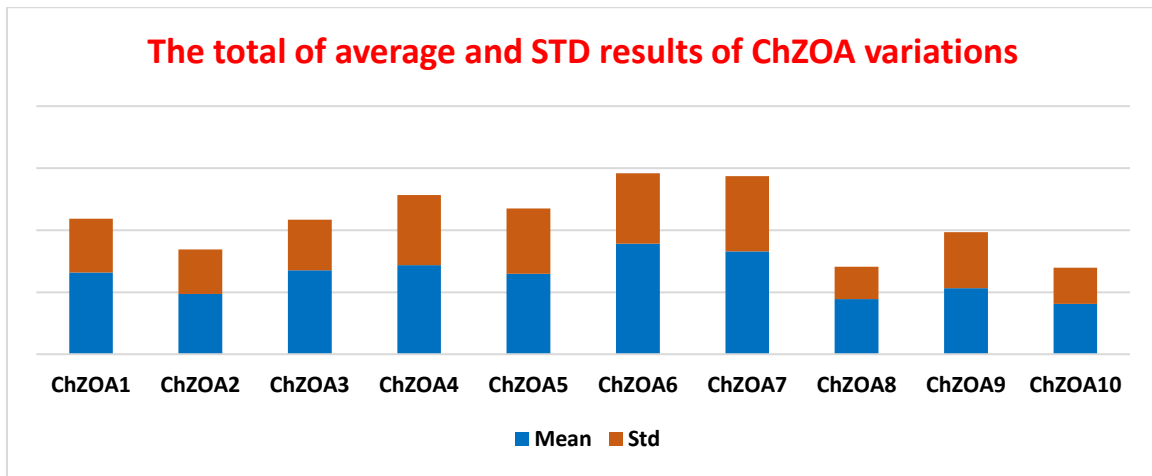


Figure 2. The total of average and STD results of ChZOA variations

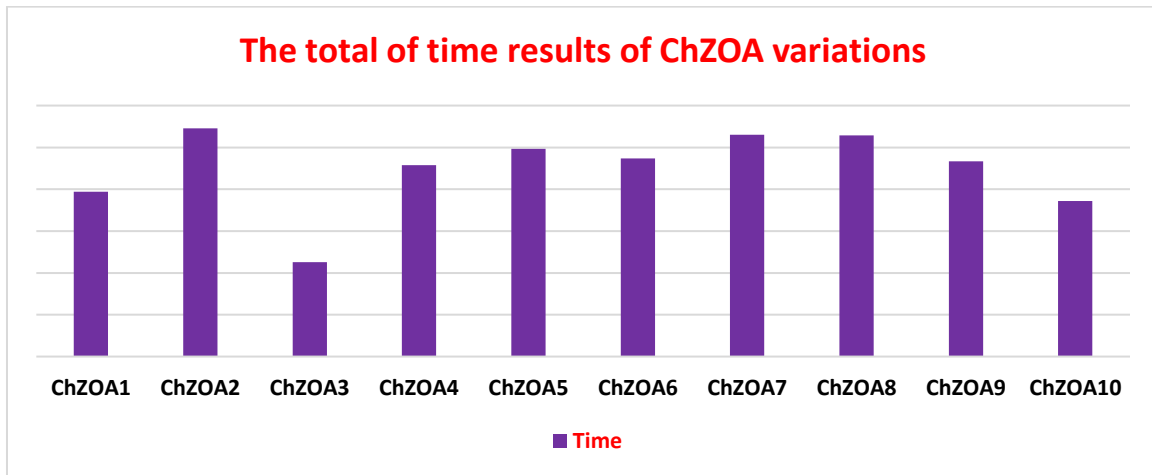
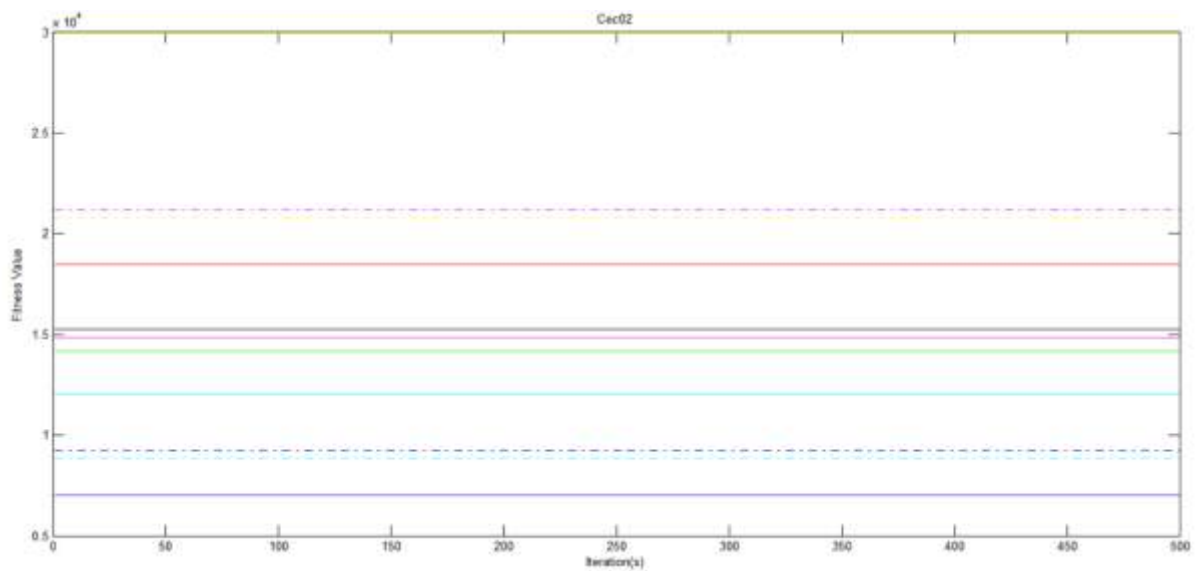
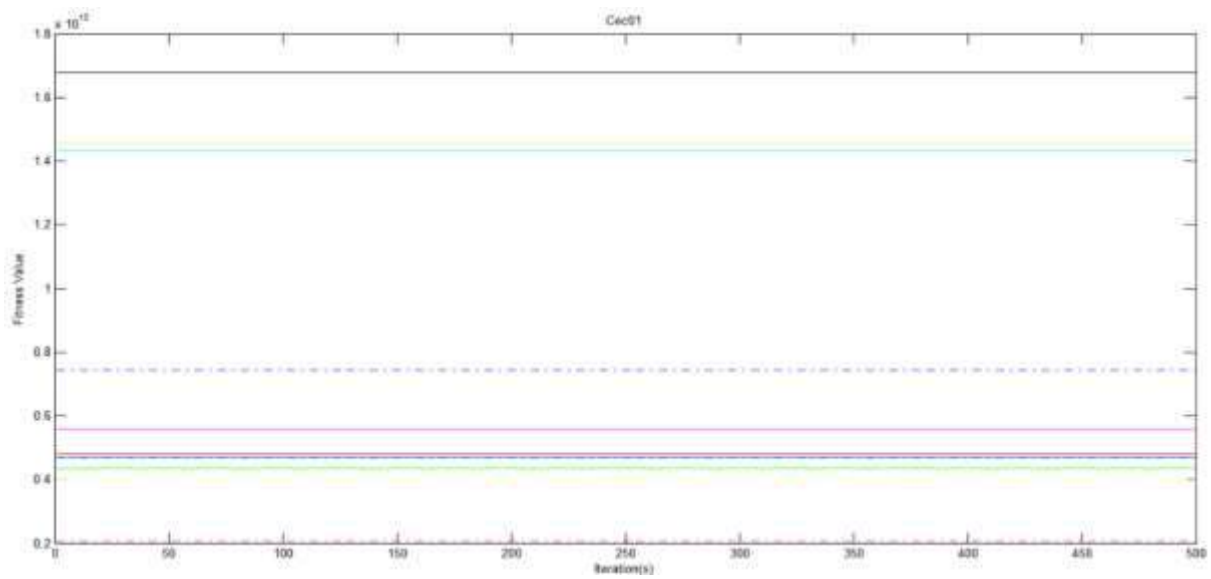


Figure 3. The total of time results of ChZOA variations

Table 6. The comparison results of the ChZOA8 and ZOA on CEC-C06 2019

F_No	ChZOA8					ZOA				
	Best	Worst	Mean	Std	Time	Best	Worst	Mean	Std	Time
Cec01	7.42E+11	1.03E+13	4,44E+12	2,61E+12	15,114	3,90E+11	2,39E+13	6,39E+12	6,22E+12	13,60
Cec02	4921,35	23370,28	15082,2	4726,18	0,120	4670,00	29000,00	16200,00	6030,00	0,19
Cec03	12,7	12,71	12,71	0	0,447	12,70	12,70	12,70	0,00	0,60
Cec04	12615,27	47965,19	29638,41	9953,37	0,320	10300,00	53200,00	30500,00	10200,00	0,25
Cec05	4,09	11,07	7,85	1,8	0,221	4,37	11,80	7,55	1,66	0,35
Cec06	13,67	17,29	15,48	1,14	2,728	13,10	17,60	15,50	1,19	2,90

Cec07	1475,73	2882,31	2214,33	361,21	0,469	1200,00	2810,00	2140,00	452,00	0,43
Cec08	7,58	8,83	8,44	0,37	0,522	7,43	8,83	8,34	0,42	0,39
Cec09	3627,58	9952,56	6184,42	1704,51	0,280	3740,00	9630,00	6090,00	1470,00	0,30
Cec10	20,92	21,34	21,2	0,13	0,424	20,60	21,30	21,10	0,17	0,26
Total mean	4440000053185,04					6390000054995,19				
Rank	1					2				



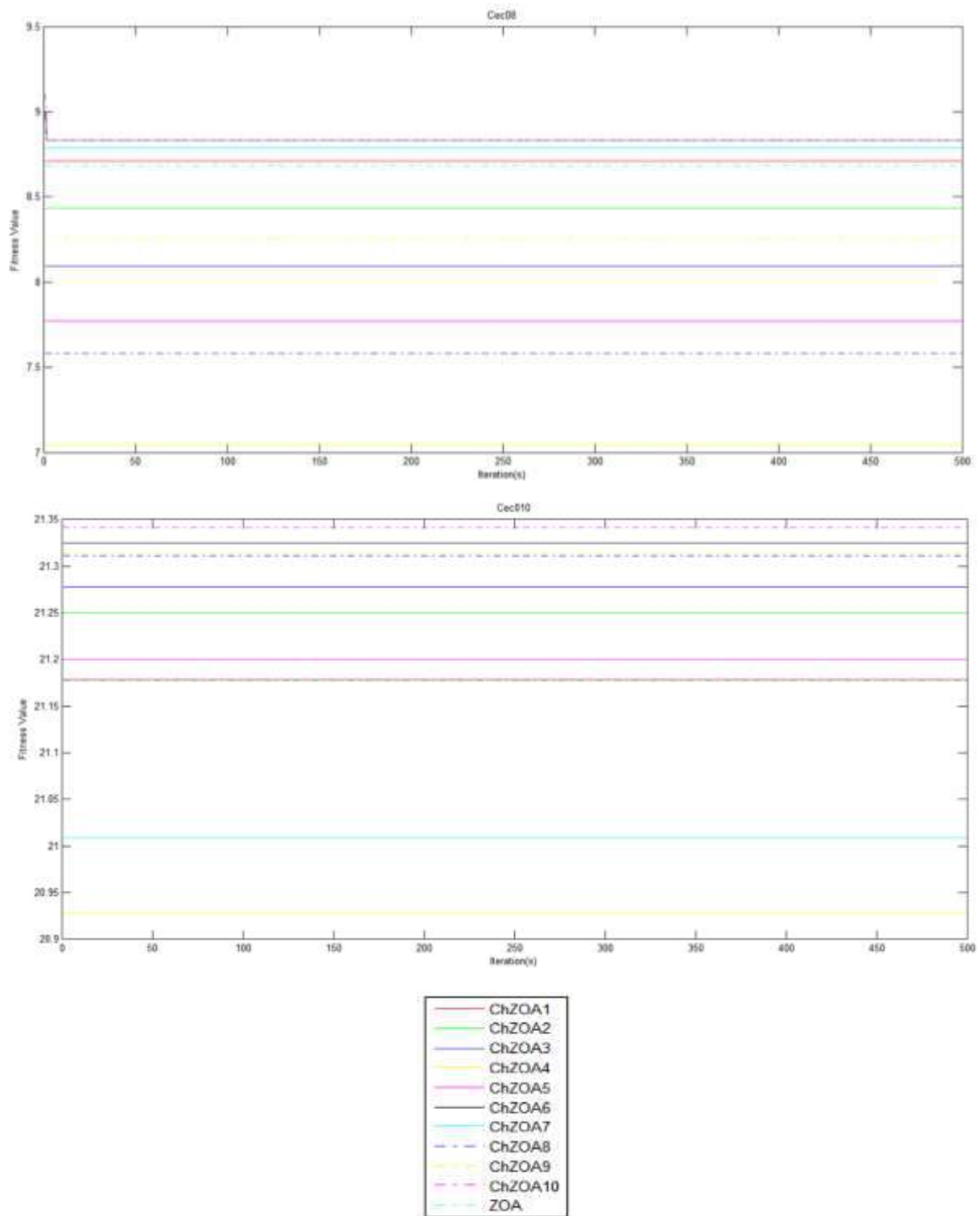


Figure 4. The convergence graphs of ChZOA variations and ZOA on CEC-C06 2019 functions

CONCLUSIONS

In this study, the Zebra Optimization Algorithm (ZOA), created by imitating the social life behaviors of zebras, was examined. They exhibit two types of characteristic behaviors in social life. These are: food search and defense behaviors against predators. ZOA was created by

mathematically modeling these two behaviors. When the literature was examined, it was seen that the success of ZOA on the benchmark functions, which consists of ten functions, was not tested. In addition, it was noticed that no analysis was made for the R parameter value affecting ZOA. In this article, ZOA performed a detailed R analysis on benchmark functions. He found the most appropriate R value to be 0.1. Additionally, the effect of population size on ZOA was analyzed for ten different population sizes. It has been noticed that ZOA success increases linearly with population size. In addition, in ZOA, the S parameter, which zebras use to escape from predators, is randomly generated. The ChZOA algorithm is proposed in this study by obtaining the S value from chaotic maps. By integrating ten different chaotic maps into ZOA, ten different ChZOA variations were obtained. The success of ChZOA variations on CEC-C06 2019 test functions was examined and the most successful ChZOA variation was determined to be ChZOA8. At the same time, by comparing ZOA with the ChZOA8 variation, it was seen that chaotic maps increased the success of ZOA. In this study, ZOA was developed for the first time using chaotic maps and gained originality.

It is planned to test the success of ZOA on different problems in future studies. In addition, it is planned to solve feature selection problems with binary ZOA.

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A NEW BINARY OSPREY OPTIMIZATION ALGORITHM BASED ON TAPER-SHAPED TRANSFER FUNCTIONS

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ABSTRACT

Osprey Optimization Algorithm (OOA) is a metaheuristic algorithm based on swarm intelligence. It was proposed for the first time by Dehghani and Trojovský in 2023. Ospreys are creatures that feed by hunting underwater fish. They have sharp eyesight. They can determine the location of fish underwater from a height of meters and hunt them. They carry the fish they catch to a safe rock and eat there. The OOA algorithm was created by imitating these two movements. OOA's exploration and exploitation capabilities have been tested on CEC-2017, CEC-2011 and engineering design problems. Since the success of OOA in binary optimization problems has not been examined sufficiently, a Binary OOA algorithm is proposed in this study. The continuous search space of BinOOA is mapped to a binary search space with the help of four different taper-shaped transfer functions. In this way, four different BinOOA variations were obtained. The success of the BinOOA algorithm was analyzed on twelve undercapacity facility layout problem datasets of different sizes. The results show that, based on total average results, the most successful BinOOA variation is BinOOA with taper-3 and the least successful BinOOA version is BinOOA-taper2. According to the sum mean and gap results, the most successful BinOOA variants are listed as follows: BinOOA-Taper3, BinOOA-Taper1, BinOOA-Taper4, and BinOOA-Taper2.

Keywords: UFL problem, osprey, taper-shaped, transfer function.

1. INTRODUCTION

The process of selecting an optimal solution from all available options for a given problem is known as optimization. Algorithms for optimization fall into two broad categories. These are intelligent stochastic algorithms and deterministic algorithms. In deterministic algorithms, the solution to a problem is similar in every run. The initial parameter values do not change (Yang, 2008). Stochastic algorithms, on the other hand, use random starting values. In most cases, both can achieve exact ideal solutions. It is also possible to make a more detailed classification of stochastic algorithms heuristics or metaheuristics. Heuristic algorithms are methods that try to find optimal solutions through trial and error. Unlike heuristic algorithms, meta-heuristic algorithms solve optimization problems with some prior knowledge about random search

(Yıldız et al. 2009). It is also possible to group metaheuristic algorithms as physical, evolutionary, bio and herd based.

It is possible to divide optimization problems into continuous and discrete optimization problems according to the type of variables they contain. A metaheuristic algorithm becomes more common as it expands the types of problems it can solve. Metaheuristics, which generally solve continuous optimization problems, can also solve discrete optimization problems with small changes made in their structure. Binary optimization problems are a special form of discrete optimization problems. Binary variables in the search space are used in the solution of the objective function by using them in the structure of the problem.

In this study, Osprey Optimization Algorithm (OOA), a metaheuristic algorithm based on swarm intelligence, was examined. OOA was first proposed by Dehghani and Trojovský in 2023 for continuous optimization problems (Dehghani and Trojovský, 2023). Its success has been tested on CEC-2017, CEC-2011 and real engineering problems. When the literature was examined, it was seen that the success of OOA on binary optimization problems was not tested sufficiently. In this study, a binary version of OOA (BinOOA) was created with four different taper-shaped transfer functions. The success of the proposed four different Binary OOA variations has been tested on the uncapacity facility layout problem (UFLP). UFLP is a popular binary problem that aims to respond to the requests of customers requested from a certain number of serving facilities. The aim of this study is to determine the open or closed status of the facilities by Binary OOA. The objective function is to open the minimum number of facilities and minimize the cost required to meet the demands of all customers from the open facilities. In this study, the success of four different Binary OOA variations on twelve different sized UFLP data sets was analyzed in detail. Analyzing OOA on UFLP using taper-shaped transfer functions is a first in the literature. In this respect, this study shows originality.

2. OSPREY OPTIMIZATION ALGORITHM (OOA)

The osprey is a bird of prey that eats fish during the day. It is also called fish hawk, river hawk or sea hawk. The osprey's upperparts are dark shiny brown and its underparts are pure white. They have narrow-long wings and a short tail (Strandberg, 2013). Ospreys feed on fish in the sea. They have good vision to see objects under water. While ospreys fly above water, they can detect the underwater location of fish. They can dive underwater to catch fish. After catching fish underwater, they carry them to a nearby rock and eat them (Poole et al., 2002; Grove et al., 2009). Inspired by the behavior of ospreys hunting fish and carrying them to a suitable location for eating, the Osprey Optimization Algorithm (OOA) optimization algorithm was proposed. OOA was first proposed by Dehghani and Trojovský in 2023 (Dehghani and Trojovský, 2023).

2.1. Mathematical model of OOA:

In this subsection, the exploration and exploitation capabilities of OOA are modeled based on the natural hunting movements of ospreys.

Initialization:

OOA is a population-based algorithm. The population of OOA includes ospreys. A flock of ospreys is expressed by a matrix as shown in Equation 1. The initial positions of the osprey flock in the search space are initialized randomly as shown in Equation 2. Each osprey in the osprey flock is a candidate solution to the relevant problem. The solution for each osprey is calculated using the objective function. These solution results are displayed with the help of a matrix, as in Equation 3 (Dehghani and Trojovský, 2023).

$$X = \begin{bmatrix} X_1 \\ \vdots \\ X_i \\ \vdots \\ X_M \end{bmatrix}_{M \times D} = \begin{bmatrix} x_{1,1} & \cdots & x_{1,j} & \cdots & x_{1,D} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{1,i} & \cdots & x_{i,j} & \cdots & x_{i,D} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{M,i} & \cdots & x_{M,j} & \cdots & x_{M,dim} \end{bmatrix}_{M \times D} \quad (1)$$

$$x_{i,j} = LB_j + rand_{i,j} \times (UB_j - LB_j), \quad i = 1, 2, 3, \dots, M; j = 1, 2, 3, \dots, D \quad (2)$$

$$Objective = \begin{bmatrix} Obj_1 \\ \vdots \\ Obj_i \\ \vdots \\ Obj_M \end{bmatrix}_{M \times 1} = \begin{bmatrix} Obj(X_1) \\ \vdots \\ Obj(X_i) \\ \vdots \\ Obj(X_M) \end{bmatrix}_{M \times 1} \quad (3)$$

where X is the positions of the osprey population, X_i is the i th osprey, $x_{i,j}$ is the j th dimension of the i th osprey, M is the number of the ospreys in osprey population, D is the problem dimension, $rand_{i,j}$ is a random number in the interval $[0,1]$, UB_j and LB_j are upper boundary and lower boundary of the problem, respectively. *Objective* is the vector of the fitness function values, Obj_i is the fitness function value of the i th osprey (Dehghani and Trojovský, 2023).

a- Exploration phase: Determining the position of the fish under water and hunting the fish

Thanks to their strong vision abilities, ospreys can easily determine the positions of fish under water. Once the location of the fish is determined, the osprey dives underwater and hunts the fish. Inspired by this behavior of ospreys, OOA's ability to explore the search space was developed. Ospreys with better fitness values than each osprey in the exploration ability of OOA were considered as underwater fish. This situation is shown in Equation 4. The osprey randomly determines the location of one of the underwater fish assigned to it. The osprey then attacks the fish. This behavior is shown in Equations 5-6. Objective function values are calculated according to the new location of the ospreys. If they have obtained a better objective function value in the new location, their old location is updated to the new location. If it is not obtained, no update is made to its old location (Dehghani and Trojovský, 2023).

$$FishPosition_i = \{X_k | k \in \{1,2,3, \dots, N\} \wedge Obj_k < Obj_i\} \cup \{X_{best}\} \quad (4)$$

$$x_{i,j}^{P1} = x_{i,j} + rand_{i,j} \times (SelectedFish_{i,j} - I_{i,j} \times x_{i,j}) \quad (5)$$

$$X_i = \begin{cases} X_i^{P1}, & Obj_i^{P1} < Obj_i; \\ X_i, & else, \end{cases} \quad (6)$$

where $FishPosition_i$ is the set of fish positions of the i th osprey, X_{best} is the position of the best osprey, X_i^{P1} is the new position of the i th osprey, Obj_i^{P1} is the fitness function value of the new osprey position, $SelectedFish_{i,j}$ is the position of the selected fish for i the osprey, $rand_{i,j}$ is a random number in the interval $[0,1]$, $I_{i,j}$ are the random numbers from the set $\{1,2\}$ (Dehghani and Trojovský, 2023).

b- Exploitation phase: Moving the caught fish to the appropriate position

After hunting fish, ospreys carry them to a safe place to eat. This behavior of ospreys is represented as exploitation behavior in OOA. This behavior has enabled the development of local search in OOA. With Equation 7, new locations for ospreys to eat fish are calculated. If the fitness values of ospreys are better in this new location, their old location is updated to the new location. Otherwise, there will be no change in their old positions. This situation is shown in Equation 8 (Dehghani and Trojovský, 2023).

$$x_{i,j}^{P2} = x_{i,j} + \frac{LB_j + rand_{i,j} \times (UB_j - LB_j)}{iter}, i = 1, 2, 3, \dots, M; j = 1, 2, 3, \dots, D; iter = 1, 2, 3, \dots, Iter_{max} \quad (7)$$

$$X_i = \begin{cases} X_i^{P2}, & Obj_i^{P2} < Obj_i; \\ X_i, & else, \end{cases} \quad (8)$$

where X_i^{P2} is the new position of the i th osprey, Obj_i^{P2} is the fitness function value of the new osprey position, $rand_{i,j}$ is a random number in the interval $[0,1]$, $iter$ is current iteration number of the algorithm, $Iter_{max}$ is maximum iteration number of the algorithm (Dehghani and Trojovský, 2023). Pseudo-code of OOA is shown in Algorithm 1 and flowchart of OOA is shown in Figure 1.

Algorithm 1: Pseudo-code of OOA (Dehghani and Trojovský, 2023)

Start OOA

Input: Setting the input parameters of OOA and the problem (M , D , *Objective Function*, $Iter_{max}$, UB, LB)

- 1: Creating the osprey population using Eqs. (1) and (2)
- 2: Evaluation of the osprey population using Eq. (3)
- 3: Setting $i=1$ and $iter=1$
- 4: **For** $iter=1$ to $Iter_{max}$
- 5: **For** $i=1$ to M
- 6: **Phase 1: Exploration phase**
- 7: Update $FishPosition_i$ using Eq. (4)
- 8: Determine the $SelectedFish_{i,j}$ by the i th osprey at random
- 9: Calculate new position of the i th new osprey ($x_{i,j}^{P1}$) using Eq. (5)
- 10: Update X_i using Eq. (6)
- 11: **Phase 2: Exploitation phase**
- 12: Calculate the new position of the i th new osprey ($x_{i,j}^{P2}$) using Eq. (7)
- 13: Update X_i using Eq. (8)
- 14: **End**
- 15: Save the best osprey found so far
- 16: **End**
- 17: Print the best osprey

End OOA

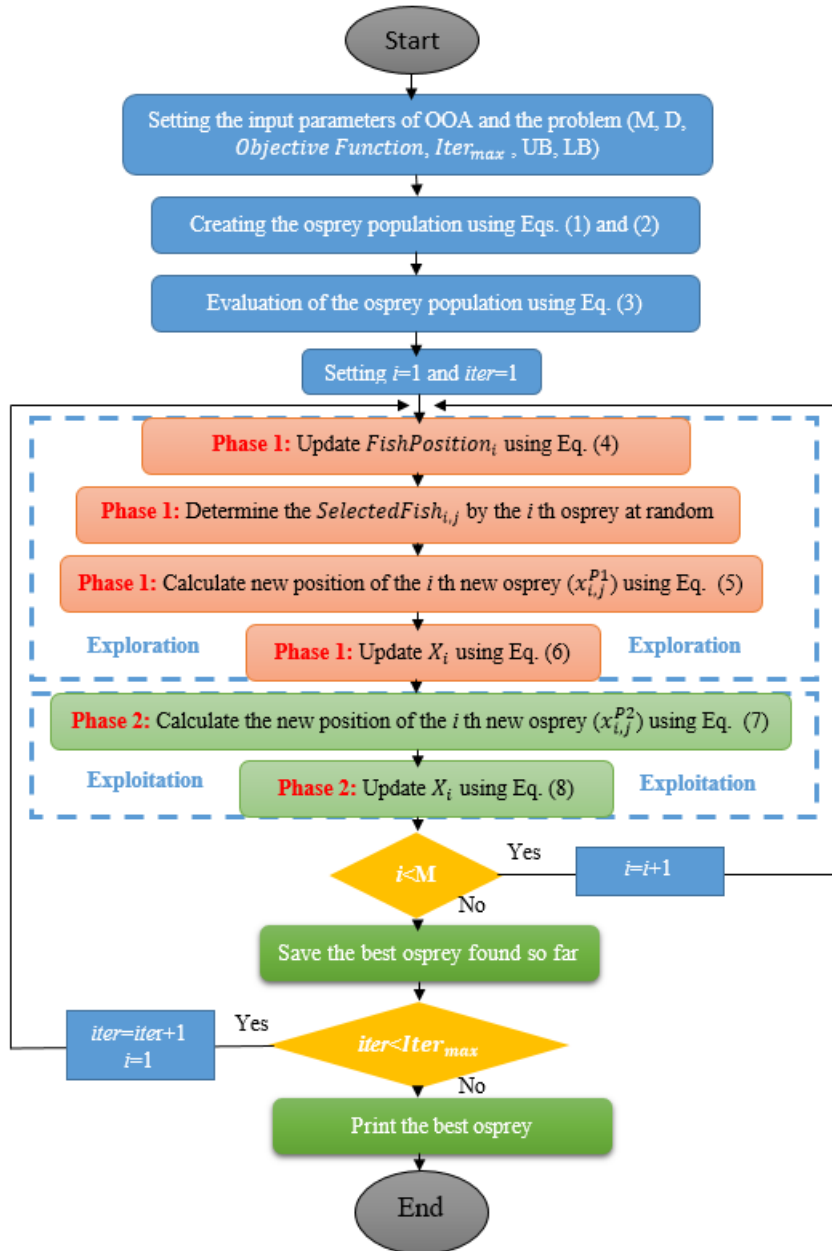


Figure 1. The flowchart of the OOA (Dehghani and Trojovský, 2023).

2.2. Binary Osprey Optimization Algorithm (Binary OOA)

When first proposed, the OOA algorithm was a heuristic algorithm developed to solve continuous optimization problems. In this study, the OOA algorithm has been updated to solve binary optimization problems (Binary OOA). The continuous search space produced by OOA was converted into binary form using taper-shaped transfer functions. Taper-shaped transfer functions are functions with four different variations that have been newly proposed in recent years. The mathematical equations of taper-shaped transfer functions are shown in Table 1. The continuous search space of OOA is converted to binary form with Equation 9.

$$y_{i,j} = \begin{cases} 1 & \text{if } F(x_{i,j}) > \text{rand,} \\ 0, & \text{else} \end{cases} \quad (9)$$

where X_i is the i th osprey in continuous search space, $x_{i,j}$ is the j th dimension of the i th osprey in continuous search space, Y_i is the i th osprey in binary search space, $y_{i,j}$ is the j th dimension of the i th osprey in binary search space.

Table 1. Taper-shaped transfer functions (Yildizdan and Bas, 2024)

Taper-shaped transfer functions A=[-5, 5]	
Taper-1	$F(x_{i,j}) = \frac{\sqrt{ x_{i,j} }}{\sqrt{ A }}$
Taper-2	$F(x_{i,j}) = \frac{ x_{i,j} }{ A }$
Taper-3	$F(x_{i,j}) = \frac{\sqrt[3]{ x_{i,j} }}{\sqrt[3]{ A }}$
Taper-4	$F(x_{i,j}) = \frac{\sqrt[4]{ x_{i,j} }}{\sqrt[4]{ A }}$

2.3. Uncapacitated Facility Location Problem (UFLP) and Datasets

In this study, twelve UFL problem datasets were used for testing Binary OOA. Table 2 shows UFL problem datasets definitions (Beasley, 1990). These datasets are taken from <https://www.brunel.ac.uk/~mastjjb/jeb/info.html> (OR-Library).

The UFL problem is a problem in which a number of facilities (M is facility number) are requested by a certain number of customers (k is number of customers' demands) and the cost is minimized. The Y array represents the binary osprey population and decides which facilities will or will not be open. A value of 0 indicates that the facility is closed, a value of 1 indicates that the facility is open. The Z array is a binary array and controls whether customer demands will be met from which facilities. Each request must be provided by one and only one facility. **OpeninCost** shows the opening cost of the facilities. The UFL problem definition is shown in Equations 9-12.

$$\text{Minimize } f = \sum_{i=1}^k \sum_{j=1}^M \text{Deman}_{ij} * Z_{ij} + \sum_{m=1}^M \text{OpeninCost}_i Y_m \quad (9)$$

$$\sum_{j=1}^M Z_{ij} = 1, \quad i = 1, 2, \dots, k \quad (10)$$

$$Z_{ij} \leq Y_m, \quad i = 1, 2, \dots, k \text{ and } m = 1, 2, \dots, M \quad (11)$$

$$Z_{ij}, Y_m \in \{0,1\}, \quad i = 1, 2, \dots, k \text{ and } m = 1, 2, \dots, M \quad (12)$$

Table 2. The datasets for UFL problems (Beasley, 1990)

ID	Problem Name	Dimension (D)	Opt
1	UFLP1	16 x 50	932615,7500
2	UFLP2	16 x 50	977799,4000
3	UFLP3	16 x 50	1010641,4500
4	UFLP4	16 x 50	1034976,9800
5	UFLP5	25 x 50	796648,4400
6	UFLP6	25 x 50	854704,2000
7	UFLP7	25 x 50	893782,1100
8	UFLP8	25 x 50	928941,7500
9	UFLP9	50 x 50	793439,5600
10	UFLP10	50 x 50	851495,3300
11	UFLP11	50 x 50	893076,7100
12	UFLP12	50 x 50	928941,7500

3. ANALYSIS ON RESULTS

This study presents a newly proposed version of the OOA algorithm for binary optimization problems. In this subsection, the success of the updated versions of the Binary OOA (BinOOA) algorithm according to four different taper-shaped transfer functions is examined. The success of BinOOA variations was analyzed on twelve different UFL problems. Each BinOOA variant was run 20 times independently of each other. For each BinOOA variant, the population size was set to 40 and the maximum number of iterations was set to 2000. Best, worst, median, average, standard deviation, time, and gap statistical calculations were made on the results

obtained. Gap value calculation is shown in Equation 13. The gap value is calculated using the optimum and average values.

$$GAP = \frac{(Opt-Average)}{Opt} \times 100 \quad (13)$$

All implemented applications were tested on a machine with Intel Core i5 1.19 GHz processor with 12 GB RAM and Windows 10 (64-bit) Operating System. Table 3 shows parameter settings. Table 4 shows the BinOOA results created using the Taper-1 shaped transfer function. Table 5 shows the BinOOA results created using the Taper-2 shaped transfer function. Table 6 shows the BinOOA results created using the Taper-3 shaped transfer function. Table 7 shows the BinOOA results created using the Taper-4 shaped transfer function. The average, standard deviation, time, and gap results of the BinOOA variant results created according to each transfer function were collected. The total average, standard deviation, time, and gap results obtained are shown in Figures 2-5.

According to Figure 2, the most successful BinOOA variant was BinOOA-Taper3, while the least successful BinOOA variant was BinOOA-Taper2. According to Figure 3, the most successful BinOOA variant was BinOOA-Taper1, while the least successful BinOOA variant was BinOOA-Taper2. According to Figure 4, the fastest running BinOOA variant was BinOOA-Taper1, while the slowest running BinOOA variant was BinOOA-Taper4. According to Figure 5, the most successful BinOOA variant was BinOOA-Taper3, while the least successful BinOOA variant was BinOOA-Taper2.

In Figure 6, convergence graphs are drawn for BinOOA variants on different UFL problem datasets. Figure 7 shows square box plots for BinOOA variants shaped according to taper-shaped transfer functions.

According to the total average and gap results, the most successful BinOOA variants are listed as follows: BinOOA-Taper3, BinOOA-Taper1, BinOOA-Taper4, and BinOOA-Taper2.

Wilcoxon sign test, a statistical test, was applied on the results of BinOOA variations. This test was applied to determine the similarity of BinOOA results to each other (Yildizdan and Bas, 2024; Baş and Yildizdan, 2023). The results are shown in Table 8. In the results with an h value of 1, the p value was less than 0.05, which means that there is a semantic difference between the compared algorithm results. In the results with an h value of 0, the p value was greater than 0.05, which means that there is no semantic difference between the compared algorithm results. When Table 8 is examined, the similarity between the results of BinOO3 and BinOO4 is striking. In other binary algorithm comparisons, there is at least a 50% difference.

Table 3. Parameter settings

Parameters	Values
Population size (M)	40
The maximum number of iterations ($Iter_{max}$)	2000
Dimension (D)	16, 25, 50
Run number	20

Table 4. The statistical analysis of BinOOA-taper1 for UFLP

UFLP_No	Best	Worst	Median	Average	Std	Time	Gap
UFLP1	932615,7565	936538,8565	933568,9065	933444,5061	976,0050103	113,3114267	0,088863613
UFLP2	977799,4075	979934,1575	977799,4075	978305,3918	656,370912	79,71701463	0,051748012
UFLP3	1010641,48	1010641,48	1010641,48	1010641,48	2,32831e-10	70,68724769	2,96841e-06
UFLP4	1034977,01	1034977,01	1034977,01	1034977,01	1,16415e-10	63,99118528	2,89862e-06
UFLP5	800186	805882,175	802850,1125	802753,1675	1500,89856	129,4476073	0,766301319
UFLP6	856767,058	862732,032	859534,6113	859522,1812	1579,941385	116,8840743	0,563701597
UFLP7	893782,115	900672,425	896640,9425	896664,3583	2083,226347	103,4885869	0,322477737
UFLP8	928941,765	932985,345	928941,765	929480,563	1214,869146	85,96784499	0,058002883
UFLP9	811662,8345	826130,096	821127,155	820796,7938	3182,064098	208,9047481	3,447929137
UFLP10	860890,133	878273,785	873961,9585	873554,8457	3889,702313	155,00595	2,590679584
UFLP11	899122,055	911230,775	905191,1035	905263,1314	2956,203144	130,6164209	1,364543635
UFLP12	929477,588	946059,123	937490,2775	937832,762	4579,721348	110,0396653	0,957111891
Total:	10936863,2	11026057	10982725	10983236	22619	1368,062	10,21137

Table 5. The statistical analysis of BinOOA-taper2 for UFLP

UFLP_No	Best	Worst	Median	Average	Std	Time	Gap
UFLP1	939750,5065	952595,0355	947342,2413	946881,4862	3331,559425	81,4923797	1,529647789
UFLP2	981649,3525	986655,029	984507,9575	984551,917	1366,090508	77,54618216	0,690583061
UFLP3	1010641,48	1012477,01	1010641,48	1010733,257	400,0444889	72,0571939	0,009083983

UFLP4	1034977,01	1034977,01	1034977,01	1034977,01	1,16415e-10	75,32340228	2,89862e-06
UFLP5	811871,475	827629,1875	821609,725	820800,4869	4445,413279	122,2056654	3,03170704
UFLP6	860870,405	870529,4625	865120,901	865513,6953	2110,172678	108,9495716	1,264706003
UFLP7	895027,195	902007,975	898496,745	898181,8495	1916,657789	108,1704327	0,492260857
UFLP8	928941,765	930026,555	928941,765	929073,8875	286,04287	97,48016568	0,014224519
UFLP9	814291,711	832272,911	824700,5973	824179,1453	3983,65827	206,6345071	3,874218885
UFLP10	865952,584	876982,56	872735,636	872399,854	3221,647108	197,7690948	2,455036838
UFLP11	898241,192	913862,603	903542,618	904967,0088	3666,437475	172,6813209	1,331386052
UFLP12	928941,765	941412,605	933047,285	933549,0085	4135,670531	154,8760713	0,495968504
Total:	10971156,4	11081428	11025664	11025809	28863,39	1475,186	15,18883

Table 6. The statistical analysis of BinOOA-taper3 for UFLP

UFLP_No	Best	Worst	Median	Average	Std	Time	Gap
UFLP1	932615,7565	933568,9065	932615,7565	932711,0715	285,945	188,2131803	0,010220876
UFLP2	977799,4075	978876,3075	977799,4075	977853,252	234,7049136	176,4678073	0,00550752
UFLP3	1010641,48	1010641,48	1010641,48	1010641,48	2,32831e-10	155,3794897	2,96841e-06
UFLP4	1034977,01	1034977,01	1034977,01	1034977,01	1,16415e-10	132,1293244	2,89862e-06
UFLP5	798535,4375	803328,2875	801544,6938	801259,2263	1360,058843	298,3455183	0,578773022
UFLP6	854704,1945	862361,447	858952,4325	859031,1146	1987,03058	255,8228032	0,506247024
UFLP7	893782,115	900026,555	898450,8025	897803,5194	1852,071588	216,368973	0,449931743
UFLP8	928941,765	935422,715	928941,765	929830,4535	1947,728005	171,1164192	0,095668377
UFLP9	812976,442	825996,6285	820520,363	820377,0618	3457,772468	434,1697539	3,395028832
UFLP10	868585,864	882514,8945	874859,275	874684,7625	3290,022683	316,8297209	2,723377529
UFLP11	895592,765	912765,838	906722,744	905738,9892	4235,416711	260,497165	1,417826602
UFLP12	928941,765	955743,144	935546,0255	937069,1891	7027,338809	171,1164192	0,87491374
Total:	10938094	11036223	10981572	10981977	25678,09	2776,457	10,0575

Table 7. The statistical analysis of BinOOA-taper4 for UFLP

UFLP_No	Best	Worst	Median	Average	Std	Time	Gap
UFLP1	932615,7565	932615,7565	932615,7565	932615,7565	2,32831e-10	213,2050014	6,96964e-07
UFLP2	977799,4075	977799,4075	977799,4075	977799,4075	1,16415e-10	195,0573528	7,67028e-07
UFLP3	1010641,48	1010641,48	1010641,48	1010641,48	2,32831e-10	166,193664	2,96841e-06
UFLP4	1034977,01	1034977,01	1034977,01	1034977,01	1,16415e-10	149,4130001	2,89862e-06
UFLP5	797582,2875	802610,5	800445,3188	800510,2969	1292,871555	451,5393336	0,484763
UFLP6	857190,1905	863905,5995	860175,5585	860068,5739	1839,453483	1419,022636	0,62762929
UFLP7	893782,115	904343,045	896689,4365	897118,2923	2630,996867	128,3500353	0,373265722
UFLP8	928941,765	936734,955	929460,985	931217,805	2857,990965	105,0574404	0,245015901
UFLP9	812300,345	829837,12	822054,163	821542,7248	4050,687026	253,7769882	3,54194146
UFLP10	869425,379	883876,627	876398,536	876512,7976	4139,572724	203,9753286	2,938062802
UFLP11	898551,555	916415,797	909007,575	907819,4115	4893,507265	222,7413463	1,65077661
UFLP12	928941,765	955743,144	943730,785	942427,4266	6956,876806	216,5091012	1,451724675
Total:	10942749,1	11049500	10993996	10993251	28661,96	3724,841	11,31319

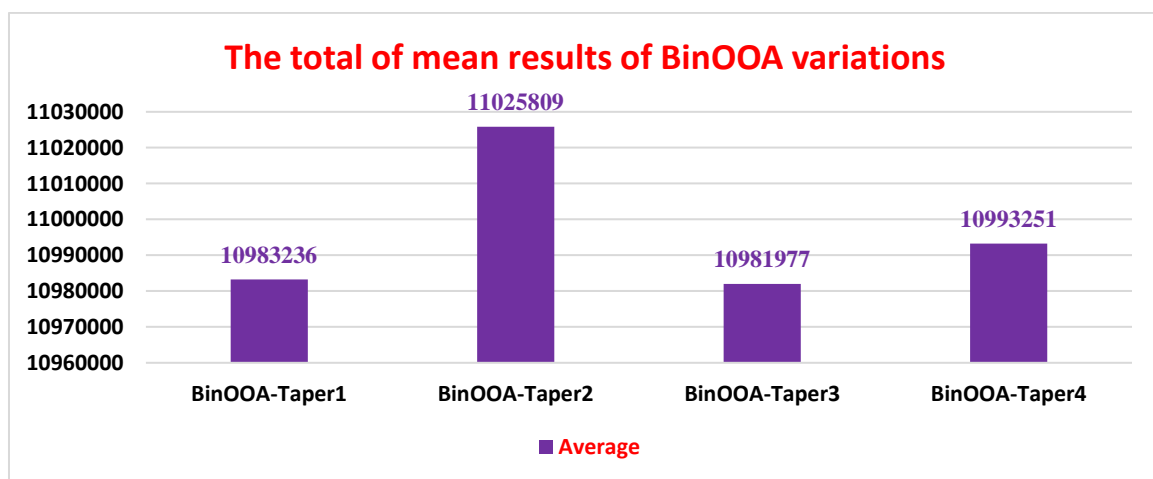


Figure 2. The total of mean results of BinOOA variations

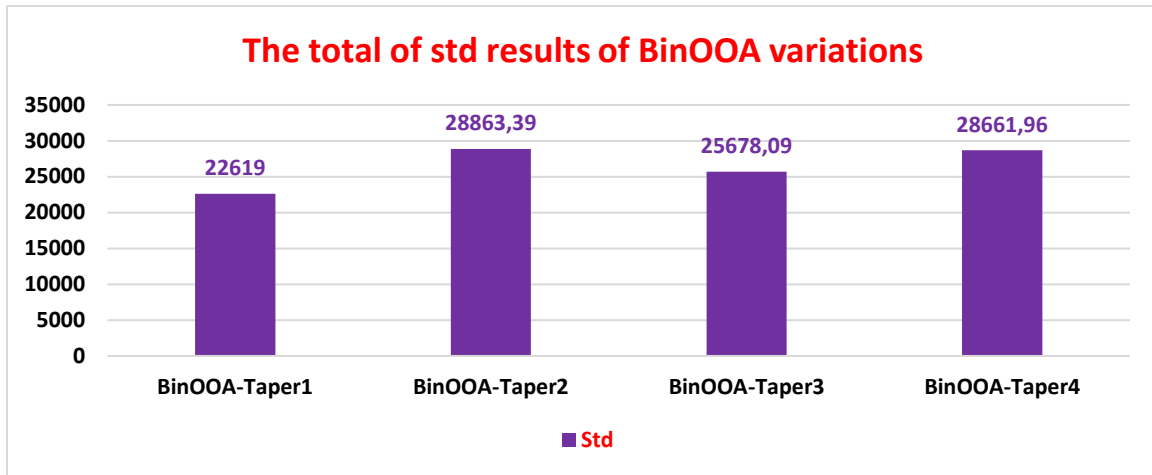


Figure 3. The total of std results of BinOOA variations

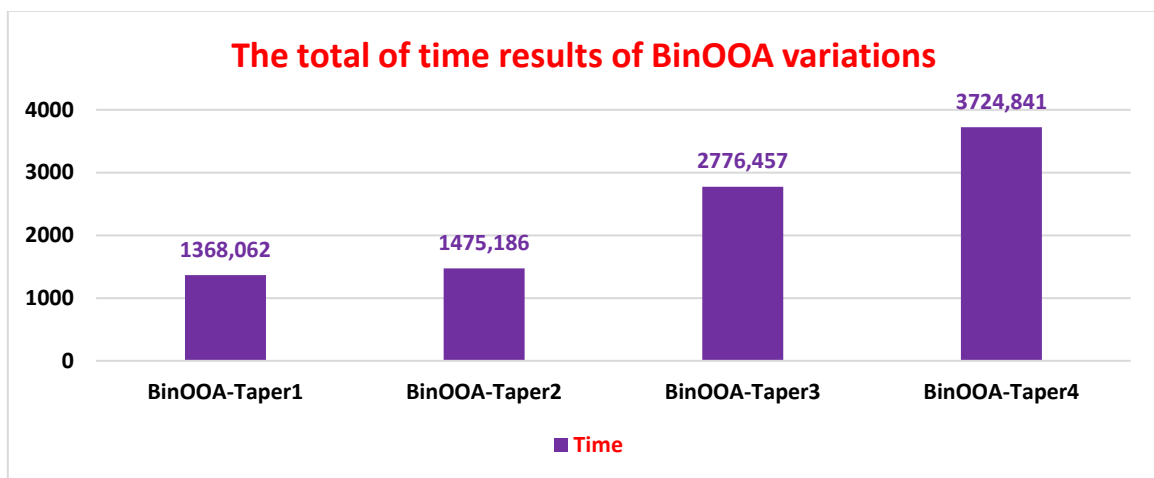


Figure 4. The total of time results of BinOOA variations

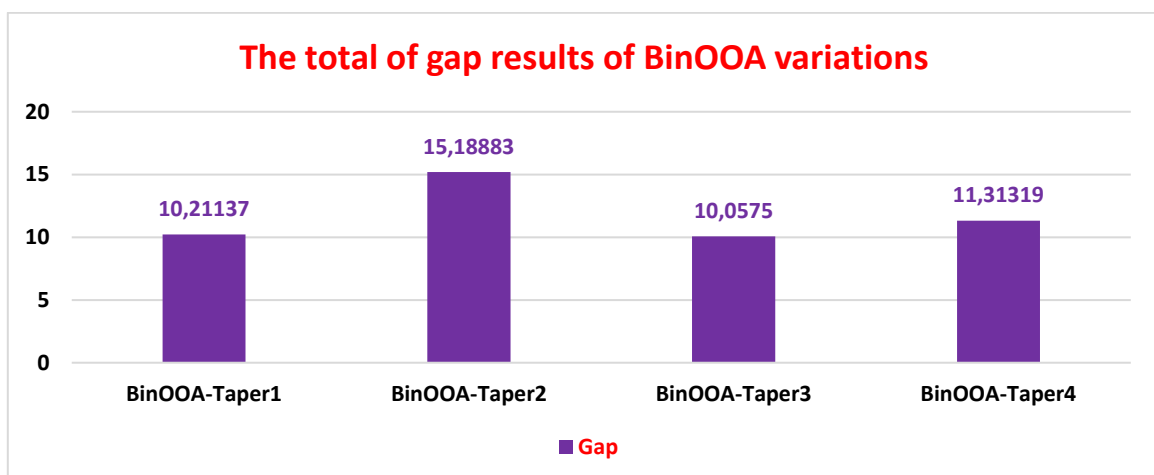


Figure 5. The total of gap results of BinOOA variations

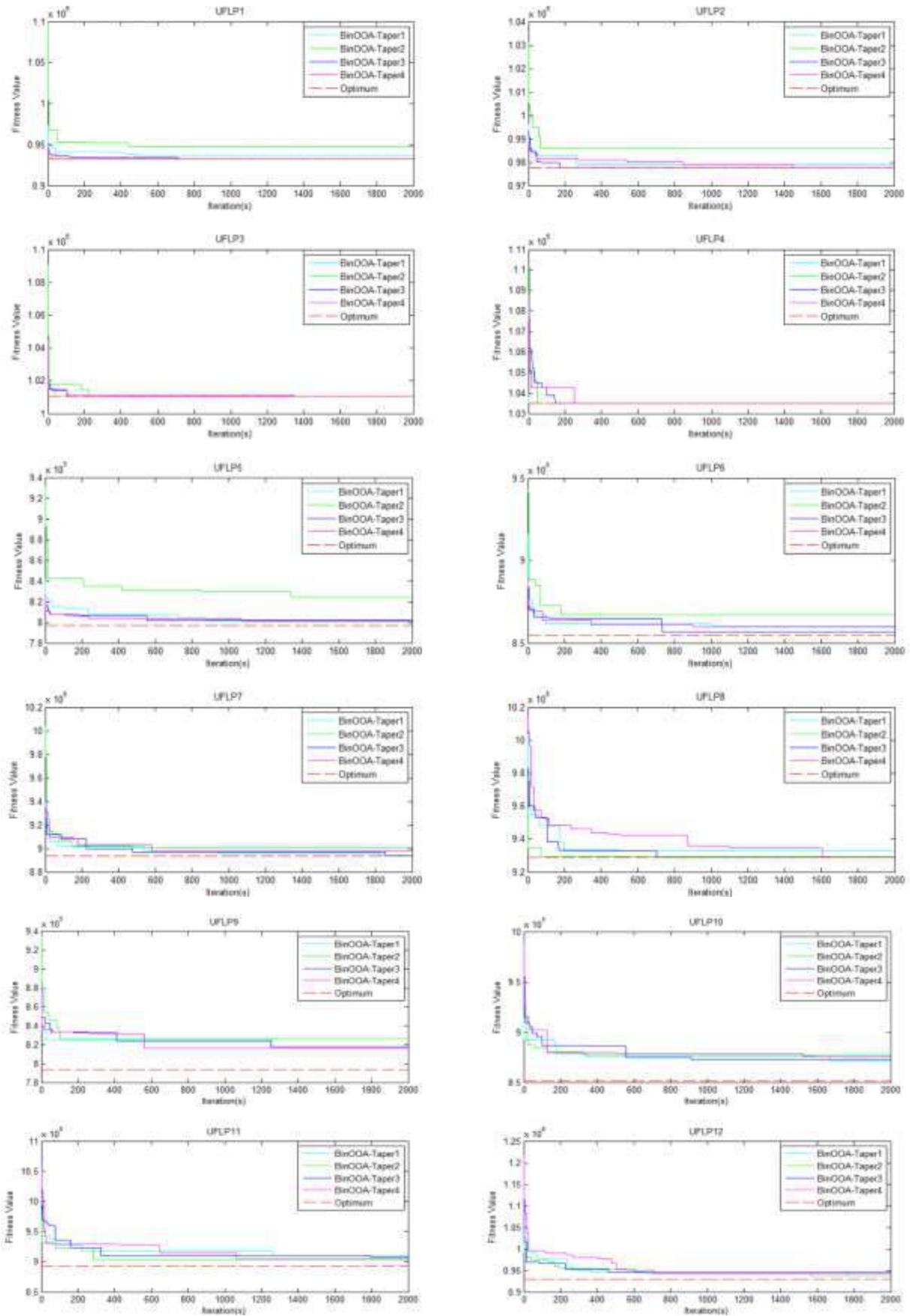
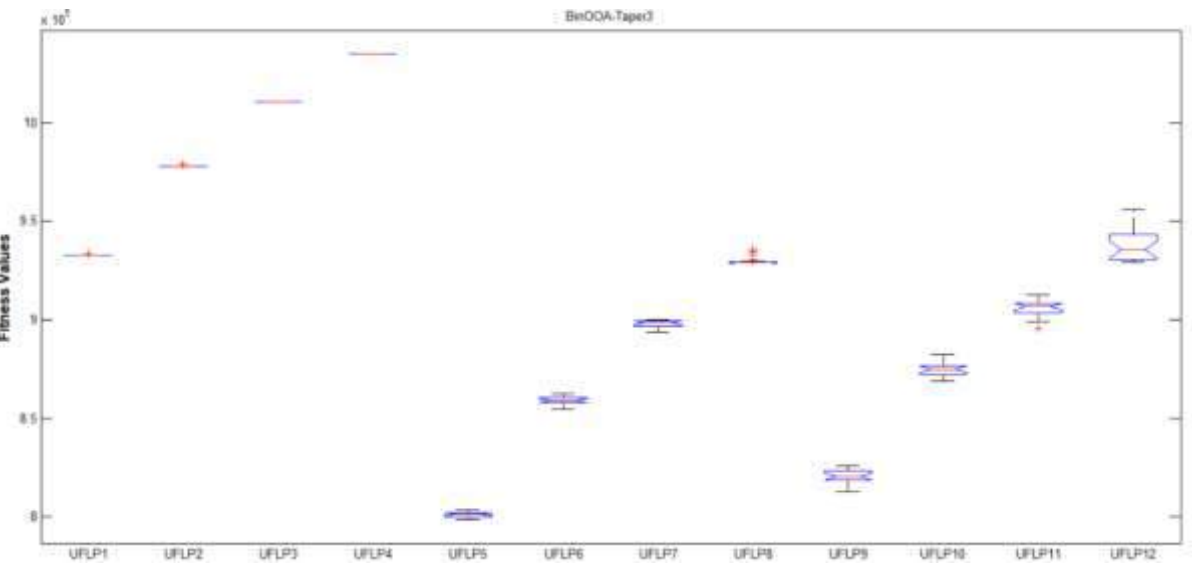
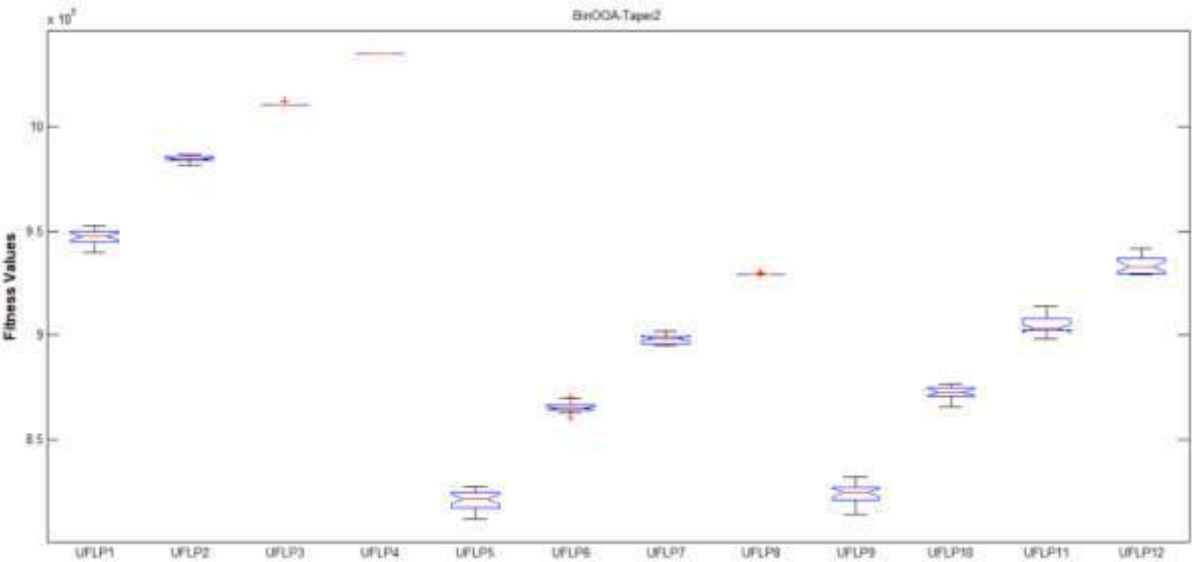
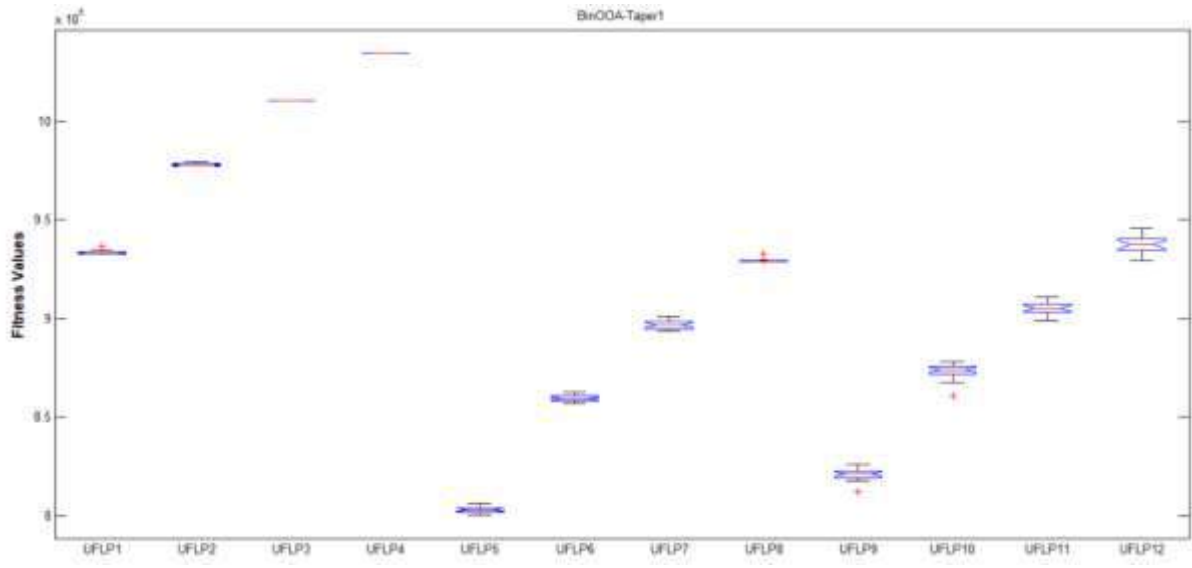


Figure 6. The convergence graphs of the variations of the BinOOA on UFL problem



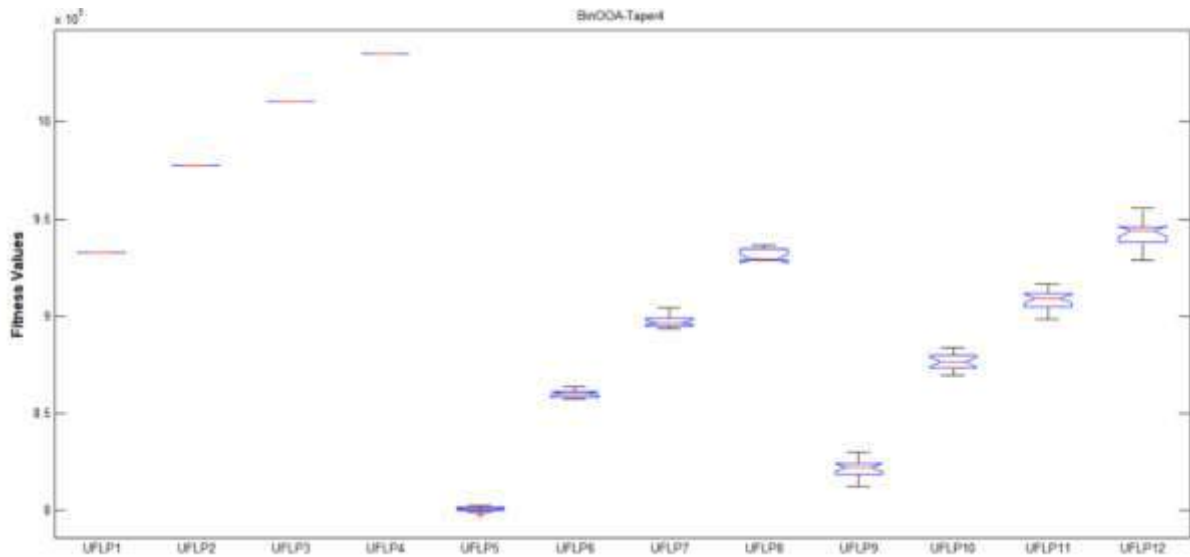


Figure 7. The boxplot graphs of the variations of the BinOOA on UFL problem

Table 8. The wilcoxon sign test results among BinOOA variations

UFLP_No	BinOOA1 - BinOOA2		BinOOA1 - BinOOA3		BinOOA1 - BinOOA4		BinOOA2 - BinOOA3		BinOOA2 - BinOOA4		BinOOA3 - BinOOA4	
	p	h	p	h	p	h	p	h	p	h	p	h
UFLP1	8,86e-05	1	0,005	1	0,00098	1	8,82e-05	1	8,82e-05	1	0,50	0
UFLP2	8,75e-05	1	0,027	1	0,008	1	8,67e-05	1	8,66e-05	1	1	0
UFLP3	1	0	1	0	1	0	1	0	1	0	1	0
UFLP4	1	0	1	0	1	0	1	0	1	0	1	0
UFLP5	8,86e-05	1	0,009	1	0,001	1	8,86e-05	1	8,86e-05	1	0,135	0
UFLP6	8,86e-05	1	0,370	0	0,627	0	0,0001	1	0,00019	1	0,156	0
UFLP7	0,0259	1	0,037	1	0,709	0	0,679	0	0,198	0	0,391	0
UFLP8	0,250	0	0,578	0	0,037	1	0,219	0	0,013	1	0,059	0
UFLP9	0,017	1	0,940	0	0,575	0	0,006	1	0,117	0	0,263	0
UFLP10	0,247	0	0,391	0	0,030	1	0,067	0	0,0072	1	0,263	0
UFLP11	0,737	0	0,709	0	0,126	0	0,351	0	0,048	1	0,145	0
UFLP12	0,002	1	0,940	0	0,001	1	0,037	1	0,00096	1	0,0098	1

4. CONCLUSIONS

Osprey Optimization algorithm (OOA) is a newly proposed metaheuristic algorithm for continuous optimization problems in recent years. In the original article, its success for CEC-2017, CEC-2011, and engineering design problems was examined. The OOA algorithm is an algorithm created by imitating the fishing behavior of ospreys. When examined in the literature, it was noticed that the OOA algorithm was not analyzed sufficiently for binary optimization problems, and a binary version of OOA (BinOOA) was proposed in this study. Four different taper-shaped transfer functions (taper1, taper2, taper3, and taper4-shaped) were used to transform the OOA, which has a continuous search space, into a binary search space. The resulting four different Binary OOA (BinOOA) versions were tested on the undercapacity facility layout problem (UFLP), whose optimum results are known. Twelve UFLP datasets of different sizes (16, 25, and 50) were selected for this study. According to the total average results, the most successful BinOOA version was determined to be BinOOA-Taper3 and the least successful BinOOA version was determined to be BinOOA-Taper2. According to the total average and gap results, the most successful BinOOA variants are listed as follows: BinOOA-Taper3, BinOOA-Taper1, BinOOA-Taper4, and BinOOA-Taper2. In future studies, it is planned to analyze the success of BinOOA for the feature selection problem in different transfer functions.

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KAFKA’NIN HAYATINDAKİ KADINLAR ÜZERİNE

ON THE WOMEN IN KAFKA’S LIFE

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ÖZET

Çok uzun yaşamamasına rağmen, arkasında çok sayıda eser bırakmış ünlü yazar Franz Kafka’nın eserleri gibi hayatı da çelişkilerle doludur. Bu nedenle, yazarın eserlerinin açıklanması için çeşitli yöntemler kullanılmaktadır. Bununla beraber, çoğu kez yazarın eserlerini açıklamak için biyografisinden yararlanılmaktadır. Gerçekten de, Kafka’nın edebi eserlerinin her satırında kendinden ve hayatından izler bulmak mümkündür. Kafka’nın hayatındaki kadınları mercek altına alan bu çalışma ile bu alandaki bir boşluğun doldurulması hedeflenmektedir. Kafka’nın hayatındaki kadınlar, ailesindeki kadınlar, annesi Julie Kafka, kız kardeşleri Elli, Valli, Ottl ve kız arkadaşları, Felice Bauer, Julie Wohryzek, Milena Jesenská, Dora Diamant, olmak üzere ele alınmaktadır. Bunun yanı sıra, yazarın hayatındaki kadınların edebi eserlerine ne şekilde yansıdığı örnek eserler eşliğinde gösterilmektedir. Örnek eserler olarak, Kafka’nın “Die Verwandlung” (Dönüşüm) başlıklı anlatısı, “Der Verschollene” (Kayıp) veya diğer başlığıyla “Amerika” romanı ve “Der Process” (Dava) başlıklı romanı verilmektedir. Çalışmanın sonuç bölümünde, Kafka’nın hayatındaki kadınların eserlerindeki varlığı vurgulanmaktadır.

Anahtar Kelimeler: Kafka, Biyografi, Kadın Figürler

ABSTRACT

Although he did not live very long, the life of the famous writer Franz Kafka, who left behind many works, is full of contradictions, just like his works. Therefore, various methods are used to describe author’s works. However, author’s biography is often used to interpret author’s works. Indeed, it is possible to find traces of himself and his life in every line of Kafka’s literary works. This study, which focuses on the women in Kafka’s life, aims to fill a gap in this field. The women in Kafka’s life are discussed as the women in his family, his mother Julie Kafka, his sisters Elli, Valli, Ottl and his girl friends, Felice Bauer, Julie Wohryzek, Milena Jesenská, Dora Diamant. In addition, it is shown how the women in author’s life are reflected in his literary works, accompanied by sample works. As sample works, Kafka’s narrative titled “Die Verwandlung” (The Transformation), his novel “Der Verschollene” (The Loss) or otherwise titled “America” and his novel “Der Process” (The Trial) are given. In the conclusion of the study, the presence of women in Kafka’s life in his works is emphasized.

Keywords: Kafka, Biography, Female Figures

I. GİRİŞ

Franz Kafka 1924 yılında kırk bir yaşında hayata gözlerini kapadığında, yazar olarak sadece yakın çevresi tarafından tanınmaktaydı. Dünyaca ünlü bir yazar haline gelmesinde samimi arkadaşı Max Brod en büyük rolü oynamış ve yazarın eşsiz eserlerine sahip çıkmıştır. Yahudi bir aileden gelen, Prag doğumlu ve Almanca yazmış olan Kafka'nın eserleri günümüze dek Almancadan çeşitli dillere çevrilmiş ve eserler üzerine çok sayıda bilimsel çalışmalar yürütülmüştür. Kafka'nın eserlerini anlamak, anlatmak ve yorumlamak için çeşitli yöntemler kullanılmıştır. Bununla beraber, yazarın biyografisinin eserlerine belli ölçüde ışık tuttuğu söylenebilir. Biyografik çalışmalar dikkate alındığında, yazarın babası ile olan çelişkili ilişkisinin ele alındığı, annesi ve kız kardeşleri ile olan ilişkilerinin ise yeterli derecede dikkate alınmadığı görülebilir (Beicken 1986; Binder 1993; Fırtına 2006; Wagenbach 1997). Yazarın hayatındaki kadınları mercek altına alan bu çalışma ile bu alandaki boşluğun doldurulması hedeflenmektedir. Kafka'nın hayatındaki kadınlar, sadece annesi ve kız kardeşleri ile sınırlı değildir. Yazarın hayatının farklı dönemlerindeki nişanlıları ve kız arkadaşları da incelenmeye değerdir. Buna ek olarak, bu çalışmada Kafka'nın hayatındaki kadınların eserlerine yansımaları üzerinde de durulmaktadır.

II. AİLESİNDEKİ KADINLAR

Franz Kafka, Kafka ailesinin ilk çocuğu olarak dünyaya gelmiş, erkek kardeşleri Georg ve Heinrich bebek çağlarında ölmüşler, kız kardeşleri Elli, Valli ve Ottla dünyaya gelene dek, Franz tek çocuk durumunda yetiştirilmiştir. Bu da, yazarın son derece duygusal ve hassas bir insan olmasına yol açmıştır. Babası Hermann Kafka'nın beklentilerinin aksine, kendini yazar olarak ifade etmek istemiştir. Babası oğlunun yazdıklarını hiçbir zaman onaylamamış, onun evlenmesini ve iş hayatında da en az kendisi kadar başarılı olmasını ümit etmiştir. Kafka'nın 1919 yılında babasına yazdığı Almanca "Brief an den Vater" başlıklı uzun mektup aralarındaki anlaşmazlıkları gözler önüne sermektedir. Mektup Hermann Kafka'ya ulaşamamış olsa bile, Kafka'nın aile ilişkileri, arkadaşlıkları, problemleri ve özel düşünceleri açısından önemli bilgiler içermektedir. Örneğin, annesi Julie Kafka'nın babasına oranla daha yumuşak bir insan olduğu dile gelmektedir: "Orası öyle, annem sınırsız ölçüde iyiydi bana karşı; ama bu seninle ilişkiliydi, yani iyi bir ilişkiden almıyordu kaynağını" (Kafka 2002: 37). Buradan yola çıkarak, Kafka'nın hayatındaki kadınlar arasında annesinin en başta geldiği belirlenebilir.

1856 doğumlu olan Julie Löwy 1882 yılında Hermann Kafka ile evlenmiştir. Eşine oranla daha varlıklı bir aileden gelen Julie Kafka her konuda eşinin en büyük desteği olmuştur. Klaus Wagenbach Kafka'nın çocukluk döneminde annesini ve babasını "seyrek" gördüğünü bildirmektedir (Wagenbach 1997: 26). Buna göre, Kafka'nın çocukluk döneminden itibaren yalnızlık çekmek durumunda kaldığı anlaşılmaktadır. Kafka annesi hakkında olumlu düşünceler içinde olmasına rağmen, babasından çekindiği için, annesinden de uzaklaşmaya başlamıştır. Babasına mektubunda bu bağlamda şu ifadeler önemlidir: "Senden kaçmak istesem, aileden de, hatta annemden de ister istemez kaçmam gerekecekti" (Kafka 2002: 47).

Buradan anlaşıldığı gibi, Julie Kafka oğlu için iyi bir anne gibi görünmekle beraber, eşine düşkünlüğü neticesinde, oğlunu yeterli ölçüde destekleyememiştir.

Kafka'nın ailesindeki diğer kadınlardan biri, kız kardeşlerinin en büyüğü, 1889 Prag doğumlu Elli (Gabriele) Kafka hakkında yazar babasına mektubunda “hantal, miskin, korkak, somurtkan, suçluluk bilimci içinde yaşayan, onurunu hiç kollamayan, sinsî, tembel” bir kız olarak bahsetmektedir (Kafka 2002: 50). Aynı mektubunda, Elli'nin evlendikten sonra neşeli bir kıza dönüştüğüne de değinmektedir (Kafka 2002: 51).

Ortanca kız kardeşi 1890 Prag doğumlu Valli, Kafka'ya göre, annesine benzemesi nedeniyle, Hermann Kafka tarafından sevilmektedir: “Annemize hepimizden yakın bulunan Valli, sana da annem gibi pek zahmet çekmeden ve pek zararını görmeden uysallık gösteriyordu” (Kafka 2002: 49).

Valli'nin aksine, en küçük kız kardeş 1892 Prag doğumlu Ottla (Ottlie) babası ile anlaşmayı başaramamış ama ona karşı direnmeyi başarabilmiştir. Kafka'nın en çok sevdiği kız kardeşi olan Ottla, aynı zamanda onun sırdaşı da olmuştur. Kafka ve Ottla özellikle babaları ve diğer konuları evlerinin banyosunda paylaşmışlardır. Bu ortaklıkları bazı mektuplara ve kartpostallara da konu olmuştur. Örneğin, 1913 yılında Ottla'ya bir kartpostalında Kafka şöyle yazmıştır: “Bunu ilerde bir ara sana evimizdeki banyoda anlatırım” (Kafka 2001: 17).

Kafka'nın biyografisi dikkatle incelendiği zaman, Kafka'nın aksine, üç kız kardeşin evlenmiş oldukları görülmektedir. Ottla, diğer kız kardeşlerinden farklı olarak bir Hristiyan ile evlenmiştir. Yahudilerin kaderine uygun olarak, Nazi döneminde, üç kız kardeş toplama kamplarında öldürülmüşlerdir. Kafka ve ebeveynleri ise, bu dönemden önce öldüklerinden dolayı, Nazi kurbanı olmaktan kurtulmuşlardır. Bununla beraber, Kafka ailesinin de çoğu Yahudi kökenli aile gibi Yahudi düşmanlığıyla yüzleştikleri belirtilmelidir.

III. KIZ ARKADAŞLARI

Kafka, babasının beklentisinin aksine, hayatının sonuna dek evlenememiştir. Bununla beraber, hayatının farklı dönemlerinde kız arkadaşları olmuş, nişanlanmış, ayrılmış ve sonunda hastalığını yenemediği hayata gözlerini kapamıştır. Kafka'nın yazarlık arzusu, bu doğrultuda yalnızlığa yönelişi, ürkek yapısı ve sağlık problemleri evlenmesine engeller olarak sayılabilir.

Kafka'nın hayatındaki kız arkadaşlarının ilki Felice Bauer adlı Berlinli bir kız olmuştur. Kafka 1912 yılında Brod ailesinin evinde karşılaştığı bu kız ile 1914 ve 1917 yıllarında iki kez nişanlanmış ve her iki nişan da bozulmuştur. Klaus Wagenbach tarafından bildirildiği gibi, “her ikisi arasında 1917'ye kadar yıllar yılı sürecek beş yüz mektup ve kartpostalı içeren bir mektuplaşma” gerçekleşmiştir (Wagenbach 1997: 104). Buradan hareketle, Kafka'nın Felice ile ilişkisi hakkında mektup arkadaşlığı ile sınırlı bir arkadaşlık denmesi uygundur. Kafka'nın edebiyata ilgisi, yazarlık aşkı, yalnızlık gereksinimi onun Felice ile ilk nişanını bozmasının nedenleri arasında görülebilir. 1914 yılındaki bu ayrıldıktan sonra Felice ile arkadaşlıkları devam etmiştir. Hans Dieter Zimmermann tarafından belirtildiği gibi, 1915 ve 1916 yıllarında buluşmuşlar ve 1917 yılında ikinci nişan yaşanmış ama bu nişan da altı hafta

sonra bozulmuştur: “Aber sechs Wochen später, wie beim ersten Mal, folgt wieder die Entlobung, diesmal von der Krankheit erzwungen” (Zimmermann 2004: 57). Bu sefer nişanın bozulması için Kafka'nın hastalığını bahane etmiş olduğu belirmektedir.

Kafka'nın hayatındaki kadınların ikincisi 1891 Prag doğumlu Julie Wohryzek adlı kız arkadaşıdır. Klaus Wagenbach bu kız ile ilgili şunları aktarmaktadır: “[...] genç bir Çek kızı olan Wohryzek aynı zamanda Prag-Weinberge havzasında hahamlık yapan bir ayakkabıcının kızıdır” (Wagenbach 1997: 150). Kafka bu kız ile 1918 yılında dinlenmek için gittiği Schelesen'de karşılaşmış ve aynı yıl nişanlanmıştır. Bu nişana Kafka'nın babası karşı çıkmış ve Kafka bu olayla bağlantılı olarak babasına mektubunu kaleme almıştır. Kafka'nın bu üçüncü nişanı da, diğer iki nişanı gibi, evlilikle sonuçlanamamıştır.

Kafka'nın kız arkadaşlarından bir diğeri, 1896 Prag doğumlu Milena Jesenská adlı Çek kadındır. Kafka ile ilişkisi yazarın bazı eserlerini Çekçe'ye çevirmesi ile başlamıştır. Kafka ile Milena arasında, Felice ile olduğu gibi, mektup arkadaşlığı da olmuştur. Meran'dan 3 Haziran 1920 tarihli bir mektubunda Kafka Milena'ya şunları yazmıştır: “Milena, sanırım ortak bir özelliğimiz var: Öylesine korkak ve çekingeniz ki hemen hemen tüm mektuplar birbirinden farklı [...]” (Kafka 2018: 59). Evli bir kadın olan Milena ile arkadaşlığı sonradan aşka dönüşmüş olan Kafka'nın bu ilişkisi de evlilik ile noktalanamamıştır. Anlaşıldığı üzere, Felice Bauer ve Julie Wohryzek gibi kızlar Kafka'nın nişanlıları olmuşlar ama Milena Jesenská ise Felice Bauer gibi yazarın mektup arkadaşı olmaktan öteye gidememiştir.

Kafka'nın hayatının son yıllarındaki kız arkadaşı Dora Diamant adlı on dokuz yaşlarında Polonyalı bir kızdır. Kafka kız kardeşi Elli ile beraber 1923 yılında Müritz'e dinlemek için gittiği sırada bu kız dikkatini çekmiştir. Aynı yıl, Kafka ve Dora Berlin'de bir ev tutmuşlar ve evlilik planları yapmışlardır. Kafka'nın sağlık durumunun kötüleşmesi bir evlilik girişimi için engel teşkil etmiştir. Ludwig Dietz, Kafka'nın son yıllarındaki hayat arkadaşının Dora olduğunu vurgulamaktadır (Dietz 1990: 114). Gerçekten de, yazarın ölümüne dek Dora hep yanında kalmış ve destek olmuştur.

IV. ESERLERİNE YANSIYAN KADINLAR

Kafka'nın hayatında edebiyat en önemli uğraş olarak göze çarpmaktadır. Üniversite öğrenimini 1906 yılında hukuk doktorası ile tamamlamış, ardından bir yıl avukatlık stajı yaptıktan sonra, 1907 yılında “Assicurazioni Generali” adlı sigorta şirketinde iş hayatına başlamıştır. Daha sonra 1908 yılında işini değiştirmiş ve 1922 yılında emekli olana dek “Arbeiter-Unfall-Versicherungs-Anstalt” adlı işçi kaza sigortası kurumunda çalışmıştır. Çalışma hayatının yanı sıra, geceleri de hesaba katmış ve çok sayıda eserlerini kaleme almıştır. Otobiyografik yazıları da diğer edebi eserleri gibi son derece ilgi çekici olan Kafka'nın tüm eserlerinde kendi hayatından izler bulmak mümkündür. Eserlerinde yaratmış olduğu figürlerin çoğunun kendisiyle, ailesinden bireylerle ve hayatından çeşitli kişilerle şaşırtıcı oranda benzerlik gösterdiği ortaya çıkmaktadır. Örnek olarak, bu çalışmanın sınırları çerçevesinde, yazarın “Die Verwandlung” (Dönüşüm) başlıklı anlatısı, “Der Verschollene”

(Kayıp) veya diğer başlığıyla “Amerika” romanı ve “Der Process” (Dava) başlıklı romanı ele alınmaktadır.

1912 yılında kaleme almış olduğu “Die Verwandlung” (Dönüşüm) başlıklı anlatısında Kafka rüya ve gerçek arasında bir olayı anlatmaktadır. Eser kahramanı Gregor Samsa bir sabah uyandığında kendisini bir böcek halinde bulmaktadır. Böcek haline dönüşmeden önce, ailesine çalışarak destek sağlayan bu genç adam, böcek olarak ailesine yük olmaya başladığından dolayı, istenmeyen adam durumuna gelmektedir. Annesi ve babası ona artık kötü davranmakta ve kız kardeşi Grete ise bir süre sonra ondan kurtulmaları gerektiğini söylemektedir: “Ich will vor diesem Untier nicht den Namen meines Bruders aussprechen, und sage daher bloss: wir müssen versuchen, es loszuwerden” (Kafka 1994a: 149). Kız kardeş Grete, Gregor için canavar kelimesini kullanmakta ve onu artık erkek kardeşi olarak görememektedir. Bu eserdeki anne, baba ve kız kardeş figürleri, Kafka’nın kendi annesi, babası ve kız kardeşleri ile paralellik göstermektedir. Sert bir baba, babayı dinleyen uysal bir anne ve önce iyi ama sonra hain olan bir kız kardeş anlatılmaktadır.

Kafka’nın üç romanından biri olan “Der Verschollene” (Kayıp) veya diğer başlığıyla “Amerika” romanı 1912 yılında kaleme alınmış ve Kafka’nın Amerika özlemine de içeren bir eseri olmuştur. Roman kahramanı Karl Rossmann adlı bir genç, Gregor Samsa’ya benzer bir şekilde, istenmeyen adam durumuna gelmekte ve ailesi tarafından evden kovularak Amerika’ya yollanmaktadır. Amerika’da da onu benzer zorluklar beklemekte ve her defasında ufak hatalar nedeniyle kovulmaktadır. Romanın ilk satırları şöyledir: “Bir hizmetçi tarafından baştan çıkarılıp kendisinden bir çocuk peydahlandığı için yoksul ailesinin Amerika’ya yolladığı on altı yaşındaki Karl Rossmann, yavaşlamış gemiyle New York limanına girerken, çok önceden fark ettiği Özgürlük Tanrıçasını bu kez sanki ansızın güçlenen güneş ışığı altında gördü” (Kafka 2003: 5). Karl’ın ailesi ile Kafka’nın ailesi arasında benzerlik tespit edilmesi kaçınılmazdır. Baba ve babayı destekleyen anne oğullarını ufak hatasından dolayı cezalandırmaktadır. Burada, babanın isteklerine karşı gelmeyen bir anne ön plandadır.

Kafka’nın önemli eserlerinden olan ve 1914 yılında Felice Bauer ile başarısız nişan olayının ardından ortaya çıkan “Der Process” (Dava) başlıklı romanında Josef K. adlı genç bir adamın aniden başına gelen dava olayı konu edilmektedir. Roman kahramanı Josef K. ile Kafka arasında benzerlik bulunmaktadır. Kadın figürlerden Josef K.’nin kaldığı pansiyonda yaşayan genç bir hanım Fräulein Bürstner ise Kafka’nın kız arkadaşı ve nişanlısı Felice Bauer ile benzerlik göstermektedir. Josef K. Fräulein Bürstner’e yaklaşmakta ve ondan davası için yardım istemektedir. Bu konu hakkında romanda şu satırlar önemlidir: “Sie werden mir dann in meinem Process ein wenig helfen können” (Kafka 1994b: 35). Bununla beraber, Kafka’nın hayatına paralel olarak, ikisi arasında daha fazla bir ilişki oluşmamaktadır. Çünkü Kafka da Felice ile ilişkisini mektup arkadaşlığından ileriye taşıyamamıştır. Buna ek olarak, hem Felice hem de Fräulein Bürstner bağımsızlığına düşkün olan ve çalışan kadın tipleridir.

V. SONUÇ

Kafka'nın birçok eserinde hayatından izlere rastlanmaktadır. Bu çalışmada ele alınan Kafka'nın hayatındaki kadınların izleri de çeşitli eserlerinde mevcuttur. Annesi Julie Kafka, kız kardeşleri Elli, Valli ve Otlta, nişanlıları Felice Bauer ve Julie Wohryzek, kız arkadaşları Milena Jesenská ve Dora Diamant Kafka'nın hayatında ve eserlerinde öne çıkan kadınlardır. Bunlar arasında aslında kesin bir ayırım yapmak zordur. Bununla beraber, en çok sevdiği kız kardeşi Otlta ile hayatının son yıllarında yazara büyük destek veren kız arkadaşı Dora diğer kadınlara göre bir adım önde gelebilir. Sonuç olarak, bu kadınların Kafka'nın hayatında özel bir yere sahip olmalarından dolayı, eserlerine de çeşitli şekillerde girmiş oldukları vurgulanmalıdır. Baba figürleri yönüyle zengin olan Kafka'nın eserlerinde anne figürlerinin ve diğer kadın figürlerin de varlığı bu çalışma ile kanıtlanmıştır.

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THE TRANSFER OF POLITICAL COURSE IN THE POST-SOVIET SPACE: AN EXAMPLE OF THE LAW ON CURBING FOREIGN INFLUENCE IN GEORGIA

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ABSTRACT

In Georgia, a country of the former post-Soviet space, in 2023, the ruling party submitted a draft law on foreign influence agents, which was withdrawn by the country's parliament due to protests from the population (civil. ge, 2024). In April 2024, the Parliament of Georgia first registered and finally approved the draft law (IDFI, 2024). It is important to note that the mentioned draft law echoes to some extent the law "On Foreign Agents" (EGI.2024) adopted in the Russian Federation in 2012, which prohibits or makes it impossible to receive education abroad, the existence of non-governmental organizations, the existence of opposition media, etc.

In the Russian Federation, this law underwent an evolution, and in 2017, restrictions were extended to the media as well. For example, the existence of "Voice of America" (media) was banned in Russia (EGI.2024). And, in 2019, restrictions were applied to bloggers and social media - sharing or liking a post led to police summons, intimidation, and arrests (EGI.2024). Moreover, in 2020, the restrictions included natural persons as well (EGI.2024). The absence of a "locking mechanism" in the document is considered to be the main common feature between the Russian and Georgian versions of the said draft law. Additionally, in 2022, Russia used the Law on False Information (Fakes) to prosecute people opposed to the war with Ukraine (EGI.2024). Against the background of the issues discussed above, it is interesting how the policy transfer is carried out in Georgia, as a post-Soviet country. The issue becomes even more interesting by the fact that Hungary, Slovakia, and Uzbekistan registered the draft law on foreign influence together with Georgia in 2024 (Agenda, 2024). Accordingly, the study of the issue is significant in terms of global and inter-country interactions.

The purpose of the study is to examine the relationship between the process of developing a political course aimed at reducing foreign influence in Georgia and the law "On Agents of Foreign Influence" in the Russian Federation. The research objectives are:

- 1.To analyzes the draft law on reducing foreign influence developed in Georgia in 2024;
- 2.To study the evolution of the law aimed at reducing foreign influence in the Russian Federation;

3. To analyze the weekly summarizing programs of television with pro-government (Imedi TV), pro-opposition (TV-Mtvari channel), and neutral (public broadcaster) editorial policies as defined by law.

The research period is April and May 2024, since during this period, the Law on Curbing Foreign Influence was first initiated and approved in the Parliament of Georgia. The research methodology is a combined research approach. In particular, qualitative and quantitative content analysis will be utilized. The Multiple Streams Theory (Kingdom, 1984) was defined as the theoretical framework of the research, which explains the implementation of different political courses. Additionally, Annelise Dodds' (2019) policy transfer tools were selected, which explain the means by which policy transfer is implemented.

Keywords: Post-Soviet country, law "On Agents of Foreign Influence, policy transfer, The Multiple Streams Theory, Media

INTRODUCTION

The countries of the post-Soviet space are constantly struggling between democracy and Russian influence. This is reflected in the fact that in 2024 in Georgia, Hungary, Slovakia and Uzbekistan, the law was registered by the legislative bodies, which refers to the control of funding of organizations in order to reduce foreign influence (Agenda, 2024), which poses a problem of challenging the existence of these organizations in the future. If it is not specified in the legislation of the state that wants to reduce foreign influence, it threatens the existence of those organizations whose business is fully engaged in democracy strengthening activities. However, a large part is financed from other countries. A similar law was approved in Georgia in May 2024, despite protests and rallies by the population (ifcat.ge, 2024).

The process of introducing the mentioned law as a political course has been criticized not only within the country, but also at the international level, which made the study of the issue even more urgent. According to the president of the country, Salome Zurbashvili, the mentioned law is against human rights and freedoms and European standards. Moreover, according to his own assessment, the law is unconstitutional because it contradicts Article 22 of the Constitution on freedom of association. The Foreign Influence Transparency Act requires organizations to register as agents of a foreign power. Forcing such self-recognition leads to their stigmatization. The law creates all the conditions for the organization's activities to be restricted and ultimately abolished.

It contradicts Article 15 of the Constitution, which deals with the rights to inviolability of personal and family life, personal space and communication, since it imposes the obligation to provide special categories of personal data. The law, in its form and content, represents a real obstacle to Georgia's European integration. This is further confirmed by the conclusion of the Venice Commission, which highlights several peculiarities and ambiguities of the law: the law

violates all requirements of the principle of proportionality, acceleration of the legislative process of adopting the law and limited participation of civil society in the process, adoption of the law in an accelerated mode and open space for parliamentary debates, less clarity/predictability of the law And its wide scope of action - the possibility of too wide discretion for state bodies - a very wide circle of entities is identified as "foreign power", starting from the government body of a foreign country, ending with any natural person who is not a citizen of Georgia and others.

At the international level, the adoption of the mentioned law in Georgia is criticized by the representatives of the US Helsinki Commission (2024) and the leading political figures of the EU member states. According to the US Helsinki Commission, the Georgian Parliament is adopting a Russian-style law on foreign agents, violently ignoring the will of the people and rejecting the Euro-Atlantic path it announced long ago. The statement also shows that the so-called The law on foreign agents is incompatible with the EU legal system and values.

According to Robin Wagener (2024) the coordinator of the German federal government for international cooperation with South Caucasus and Central Asian countries, the adoption of the law is a fundamental mistake and is directed against Georgia's path to the European Union. According to him, the government of Georgia not only broke the promise given last year that it would not adopt the law, but also completely ignored the will of the absolute majority of the Georgian people, who want to see their country as a member of the European Union. He notes that the adoption of the law will stop Georgia's integration into the European Union. Creating an environment where civil society organizations can operate freely and media freedom is ensured is the foundation of every democratic country. It is also crucial for a successful EU accession process. Finally, he evaluates the Georgian government as the authors of an authoritarian and anti-European course, which will harm the entire country in the future, and this will primarily affect the suspension of political and financial support for Georgia from the European Union.

Depending on the relevance of the issue, The purpose of the study is to examine the relationship between the process of developing a political course aimed at reducing foreign influence in Georgia and the law "On Agents of Foreign Influence" in the Russian Federation. Accordingly, it is interesting to study how Russian soft power is manifested in different ways in post-Soviet countries. The adoption of such laws creates various challenges for countries like Georgia, such as: protection of women's rights and the rights of various non-dominant groups. Since, mostly non-governmental organizations are working on similar issues, which are financed from abroad. The subject of our research is the transfer of political courses in the post-Soviet space, using Georgia as a case study.

The aim of the study and objectives

Based on the subject of the research, we developed the following research objective. In particular, The purpose of the study is to examine the relationship between the process of

developing a political course aimed at reducing foreign influence in Georgia and the law "On Agents of Foreign Influence" in the Russian Federation. The research question was formulated as follows: What is the relationship between the challenges posed by foreign influence in Georgia and the implementation of policies regarding agents of foreign influence in Russia?

Based on the purpose of the research, we developed the following research tasks. The research objectives are:

1. To analyze the draft law on reducing foreign influence developed in Georgia in 2024.
2. To study the evolution of the law aimed at reducing foreign influence in the Russian Federation;
3. To analyze the weekly summarizing programs of television with pro-government (Imedi TV), pro-opposition (TV-Mtavari channel), and neutral (public broadcaster) editorial policies as defined by law.

The months of April and May 2024 were determined as the research interval/period of weekly summary programs of television stations. Since, in the month of April 2024, the parliamentary majority of Georgia will start the discussion of the draft law on **Curbing Foreign Influence** and in the month of May, the draft law was sent to the President for signature and approval. (Civil.ge, 2024).

Qualitative sociological research methods were used in the research methodology: quantitative and qualitative content analysis. The combined method of the mentioned research makes it possible to study the issue in depth. In particular the following activities were carried out through qualitative content analysis:

1. The present age of airtime allocated to research issues in the media agenda was determined.
2. The priority of the research topic in the television media space was determined. In particular, the order of news items related to the research topic within the media agenda was analyzed.

By using Quantitative content analysis, the following research aspects were implemented:

1. Manipulative terms, words and related words spread in the media were singled out. Coding of these terms was carried out.
2. The legal frameworks of the researched countries regarding foreign influence agents and forces were analyzed.

Literature Review and Theoretical Framework

The theoretical framework employed in this study primarily encompasses the analysis of political course change studies, political course transfer analysis theories, and theories of media-mediated political communication.

The alteration of political courses is a significant issue in comparative public policy research. It is crucial to differentiate between change (upheavals in the existing structure and the introduction of an innovative political course) and reformation (modifications within the existing structure) (Fullan, 2000). Among the principal theories of political course change, this paper examines Kingdon's (1984) multiple streams theory. This theory posits that a policy window opens and political course change occurs when three streams of the political system (Problems, Policies, and Politics) converge, creating a policy window of opportunity.

A policy window may open due to several factors:

- The emergence of a new problem or a novel understanding of an existing issue
- The post-election period in a country
- A change in government
- A favorable shift in national attitudes or during a crisis

The primary rationale for employing this theory in examining the research question was to determine which alternatives contributed to the opening of the policy window during political course changes in Georgia.

In addition to studying political course change, it is essential to consider various policy instruments that enable us to ascertain who was involved in public policy decisions and who is affected by any alterations in public policy. From this perspective, the classification of policy instruments by Anneliese Dodds (2019) was analyzed. The approach shared by Dodds presents policy instruments as a means of studying public policy in different countries and sectors. Dodds distinguishes four types of policy instruments:

- ❖ Financial resource instruments: taxes, tax benefits, subsidies, grants, and others
- ❖ Instruments of power: licensing, regulation, behavior encouragement, imposition of requirements, etc.
- ❖ Organizational tools: creation of institutions, structures, agencies, agreements, administration, cooperation, and service delivery-reformation
- ❖ Information provision tools: propaganda, advertising, and information dissemination.

In addition, we will also consider manipulation approaches during political communication. Because, we will study the summary programs of the week of TV media operating in Georgia, where interviews on our research issue, appeals to politicians, etc. were discussed. Also, it should be noted that the task of political communication is to mobilize maximum human support to achieve a specific goal (Matsaberidze 2012). Media is an intermediary link in this process. In particular, according to Max McComb and Donald Shaw's "agenda and setting" theory, the media determines to the public what they should focus on; which are important and less important news (M.McCombs&D.Shaw 1972). Media content shapes society's agenda. In

particular, media outlets deliver news to the population purposefully, in a pre-selected order. As a result, the audience is made to think that the particular news is more important than the rest. The theory of political pressure" (M.Carey & M.Shugart .2015) tells us that politicians use the media to create the mood they want in society. That is why they actively apply the "method of informational subsidy" (D. Lilleker. 2006). In this case, political figures represent a source of information for the media in order to gain space and time in the broadcast network (D. Lilleker. 2006). According to Entaman (1993), politicians create a specific frame for this purpose, which means spreading information using pre-selected symbols (Entaman.1993). According to Lilleker (2006), there are two approaches to creating the desired mood in the population: 1. Pre-selection of topics and dissemination when the population's reaction will be maximum; 2. The use of subconscious informational stimuli, which involves the manipulation of emotional aspects of a person. It implies the creation of a specific framework in the communication process. It, taking into account the anatomy and socio-cultural aspects of society, selectively brings forward some aspects of the issue, interprets/determines the problem and formulates ways of solving this problem. Also, manipulation methods organized by Lilleker (Lilleker.2006). He notes that to change public attention vectors often use rhetoric that involves symbolism, pre-selected communication language and soundbites. A soundbite is an emotional hook. For example, J. Kennedy's phrase "I am a Berliner" ("ich bin ein Berliner"), with which he expressed his solidarity with the people of Germany. Z. Zhvania's speech "I am Georgian, therefore I am European" is also a soundtrack. Such phrases are mostly used by politicians in interviews to gain control over the conversation. Lilleker also discusses the information subsidy method. In this case, politicians are in the role of a source in order to direct the discussion of events in the desired direction and gain informational time/space. In addition, Lilleker discusses the following methods of manipulation: 1) "Creation of political myths" - targeted messages that serve to create a kind of "political formulas"; 2) "Information flow transformation technologies" - events are covered objectively, however, specific facts are deliberately ignored or disseminated with incorrect interpretation. 3) "Creation of a desired mood in a person" - information is provided to the population in such a way as to create a favorable attitude for them. 4) "leakage of classified information"; 5) Use of "information incentives" (appeals to safety, access to food, and other issues) when providing information. 7) "Method of informational-propagandistic induction" - at this time the facts are stacked in such a way that it creates a negative attitude overall. 8) With the "semantic collision method", news are placed in such a way that they complement/develop each other. 9) "Balancing information" - at this time, it is impossible to cover specific news about a political opponent (due to the sensational nature of the issue), however, it is followed by information balancing this news; 10) When talking about political topics, they often create the "illusion of universal support" with terms such as: public support, majority, etc. 11) "sticking labels" eg: chauvinist; As Lilleker points out (2006), television also uses an approach in which a dry fact is followed by a comment (and the author of the comment may be in agreement with the editorial policy of the channel). In the process of public policy, the use of emotional sides of people with similar methods creates the danger of

"simplifying politics", which Lilleker calls "dumping down" (2006) - at this time, the emphasis shifts from real politics to imitating politics.

From the point of view of the novelty of the research, it should be noted that since the law on transparency of foreign influence in Georgia was adopted in 2024, no research has been conducted in this regard yet.

RESULTS AND DISCUSSION

Data are discussed in the paper in two directions. On the one hand, we will consider the Russian law on "agents of foreign influence" and the law adopted in Georgia "on the transfer of foreign influence". On the other hand, data are presented on the research results of TV media with different editorial policies (pro-government, anti-government and law-neutral TV media), coverage of the submission and approval process of the draft law initiated by the ruling party in Georgia.

Analysis of Georgian and Russian legislation on foreign influence / agents

The analysis of empirical data from the point of view of Russian and Georgian legislation (on agents of foreign influence) presents similarities in terms of considering differences, both in terms of procedural and used instruments.

We will consider a procedural comparison of the development of legislation related to the reduction of foreign influence in Russia and Georgia.

First of all, we will consider the common aspects that are manifested in the procedural part of the adoption of the law on the "transparency of foreign influence" in Georgia and the legislation on "agents of foreign influence" in Russia.

Pre-election corruption revelations of the ruling forces by non-governmental organizations - confrontation between civil society actors and the government;

The government engaged in the downgrading and indictment of key NGO actors;

- Lack of consultation in the process of adopting legislation;
- Both countries looked to the United States' Foreign Agents Registration Act (FARA) as an example to support the introduction of legislation aimed at reducing foreign influence;
- Appeal to state sovereignty, neutrality, religious and national issues.

It is also essential to consider the distinguishing aspects revealed in the procedure of adoption of legislation on "agents of foreign influence" in Russia, which are not found in Georgia.

- Constant progression of legislation: **Russia**

1. In 2012, the term "agent of foreign influence" was introduced to designate non-profit organizations.;

2. In 2017, the designation "agent of foreign influence" was extended to include media entities.;
3. 2019: "Agent of foreign influence" - bloggers and social media users;
4. 2020: "agent of foreign influence" - natural person;
5. 2022: "Law on False Information (Fakes)" and "Law on Military Censorship,,"

It should be noted that no distinguishing aspects were identified in the procedural part of the mentioned law in Georgia, which once again indicates the transfer of legislation from Russia to Georgia.

Based on the comparative content analysis of the legislation on agents of foreign influence, the following similar aspects were identified in terms of the introduction of political instruments through the adoption of legislation in Georgia and Russia.

Similar Aspects:

- Stigmatization of non-governmental organizations by using the term of a carrier or agent of the interests of a foreign power;
- Preparation of the appropriate register of organizations financed from abroad and use of restrictive levers.

It is important to present in the paper different political mechanisms that are established through the adoption of the mentioned law.

Russia

- applies to individuals, media and organizations;

Prohibitions An object recognized as an agent of foreign influence:

- The right to use an active vote in elections;
- Use of public goods;
- Restriction of work in public institutions;
- Limiting the conduct of independent anti-corruption expertise;
- Organizing of public events and financial provision;

Georgia:

- The law applies to Organizations and Media;
- Establishing only financial sanctions for objects carrying the interests of a foreign power.

The role of the media in the transfer of the political course in Georgia

It is important how the mentioned information was disseminated by the media and what is the role of the media in this.

A narrative created by a neutral public broadcaster television in Georgia:

- ❖ Emphasizing that the opponents of the law on the suppression of foreign influence do not argue why the law is related to the Russian law and is unacceptable to them;
- ❖ According to the explanation of the mentioned television, the purpose of the foreign influence legislation is only the financial hardship of the organizations and nothing else;
- ❖ Emphasis on the principled protection of Georgia's sovereignty. In particular, the non-approval of the Law on the Difficulty of Foreign Influence should not happen just because it was the object of criticism by international partners.
- ❖ The focus of the conversation on the actions held against the law was not on the use of force by the police, but on violent protests by the citizens. These forms of protest were associated with fascism and considered a pre-revolutionary activity.

The manipulative techniques used by the neutral public broadcasting television in Georgia according to the legislation:

1. The method of information subsidy - the sources of information were: members of the ruling party;
2. Information flow transformation technologies;
3. Use of informational and subconscious stimuli when providing information;
4. label delivery technique;
5. The technique of the illusion of universal support;

Key words used: *revolutionary benefits, power-motivated violence, and political acrimony.*

Note: *All negative phrases were directed at the opposition spectrum.*

The role of the media in the transfer of the political course in Georgia

Narrative created by pro-government TV Imedi in Georgia

- The process of adopting the law on foreign hardship in Georgia was compared to the experience of European countries. They claimed that the population in these countries also protested, however, the law was passed;
- According to this television, the adoption of the mentioned law in Georgia serves the purpose of European integration and joining the European Union.
- According to TV Imedi, the opposition forces manipulatively convinced Georgia's international partners to criticize the law;

➤ It was said that the opposition and non-governmental organizations aimed at the revolution in the country and the opening of a second war front in post-Ukraine Georgia;

➤ They pointed out that the adoption of this law was a matter of Georgia's sovereignty

Manipulative techniques used by the pro-government TV Imedi in Georgia

1. Polarization of the denomination - division of the population into two poles (supporters and opponents of the law on foreign poverty);
2. Information flow transformation technologies;
3. Use of informational and subliminal stimuli when providing information;
4. label delivery technique;
5. The technique of the illusion of universal support;
6. Creation of political myths and political formulas;
7. Informational-propagandistic induction method.

The role of the media in the transfer of the political course in Georgia

Anti-government television in Georgia - a narrative created by TV Mtavari in Georgia

- Emphasizing that the government of Georgia creates a threat of losing Georgia's freedom by adopting a law that carries foreign influence;
- Emphasizing that adopting such a law for dictatorial regimes is historically a well-tested practice of stigmatizing and dividing society;
- According to this television, the adoption of the mentioned law in Georgia serves to distance from the European integration process and return to the Russian colonial space;
- The mentioned media draws attention to the fact that the ruling party of the country is taking anti-European steps with its actions and is helping to sabotage the country's European future.

Manipulative techniques used by anti-government television in Georgia - TV Mtavari

- Creation of "political myths" - targeted messages for predicting political formulas;
- Method of informational-propagandistic induction;
- Creating a desired mood in a person

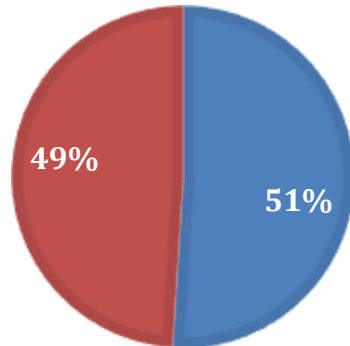
A quantitative content analysis

Diagram N1

Diagram N 2

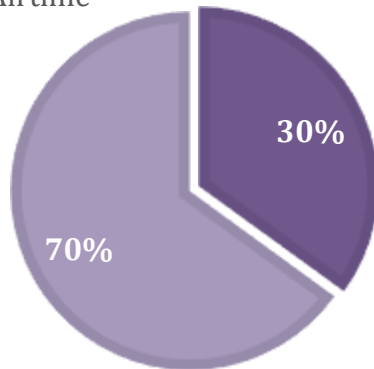
TV İMEDI

- Time allocated to the research question
- Total Airtime



TV MTAVARI

- Time allocated to the research question
- Total Airtime

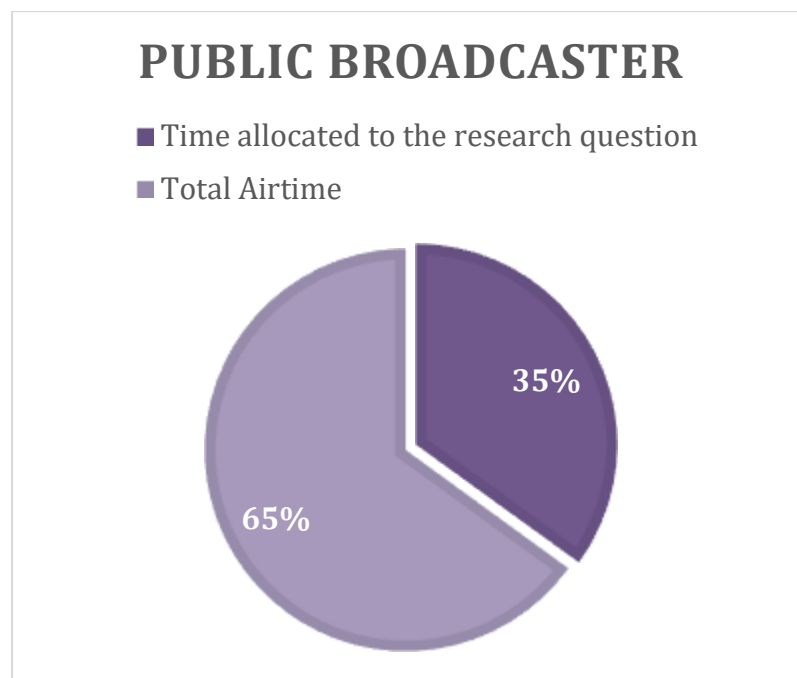


A quantitative content analysis was included in Special Farglen, within the framework of which television stations were determined and how much time they devoted to the discussion of the research topic. According to the data, TV İmedi - pro-government media gave the most air time to the discussion. In particular, the air time is 49% (Diagram N1). The reason for this is that the adoption of the "Transparency of Foreign Influence" law was met with great protest and dissatisfaction among the population. And pro-government media TV. İmedi tried to present a false version of the current events, as well as to present the opponents of the mentioned law in a negative context and applied the technique of "shooting arrows" towards the opposition and non-governmental organizations.

As for the rest of the media, the public broadcaster devoted 35% of its air time (Diagram N3), the anti-government Mtavari TV devoted 30% of its air time to the discussion of the research topic (Diagram N2).

It is worth noting that research televisions mainly aired the news about the adoption of the law on the reduction of foreign influence in Georgia in the first, second and third order broadcast networks. This indicates that the Georgian TV media fully covered the discussion of the research issue due to its essential importance.

Diagram N3



In the process of analyzing the transfer of the political course, the mentioned research answered several basic questions in the process of studying the transfer of the political course:

- **Who is responsible for transferring the assets?** *Government of Georgia;*
- **In what form is it transferred?** *Voluntary transfer*
- **To what degree does it transfer?** *Inspiration - for the government of Georgia, the experience of another country was the motivator for change;*
- **Where is it transferred from?** *from international space;*
- **What is transferred?** *The aim of the political course;*
- **What prevents the transfer?** *The negative historical experience of the Georgian people, the international strategic partners of Georgia (their negative evaluations of the influence of foreign power on the hardship law) and opposition parties/non-governmental organizations.*

In conclusion, it is important to highlight main statements:

- The inspiration for the preparation of the draft law on the difficulty of foreign influence in Georgia was the law on foreign agents in the Russian state;
- TV media was actively used in the implementation of policy transfer. This creates the danger of "policy simplification", which is called "dumping down" (Lilekeri, 2006). At this time, the emphasis shifts from real politics to imitating politics;
- The pro-government media and the public broadcaster created an agenda by using manipulative techniques, where the supporters of the law initiated by the government - the hardships of foreign influence are the boosters of the country's European integration. And opponents of the law were declared to be supporters of Russia;
- Anti-government television – TV Mtavari was Using manipulative methods, Mtavari changed the agenda, according to which the Georgian government, by adopting the above-mentioned legislation, fulfills Russia's order.

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DÜZEYLERİNİN TÜKETİCİ BOYKOT DAVRANIŞLARINA ETKİSİ**
THE EFFECT OF THE LEVEL OF CYNICISM OF HOSPITALITY CONSUMERS ON
CONSUMER BOYCOTT BEHAVIOR

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ÖZET

Sürekli gelişen turizm sektöründe, konaklama işletmelerinin de bu değişime ayak uydurması zorunlu bir hale gelmiştir. Çünkü turistler ve konaklama işletmeleri bir etkileşim içerisindeyler. Turistler bir tüketici olarak değerlendirildiğinde, modern pazarlama anlayışı çerçevesinde tüketicilerin beklentilerinin karşılanması önem arz etmektedir. Bu nedenle konaklama işletmeleri, birer tüketici olan turistlerle ilişkilerini pozitif yönde geliştirebilmek adına sürekli çaba sarfetmektedirler. Tüm bunlara rağmen turistlerin zaman zaman beklentileri karşılanmamakta ve beklentileri karşılanmamış olan bireyler tepkilerini hem duygusal hem de davranışsal olarak yansıtabilmektedirler. Birer tüketici olan turistlerin karakteristik yapıları ve konaklama işletmeleri ile yaşadıkları olumsuz deneyimleri, onların sinik tutum ve davranışlar geliştirmelerine neden olabilmektedir. Bireyler, sinik tutumda bulunmalarına neden olan konaklama işletmelerine yönelik tepkilerini bireysel ya da kolektif halde boykot şeklinde gösterebilmektedir. Gelişen iletişim teknolojileri ile bu süreç daha hızlı ve daha ucuz şekilde sürdürülebilmektedir. Bu durum turizm sektörü açısından olduğu kadar genel pazarlama faaliyetleri açısından da önemlidir. Bu nedenle bu çalışmanın amacı,

Konaklama işletmelerinde konaklayan bireylerin sinizm düzeylerinin boykot davranışlarına etkisini incelemektir. Çalışmanın bir diğer amacı ise her iki değişken arasındaki ilişkiyi ortaya koymaktır. Bu amaçla hazırlanan anket İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış 400 bireye uygulanmıştır. Elde edilen veriler SPSS analiz programı ile analiz edilmiştir. Öncelikle boykot davranışını ölçen ölçeğe ve sinizm ölçeğine yönelik güvenilirlik analizi yapılmış olup, her iki ölçeğin de yüksek derecede güvenilir olduğu sonucuna ulaşılmıştır. Araştırmada kullanılan ölçeklerin yapı geçerliliğinin test edilmesi için yapılan faktör analizi sonucunda, hem sinizm ölçeğinin hem de ve boykot davranışını ölçeğinin tek boyut altında toplandığı sonucuna varılmıştır. İstanbul'daki konaklama işletmelerinden son bir yılda konaklama hizmeti satın alan bireylerin sinizm düzeylerinin boykot davranışı üzerindeki etkisini belirlemek için regresyon analizi yapılmıştır. Yapılan analiz sonucunda, sinizm düzeyinin boykot davranışı üzerinde etkili olduğu belirlenmiştir. Ayrıca her iki değişken arasındaki ilişkiyi ortaya koymaya yönelik korelasyon analizi yapılmış olup, değişkenler arasında orta ve pozitif yönlü bir ilişki olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Sinizm, boykot davranışı, konaklama işletmeleri.

ABSTRACT

In the ever-evolving tourism sector, it has become imperative for accommodation businesses to keep pace with this change. Because tourists and accommodation establishments are in an interaction. When tourists are considered as consumers, it is important to meet the expectations of consumers within the framework of modern marketing approach. For this reason, accommodation establishments are constantly making efforts to improve their relations with tourists, who are consumers, in a positive way. Despite all these, tourists' expectations are not met from time to time and individuals whose expectations are not met can reflect their reactions both emotionally and behaviorally. The characteristics of tourists as consumers and their negative experiences with accommodation establishments may cause them to develop cynical attitudes and behaviors. Individuals can show their reactions to accommodation businesses that cause them to have cynical attitudes individually or collectively in the form of boycott. With the developing communication technologies, this process can be carried out faster and cheaper. This situation is important for the tourism sector as well as for general marketing activities. Therefore, the purpose of this study is to examine the effect of cynicism levels of individuals staying in accommodation establishments on their boycott behavior. Another aim of the study is to reveal the relationship between both variables. The survey prepared for this purpose was applied to 400 individuals who have purchased accommodation services in accommodation establishments in Istanbul in the last year. The data obtained were analyzed with SPSS analysis program. Firstly, reliability analysis was performed for the scale measuring boycott behavior and the cynicism scale, and it was concluded that both scales were highly reliable. As a result of the factor analysis

conducted to test the construct validity of the scales used in the research, it was concluded that both the cynicism scale and the boycott behavior scale were gathered under a single dimension. Regression analysis was conducted to determine the effect of cynicism levels of individuals who purchased accommodation services from accommodation establishments in Istanbul in the last year on boycott behavior. As a result of the analysis, it was determined that cynicism level was effective on boycott behavior. In addition, correlation analysis was performed to reveal the relationship between both variables and it was concluded that there is a moderate and positive relationship between the variables.

Keywords: Cynicism, boycott behavior, hospitality businesses.

GİRİŞ

Tüketicilerin boykot davranışları, işletmeler ve destinasyonlar üzerinde önemli etkileri olabileceğinden, pazarlama ve tüketici davranışı literatüründe ilgi gören konulardan biri olmuştur (Olson & Park, 2019: 356). Tüketici boykotu, "bir veya daha fazla tarafın, bireysel tüketicileri piyasada belirli alımları yapmaktan kaçınmaya teşvik ederek belirli hedeflere ulaşma girişimi" olarak tanımlanır (Friedman, 1985: 98). Bugüne dek tüketici boykotları üzerine gerçekleştirilmiş mevcut çalışmalar, tüketicileri boykot faaliyetlerine katılmaya motive eden, bir firmanın eylemlerinin algılanan korkunçluğu, bir fark yaratma arzusu ve kendini geliştirme potansiyeli gibi çeşitli faktörleri araştırmıştır (Klein vd., 2004: 94). Buna ek olarak, araştırmalar boykot kararlarının olumsuz destinasyon imajlarına yol açabileceğini göstermiş ve tüketici boykot davranışını anlamının ve yönetmenin önemini vurgulamıştır. (Olson & Park, 2019: 362). Konaklama sektörünün itibarı ve müşteri algıları, başarısı için hayati öneme sahiptir, çünkü olumsuz tanıtım ve güven kaybı, bir işletmenin kârlılığı üzerinde yıkıcı etkiler yaratabilir. Tüketici boykotları, hoşnutsuz müşterilerin kolektif satın alma kararlarının gücünü kullanarak hoşnutsuzluklarını dile getirmesiyle konaklama endüstrisinde giderek yaygınlaşan bir olgu haline gelmiştir (Makarem ve Jae, 2016: 196).

Turizm endüstrisinin büyümesi ve tüketim kültürünün yükselişi, hem turistlerden hem de yerel topluluklardan çok çeşitli tepkilerin ortaya çıkmasına neden olmaktadır. Bu büyüyen trend, tüketicilerin pazarlama faaliyetlerinin bütünlüğü ve şeffaflığı konusunda giderek daha güvensiz ve şüpheli hale gelmesiyle karakterize edilen, tüketiciler ve markalar arasındaki ilişkideki tüketici sinizmine vurgu yapan değişimi yansıtmaktadır (Pervan & Martin, 2012: 344). İlgili yazın, bir bireyin sinizm düzeyinin veya başkalarının güdü ve davranışlarına yönelik genel güvensizliğin ve şüpheliğin, bu tür boykotlara katılma olasılıklarını belirlemede önemli bir faktör olabileceğini ileri sürmektedir (Klein vd., 2004: 94).

Bu çalışma, tüketicilerin sinizm düzeyleri ile boykot davranışları arasındaki ilişkiyi konaklama sektörü bağlamında incelemektedir, zira bu dinamiğin anlaşılması konaklama işletmeleri ve destinasyon pazarlamacıları için değerli içgörüler sağlayabilir. Bu çalışmanın bulguları, özellikle konaklama sektörü bağlamında, sinizmin boykot davranışlarını

şekillendirmedeki rolüne ilişkin ampirik kanıtlar sağlayarak tüketici boykotlarına ilişkin mevcut literatüre katkıda bulunacaktır. Çalışmanın sonuçlarının, tüketici boykotlarının olumsuz etkilerini azaltmaya ve olumlu marka (destinasyon) imajlarını korumaya yönelik stratejilerin belirlenmesi yönünde katkılar sunması beklenmektedir bu nedenle araştırma sonucu konaklama işletmeleri ve destinasyon pazarlamacıları için değerli olacaktır.

KAVRAMSAL ÇERÇEVE

Tüketici Sinizmi

Sinizizm (cynicism) kavramı “*İnsanın erdem ve mutluluğa, hiçbir değere bağlı olmadan bütün gereksinimlerden sıyrılarak kendi kendine erişebileceğini savunan Antisthenes'in öğretisi; kinizm.*” şeklinde tanımlanmaktadır (<https://sozluk.tdk.gov.tr/>). Öte taraftan Tokgöz ve Yılmaz (2008: 285) kavramı insanların açığa vurulmuş veya vurulmamış niyetleriyle ilgili kötümser, hayal kırıklığına dayalı bir şekilde olayları açıklama şekli veya insanların kendi çıkarlarını korumak ve artırmak amacıyla araç olarak bir başka kişiyle ilgilenme ve işleri idare etme durumu olarak tanımlamaktadır. Eski Yunan`da ortaya çıkan bireyin toplumdan kendini soyutlanarak idealist bir yaşam sürmesini anlatan sinizim, günümüzde çok farklı anlamlarda kullanıldığı görülmekte (Güven, 2016: 155) ve genellikle memnuniyetsizlik, güvensizlik, onaylanmamış beklentiler ve karamsarlık sonucu oluşan durumlarla ilişkilendirilmektedir. Bir başka deyişle, diğerlerine güvenmeme, hoşlanmama, kurumlara karşı olumsuz ve güvensiz tutum içinde olma, engelleme, hayal kırıklığı ve umutsuzluk, insanların yaptıklarının iyilik ve samimiyetine inanmama eğilimi göstermesi, kişi, grup, toplumsal, ideoloji, gelenek ve kuruma karşı olumsuz duygular içerisinde olma eğilimi içinde olmaktadır (Arslan, 2012: 13).

Yüzyıllar boyunca edebi ve felsefi bir yapı olarak kullanılmasına karşın son yıllarda sosyal bilim alanındaki araştırmacıların üzerinde çalıştığı bir alan olarak kabul görmektedir. Mesleki (iş), çalışan, örgütsel veya örgütsel değişim sinizmi gibi konularına eğildikleri gözlenmektedir (Çetinkaya ve Ceng, 2018: 169). Sinizim ile ilgili üzerinde durulan bir diğer konu ise, tüketici sinizmidir. Tüketici sinizmi kavramı, sinizmin ana bileşenlerinden bilişsel, davranışsal ve duygusal boyutlarına göre sınıflandırmaya dahil edilmiştir. Sinizmin duygusal boyutunda tatminsizlik ve yabancılaşma kavramlarını, davranışsal boyutunda düşmanlık ve direniş, bilişsel boyutunda ise kuşku, itimatsızlık ve şüphe kavramlarına değinilmektedir (Chylinsky ve Chu, 2010:780). Odou ve Pechpeyrou (2011:1802) ise, tüketici sinizmini dört farklı kategoriye ayırmaktadır. Bunlardan savunmacı sinizim, kendi çıkarı peşinde olan birey şirketin iyi niyetini bile kırma davranışı içindedir. Saldırgan sinizmde kendi çıkarı peşinde koşan birey başkası tarafından aldatılmadan önce elde edebileceğini düşündüğü her şeyi elde etme düşüncesi içindedir. Yıkıcı sinizm ise, burada birey diğer tüm tüketicilere piyasanın tüketim kodlarını açıklama ve aldatıldıklarını ifşa etme çabası içindedir. Son tüketici sinizm türü olan etik sinizmde ise, tüketici kendi değer yargı ve zevklerine odaklanmakta ve onun dışındaki tüm değer yargılarını yok saymaktadır.

Tüketici sinizmi, tüketicinin sektördeki kurumlara karşı hayal kırıklığı yaşaması, şüphe duyması ve aldatılmaya çalışıldığı düşüncelerinin ortaya çıkmasına yol açan bir tür psikolojik telafi stratejisi olarak da tanımlanmaktadır. Burada bahsedilen tüketici sinizmi basit bir eleştiriden ziyade radikal bir davranıştan, tutumdan bahsedilmektedir (Mikkonen, Moisander ve Fırat: 2011: 101).

Tüketici Boykot Davranışı

Genel tüketim karşıtı davranışların içinde yer alan boykot kavramı (Kırmızı ve Babaoğul, 2012: 3), *“bir işi, bir davranışı yapmama kararı alma”* ya da *“bir kimse, bir topluluk veya bir ülkeyle amaca ulaşmak için her türlü ilişkiyi kesme”* şeklinde tanımlanmaktadır (<https://sozluk.tdk.gov.tr/>). Tüketim karşıtlığı davranışı esasen 1970’li yılların sonuna doğru toplumsal düzene karşı koyan gruplarca oluşturulmuş bir hareketlilik ve küreselleşmenin etkisiyle 2000’li yıllar itibariyle geniş kitleler tarafından benimsenmiştir (Kırmızı ve Babaoğul, 2012: 3). Söz konusu kitleler ise çeşitli gruplara ayrılarak boykot davranışını başlatmıştır. Bu gruplardan en popülerleri; kadın haklarını savunan gruplar, çevreci gruplar, işçi haklarını savunan gruplar, savaş karşıtı gruplar ve hayvan haklarını savunan gruplardır (Friedman, 1995: 10). Daha spesifik olarak, Sevgililer Günü Karşıtları, Satın Almama Günü ve Yavaş Şehir gibi hareketler de boykot davranışını simgeleyen gruplara örnek olarak verilebilir (Kırmızı ve Babaoğul, 2012: 3). Dolayısıyla bu davranış, söz konusu grupların piyasadaki birliktelik eylemini gösterirken tüketici hâkimiyetinin, kapitalizmin ve siyasal ekonomik yapının çıktısını yansıtmaktadır (Smith, 1990: 314 akt. Balaban ve Yücel, 2019: 194). Ayrıca boykotlar, örgütleri ekonomik yönden olduğu kadar imaj yönünden de etkilemektedir (Çakır, 2010: 125). Tüm bu durumlar ise, örgüt ve toplum arasındaki ilişkiyi ve örgütlerin toplum tarafından kontrol edilmesinin önemini göstermektedir (Smith, 1990: 314 akt. Balaban ve Yücel, 2019: 194).

Geçmiş 14. yüzyıla dayanan boykotların (Klein vd., 2004: 93), örgütün satışlarını düşürme, kârlarını azaltma, piyasadaki imaj ve itibarını zedeleme gibi sonuçlarıyla her zaman bir tehdit unsuru olmasına rağmen yakın tarihe kadar çok fazla önemsenmediği bilinen bir gerçektir (Ettenson ve Klein, 2005: 201). Bu duruma dikkat çeken Garrett (1987: 47), boykotu düzenleyenlerin daha tecrübeli hale geldiğini ve boykot hareketliliğinin arttığına vurgu yaparak boykotların pazarlamayla doğrudan ilişkili olduğunu ve bu nedenle de pazarlama araştırmacıları tarafından ele alınmasının önem arz ettiğini ifade etmiştir. Nitekim örgütün kontrolündeki sosyal bir mekanizmayı temsil eden ve bu bağlamda tüketici gücünün bir tür kaynağı olan boykot davranışı, müşteri devamlılığını etkileyerek pazarlama yöneticilerinin alacakları kararları yönlendiren bir unsur olarak görülmekte (Klein vd., 2004: 92) ve satın alma karar sürecinde etkili bir araç olarak nitelendirilmektedir (Sen vd., 2001: 404).

Tüketici boykotlarını yalnızca bir işletmenin ya da bir ülkenin mamulünü satın almama eğilimi şeklinde ifade etmek yanlış bir sınıflandırma olacaktır. Çünkü tüketici grupları boykot davranışlarını hem kendileri ile ilgili problemleri çözmek hem bilgi yayma faaliyetlerini işletmek hem de geniş çaplı toplumsal hareketleri başlatmak amacıyla kullanmaktadırlar

(Balıkçiođlu vd., 2007: 81). Bu nedenle tüketiciler boykotu, belirlenen bir amaca ulaşmak için bir ya da daha fazla grubun girişimde bulunup tüketicilerin piyasada tanımlanmış ürün veya ürün grubunu satın almaktan kaçındırılmasını ifade etmektedir (Friedman, 1985: 97). Balıkçiođlu vd. (2007: 85) ise, tüketiciler boykotlarının danışma (referans) gruplarından ve kültürel faktörlerden doğrudan veya dolaylı bir şekilde etkilenmesi sonucunda oluştuđuna vurgu yapmaktadır. Nitekim tüketiciler davranışı teorisine göre tüketiciler satın alma kararı ve tüketim davranışı, içinde bulunulan ya da bulunulmak istenen danışma gruplarından etkilenmektedir.

Tüketiciler şikâyetçi oldukları marka veya işletmenin yönetimine doğrudan ulaşamadıkları durumlarda tepkilerini boykot olarak gösterebilmektedir. Dolayısıyla boykotlar, tüketicilerin ilgili marka veya işletmeye ulaşip tepkilerini bildirmede bir iletişim rolü üstlenebilmektedir (Barkmann ve Micheletti, 2007: 3). Bu tepkiler ise genel olarak “*dile getirme*” ve “*terk etme*” olmak üzere iki şekilde gösterilmektedir. Terk etme tepkisi, tüketicilerin ilgili ürün veya markayı satın almaktan vazgeçip satın aldığı işletmeyi değiştirmeye gerçekleşmektedir ve işletmeler için ciddi tehlike arz etmektedir. Dile getirme tepkisi ise, tüketicilerin memnuniyetsizliklerini gerek işletme ile doğrudan iletişime geçerek gerekse de yakın çevre veya tüketiciler destekli sivil toplum kuruluşlarına anlatılarak şikâyetle bulunulmasını ifade etmektedir (Balaban ve Yücel, 2019: 194). Dolayısıyla tüketicilerin işletme veya markaya yönelik algılarının boykota dönüşmesi başarısızlığı yansıtan bir kanıt olarak değerlendirilmektedir (Klein vd., 2004: 93).

Tüketiciler Sinizmi ve Tüketiciler Boykotu İlişkisi

Alan yazın incelendiğinde, gerek tüketiciler sinizminin sonuçlarını gerek tüketiciler boykot davranışına neden olan faktörleri gerekse de bu iki değişken arasındaki ilişkiyi inceleyen çalışmaların kısıtlı olduğu görülmektedir. Dolayısıyla bu bölümde, tüketiciler sinizmi ile tüketiciler boykotu ilişkisini ele alan çalışmalara ve bu çalışmaların bulgularına yer verilmiştir.

Chu ve Chylinski (2006:1) yapmış oldukları çalışmalarında, tüketicilerin işletmelerin uyguladıkları pazarlama taktikleri karşısında manipüle edildikleri ve aldatıldıkları algılarının onları sinik davranışlar sergilemeye yönlendirdiğini ve bu davranışsal sonuçların da boykota dönüşebileceği vurgusunu yapmıştır. Tüketicilerin sinizm davranışlarının pazar yeri davranışlarına ve algılarına etkisini araştıran Helm vd. (2015), sinik tüketicilerin marka veya işletmeleri boykot etmek amacıyla davranışlarda bulunulduđunu ifade etmişlerdir. Atılgan vd. (2017) yapmış oldukları çalışmalarında, işletmelerin fiyat farklılaştırma uygulamaları durumunda tüketiciler sinizmi, fiyat şeffaflığı, fiyat adaleti, satın alma niyeti ve boykot yapmaya yönelik tutumları arasındaki ilişkileri incelemeyi amaçlamışlardır. Araştırmanın amacı çerçevesinde yapılan analizlerde, tüketiciler sinizmi ile boykot yapmaya yönelik tutum arasında pozitif yönlü anlamlı bir ilişki olduğu sonucuna ulaşılmıştır. Hizmet sektöründe tüketiciler sinizminin öncüllerini ve davranışsal sonuçlarını ortaya koymayı amaçlayan Akçay (2021), verilerini Bursa ilindeki tüketicilerden elde etmiştir. Araştırmacı yaptığı analizler sonucunda, hizmet sektörüne yönelik tüketiciler sinizminin tüketiciler boykotları üzerinde anlamlı ve pozitif

etkiye sahip olduğunu tespit etmiştir. Durmuş (2022) marka güveninin yitimine yönelik tüketici sinizminin öncülleri ve sonuçlarını ortaya koymayı amaçladığı çalışmada, tüketicilerin pazarlama iletişimiyle ilgili üretilen sinik tutumlarının boykot davranışına dönüşebileceği sonucuna ulaşmıştır. Tüketici sinizminin tüketici boykot davranışına etkisinde tüketici boykot katılım güdülerinin aracılık rolünün olup olmadığını inceleyen Keser ve Söğütlü (2023), verilerini Erzurum’da yaşayan 401 tüketiciden elde etmişlerdir. Araştırmacılar yapmış oldukları veri analizleri sonucunda, tüketici sinizminin boykot davranışını etkilediğini, tüketici boykot katılım güdülerinin ise bu etkiye aracılık ettiğini tespit etmişlerdir.

Yapılan çalışmalar incelendiğinde, tüketici sinizmi ile tüketici boykotu arasındaki ilişkinin konaklama işletmeleri bağlamında incelendiği herhangi bir çalışmaya rastlanılmamıştır. Ancak turizm işletmelerine yönelik olarak konaklama hizmeti alan tüketicilerin boykot davranışlarının tüketici sinizm davranışının bir sonucu olabileceği düşünülmektedir. Bu düşünceden yola çıkarak aşağıdaki hipotezler geliştirilmiştir.

H₁: İstanbul’daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeylerinin tüketici boykot davranışları üzerinde etkisi vardır.

H₂: İstanbul’daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeyleri ile tüketici boykot davranışları arasında anlamlı bir ilişki vardır.

ARAŞTIRMA VE BULGULAR

Yöntem

Araştırmanın Amacı

Bu çalışmanın amacı, İstanbul’daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin sinizm düzeylerinin boykot davranışlarına etkisini incelemektir. Çalışmanın bir diğer amacı ise her iki değişken arasındaki ilişkiyi ortaya koymaktır.

Örnekleme Süreci

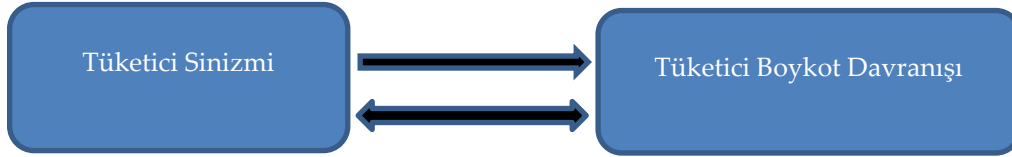
Araştırmanın ana kütlesini İstanbul’daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireyler oluşturmaktadır. Ancak “*zaman ve maliyet kısıtlaması nedeniyle örnekleme yoluna gidilmiş ve örneklem büyüklüğünün %95 güvenilirlik ve %5 örneklem hatası ile 384*” olduğu tespit edilmiştir (Yazıcıoğlu ve Erdoğan, 2004). Verilerin toplanmasında kolayda örnekleme yöntemiyle anket uygulaması yapılmıştır. Veriler yüz yüze ve online anket tekniği yoluyla toplanılmıştır. Anketler 01.01.2024 ile 01.05.2024 tarihleri arasında İstanbul’daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış 400 bireye gönüllülük esasına göre uygulanmıştır.

Veri Toplama Yöntemi ve Aracı

Araştırma için gerekli olan veriler, anket tekniği ile toplanmıştır. Araştırma için hazırlanan anket üç bölümden oluşmaktadır. Birinci bölümde, Helm vd. (2015) yaptığı araştırmada kullanılan 8 maddelik tüketici sinizm ölçeği yer almaktadır. Anketin ikinci bölümünde, Hoffmann vd. (2018) yapılan araştırmada kullanılan 7 maddelik tüketici boykot davranışını ölçen ölçek yer almaktadır. Üçüncü bölümde ise, demografik özellikleri ölçen 5 soruya yer verilmiştir.

Araştırmanın Modeli ve Hipotezleri

Şekil 1: Araştırmanın Modeli



Araştırmanın modeli ve amacı doğrultusunda geliştirilen hipotezler şu şekildedir:

H₁: İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeylerinin tüketici boykot davranışları üzerinde etkisi vardır.

H₂: İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeyleri ile tüketici boykot davranışları arasında anlamlı bir ilişki vardır.

Kullanılan Yöntemler

Araştırmada elde edilen veriler “SPSS (Statistical Package for Social Sciences) for Windows Programı” kullanılarak analiz edilmiştir. Verilerde normal dağılıma uygunluk Q-Q Plot çizimi ile incelenmiştir. Çarpıklık ve basıklık değerlerinin “ $\pm 1,96$ arasında kalıyorsa veriler normal dağılıyor” yorumu yapılabilir (Can, 2022, s. 87). Normal dağılım uygunluk normallik testleri ve basıklık çarpıklık değerleri ile kontrol edilmiştir. Bu doğrultuda verilerin normal dağılım varsayımını sağladığı tespit edilmiştir. Araştırmada kullanılan ölçeğin güvenilirliği Cronbach Alpha ile hesaplanmıştır. Ayrıca ölçeğe ilişkin açıklayıcı faktör analizi yapılmıştır. İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeylerinin tüketici boykot etkisini belirlemek için regresyon analizi yapılmıştır. Ayrıca her iki değişken arasındaki ilişkiyi ortaya koymaya yönelik Pearson Korelasyon analizi yapılmıştır.

Verilerin Analizi ve Araştırmanın Bulguları

Güvenilirlik Analizi

Ölçeğin Cronbach Alfa güvenilirlik katsayısı “ $0.00 \leq \alpha < 0.40$ ise ölçek güvenilir değil, $0.40 \leq \alpha < 0.60$ ise ölçek düşük derecede güvenilir, $0.60 \leq \alpha < 0.80$ ise ölçek oldukça güvenilir ve $0.80 \leq \alpha < 1.00$ ise ölçek yüksek derecede güvenilir” olarak değerlendirilir (Can, 2022, s. 396).

Tablo 1'de araştırmada kullanılan ölçeklerin güvenilirlik analizi yapılmıştır.

Tablo 1: Güvenirlilik Analizi Sonuçları

Faktör Adı	Cronbach's Alpha	Madde Sayısı
Tüketici Sinizmi	,955	8
Tüketici Boykot Davranışı	,980	7

Araştırmada kullanılan ölçeğe uygulanan güvenilirlik analizine göre, Cronbach's Alfa (α) değeri tüketici sinizm ölçeği için 0,955 olarak ve tüketici boykot davranışı ölçeği için ,980 olarak belirlenmiştir. Elde edilen sonuç, araştırmada kullanılan her iki ölçeğin yüksek derecede güvenilir olduğunu göstermiştir.

Faktör Analizi

Tüketici sinizm düzeyini ölçen veri setinin faktör analizine uygunluğunu test eden KMO değeri (0,923) faktör analizi yapılabilmesi için uygun ve mükemmel bir değerdir. Yine aynı amaca hizmet eden Bartlett testi anlamlılık düzeyi = 0,00 olduğundan ve $p < 0,05$ olması koşulunu sağladığından verilerin faktör analizi için uygun olduğuna karar verilmiştir. Tüketici sinizm düzeyini ölçmek amacıyla uygulanan faktör analizi sonucunda, kullanılan ölçekteki ifadelerin tek boyut altında toplandığı görülmektedir. Açıklanan toplam varyans %76,151 olarak belirlenmiştir.

Tablo 2: Tüketici Sinizm Düzeyini Ölçmeye Yönelik Değişkenlere İlişkin Faktör Analizi Sonuçları

Ölçek Alt Boyutları	Maddeler	Yük Değerleri	Açıklanan Varyans (%)
Tüketici Sinizmi	TS1	,628	76,151
	TS2	,804	
	TS3	,818	
	TS4	,741	
	TS5	,684	
	TS6	,839	
	TS7	,800	
	TS8	,778	

Tüketici boykot davranışını ölçen veri setinin faktör analizine uygunluğunu test eden KMO değeri (0,901) faktör analizi yapılabilmesi için uygun ve mükemmel bir değerdir. Yine aynı amaca hizmet eden Bartlett testi anlamlılık düzeyi = 0,00 olduğundan ve $p < 0,05$ olması

koşulunu sağladığından verilerin faktör analizi için uygun olduğuna karar verilmiştir. Tüketici boykot davranışını ölçmek amacıyla uygulanan faktör analizi sonucunda, kullanılan ölçekteki ifadelerin tek boyut altında toplandığı görülmektedir. Açıklanan toplam varyans %89,385 olarak belirlenmiştir.

Tablo 3: Tüketici Boykot Davranışını Ölçmeye Yönelik Değişkenlere İlişkin Faktör Analizi Sonuçları

Ölçek Alt Boyutları	Maddeler	Yük Değerleri	Açıklanan Varyans (%)
Tüketici Boykot Davranışı	TBD1	,834	89,385
	TBD2	,896	
	TBD3	,934	
	TBD4	,884	
	TBD5	,906	
	TBD6	,941	
	TBD7	,862	

Demografik Bulgular

Araştırmaya katılan kadınların demografik olarak dağılımları Tablo 4'te yer almaktadır.

Tablo 4: Katılımcıların Demografik Özelliklerine Göre Dağılımı

Cinsiyet	N	%
Kadın	125	31,2
Erkek	275	68,8
Toplam	400	100
Medeni Durum	N	%
Evli	130	32,5
Bekar	270	67,5
Toplam	400	100
Yaş	N	%

25 ve altı	52	13,0
26-35	102	25,5
36-45	172	43,0
46 ve üzeri	74	18,5
Toplam	400	100
Aylık Gelir	N	%
20000 TL' den az	74	18,5
20001-25000 TL	175	43,8
25001-30000 TL	67	16,7
30001-35000 TL	44	11,0
35001 TL' den fazla	40	10,0
Toplam	400	100
Eğitim Durumu	N	%
Ön lisans	170	42,5
Lisans	149	37,3
Lisansüstü	81	20,2
Toplam	400	100

Hipotezlerin Test Edilmesi

H₁: İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeylerinin tüketici boykot davranışları üzerinde etkisi vardır.

Tablo 5: Tüketici Sinizm Düzeyinin Tüketici Boykot Davranışı Üzerindeki Etkisini Belirlemeye Yönelik Regresyon Analizi Sonucu

Bağımlı Değişken: Tüketici Boykot Davranışı	Standart Olmayan Katsayılar		Standart Katsayılar		
	B	Std. Hata	Beta	T	Sig.
(Sabit)	2,093	,120		17,496	,000

Tüketici Sinizmi ,622 ,039 ,628 16,098 ,000

R:0,628 R2:0,394 Düzeltilmiş R2:0,393 F:259,147 p:0,000

Tüketici boykot davranışı üzerinde etkisi olduğu düşünülen tüketici sinizm düzeyi değişkeninin tüketici boykot davranışını ne şekilde etkilediğini belirlemek için yapılan regresyon analizi sonucunda her iki değişken arasında anlamlı bir ilişki ($R=0,628$, $R^2=0,394$) olduğu ortaya çıkmıştır ($F=259,147$, $p=,000<,05$). Tüketici sinizm düzeyi tüketici boykot davranışındaki değişimin %39,4'ünü açıklamaktadır ve regresyon katsayısının anlamlılık testleri göz önüne alındığında tüketici sinizm düzeyinin ($p=,000<,05$, $T=-16,098$) tüketici boykot davranışı değişkeni üzerinde anlamlı bir etkisi olduğu sonucuna ulaşılmıştır. H_1 hipotezi desteklendi.

H₂: İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeyleri ile tüketici boykot davranışları arasında anlamlı bir ilişki vardır.

Tablo 6: Tüketici Sinizm Düzeyi ile Tüketici Boykot Davranışı Arasındaki İlişkiyi Belirlemeye Yönelik Pearson Korelasyon Analizi Sonucu

	Tüketici Sinizmi	Tüketici Boykot Davranışı
Tüketici Sinizmi		
Pearson Korelasyon	1	,628**
Sig. (2-kuyruklu)		,000
N	400	400
Tüketici Boykot Davranışı		
Pearson Korelasyon	,628**	1
Sig. (2-kuyruklu)	,000	
N	400	400

** . Korelasyon 0,01 düzeyinde anlamlıdır (2 kuyruklu).

İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeyleri ile tüketici boykot davranışları arasındaki ilişkiyi belirlemeye yönelik olarak Pearson korelasyon analizi yapılmıştır. Korelasyon katsayısı -1 ile +1 aralığında değer almakta olup, ilişki bu değerler doğrultusunda yorumlanmaktadır. Korelasyon katsayısı yani r değeri 0,00-0,25 arasında ise çok zayıf, 0,26-0,49 arasında ise zayıf, 0,50-0,69 arasında ise orta, 0,70-0,89 arasında ise güçlü ve 0,90-1,00 arasında ise çok

güçlü bir ilişki olduğu yorumu yapılabilir (Arslan, 2018:53). Yapılan Pearson Korelasyon analizi sonucunda elde edilen sig. (p) değeri ,000'dır. $p=,000$ değeri ,05 değerinden küçük olduğu için bu iki değişken arasında anlamlı bir ilişki olduğu sonucu elde edilmiştir. Tüketici sinizm düzeyi ile tüketici boykot davranışı arasındaki korelasyon kat sayısı değeri $r=-,628$ olmasından dolayı aralarında pozitif ve orta bir ilişki olduğu sonucuna varılmaktadır. Yani tüketici sinizm düzeyi yükseldikçe tüketici boykot davranışı da artmaktadır. **H2** hipotezi desteklendi.

SONUÇ ve ÖNERİLER

Bu çalışma, İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin sinizm düzeylerinin boykot davranışlarına etkisini belirlemek amacıyla yapılmıştır. Çalışmanın bir diğer amacı ise her iki değişken arasındaki ilişkiyi ortaya koymaktır.

Araştırmanın ana kütesini İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireyler oluşturmaktadır. Zaman ve maliyet kısıtlaması nedeniyle örnekleme yoluna gidilmiş ve 400 bireye gönüllülük esasına göre uygulanmıştır. Verilerin toplanmasında kolayda örnekleme yöntemiyle anket uygulaması yapılmıştır. Veriler yüz yüze anket tekniği yoluyla 01.01.2024 ile 01.05.2024 tarihleri arasında toplanılmıştır.

Araştırmada elde edilen veriler "SPSS (Statistical Package for Social Sciences) for Windows 25.0 programı" kullanılarak analiz edilmiştir. Normal dağılım uygunluk normallik testleri ve basıklık çarpıklık değerleri ile kontrol edilmiştir. Bu doğrultuda verilerin normal dağılım varsayımını sağladığı tespit edilmiştir. Araştırmada kullanılan ölçeğin güvenilirliği Cronbach Alpha ile hesaplanmıştır. Yapılan analiz sonucunda, araştırmada kullanılan her iki ölçeğin yüksek derecede güvenilir olduğunu göstermiştir. Ayrıca ölçeğe ilişkin açıklayıcı faktör analizi yapılmıştır. Yapılan analiz sonucunda her iki ölçeğin de tek boyut altında toplandığı belirlenmiştir.

İstanbul'daki konaklama işletmelerinde son bir yılda konaklama hizmeti satın almış bireylerin tüketici sinizm düzeylerinin tüketici boykot davranışları üzerinde etkisini belirlemek için regresyon analizi yapılmıştır. Analiz sonucunda, tüketici boykot davranışı değişkeni üzerinde anlamlı bir etkisi olduğu sonucuna ulaşılmıştır. Ayrıca her iki değişken arasındaki ilişkiyi ortaya koymaya yönelik Pearson Korelasyon analizi yapılmıştır. Analiz sonucunda, her iki değişken arasında pozitif ve orta bir ilişki olduğu sonucuna varılmıştır. Yani Yani tüketici sinizm düzeyi yükseldikçe tüketici boykot davranışı da artmaktadır.

Çalışmanın kısıtları, örnekleme yöntemlerinden kolayda örnekleme yönteminin ve birincil veri toplama yöntemi olarak da anket tekniğinin kullanılmış olmasıdır. Çalışmanın tüketici sinizm düzeyinin daha yüksek olduğu düşünülen konaklama hizmeti alan tüketiciler üzerinde yapılmış olması da bir diğer kısıttır. Sonraki çalışmaların farklı örneklem grupları ile farklı sektörlerde tekrar edilmesi bu araştırmanın sonuçlarının genelleştirilebilmesi açısından önem arz etmektedir. Ayrıca bu çalışmada tüketici sinizmi ve boykot davranışı

birlikte incelenmiştir. İleriki çalışmalarda hem tüketici sinizmi kavramının hem de boykot davranışının farklı kavramlarla ve değişkenlerle ilişkilerinin ortaya konması da önemlidir.

Literatür araştırması sonucunda gerek ulusal gerekse uluslararası yazında tüketici sinizminin tüketici boykot davranışına etkisini turizm sektöründe inceleyen herhangi bir çalışmaya rastlanılmamış olması çalışmanın özgünlüğünü ortaya koymaktadır.

Araştırmanın bilimsel katkısı, bu çalışma sonucunda tüketici sinizmini ve boykot davranışını bir sorun olarak gören ve bunu çözmek için stratejiler geliştiren turizm sektörü yöneticilerine ve ilgili alandaki akademisyenlere yapacakları çalışmalarda rehberlik edilecek olmasıdır.

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YAŞAM HAKKI: AİHM VE AYM KARARLARI IŞIĞINDA BİR DEĞERLENDİRME

RIGHT TO LIFE AN EVALUATION IN THE LIGHT OF THE DECISIONS OF THE ECHR AND THE CONSTITUTIONAL COURT

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ÖZET

İnsan, biyolojik ve toplumsal bir varlıktır. O nedenle insanın birey olarak da bir kişiliği vardır. Dolayısıyla insanın sahip olduğu kişilik gerek insani gerekse de hukuki açıdan büyük öneme sahiptir. Şu halde kuşkusuz yaşama hakkı en temel haklardandır bu nedenle mutlak hakların da başında gelir. Hakeza yaşama hakkı karşısında diğer haklar ikincil öneme sahiptir. Yaşama hakkının önemi ve tartışılmazlığı karşısında diğer tüm hakların kullanımı hatta varlığı bu hakka bağlı olarak değerlendirilir. Bu nedenle de Avrupa İnsan Hakları Sözleşmesi (AİHS)'nde, yaşama hakkı; dokunulmaz haklar veya hakların sert çekirdeği olarak ifade edilmektedir.

Bu çalışmada; Avrupa İnsan Hakları Sözleşmesi'nin (AİHS) 2. maddesinde güvence altına alınan yaşam hakkı Avrupa İnsan Hakları Mahkemesi (AİHM) içtihatları ile Türk hukuku çerçevesinde ele alınmıştır. Hakeza çalışma kapsamında; yaşama hakkının önemi ve istisnaları, yaşama hakkının korunması açısından devletlerin yükümlülükleri ile yaşama hakkı kapsamında dikkat edilmesi gereken hususlar bu çerçevede açıklanacaktır.

Bununla birlikte, AİHS ile diğer uluslararası sözleşmeler bir bütün olarak ele alınarak AİHS de güvence altına alınan hakların başında gelen yaşam hakkı soyut bir hak olarak değerlendirilmemelidir. Aksine belli başlı düşünce ve yaklaşımlar; evrensel hukuk ilkeleri, meşru amaç, gereklilik, orantılılık, keyfi olmama ve adil denge testi gibi AİHS'nin yapısı ve AİHS'deki çeşitli haklar vasıtasıyla önemli kriterler kapsamında ele alınarak güvence altında tutulmalıdır. Kaldı ki AİHS'ndeki belirli maddeler arasında spesifik bağlar mevcuttur.

AİHS'nin ihlali iddiasının incelenmesi açısından yaşam hakkı ihlallerini engellemek üzere yürürlüğe konulan mevzuatlar, uluslararası sözleşmeler ile alınan tedbirler ve yapılan uygulamalar AİHM'nin yargılama yetkisi kapsamına girmektedir. Bu konuda AİHM'nin yargısal yetkisi ikincil nitelikte olmakla birlikte kararları AİHS'e taraf devletler için bağlayıcı niteliktedir.

Anahtar Kelimeler: Yaşam hakkı, devletlere düşen yükümlülükler, Avrupa İnsan Hakları Mahkemesi, Avrupa İnsan Hakları Sözleşmesi, silah kullanma ve silahlı çatışma.

ABSTRACT

Human is a biological and social being. For this reason, humans also have a personality as an individual. Therefore, the personality a person has is of great importance both in human and legal terms. In this case, undoubtedly, the right to life is one of the most basic rights, therefore it is the core of absolute rights. Likewise, other rights are of secondary importance compared to the right to life. Considering the importance and indisputable nature of the right to life, the use and even existence of all other rights are evaluated as dependent on this right. European Convention on Human Rights (ECHR) expresses the right to life as inviolable right and the hard core of rights.

This study discusses the right to life, guaranteed in Article 2 of the European Convention on Human Rights (ECHR), within the framework of the jurisprudence of the European Court of Human Rights (ECHR) and Turkish law. This work illustrates the importance of the right to life considering the obligations of states and relevant issues.

On the other hand, ECHR, relevant international agreements, certain thoughts and approaches, and the principles of universal law must be safeguarded through the structure of the ECHR and various rights in the ECHR, such as legitimate purpose, necessity, proportionality, non-arbitrary and fair balance test.

The study analyses the alleged violation of the ECHR, and proposes the draft law to prevent violations of the right to life.

Keywords: Right to life, obligations of states, European Court of Human Rights, European Convention on Human Rights, use of arms and armed conflict.

GİRİŞ

İnsan haklarının insan türünün, varlıklarının ve doğasının herhangi bir yasal sisteme veya toplumsal ahlaki koda bağlı olmaması için yapay olmaktan ziyade doğal olan temel ahlaki haklardan oluştuğunu söyleyebiliriz. İnsan hakları, bir insanın öznel ve fakat objektif ilkelere yönelik haklarıdır; tüm hakların normatif doğasını paylaşırlar. Haklar, her zaman, bu haklara saygı göstermek zorunda olan diğer kişilere yönelik bir emri ifade eder. İnsan haklarının temel dayanağı, devletin yükümlülüklerini tesis etmektir.

Yaşam hakkının insan onuru bağlamında bir fonksiyonel değeri ifade ettiği ve bunun da diğer tüm haklara şamil olduğu söylenebilir. İnsan onuru, son birkaç on yılda anayasal ve insan hakları söyleminde önemli bir ilke haline gelmiştir. İnsan Hakları Evrensel Beyannamesine (İHEB) merkezi bir kurucu değer olarak dahil edildikten sonra, artan bir sıklıkla ulusal anayasalarda temel hakların temelini oluşturmuştur. Ancak İHEB, uzun bir sosyal ve dini geçmişi olan terimin kapsamı ve kesin hatlarıyla ilgili konuyu açık bırakmıştır. İnsanın dokunulmazlığı ve içsel değeri gibi genel ve soyut kavramlar üzerinde fikir birliğine varılmasına rağmen, ulusal yargılarda insan onurunun hukuki statüsü konusunda anlaşmazlık

halen vardır (Staffen ve Arshakyan, 2017, 44). İnsan onuru kavramının şekilsiz ve metafizik doğası, yargısal değer dayatması ve ilkesiz karar verme için iyi bir kaynak olarak tutarlı hukuk uygulama standartlarını karşılamaması anlamında eleştiriye kapı açmıştır (Glensy, 2011, 65). Ancak yine de insan haklarının ve özellikle yaşam hakkının dinamosunu insan onurunun teşkil ettiğini söylememiz gerekir.

I. YAŞAM HAKKI

Yaşam Hakkı, diğer temel hak ve özgürlüklerin başında gelmekte olup bu hakkın sağlanamaması durumunda insanın hayatı sona ereceği için diğer hakların bir ehemmiyeti kalmayacaktır.

21. yüzyıla gelindiğinde 2. Dünya Savaşı sonrası oluşturulan uluslararası insan hakları belgelerinde yaşam hakkının yer aldığını görmekteyiz. Buna göre 1948 tarihli Birleşmiş Milletler İnsan Hakları Evrensel Beyanname'sinin 3. maddesinde, 1966 tarihli Birleşmiş Milletler Medeni ve Siyasi Haklar Sözleşmesi'nin 6. maddesinde, 1950 tarihli AHİS'in 2. maddesinde, 1969 tarihli Amerikalılararası İnsan Hakları Sözleşmesi'nin 4. maddesinde, 1981 tarihli Afrika İnsan ve Halkların Hakları Şartı'nın 4. maddesinde ve Avrupa Birliği Temel Haklar Şartı'nın 2. maddesinde yaşam hakkı düzenleme altına alınmıştır (Çiftçioğlu, 2012, 45-46).

Çalışmada AİHS ve 1982 Anayasası'nda tanımlanan yaşam hakkının, söz konusu düzenlemelerle ilgili insan hakları mahkemesi olan AHİM ve Anayasa Mahkemesi kararları ışığında incelemeye çalışılmıştır.

II. AVRUPA İNSAN HAKLARI SÖZLEŞMESİ'NDE YAŞAM HAKKI VE DEVLETİN YÜKÜMLÜLÜKLERİ

A. AVRUPA İNSAN HAKLARI SÖZLEŞMESİ'NDE YAŞAM HAKKI

AHİS'nin 2. maddesinde yaşam hakkı aşağıda yer aldığı şekilde düzenlenmiştir;

1. Herkesin yaşam hakkı yasanın koruması altındadır. Yasanın ölüm cezası ile cezalandırdığı bir suçtan dolayı hakkında mahkemece hükmedilen bu cezanın yerine getirilmesi dışında hiç kimse kasten öldürülemez.

2. Öldürme, aşağıdaki durumlardan birinde kuvvete başvurmanın kesin zorunluluk haline gelmesi sonucunda meydana gelmişse, bu maddenin ihlali suretiyle yapılmış sayılmaz:

a. Bir kimsenin yasa dışı şiddete karşı korunması için;

b. Usulüne uygun olarak yakalamak veya usulüne uygun olarak tutuklu bulunan bir kişinin kaçmasını önlemek için;

c. Ayaklanma veya isyanın yasaya uygun olarak bastırılması için.”

Yukarıda yer verilen maddenin ilk fıkrasının ilk cümlesinde yaşam hakkının, hukuk düzeni tarafından korunacağı ifade edilmiştir. İkinci cümlede ise mahkemece verilen ölüm

cezasının infazı hariç devletin kimseyi kasten öldürmeyeceği belirtilmiştir. AİHS'in orijinal metninde yer alan bu düzenleme, 04.11.1950 tarihinde esasında Avrupa Konseyi üyesi devletlerde ölüm cezasının uygulandığı zamana denk gelmektedir.

AHİS'in orijinal metninde yer alan ölüm cezasına ilişkin hüküm, 1983 tarihli 6 No'lu Protokol ile kaldırılmıştır. Çalışmanın yapıldığı tarih itibariyle de Avrupa Konseyi üyesi devletlerin hiçbirinde ölüm cezası yoktur.

Yaşam hakkının AİHS'te düzenlemeye kavuşturulan ilk hak olması, esasen Sözleşmenin söz konusu hakka verdiği ehemmiyeti ortaya koymaktadır. Çünkü eğer yaşam hakkı daha en başta güvencede değilse, keyfi müdahalelere maruz kalıyorsa diğer hakları garanti etmenin pek bir önemi yoktur (Keser, 2022, 415).

Maddenin ikinci fıkrasında ise yaşam hakkı kapsamında değerlendirilmeyen öldürme eylemleri sayılmıştır. Böylelikle bu fıkra kapsamında gerçekleşen eylemler, yaşam hakkı kapsamında değerlendirilmeyecektir.

Öte yandan örneğin 2. maddeyi içeren AİHM önündeki ilk dava olan McCann ve Diğerleri v. Birleşik Krallık davasında, başvuranlar bu hükmün birinci paragrafının devletlere yaşamı "korumak" için pozitif bir görev yüklediğini iddia etmişlerdir. Bunun, devletlerin, diğerlerinin yanı sıra, yeterli eğitim vermesini ve güvenlik güçlerinin ölümcül güç kullanımını içerebilecek operasyonları üzerinde sıkı kontrol uygulamasını gerektirdiğini savunmuşlardır. Üç akrabasının İngiliz SAS (Özel Hava Servisi) askerleri tarafından kurşuna dizilmesiyle sonuçlanan güvenlik operasyonu, onların bakış açısından bu Sözleşme yükümlülüklerini yerine getirilmediğini ortaya koymuştur. Mahkeme, bu dava bağlamında, başvuranların iddialarının, algılanan terör saldırısı tehdidinde verilen resmi tepkinin orantılılığı açısından 2(2) maddesi kapsamında değerlendirilmesi gerektiğine karar vermiştir. Büyük Dairenin salt çoğunluğu (dokuza karşı on oyla), 1988 başlarında Cebelitarık'ta İngiltere'nin düzenlediği terörle mücadele operasyonunun kontrol ve örgütlenmesinin 2. maddeye uymadığı sonucuna varmıştır.¹

McCann davasında Mahkemenin hem çoğunluğu hem de azınlığı, başvuranların pozitif görev dilini açıkça benimsememekle birlikte, 2. maddeye uyulup uyulmadığının

¹ Mahkemeye göre "Soruşturmada askerlerin aldıkları eğitime ilişkin ayrıntılı soruşturma, verilen kamu yararı belgeleriyle engellense de, askerlerin hedeflerini yaralamak için ateşli silah kullanmanın suç teşkil edip etmediğini değerlendirmek için eğitilip eğitilmedikleri veya talimat alıp almadıkları açık değildir. Bu hayati anlamdaki refleks eylemleri, tehlikeli terörist şüphelilerle uğraşırken bile, demokratik bir toplumda kolluk kuvvetlerinden beklenen ateşli silahların kullanımındaki dikkat derecesinden yoksundur ve bu konuda yansıtılan özen standardına belirgin bir tezat oluşturmaktadır. Yetkililerin bu başarısızlığı, tutuklama operasyonunun kontrolü ve organizasyonunda uygun özenin gösterilmediğini de göstermektedir. Özetle, şüphelilerin Cebelitarık'a seyahat etmelerini engellememe kararı göz önüne alındığında, yetkililerin istihbarat değerlendirmelerinin en azından bazı açılardan hatalı olabileceği ihtimaline ve otomatik başvuruya yeterli izin vermemeleri, askerler ateş açtığı anda öldürücü güç kullanma konusunda Mahkeme, üç teröristin öldürülmesinin, Sözleşme'nin 2. maddesi anlamında kişilerin hukuka aykırı şiddete karşı savunması için kesinlikle gerekli olan daha fazla güç kullanımını oluşturduğuna ikna olmamıştır. Dolayısıyla Mahkeme, Sözleşme'nin 2. maddesinin ihlal edildiğine karar verir." McCann ve Diğerleri v. Birleşik Krallık Kararı, (27 Eylül 1955, Seri A No. 324, paragraf 146-147).

değerlendirilmesinde, yetkililerin itiraz edilen terörle mücadele operasyonunun örgütlenmesini ve kontrolünü temel bir unsur olarak dikkatle incelemiştir. Bu nedenle, bu dava, Mahkemenin üye devletlerin ilgili makamlarının güvenlik güçlerinin operasyonlarını uygularken gösterdikleri özeni inceleme konusundaki istekliliğinin temelini oluşturmaktadır.

B. YAŞAM HAKKI KAPSAMINDA DEVLETİN YÜKÜMLÜLÜKLERİ

1. Negatif Edim Yükümlülüğü

Yaşam hakkı kapsamında devletin temel yükümlülüğü, insanların yaşam hakkına kasıtlı ve hukuka aykırı olarak son vermemesidir.² Kutsal kitaplarda geçen “öldürmeme emri” bu yükümlülüğe karşılık gelmektedir.

AİHS'ten çıkarılacak ilk sonuç negatif yükümlülük olarak da ifade edilen, devletlerin kasıtlı ya da hukuka aykırı şekilde yaşam hakkına müdahale etmemeleri gereği sonucudur. AİHM söz konusu bu yükümlülüğün çerçevesini özellikle “gözaltında ölüm” ve “zorla kaybedilme” vakalarında verdiği kararlar çizmiştir. Örneğin Mahkeme Tanlı v. Türkiye Kararında şu değerlendirmede bulunmuştur (Tanrıkulu, 2006, s. 58-59). “2. madde ile sağlanan güvence bağlamında mahkeme, ölümleri sadece devlet görevlilerinin fiillerini değerlendirerek değil, aynı zamanda ölümün gerçekleştiği şartları da değerlendirerek incelemelidir. Gözaltına alınan şahıslar hassas bir durumdadırlar ve yetkililer bu kişileri korumakla sorumludurlar. Sonuç olarak, bir kimsenin sağlıklı olarak gözaltına alınıp sağlıklı bir şekilde serbest bırakıldığında devlet bu konuya açıklık kazandırmak zorundadır. Gözaltındaki kişi öldüğü zaman, yetkililerin söz konusu kişiye nasıl muamele edildiği hakkında açıklama yapma sorumluluğu özellikle daha da ağırdır. Kanıtlar değerlendirilirken olayların geliştiği şartlar bağlamında uygulanan genel kural ‘makul şüphenin ötesinde’ kanıtların ortaya konulmasıdır. Ancak bu nitelikteki kanıtlar kuvvetli, açık ve birbiri ile çelişmeyen çıkarsamaların veya aksi ispat edilmeyecek olayların var olması sonucunda söz konusu olabilir. Söz konusu olayların gözaltında tutulma esnasında kısmen veya tamamen idarenin bilgisi dâhilinde gerçekleşmesi ve ölüm veya vücutta yara olması halinde, bu durumdan kuvvetli neticeler çıkacaktır. Gerçekten de ikna edici ve inandırıcı bir açıklama sunma sorumluluğu yetkililere aittir. Ayrıca yapılan inceleme, başvuranın oğlunun işkence gördüğü iddialarını da çürütmemiştir. İşkence yapıldığına ilişkin yüzeysel izlerin saptanmasına yönelik testler de yapılmamıştır. Mahkemenin de belirttiği gibi hukuktaki post mortem (otopsi) prosedürleri Mahmut Tanlı'nın ölümünü açıklayamamıştır. Hükümetin belirttiği gibi doğal sebeplerle öldüğü sonucuna varılamaz. Yetkililer, 22 yaşındaki ve sağlık durumu iyi olan Mahmut Tanlı'nın gözaltında gerçekleşen ölümü için yeterli ya da ikna edici bir açıklama sunamamışlardır.” Mahkeme, bu sebeple Mahmut Tanlı'nın, Uluyol Karakolu'nda gözaltı esnasında ölmesine bir açıklık kazandırmadığı için hükümetin ölümden dolayı sorumlu olduğu görüşündedir. Bu nedenle 2. madde ihlal edilmiştir.

² “Devletin, negatif bir yükümlülük olarak, yetki alanında bulunan hiçbir bireyin yaşamına kasıtlı ve hukuka aykırı olarak son vermemesi, (...) yükümlülüğü bulunmaktadır.” Anayasa Mahkemesi Bireysel Başvuru Kararı, Sadık Koçak ve Diğerleri Başvurusu, 2013/841 Başvuru No, 23.01.2014 Karar Tarihi, <https://kararlarbilgibankasi.anayasa.gov.tr/BB/2012/841>.

2. Pozitif Edim Yükümlülüğü

Yaşam hakkı kapsamında devlete yüklenen ikinci yükümlülük ise insanların yaşamının diğer insanlardan gelecek saldırılara karşı korumaktır. Böylelikle devletten beklenenin sadece öldürmeme eylemi değil aynı zamanda insanların dışarıdan gelecek tehlikelere karşı yaşamda kalmasını sağlamak olduğunu söyleyebiliriz.

Devletin bu yükümlülüğünün başlangıcı, bir bireyin yaşam hakkına yönelik ciddi ve yakın bir zamanda gelebilecek tehlikeden haberdar olunması ya da haberdar olunmasının gerekli olması ile başlamaktadır.³ Böyle bir durumda devlet, kendi teşkilat yapısı ve bu yapının imkânları çerçevesinde söz konusu tehlikeyi bertaraf etmesi gerekmektedir. Buradan devletin böyle bir mekanizmayı kurmakla ve o mekanizmayı etkin bir şekilde yürütmekle yükümlü olduğu çıkarımına da varabiliriz.

İlgili bir pozitif yükümlülük, üye devletlerin, bireylere, üçüncü şahıslardan gelecek yaşamlarına yönelik ani tehditlere karşı uygun koruma önlemleri sağlama görevidir. Bu yükümlülük ilk olarak Mahkeme tarafından Osman v. Birleşik Krallık davasında dile getirilmiştir.

Başvuranlar (Bayan Osman ve oğlu Ahmet), diğerlerinin yanı sıra, Londra polisinin 2. maddenin gerektirdiği şekilde Bay Osman ve Ahmet'in hayatlarını korumadığından şikayet etmişlerdir. Ahmet'in ona takıntısı olan eski bir öğretmeni söz konusudur. Bir yıl önce tapu sayımıyla Ahmet'i taklit etmek için adını değiştiren öğretmen, Ahmet'in okulunda müdür yardımcısını da yaralamış ve Ahmet'i öldürmüştür. Cinayetlerden önce polise, öğretmenin ilişkisi hakkında bilgi verilmiştir, ancak ilişkide cinsel bir unsur olmadığı için konunun okul yetkilileri tarafından ele alınması gerektiğine karar verilmiştir. Durum böyle olmakla birlikte öğretmen, bir psikiyatrist tarafından görülmüş ve tıbbi olarak çalışmaya uygun olmadığı belirlenmiştir.

Büyük Daire, devletlerin koruma yükümlülüğünü şu ifadelerle açıklamıştır:⁴ “*Mahkeme, 2 § 1 maddesinin ilk cümlesinin Devlete yalnızca kasıtlı ve yasa dışı olarak ölüme son vermekten kaçınmasını değil, aynı zamanda kendi yargı yetkisi içindeki kişilerin yaşamlarını korumak için uygun adımları atmasını da emrettiğini kaydeder. Devletin bu konudaki yükümlülüğünün, önleme için kolluk kuvvetleri tarafından desteklenen kişilere karşı suçların işlenmesini caydırmak için etkili ceza hukuku hükümlerini devreye sokarak yaşam hakkını güvence altına alma birincil görevinin ötesine geçtiği ortak bir zemindir. Bu nedenle, Mahkeme huzurunda bulunanlar tarafından, Sözleşmenin 2. maddesinin, belirli ve iyi tanımlanmış koşullarda, yetkililerin, başkalarının cezai fülllerinden hayatı tehlikede olan bir bireyi korumak için önleyici operasyonel tedbirler alma konusunda pozitif bir yükümlülük ima edebileceği kabul*

³ “*Mahkeme; bireyin hayatının üçüncü bir kişinin suç teşkil eden eyleminden dolayı gerçek ve yakın risk altında olduğunun içinde bulunulan koşullardan dolayı kamu makamlarınca bilinmesi veya bilinmesi gereken durumlarda, yetkililerin bireyin yaşamını korumakla yükümlü olduğunu belirtmektedir.*” Avrupa İnsan Hakları Mahkemesi, İlbeyi Kemalolu ve Meriye Kemalolu/Türkiye Kararı, 1998/06 Başvuru No, 10.04.2012 Karar Tarihi, <https://dergipark.org.tr/tr/download/article-file/1671673>.

⁴ Osman v. Birleşik Krallık Kararı, p. 115-116.

edilmektedir. Bu yükümlülüğün kapsamı hakkında taraflar arasında bir ihtilaf konusudur. Mahkemeye göre, modern toplumları denetlemenin içerdiği zorluklar, insan davranışının öngörülemezliği ve öncelikler ve kaynaklar açısından yapılması gereken operasyonel seçimler göz önünde bulundurulduğunda, böyle bir yükümlülük, yetkililere imkânsız veya orantısız bir yük yükleyebilmektedir. Buna göre, yaşama yönelik her iddia edilen risk, yetkililerin bu riskin gerçekleşmesini önlemek için operasyonel önlemler alması adına bir Sözleşme gerekliliği sonucunu doğurmaz. İlgili bir diğer husus, polisin suçu soruşturmak ve suçluları adalete teslim etmek için eylemlerinin kapsamına meşru bir şekilde kısıtlamalar getiren yasal sürece ve diğer garantilere tam olarak saygı gösterecek şekilde suçu kontrol etme ve önleme yetkilerini kullanmasını sağlama ihtiyacıdır. Sözleşmenin 5. ve 8. maddelerinde yer alan garantiler buna dâhildir. Mahkeme, yetkililerin yukarıda belirtilen kişiye karşı işlenen suçları önleme ve bastırma görevleri bağlamında yaşam hakkını korumaya yönelik pozitif yükümlülüklerini ihlal ettiklerine ilişkin bir iddianın bulunduğu durumlarda, bu durumun tatmin edici şekilde tespit edilmesi gerektiği görüşündedir. Yetkili makamların, kimliği belirli bir kişi veya kişilerin yaşamına yönelik üçüncü bir kişinin suç teşkil eden fiillerinden kaynaklanan gerçek ve yakın bir riskin varlığını bildiği veya bilmesi gerektiği ve yetkileri kapsamında önlem almadıkları görülmektedir. Mahkeme, Hükümetin, o sırada bilinen koşullarda yaşam tehlikesini algılamamasının veya bu riskten kaçınmak için önleyici tedbirler almamasının, ağır ihmal veya yaşamı koruma görevini kasıtlı olarak göz ardı etmesi gerektiği görüşünü kabul etmemektedir. Böyle katı bir standart, Sözleşme'nin 1. maddesinin gereklilikleriyle ve Sözleşmeciler Devletlerin, 2. madde de dâhil olmak üzere, Sözleşmede belirtilen hak ve özgürlüklerin pratik ve etkin bir şekilde korunmasını sağlamak için bu madde kapsamındaki yükümlülükleriyle bağdaşmaz olarak değerlendirilmelidir. Mahkeme ve Sözleşmenin düzeninde temel bir hak olan 2. madde tarafından korunan hakkın niteliği dikkate alındığında, bir başvuruçunun, yetkililerin makul olarak onlardan kaçınmaları beklenebilecek her şeyi yapmadığını göstermesi yeterlidir. Bu, yalnızca belirli bir davanın tüm koşulları ışığında yanıtlanabilecek bir sorudur. Yukarıdaki anlayışa göre Mahkeme, bu davanın özel koşullarını inceleyecektir.”

3. Usul Yükümlülüğü

Yaşam hakkı kapsamında devletin son yükümlülüğü ise yaşam hakkı ihlallerine karşı devletin etkili soruşturma yapma yükümlülüğüdür. Burada beklenen de devletin pozitif bir davranışta bulunmasıdır. Bir yaşam hakkı ihlalinin söz konusu olabileceği durumlarda devlet, etkin bir soruşturma yürüterek olayı tüm yönleriyle aydınlatılmalı, sorumluluğu olan kişileri tespit etmeli ve gerekli cezanın verilmesini sağlamalıdır.⁵ Burada sonuçtan ziyade

⁵ “Buna göre, üçüncü kişilerin eylemleri sonucunda ortaya çıkan öldürme olaylarına yönelik devletin kapsamlı ve etkin bir cezai soruşturma yürütmesi yükümlülüğü bulunmaktadır. Önleyici tedbirlerin alınmaması sonucu meydana gelen can kayıplarından Devletin sorumluluğunu gerektiren durumlarda, Anayasa'nın 17. maddesi gereğince oluşturulması gereken “etkili bir yargısal sistem”in kapsamında, etkililiğe dair belirlenmiş asgari standartları karşılayan ve soruşturmanın bulguları çerçevesinde adli cezaların uygulanmasını sağlayan bağımsız ve tarafsız bir resmi soruşturma usulünün bulunması gerekir. Bu gibi davalarda, yetkili makamlar büyük bir gayretle ve ivedilikle çalışmalı ve ilk olarak olayın meydana geliş

gerçekleştirilen ceza muhakemesinin etkin, tarafsız ve adil bir şekilde yerine getirilmesi aranmaktadır.

Yargı kararlarında usul yükümlüğünün temel boyutu yukarıdaki paragraftaki gibi geçse de bunun yanında yaşam hakkı ihlalden dolayı ölenin yakınlarının mağduriyetinin hukuk ve idari davalarla da karşılanması yükümlülük kapsamındadır. Yine açılan ceza davalarında mutlaka mahkûmiyet hükmünün verilmesi gerekliliği bulunmaktadır.⁶

Diğer haklarda olduğu gibi bu hak kapsamında yapılan bireysel başvuruların tamamında hak ihlali kararı verilmemektedir. Örneğin AIHM önüne gelen Huci vs. Romanya kararında devletin usüli yükümlüklerini yerine getirdiğine hükmedilmiştir.⁷

4. Yaşam Hakkı İhlalinde Başvurucu Olabilecek Kimseler

Bir yaşam hakkı ihlali söz konusu olduğunda yaşamı sona eren kişinin hem fiili olarak yaşamının son bulmasıyla hem de hukuken kişiliğinin sona ermesi nedeniyle başvuru yapma imkânı bulunmamaktadır. Bu yüzden hak ihlali nedeniyle başvuru yapacak kimselerin ölenin yakınları olacaktır. Başvurucuların ölen kimseyle yakınlık derecesi konusunda kesin bir kural olmamakla beraber ölen kimsenin eşi, çocukları, kardeşleri ve anne ile babaları yargı mercileri tarafından başvuru olarak kabul edilmektedir.⁸

Bireysel başvurunun yanı sıra AIHM sisteminde devletlerarası başvuru mekanizması da bulunmaktadır. Yaşam hakkı bağlamında bu başvuruya örnek olarak Gürcistan'ın Rusya aleyhine birden fazla hak ihlali iddiasıyla başvurduğu ve AIHM tarafından kabul edilebilirlik kararı verilen kararı verebiliriz.⁹

5. Yaşam Hakkı İhlalinde Tüketilmesi Gereken Yollar

koşulları ile denetim sisteminin işleyişindeki aksaklıkları ele almalı, ikinci olarak da söz konusu olaylar zincirinde herhangi bir şekilde rol oynayan Devlet görevlileri ya da makamlarını tespit etmek için resen soruşturma açmalıdır” Anayasa Mahkemesi Bireysel Başvuru Kararı, Rahil Dink ve Diğerleri Başvurusu, 2012/848 Başvuru No, 17.07.2014 Karar Tarihi, <https://kararlarbilgibankasi.anayasa.gov.tr/BB/2012/848>.

⁶ “Diğer yandan, burada yer verilen değerlendirmeler hiçbir şekilde Anayasa'nın 17. maddesinin başvuru sahiplerine üçüncü tarafları adli bir suç nedeniyle yargılatma ya da cezalandırma hakkı verdiği (benzer yöndeki AIHM kararı için bkz. Perez/Fransa, 47287/99, 22/7/2008, § 70), tüm yargılamaları mahkûmiyetle ya da belirli bir ceza kararıyla sonuçlandırma ödevi (benzer yöndeki AIHM kararı için bkz. Tanlı/Türkiye, 26129/95, § 111) yüklediği anlamına gelmemektedir.” Anayasa Mahkemesi Bireysel Başvuru Kararı, Serpil Kerimoğulları ve Diğerleri Başvurusu, 2012/752 Başvuru No, 17.09.2013 Karar Tarihi, <https://kararlarbilgibankasi.anayasa.gov.tr/BB/2012/752>.

⁷ Avrupa İnsan Hakları Mahkemesi Kararları Bilgi Notları Nisan 2024, <https://www.evrenselhaklar.org/bfiles/ugd/23e0bce4fa436b771c48ca9882eaf23f4d93c0.pdf>.

⁸ “Yaşam hakkının doğal niteliği gereği, yaşamını kaybeden kişiler açısından bu hakka yönelik bir başvuru ancak yaşanan ölüm olayı nedeniyle mağdur olan ölen kişilerin yakınları tarafından yapılabilecektir. Başvurucular, başvuru konusu olayda ölen kişinin eşi, çocukları ve kardeşleridir. Bu nedenle başvuru ehliyeti açısından bir eksiklik bulunmamaktadır.” Anayasa Mahkemesi Bireysel Başvuru Kararı, Serpil Kerimoğulları ve Diğerleri Başvurusu.

⁹ “Mahkeme, başvurunun yalnız yaşam hakkı kapsamında incelenmesi gerektiğine karar vermiş, soruşturmanın yüzeysel veya keyfi olmadığını, kazanın koşullarının ve ilgili kişilerin sorumluluğunu belirlendiğini tespit etmiştir.” Avrupa İnsan Hakları Mahkemesi, Gürcistan/Rusya Kabul Edilebilirlik Kararı, 39611/18 Başvuru No, 20.04.2023 Karar Tarihi, [file:///C:/Users/User/Downloads/Interstate%20case%20Georgia%20v.%20Russia%20\(IV\)%20declared%20admissible.pdf](file:///C:/Users/User/Downloads/Interstate%20case%20Georgia%20v.%20Russia%20(IV)%20declared%20admissible.pdf).

1982 Anayasasınının 148. maddesine göre, “*Herkes, Anayasada güvence altına alınmış temel hak ve özgürlüklerinden, Avrupa İnsan Hakları Sözleşmesi kapsamındaki herhangi birinin kamu gücü tarafından, ihlal edildiği iddiasıyla Anayasa Mahkemesine başvurabilir. Başvuruda bulunabilmek için olağan kanun yollarının tüketilmiş olması şarttır.*” Görüldüğü gibi burada olağan kanun yollarının tüketilmesi şartı getirilmektedir.

Dolayısıyla Anayasa Mahkemesi`ne bireysel başvuruda bulunmadan önce 6216 sayılı kanununun 45. maddesinin ikinci fıkrası gereği de ilgili idari ve yargısal yollarının tamamının tüketilmesi şarttır. Aynı husus, AİHM için de geçerli olduğundan Türkiye`de bir hak ihlali vuku bulduğunda başvurulması zorunlu idari ve yargısal yollar tüketildikten sonra öncelikle Anayasa Mahkemesi`ne başvuruda bulunulmalıdır. Anayasa Mahkemesi`nce karar verildikten sonra ihlalin giderilmediğini düşünen başvuru, AİHM`ye başvuruda bulunabilecektir.

Kanunda yer almamasına rağmen insan hakları mahkemelerince iç hukuk yollarının tüketilmesi şartının sadece “etkin” iç hukuk yolları için geçerli olduğuna içtihat edilmektedir. Konu hakkındaki AİHM`nin yerleşik şu şekildedir: “*Bu çerçevede, hiçbir başarı şansı göstermeyen bir yolu tüketmek gerekli değildir. Buna karşılık bir yolun etkili olduğuna dair basit bir şüphenin varlığı kişiyi o yolu tüketmek yükümlülüğünden kurtarmaz*” (Karakaş, 2015, 245-259).

Görüldüğü üzere iç hukuk yollarının tüketilmesi zorunluluğu söz konusu yolların etkin olmasına bağlanmaktadır. Hak ihlaline sebep olan hususta açık bir kanun hükmünün olması durumunda veya iç hukuk yollarının etkinliğini zedeleyen yerleşik yargı kararlarının olması halinde iç hukuk yollarının tüketilmesi koşulu aranmamaktadır. Elbette diğer uygulamalar da, örneğin yoğun ve sistematik mahiyette ihlaller de iç hukuk yollarının etkisizliğini gösterebilmektedir. Keza etkin iç hukuk yollarının olmaması, haliyle, başvurunun kabul edilebilirliği bakımından aranan iç hukuk yollarının tüketilmesi şartını bertaraf etmektedir (Yokuş, 2016, s. 37).

III. TÜRK ANAYASA YARGISINDA YAŞAM HAKKI

1982 Anayasası`nın 17. maddesinde yaşam hakkı şu şekilde düzenlenmiştir:

Madde 17 – “*Herkes, yaşama, maddî ve manevî varlığını koruma ve geliştirme hakkına sahiptir*”.

– “*Tıbbi zorunluluklar ve kanunda yazılı haller dışında, kişinin vücut bütünlüğüne dokunulamaz; rızası olmadan bilimsel ve tıbbi deneylere tabi tutulamaz*”.

– “*Kimseye işkence ve eziyet yapılamaz; kimse insan haysiyetiyle bağdaşmayan bir cezaya veya muameleye tabi tutulamaz*”.

“*(...) Meşru müdafaa hali, yakalama ve tutuklama kararlarının yerine getirilmesi, bir tutuklu veya hükümlünün kaçmasının önlenmesi, bir ayaklanma veya isyanın bastırılması, (...) veya olağanüstü hallerde yetkili merciin verdiği emirlerin uygulanması sırasında silah*

kullanılmasına kanunun cevaz verdiği zorunlu durumlarda meydana gelen öldürme fiilleri, birinci fıkra hükmü dışındadır.”

Yukarıdaki maddenin ilk fıkrasında yaşam hakkı, maddi ve manevi varlığı koruma ve geliştirme hakkı ile birlikte hukuk düzenince koruma altına alınmıştır.¹⁰ İkinci ve üçüncü fıkralar, kişinin vücut bütünlüğü ve işkence ile kötü muameleye tabi olmama hakkına ilişkin olup konumuz dışındadır.

Dördüncü fıkrada ise AHİS’de yer alan düzenlemeye paralel olarak yaşam hakkına girmeyen öldürme eylemleri tek tek belirtilmiştir. Fıkrada yer alan iki farklı ifade iki anayasa değişikliği ile madde metninden çıkarılmıştır. Bunlardan biri 07.05.2004 tarihli ve 5170 sayılı kanunun 3. maddesiyle “Mahkemelerce verilen ölüm cezalarının yerine getirilmesi hali ile” ibaresinin madde metninden çıkartılmasıdır. Ölüm cezasının AK üyesi devletlerde kaldırma sürecine ilişkin olarak Türkiye’de yapılan bu düzenleme ile anayasal açıdan ölüm cezasının kaldırıldığını görmekteyiz.¹¹

Madde metninde yapılan diğer bir değişiklik ise 21.01.2017 tarihli ve 6771 Sayılı Kanun’un 16. maddesiyle “sıkıyönetim” ibaresinin madde metninden çıkarılmasıdır. Bu değişiklik, 2017 yılı Anayasa değişikliği ile bir olağanüstü hal rejimi olan sıkıyönetimin kaldırılması sonucu yaşam hakkına ilişkin maddenin yenilenmesinden ibarettir. Türkiye’nin olağanüstü hal rejimi sistemiyle alakalı bu düzenlemenin yaşam hakkının istisnalarına ilişkin getirdiği bir yenilik bulunmamaktadır.

Yakın tarihli bir kararında Anayasa Mahkemesine göre, “Yaşam hakkı kapsamındaki devletin pozitif yükümlülüğü kapsamında etkili soruşturma yükümlülüğü bulunmaktadır. Bir devlet görevlisi ya da üçüncü kişi tarafından hukuka aykırı olarak ve Anayasa’nın 17. maddesini ihlal eder biçimde bir muameleye tabi tutulduğuna ilişkin savunulabilir bir iddianın bulunması hâlinde Anayasa’nın 17. maddesi -“Devletin temel amaç ve görevleri” kenar başlıklı 5. maddedeki genel yükümlülükle birlikte yorumlandığında- etkili resmî bir soruşturmanın yapılmasını gerektirmektedir (Tahir Canan, § 25). Bu tür olaylarda yürütülen idari ve hukuki soruşturmalar ve davalar sonucunda sadece tazminat ödenmesi, bu hak ihlalini gidermek ve mağdur sıfatını ortadan kaldırmak için yeterli değildir. Bu soruşturmanın temel amacı, yaşam hakkını koruyan hukukun etkili bir şekilde uygulanmasını ve kamu görevlilerinin müdahalesiyle veya onların sorumlulukları altında meydana gelen veya diğer bireylerin fiilleriyle gerçekleşen ölümler nedeniyle sorumluların hesap vermelerini sağlamaktır (Serpil Kerimoğlu ve diğerleri, § 54). Bu, bir sonuç yükümlülüğü değil uygun araçların kullanılması yükümlülüğüdür. Diğer yandan burada yer verilen değerlendirmeler,

¹⁰ “Anayasa’nın 17. maddesi gereğince herkese tanınan yaşama, maddi ve manevi varlığı geliştirme hakkı birbirleriyle sıkı sıkıya bağlantılı, devredilmez ve vazgeçilmez haklardandır.” Anayasa Mahkemesi İptal Başvurusu, 2007/78 Esas, 2010/120 Karar, 30.12.2010 Tarihli Kararı, <https://normkararlarbilgibankasi.anayasa.gov.tr/Dosyalar/Kararlar/KararPDF/2010-120-nrm.pdf>.

¹¹ Anayasa’da yapılan bu düzenlemeyle paralel olarak temel ceza kanunumuz olan 5237 Sayılı Türk Ceza Kanunu’nun 01.06.2005 tarihinde yürürlüğe girmesi ile birlikte ölüm cezası hukuk sistemimizden çıkartılmıştır. Her ne kadar 1632 Sayılı Askeri Ceza Kanunu’nda ölüm cezasına ilişkin maddeler mer’i ise de uygulamasının olmadığını söyleyebiliriz.

hiçbir şekilde Anayasa'nın 17. maddesinin başvuruçulara üçüncü tarafları adli bir suç nedeniyle yargılatma ya da cezalandırma hakkı verdiği tüm yargulamaları mahkûmiyetle ya da belirli bir ceza kararıyla sonuçlandırma ödevi yüklediği anlamına gelmemektedir. Temel anlayış bu yönde olmakla birlikte derece mahkemelerinin yaşamı tehlikeye soktuğu açık olan eylemlerin ve maddi ve manevi varlığa yönelik ağır saldırıların cezasız kalmalarına imkân vermemeleri de gerekmektedir.”¹²

SONUÇ

Yaşam hakkına dair yükümlülükler oldukça önem ihtiva etmektedir. Bu bağlamda devletin negatif yükümlülüğü, yaşam hakkının herkes bakımından korunmasıdır. Burada ayırım gözetilemez. Ayrıca buna dair istisnalar Anayasanın 17. maddesinin son fıkrasında ve AİHS m. 2'de sınırlı olmak üzere belirtilmiştir. Keza yaşam hakkı bakımından devlet güçleri zor kullanma zorunda kalırlarsa bile bunu ölçülülük çerçevesinde gerçekleştirilmelidir.

Pozitif yükümlülük ise, yaşam hakkı bakımından devletin etkin bir mevzuata sahip olması, koruyucu önlemlerin alınması ve nihayet tüm bunların etkili bir şekilde uygulanmasını gerektirir. Örneğin buna yönelik adli ve idari birimlerin teşkil olunması gerekir. Eğer kişinin yaşamı tehlikedeyse ve bu devlet tarafından biliniyor veya bilinmesi gerekiyor ise gerekli ve etkin önlemlerin alınması şarttır. Kamu müesseseleri ve birimleri tüm bu açılardan re'sen davranmalı, hızlı olmalı, özenli, etkili ve birden çok yönlü olarak soruşturma yapmalıdır.

Nitekim gerek Anayasa Mahkemesi gerek Avrupa İnsan Hakları Mahkemesi bakımından tüm bu hususlar çerçevesinde devletin hesap verebilirliği dikkate alınmaktadır. İşte yaşam hakkı bakımından yukarıda değindiğimiz tüm bu hususlar bu nedenle önem arz etmektedir. Keza yukarıdaki hususların uygulanması hem hak ihlalini önleyecek hem de devletin tazminata mahkûm olmasının önüne geçilebilecektir. Şu halde yaşam hakkının etkin ve öngörülebilir şekilde korunması, başta hak ihlallerini önlemek olmak üzere devletin uluslararası imajını da etkilemektedir.

¹² Anayasa Mahkemesine göre, şüpheli bir ölüm olayı hakkında yürütülen ceza soruşturmasının Anayasa'nın 17. maddesinin gerektirdiği etkinlikte olduğunun kabul edilebilmesi için;

- a. *“Soruşturma makamlarının haberdar olur olmaz resen harekete geçerek ölüm olayını aydınlatabilecek ve sorumluların belirlenmesini sağlayabilecek bütün delilleri tespit etmeleri gerekir (Serpil Kerimoğlu ve diğerleri, § 57). Soruşturmada ölüm olayının nedeninin veya sorumlu kişilerin belirlenmesi imkânını zayıflatan bir eksiklik, etkili soruşturma yükümlülüğüne aykırılık oluşturabilir.*
- b. *“Soruşturma sürecinin kamu denetimine açık olması ve ölen kişinin yakınlarının meşru menfaatlerini korumak için soruşturma sürecine gerekli olduğu ölçüde katılabilmeleri gerekir (Serpil Kerimoğlu ve diğerleri, § 58).*
- c. *Soruşturmada görevli olan kişilerin olayların içinde olan veya olması muhtemel olan kişilerden bağımsız olması gerekir. Bu durum sadece hiyerarşik veya kurumsal bir bağlantı bulunmamasını değil aynı zamanda somut bir bağımsızlığı da gerektirmektedir (Cemil Danişman, B. No: 2013/6319, 16/7/2014, § 96). Cumhuriyet savcısının emrinde adli kolluk olarak görev alan kişilerin sırf kamu görevlileri olmaları nedeniyle soruşturmanın bağımsız ve tarafsız yürütülmesi ilkesinin zedelendiği kural olarak kabul edilmez. Aksi yöndeki iddianın somut olgularla desteklenmesi gerekmektedir (Cemil Danişman, § 103; Ahmet Kortak ve diğerleri, B. No: 2016/14603, 10/12/2019, § 115).*
- d. *Soruşturma makamlarınca olayın sebebinin objektif analizinin yapılması ve soruşturma sonucunda alınan kararın soruşturmada elde edilen tüm bulguların kapsamlı, nesnel ve tarafsız bir analizine dayalı olması gerekir (Cemil Danişman, § 99).” Bkz. Cem Sarısülük ve Diğerleri Başvurusu, B. N. 2015/16451, Kt. 15/12/2021, p. 39 vd.*

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GELENEĞİN ÖTESİNDE: DİNİN SOSYAL SERMAYEYE VEYA PİYASA EKONOMİSİNE YÖNELİK RADİKAL EVRİMİ ÜZERİNE BİR ÇALIŞMA¹
BEYOND TRADITION: A STUDY ON THE RADICAL EVOLUTION OF RELIGION INTO SOCIAL CAPITAL OR MARKET ECONOMY

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ÖZET

Bu çalışmada, din ile ekonomi arasındaki ilişki detaylı bir şekilde incelenmiş ve bu ilişkinin gelecekteki olası sonuçları tartışılmıştır. Günümüzde mevcut din anlayışının evrildiği süreci belirlemek amacıyla geniş bir literatür taraması yapılmış ve çalışmanın hedefine uygun farklı çalışmalardan ve verilerden faydalanılmıştır. Bu amaçla, çeşitli dini kurumlar ve kişilerle görüşmeler gerçekleştirilmiş ve elde edilen verilerle durum analizi yapılmıştır. Benzer şekilde, çalışmanın bilimsel ve kuramsal temellerinin oluşturulması hedeflenmiştir. Dinin, küresel ekonomik boyutta nasıl bir etkiye sahip olduğunu göstermek amacıyla muhtemel sonuçlara dayalı güncel veriler sunulmuştur. Bu bağlamda, çeşitli dinlerle ilgili örnekler verilmiş ve gelecekteki gelişmeler analiz edilmiştir. Özellikle son yıllarda sosyal sermaye bağlamında anlam taşıyan dinin, günümüzde gerek kitle iletişim araçları gerekse ekonomi ve siyasetle özdeşleşen yeni dini hareketler (YDH) gibi iki farklı olguyla birlikte nasıl pazar ekonomisine dönüştüğü ve gelecekte birey ve toplum üzerindeki etkisinin nasıl olabileceği ele alınmıştır. Çalışmanın sonunda, sorunun çözümüne yönelik önerilerde bulunulmuş ve bu öneriler arasında akıl, demokrasi ve özgür düşüncenin önemine vurgu yapılmıştır.

Anahtar Kelimeler: Din Psikolojisi, Din, Sosyal Sermaye, Pazar Ekonomisi.

ABSTRACT

In the current study, the relationship between religion and economy has been thoroughly examined, and the possible consequences of this relationship in the future have been discussed. A comprehensive literature review has been conducted to determine the evolving process of the current understanding of religion, and various studies and data relevant to the objective of the study have been utilized. In order to achieve this, a number of interviews have been conducted with various religious institutions and individuals face to face, and a situational analysis has been carried out based on the obtained data. Similarly, it was aimed to establish the scientific

¹ Bu çalışma, Genç Mütefekkirler Dergisi'nde (Yıl: 5, Cilt: 5, Sayı: 1) yayınlanan makaleden alınmıştır.

and theoretical foundations of the study. Current data based on the potential outcomes have been presented to demonstrate the global economic impact of religion. In this context, examples related to various religions have been provided, and future developments have been analyzed. Particularly, the study has delved into how religion, having gained significance in the context of social capital in recent years, has transformed into a market economy alongside two different phenomena, namely, mass media and new religious movements (NRMs) that are currently synonymous with economy and politics. The study has also examined how this transformation might impact individuals and society in the future. And lastly, recommendations have been made for solving the problem, with a special emphasis on the importance of reason, democracy, and free thought among the diverse proposed solutions.

Keywords: Psychology of Religion, Religion, Social Capital, Market Economy.

GİRİŞ

Din kavramının tanımlanmasıyla ilgili farklı görüşler olmakla birlikte bugün konu ile ilgili ortak bir fikir birliği mevcut değildir (Loewenthal, 2017, s. 3). Dinin çok yönlü yapısından kaynaklı olarak her araştırmacı, kendi perspektifinde bu kavramı zamanın ruhuna göre tanımlamaya ve anlamaya çalışmıştır (Kirkpatrick, 2004, s. 1). Din ile ilgili yapılan tanımlar analiz edildiğinde dinin, tanımlandığı zamanın ruhu (zeitgeist) ile yakın bir ilişki içinde olduğu görülmektedir (Jr vd., 1996, s. 50; Yapıcı & Kalgı, 2018, s. 134). Bu durum, kavramın anlam kayması yaşamasına sebep olmuş ve bu konuda kolektif bir bilincin oluşmasının önüne geçmiştir. Nitekim kavramın tanımlanması ile ilgili gelinen duruma bakıldığında, tarihi süreç içerisinde dine yüklenen farklı anlamlardan kaynaklı olarak tablonun daha da belirsizleştiği ve konuyu çalışan araştırmacıların soruna kısmi çözümler üretmekten öteye geçemediği görülmektedir. Bu çalışmada, dinin sosyal ve manevi gerçekliğinden kopararak maddi değer elde etme gerçekliğine evrilme süreci ve günümüzde bu olguya yüklenen ekonomik değer in ifade ettiği anlam ele alınmıştır.

Sekülerleşme kavramının din üzerinde bir etkisinin olduğunu söylemek mümkündür (Davison, 2002; Hervieu-LÉGER, 2004; Karaaslan, 2015; Kirman, 2005). Nitekim bu durum, dinin metalaşmasına ve ekonomisinin önemli bir paydaşı olmasına neden olmuştur. Dine yüklenen bu işlevi tespit etmek ve bu durumun altında yatan sosyo-psikolojik, ekonomik ve sosyal gerekçeleri ortaya koymak çalışmamız açısından değer arz etmektedir.

Din, ortaya çıktığı dönem itibariyle toplumun sürdürülebilirliği açısından problem teşkil eden geleneksel uygulamalara karşı her ne kadar bir tepki olarak ortaya çıksa da kendi yapısından kaynaklı olarak daha sonra bazı geleneklerle bütünleşir. Gelenekselleşen din, mevcut sosyo-kültürel yapı içerisinde deformasyona uğrayarak birçok politik, ekonomik, sosyal vb. soruna sebep olmaktadır. Bu sorunlara çıkar çatışmalarının eklenmesiyle birlikte sorun daha da çözülmez bir hal almaktadır. Bugün birçok toplumda yaşanan iç ve dış kargaşa, kaos, toplumsal çatışma vb. durumlar çıkar çatışmasının bir sonucudur. Bu anlamda iktidar kavgaları tarihte hep vuku bulmuş ve bulmaya da devam etmektedir. Çünkü siyasi güç elde etmek demek, dünya

nimetlerinin tümünü elde etmek anlamına geldiğini unutmamak gerekir. Bunun için siyasi zekaya sahip yöneticiler gücü elde etmek için kendi isteklerini halkın istekleri ile örtüştürerek mevcut taleplerine bir meşrulaştırma kazandırmaktadır (Onat, 2022b, 2022a). Bu meşrulaştırma zeminine en uygun ortamı ise ancak din sağlayabilmektedir. Tüm bu tartışma ekseninde çalışmamızın sorusu dinin *ne olduğundan* daha çok işlevinin ne olduğunu belirlemektir.

Bugün dinî programı amaç edinen toplumlarda mezhepçilik ve cemaatleşme kavramları toplumun sosyal ve politik yapısında önemli belirleyicilerdir. Bu iki faktör dinî toplumlarda menkıbelerin, paranormal inançların ve mitik söylemlerin yaygınlaşmasına yol açmaktadır (Arslan, 2011; Kalgı & Şimşek, 2020). Rasyonaliteden uzak bu tür inançlar, bireylerin zihinlerini provake etmekle birlikte dinî istismara da kapı aralamaktadır. Bu durum, ihtirashlı din adamlarının dinî meta aracı olarak kullanılmasına sebep olmaktadır. Nitekim dinin metalaşması ile birlikte dinde anlam kayması meydana gelmekte ve gelineen durumda dinin toplumsal fonksiyonunu kaybetmesine yol açmaktadır. Din veya tanrı adına savaş (Armstrong, 2017) ya da din temelli çatışmalar bu problemi daha da çıkmaza sokmakta ve kaosa neden olmaktadır. Gelineen duruma bakıldığında toplumun din adına bu şiddet sarmalından kurtulabilmesinin yolu aklın, eleştirinin ve özgür düşüncenin hâkim olduğu bir dinî anlayışın inşasını zorunlu kılmaktadır. Çalışmamızın problem çözümünde dinin esas olan aklın önemini ön plana koymayı hedeflemekteyiz.

1. Küresel Ekonomilerde Dinin Rolü

1.1. Sosyal Sermaye Olarak Din

Sosyoloji literatüründe önemli bir işlevi olan ve kâr/verim üzerinden tanımlanan (Yarcı, 2014, s. 127). sosyal sermaye kavramı, toplumların maddi ve manevi yönden kalkınmalarını sağlayan temel unsurlardan birisi olarak kabul edilmektedir (Şan, 2008, s. 74). Aynı şekilde toplumların önemli bileşenlerinden biri olan din kurumunun da ifade ettiği ekonomik anlamın yardımlaşma ve dayanışma gibi hususlarla açık veya örtük bir biçimde toplumsal birlikteliği sağlama gibi bir görevi vardır (Aydemir & Tecim, 2012, s. 49). Başka bir ifade ile toplumsal yararın sağlanmasında önemli roller üstelenen din kurumu, bireyin psikolojik sorunlarla başa çıkmasından toplumsal bütünlüğü sağlamaya dönük birçok işlevi yerine getirmektedir. Yapılan araştırmalarda dinin toplumsal ahlakın düzenlenmesi (McKay & Whitehouse, 2015), aile kurumuna pozitif katkılar sağlanması (Thomas & Cornwall, 1990), suç oranlarının azaltılmasına katkı sağlanması (Pettersson, 1991), psikolojik sağlığa olumlu etkilerinin olması (Yapıcı, 2013) vb. bireysel ve toplumsal faydalar göstermesi dinin sosyal sermaye içindeki payını ve değerini göstermektedir. Dinin bahsedilen bu olumlu işlevlerinin sürdürülebilir olması için toplum içinde güven inşa etmesi açısından işlevsel olması önem arz etmektedir.

Dünya güven endeksi araştırmalarında birbirinden farklı sonuçlara ulaşılmıştır. Araştırma verileri karşılaştırıldığında genel anlamda dindarlık düzeyi yüksek ekonomik düzeyi düşük (Çarkoğlu & Kalaycıoğlu, 2009) olan ülke vatandaşlarının güvenilirlik düzeylerinin daha düşük olduğu görülmüştür (Esmer, 1999, s. 33). Şan, düşük güvenirliliği olan ülkeler içerisinde köklü bir dinî geçmişi olan Türkiye'nin de yer almasının gerekçesini cumhuriyetle birlikte toplumun

batılılaşmasına ve paradigmal deęişim geçirmesinin neticesinde dinin sosyal sermaye içerisindeki önemini yitirmesine bağlamaktadır (Şan, 2008, s. 84). Bununla birlikte bazı pozitivist ve Batıcı düşünür ve aydınlar ise Türkiye'nin içinde bulunduğu güven bunalımı durumunu ise İslam dininin inanç esaslarına dayandırarak, ancak bu inanç esaslarından uzaklaşmakla çözümün mümkün olabileceğini ileri sürmüşlerdir (Sezer, 2015). Nitekim her ne kadar dinin sosyal sermaye içerisindeki payı ve ülkeler bazında etkileri farklılık gösterse de mevcut durumu dinin özüne bağlamak indirgemeci bir yaklaşım olur. Bununla birlikte duruma tekçi söylemlerle yaklaşmak yerine bütüncül yaklaşımlardan yola çıkarak bir sonuca varmanın daha bilimsel olacağını söyleyebiliriz.

Sosyal sermayenin önemli paydaşlarından biri olan dinin, bireysel ve toplumsal fayda sağlamanın yanı sıra (Boz, 2023) dine getirilen radikal yorumlar, onun nefret ve şiddet üreten bir kuruma dönüşmesini de mümkün kılmaktadır (Onat, 2022a, s. 11). Amritsar tapınağı çevresinde Hindularla Müslümanlar arasında yaşanan çatışmalar, Lübnan'da dinî cemaatler arasında meydana gelen şiddet sarmalı, Şii-Sünni ayrılıklar ve bu iki mezhep arasında yıllarca süren kavgalar, Taliban'ın Afganistan'da oluşturduğu kaos ortamı vb. birçok olay bu olgunun bir kanıtı olarak örnek verilebilir.

Sosyal sermaye sağlayıcısı dinin, fayda ve zarar üretme mekanizmasına dönüşmesi ona getirilen yorumla ilişkilidir. Din toplumsal bütünleşmeyi sayılabileceği gibi toplumsal çatışmanın da tetikleyicisi olabilir. Çünkü din, bireyin varoluşsal sorunlarına, metinsel çözümlerle kişilerin problemlerine çözüm üretme kabiliyetine ve kimlik kazandırma yetkinliğine (Yapıcı & Kalgı, 2018, ss. 133-134) sahip olduğu gibi ruhsal problemleri ve toplumsal kaosu ortaya çıkarma yetkinliğine de sahiptir (Corm, 2008, ss. 11-13). Din ile ilgili birbirinden farklı zıt anlayışların ortaya çıkmasında din kavramının nasıl yorumlandığı, nasıl tanımlandığı ve çağımızda müdahale alanlarının neler olduğu gibi durumların etkili olduğunu düşünmekteyiz Tüm bu soruların cevapları makul yorumlarla desteklendiğinde dinin sosyal sermayeye olan katkısının somut örnekleriyle karşılaştırılması mümkün olacaktır. Umberto Eco'nun ifadesi ile bir yerde metin varsa orada yorum vardır demektir, önemli olan makul yorumu yakalamaktır (Eco, 2013).

1.2. Dinin Ekonomideki Yeri

Çalışmamızın bir önceki bölümünde dinin sosyal sermaye içindeki yeri ele alındı. Bu başlık altında ise dinin sosyal sermaye ile olumlu ilişkisinden metalaşmaya nasıl evrildiği ve günümüzde inananların kutsal merkezler olarak bildiği bölge ve ülkelerde ifade ettiği ekonomik değerlerin ne olduğu somut verilerle tartışılacaktır.

Küreselleşme kavramının (L. Berger, 2017, s. 604) önemli paydaşlarından biri olan dinin, sosyal sermaye içerisinde önemli bir payı vardır. Özellikle evrensel bir hüviyete kavuşan bazı dinlerin ekonomiye katkısı diğer tüm faktörlerden daha fazla olduğu görülmektedir. Hatta dinî kimlikle özdeşleşen bazı toplum ve devletler neredeyse en önemli geçim kaynağı dindir. Özellikle kutsal kabul edilen mekanlara sahip olan bölgelerde bu durum belirgin olarak göze çarpmaktadır. Çünkü bugün her birey bir şekilde ekonomik gelirinin bir kısmını bir şekilde inançları ve inandıkları kutsallar için harcamaktadır (Pehlivan, 2016, s. 14). Hâl böyle olunca

kutsal mekân ve kişiler için ekonomik anlamda devasa paylar ayrılmakta ve o bölge için önemli ekonomik getiri sağlamaktadır. Bu anlamda sosyal sermayenin önemli bir paydaşı olarak görülen dinin hangi ülkelerde/bölgelerde ve ne oranda ekonomik getiri sağladığına dair detaylı araştırmaların yapılmasına ihtiyaç vardır.

Sihlerce kutsal kabul edilen ve Hindistan'ın Amritsar şehrinde bulunan Sih tapınağı, Müslümanların Hac merkezi olan ve Suudi Arabistan'ın Mekke şehrinde bulunan Kâbe, Hristiyanlık dininin Katolik mezhebinin merkezi olan Vatikan, Hindularca kutsal sayılan Ganj nehrinin yanında yer alan ve binlerce yıldır burada ibadet etmek için ülkenin her tarafından gelenleri misafir eden Varanasi şehri vb. birçok kutsal bölge ya da mekân büyük kalabalıkların toplanma merkezine dönüşmüş durumdadır (Corm, 2008, s. 11). Tüm bu bölgelere insan akını olması ya da bu bölgelerin toplanma merkezine dönüşmesi beraberinde sermaye akışının da bu bölgelere kaymasını sağlamıştır. Bu sermaye her yıl akışı giderek artmaktadır. Sahadan elde ettiğimiz verilere göre Müslümanlar tarafından kutsal topraklar olarak kabul edilen Suudi Arabistan'a her yıl milyonlarca Müslüman, hac vazifesini yerine getirmek için seyahatler yapmakta ve bu seyahatlerde milyarlarca dolar para harcamaktadır (CMS, t.y.) Hac'ın, Suudi Arabistan'a yıllık gelirinin 8 milyar dolar olduğu tahmin edilmektedir (How Much Does Saudi Arabia Earn from Hajj?, 2023). Benzer şekilde Hristiyanlarca kutsal kabul edilen Kudüs, İtalya/Roma ve Türkiye'nin bazı bölgelerinde dinî turizmin yapılması sosyal sermaye olarak dinin bu alanda önemli rol üstlendiğini bize göstermektedir. Nitekim din(ler)in farzlarından biri olan ve günden gün arınma psikolojisinin en güzel ifadesi olan hac, kutsallık ifadesinin ötesinde sosyal eşitliğin mutlak anlamda sağlandığı üç hayat aşamasından ikincisini oluşturan bu kutsal vazife, dinin metalaşmasıyla birlikte artık insanların kıyafet giymediği kıyafetlerin insanları giydiği (Şeriatî, 2011) bir yapıya bürünerek sosyal eşitliğin bozulduğu bir konuma gelmiştir.

Dinin toplum içindeki yeri, dine getirilen yorumlarla yakından ilişkilidir. Dinin radikal olarak yorumlandığı toplumlarda din, yerelliğe hapsedilerek küreselleşmesi engellenmektedir. Bugün Afganistan'da faaliyet gösteren Taliban'ın din ile ilgili yorumları neticesinde meydana gelen radikal olaylar bu duruma örnek olarak gösterilebilir. Taliban'ın, dinî radikal anlamda yorumlaması ve rasyonaliteden uzak bir anlayış ortaya koyması hem o bölgeyle ilgili kötü bir imajın hem de mevcut din ile ilgili olumsuz bir bakışın meydana gelmesine sebep olmaktadır. Ayrıca geline durum, Afganistan'a yapılacak yatırımların sekteye uğratılması ve ülkenin turizm potansiyelinin kötü etkilenmesi ile birlikte ülke yoksulluğa ve fakirliğe mahkûm edilmektedir.

Nitekim din olgusu sadece hayatın uhrevi kısmı için değil, yaşamın tümünü kapsayan bir fonksiyona sahiptir (Pehlivan, 2016, ss. 16-17). He ne kadar günümüzde yapılan araştırmalarda dinin büyük oranda uhrevi hayat için geçerli bir işlevi olduğu düşünülse de bu olgunun çok yönlü² olmasından kaynaklı olarak yaşamın her tarafını kapsayan bir yönünün olduğunu

² Mehmet Kalgı, *Din Değiştirme Olgusu: Müslümanlıktan Hristiyanlığa Geçen Kişiler Üzerine Psiko-Sosyal Bir Araştırma* (Ankara: Sonçağ Akademi Yayınları, 2023), 144.

vurgulamak gerekir. Çünkü din ve ekonomi insan hayatının büyük bir kısmını oluşturmaktadır. Durum bu olunca dinin sosyal sermaye içerisinde en önemli bileşen olduğu söylenebilir. Çeşitli dinlere mensup insanların dinî inançları için ayırdıkları bütçelerin oranını göz önünde bulundurduğumuzda bu gerçeğin ne kadar önemli olduğu görülebilir.

1.3. Kitle İletişim Araçlarında Dinin Pazar Ekonomisine Dönüşmesi

İletişim araçlarının gelişmediği dönemlerde dinî irşat ve vaazlar geleneksel yöntemlerle insanlara aktarılmaktaydı. Bu durum ancak sınırlı çevreyle yapılmaktaydı. İletişim medyasının güçlenmesi ve yaygınlaşması ile birlikte artık dinî kültürü tanıtıcı ve benimsetici faaliyetler, modern yöntem ve tekniklerle yapılmaya başlanmıştır (Arslan, 2016, s. 10). Başka bir ifade ile dinî irşat ve vaazların iletişim teknolojinin gelişmesi neticesinde az zamanda çok kişiye ulaştırılması mümkün olmuştur (Kalgı, 2021). Bu durum insanlara ulaştırılmak istenen Tanrı mesajının başka amaçlarla kullanılmasına neden olmuştur. Bugün TV programlarında yer alan medyatik dinî lider ve hocalar tarafından astronomik ücretler karşılığında vaazlar verilmesi, bazı dinî grup ve cemaatlerin dinsel ürünleri (yanmaz kefen, terlik, lavanta, takke vb.) satmak için sosyal medyada ve diğer iletişim kanallarında pazarlanması, dinî kitaplardan gelir elde edilmesi için piyasaya sürülmesi ve bunu pazar ekonomisi haline dönüştürülmesi gibi birçok durum iletişim medyasında dinin pazar ekonomisi haline evrildiğinin bir göstergesi olarak yorumlanabilir.

Günümüzde dinin kitle iletişim araçları aracılığıyla pazar ekonomisinde daha fazla yer almasında, çok kültürlülüğün arz-talep üzerindeki etkisinden kaynaklı olarak meydana gelen değişim ve bu değişimin neticesinde ortaya çıkan üretim-tüketim mekanizması içerisinde oluşan tüketim kültürünün önemli bir rolü vardır (Arslan, 2016, s. 14). Jean Baudrillard'ın "Tüketim Toplumu" olarak ifade ettiği günümüzdeki nesil, ihtiyaçlarının sınırlarını belirleyememesinden kaynaklı olarak her şeyi meta olarak görmekte ve tüketim yapmayı zorunlu bir faaliyet olarak düşünmektedir (Baudrillard, 2020). Bu yönüyle pazar ekonomisinde parasal karşılığı olan tüm ürünler bir meta olarak görülmekte, kitle iletişim ve sosyal medya kanallarıyla bu ürünler pazarlanmaktadır. Bu durum dinî inançların sekülerleşmesi anlamına gelmektedir (Hervieu-LÉGER, 2004; Kirman, 2005). Sekülerleşen dinî inançların içerikleri elbette tamamen işlevsizleştirilmiş değildir. Sadece tüketimi kendisine şiar edinen tüketim çılgını toplumlar için artık din soyut anlamda bir değer ifade etmez, daha fazla haz almak için araç vazifesini görür. Günümüzde dinî vaazlar karşılığında yüksek miktarda ücret talep eden medyatik din hocaları ya da teologlar, dinî ürünleri reklam aracı haline dönüştüren kurum ve kuruluşlar ve aynı şekilde bazı dinî tarikat ve cemaatlerin daha fazla gelir elde etmek için dinî motif ve kavramları kullanması bu duruma örnek olarak verilebilir. Yaşanan tüm bu somut örnekler dinde yapaycılığa neden olmakta ve gündelik yaşam düzeyinde dinin asli unsurlarını tartışma konusu haline dönüştürmektedir (Arslan, 2016, s. 15). Artık dinî inançlara yönelik tehditler din dışı unsurlardan değil dinî temsil ettiği düşünülen kişi, kurum, tarikat ve dinî cemaatlerden gelmektedir.

Sosyal medyada dinsel ürünlerin (takke, cüppe, teşbih vb.) içinde sırlar, ezoterik ve mistik unsurlar barındıran dizi, film ve programlar içerisinde harmanlanarak verilmesi bu ürünlere olan talebi daha da artırmaktadır. Dinsel reklamın farklı bir türü olan bu durum bir yandan bu ürünleri, insanlar için cazibeli hale getirirken öbür taraftan bu ürünleri satın almanın dindar olanlar açısından dinsel bir zorunluluk olduğu algısını oluşturmaktadır. Medyada paranormal inançlar barındıran programlarla dinsel ürünlerin sunulması ile bu ürünler bir kâr aracına dönüştürülse de durumun sebep olduğu endişe, kitlelerin ezoterik eski geleneklere yeniden ilgi duymasına neden olmaktadır (Arslan, 2016, ss. 20-21). Çünkü seyirci bulma kaygısıyla işlenen parapsikolojik temalı programlar, medya eliyle geniş halk kesimine ulaştırılmakta ve bu durum halkın inançlarında deformasyona yol açmaktadır (Arslan, 2011).

1.4. Dinin Önemli Sosyal Sermaye Sağlayıcısı Olarak Yeni Dini Hareketler (YDH)

Küresel ölçekte dinin bir meta aracı olmasında ve rekabet edilebilirliği sağlamasında önemli bir faktör de Yeni Dini Hareketlerdir (YDH). 20. yüzyılın ikinci yarısından sonra yaygınlık kazanan bu hareketler (Barker, 1999), toplum içinde olağanüstü özelliklerinin olduğuna yönelik yaygın inanışların ortaya çıkması (Özkan, 2006, ss. 49-53) ile birlikte bu hareketler küreselleşmeye doğru evrilmiştir. Ayrıca bu hareketlerin içinde toplu intiharların meydana gelmesi,³ karizmatik liderlerinin cemaatin zayıf kesimlerine yönelik istismarlarda bulunması, hareketin ticarileşerek büyük bir sektör haline gelmesi, eğitim adı altında dünyanın çeşitli ülkelerinde kurumsal kimlik kazanması ve bunun neticesinde devletin iç işlerine müdahale edebilecek kadar güç kazanması gibi birçok durum bu hareketlerin medyada daha sık gündeme gelmesine neden olmuştur. Tüm bu durumlar dinin ekonomi ve politika ile yakın ilişki içinde olması ve neticesinde dinin ekonomide ve politikada önemli getiriler sağlaması ile mümkün olmuştur.

Birey için vazgeçilmez bir kavram olan din, bireye dünya ve ahiret saadeti kazandırma adına önemli bir fonksiyonu üstlenmektedir. Bazı dini kurum, kuruluş, tarikat ve cemaatler, din üzerinden saadet elde etme yollarını arayan bireylerin psikolojik yönden zayıflık hissettiği durumları istismar ederek din gerçeğini pazar ekonomisine dönüştürmekte veya bunu önemli bir sermaye olarak değerlendirmektedir. Dinî hareketlerin müritlerinden beklentilerinin iman, inanç ve ibadet şemasından ticarete evrildiğini görmek mümkündür. Ekonomik sermayenin katlanarak artmasında cemaate kazandırılan müritlerin sayıları önem kazanmaktadır. Çünkü cemaate kazandırılan her mürit hem potansiyel bir müşteridir hem de cemaatin reklamını yapmada önemli bir araçtır. Bu yönüyle müridin cemaate sadakati ve bağlılığı, onun cemaat için yaptığı propagandaya ve gösterdiği işgücüne göre belirlenmektedir. Elbette dini önemli bir ekonomi aracı olarak kullanan YDH'lerin bunu siyasi ve politik ilişkilerden bağımsız olarak yaptığı düşünülemez. Stark'a göre dini cemaatlerin başarılarının arkasında yatan ana etken neden, nüfuzdur (Stark & Bainbridge, 1986). Bazı cemaatlerin üye sayılarının az olmasına

³ 1979'da San Francisco'da 913 üyesi olan Halk Tapınak Kilisesi'nin üyeleri, liderleri Jim Jones'in emri ile birlikte Guyana kampında, Kool-Aid zehrini içerek toplu intihar ettiler.

rağmen maddi birikimleri ve siyasi ilişkileri onları sandığından daha etkili yapabilir (Demirci, 2019, s. 46).

YDH'lerin oluşumlarının birinci basamağı olan dinin kurumsal kimliğinin müntesipler arasında sağlam bir zemine oturtulması daha sonra, ikinci basamağı şirketleşme ve üçüncü basamağı politikleşme takip etmektedir. Bir başka ifade ile YDH'ler din, ekonomi ve siyaset üçgeninde kurumsallık kazanarak küreselleşmektedir. Bu bağlamda Türkiye'de oluşumunu tamamlayarak küreselleşen onlarca dinî cemaat ve tarikat mevcuttur. Türkiye'deki dinî cemaatlerin yapısı, oluşumları, nerede faaliyet gösterdikleri gibi birçok parametre mevcut olmasına rağmen bu çalışmada mevcut dinî hareketleri tartışma niyetinde değiliz.

Türkiye'de faaliyet gösteren cemaat ve tarikatların devlet yetkilileri tarafından kontrol edilmemesi neticesinde mal varlıklarının ne kadar olduğu ve her dinî harekete bağlı kaç mensup olduğu ile ilgili elimizde kesin bir bilgi mevcut değil. Dünya ölçeğinde YDH'lerle ilgili yapılan araştırmalardan yola çıkarak Türkiye'de de bu dini hareketlerin milyonlarca üyesi ve milyonlarca dolara varacak mal varlıklarının olduğunu söyleyebiliriz (Argyle, 2022, s. 290; Günay & Ecer, 1999, s. 26). 2017 yılında MAK Araştırma Değerlendirme Danışmanlık A.Ş. tarafından finanse edilen ve 33 büyükşehir, 23 il, 154 ilçe de 5400 kişi ile yüz yüze görüşmelerle yapılan bir araştırmada herhangi bir dini cemaate veya tarikata bağlı olmadığını ifade edenlerin oranı %60'tır (Kulat, 2017, s. 20). Geriye kalan oranın herhangi bir dinî cemaat ya da tarikat ile bağlantısı olduğu düşünüldüğünde ortaya çıkan sonuç dikkate değerdir.

Türkiye'de faaliyet gösteren dinî hareketlerle ilgili saha çalışmalarının sınırlı olmasında bazı faktörlerin rolünün olduğu tartışılabilir. Birincisi, Türkiye'nin içinde bulunduğu siyasi durum: Cumhuriyetin ilanından sonra tekke ve zaviyelerin kapatılması, bazı tarikatların yasaklanması veya bu hareketlerin dinî faaliyetlerinin cumhuriyetin temel değerlerine tehlike teşkil ettiği gerekçesiyle yasaklanması, bu dini hareketlerin çalışmalarını gizli olarak yürütmelerine neden olmuştur. Özellikle 28 Şubat sürecinde dönemin siyasi ortamındaki tablodan kaynaklı olarak bu hareketler bir yandan dinî faaliyetlerini yürütürken diğer taraftan siyasi pozisyon almıştır. Bu durum cemaatlerin kendi içinde sırlarının ifşa olmaması için bazı önlemler almasına neden olmuştur. Cemaatlerin faaliyetlerini gizli yürütmesi bu konuda araştırma yapmak isteyen akademisyenlerin cemaatlerle ilgili veri toplanmasını zorlaştırmıştır. İkincisi, cemaat faaliyetlerinin yasaklanması neticesinde bu konuda araştırma yapmak isteyen araştırmacılarda kamuoyunda cemaate mensubiyet algısı oluşturacağı endişesi ve bu endişenin araştırmacıda mesleki, kariyer, ekonomik vb. kaygılar oluşturması faktörünün rolü olduğu söylenebilir. Üçüncüsü, şiddete eğilimli bazı cemaatlerin araştırmacı açısından risk içermesi.

Nitekim dinî cemaat ve tarikat mensuplarının sayısı ve genel bütçeleri düşünüldüğünde din içinde ortaya çıkan bu dinî oluşumların büyük bir nüfuzları olduğu gerçeğinden hareketle bu dinî oluşum ve hareketlerin gerek devlet gerekse de dinin esasına yönelik teşkil ettiği tehlikeleri öngörmek için sosyo-psikolojik araştırmalar yapmak büyük önem arz etmektedir. Bu dinî oluşumlara mensubiyet hisseden kişilerin bu hareketlere ne kadar bağlı olduğu başka bir sorudur. Her ne kadar bugün hem dünyada hem de Türkiye'de dinî cemaat ve tarikatların

mensupları niceliksel olarak bir artış gösterse de aslında bu cemaat ve tarikatlarla bağlı olanların gerçek anlamda kendilerini bu dinî oluşumlara adanmışlıkları sorgulanması gereken bir konudur. Tarafımızca yapılan ve yayınlanmamış bir araştırmada dinî cemaat ve tarikatlarla sosyo-ekonomik gerekçelerle katılanların oranı %63.7 ve sunduğu imkânlardan faydalanmak için katılanların oranı ise %78.3 olarak tespit edilmiştir. Bu veri, bize dinî cemaat ve tarikatlarla katılanların büyük çoğunluğunun pragmatist gerekçelerle dinî hareketlere katıldığını ve dinî hareketlerin içinde yer alanların büyük çoğunluğunun bu hareketlere adanmamış kişilerden oluştuğunu göstermektedir. Türkiye’de yapılan başka bir araştırmada da sekülerleşen zihinlerle birlikte dinî hareketlere ve hareketlerin liderlerine yönelik bir güven bunalımının olduğunu göstermektedir (Ete & Yargı, 2023, ss. 102-108). Bu durum dinî hareketlerin dinin esasından uzaklaştıkça toplum tarafından bu hareketlere ve bu hareketlerle birlikte dine yönelik hem itirazların yükselmesine hem dinin meta aracı olarak görülmesine sebep olmaktadır. Dinî hareketler ilgili oluşan algının ana gerekçesi olarak bu hareketlerin dinî fazlasıyla siyasi ve ekonomiye alet etmesi veya onların dünyevileşmesi ile ilgili olduğu söylenebilir.

SONUÇ

Bu çalışmada dinin ekonomi ile ilişkisi irdelenmiş olup gelecekte bu ilişkinin olası sonuçları tartışılmıştır. Muhtemel sonuçlara göre dinin ekonomik anlamda küresel boyut kazandığı bazı güncel verilerle ortaya konulmaya çalışılmıştır. Bu bağlamda bazı dinlerle ilgili örnekler verilmiş ve gelecekte evrileceği durum analiz edilmiştir. Özellikle sosyal sermaye bağlamında manevi bir değer ifade eden dinin gerek kitle iletişim araçları olsun gerekse de günümüzde ekonomi ve siyasetle özdeşleşen YDH’ler olsun bu iki boyutla birlikte pazar ekonomisine nasıl dönüştüğü ve gelecekte muhtemel durumu ile birey ve toplum üzerindeki etkisi yordanmaya çalışılmıştır.

Modernizmin, hedonizmin, narsizmin ve bireyciliğin yaygınlaştığı günümüzde din kavramı meta olarak görülmekte ve inanları ise müşteri olarak değerlendirilmektedir. Bu yönüyle pek çok yeni dini hareket kendi alacaklılarına gerçek satıcılar olarak talip olmaktadır. Çünkü inananlarının beklentilerine cevap veremeyen dini cemaatler müşterilerini kaybetmeye mahkûmdur. Küreselleşen dünyamız artık dinler marketine dönüşmüş durumdadır (Özkan, 2006, ss. 34-35). Bu durum dini cemaatler arasında müşteri kapmak için kıyasıya bir mücadeleye başka bir ifade ile cemaatler arasında korkunç bir rekabete sebep olmaktadır.

Din, tanrı ile insanlar arasında karşılıklı bir ahittir. Bu ahitleşme tanrı(lar)ın insanlara nimet ve lütuflarına karşılık olarak insanların tanrıların memnun etmek için tapınaklar ve kutsal alanlar inşa etme çeşitli ritüeller yapma, dualar okuma, gösteriler yapma, adaklar sunma, ilahiler söyleme, programlar düzenleme vb. birçok faaliyet dinin halk içindeki anlamını ifade eder (Platon, 2023, s. 127). Sokrates’in ifadesiyle din ya da dindarlık, tanrı(lar) ile insanlar arasında bir ticarettir (Platon, 2023, s. 111). Bunun günümüzdeki karşılığı pragmatist dindarlıktır ve pragmatist dindarlık hayatın iyileştirici yönüne tekabül eder (James, 2000, s. 597).

Her ne kadar Marksist düşüncenin ortaya çıktığı tarihe kadar din ve dindarlık kavramı ile ilgili yaklaşımlar dinin özüne yönelik olsa da o tarihten günümüze kadar dinin özsel olmaktan daha

çok insanlar için işlevsel olduğu görülmektedir (Bkz. Yapıcı, 2013, ss. 9-20). Dinin işlevsel olduğuna yönelik dua ve ibadetin birey üzerinde yaptığı olumlu psikolojik etki, duruma örnek olarak verilebilir (Argyle, 2006, ss. 320-322). Kaldı ki dua ve ibadet bireyin psikolojisini pozitif anlamda etkilemekle birlikte bazen Tanrı ile bir pazarlık aracına da dönüşebilmekte (Olgun, 2016, s. 83) bazen de bireyin işlediği günahlardan ve suçlardan arınma anlamına gelmektedir. Argyle'ye göre dua ibadeti çaresizlik içinde bocalayan kişilerin en sık başvurduğu dinî motiftir (Argyle, 2006, s. 333). Türkiye'de yapılan bir araştırmada katılımcıların %92.8'i bir sıkıntısı olduğunda Tanrı'ya dua ederek yardım istediğini belirtmiştir (Ete & Yargı, 2023, s. 17). Vurgulanan tüm bu durumlar ve veriler dinin özselden işlevsele ve işlevselden sermaye aracına doğru bir evrilmenin sonucu olarak gerçekleştiği söylenebilir.

Kârını maksimize etme mantalitesi üzerine kurulmuş olan kapitalizmin piyasaya yaklaşımı parçacı değil bütüncül olduğu bilinmektedir. Başka bir ifade ile ekonomik getirisi olan her şeyi kapitalist üretimin dolaşımına dahil eden günümüz sömürü düzeni, parasal değeri olmayan tüm manevi unsurları da bu dolaşıma almak için politikalar üretmektedir. Para karşılığında vaaz verme, dinî programlar icra etme, dinî ritüeller düzenleme gibi birçok dinî faaliyet bu politikaların bir sonucu olduğunu söyleyebiliriz. Bugün dünya ölçeğinde çoğunlukla din adamlarının devlet memuru olması ve dinî unsurları para karşılığında insanlara sunması, tebliğ faaliyetlerinin parasal değerinin yüksek olması ve bunun da insanlara cazibeli gelmesi, hac merkezlerinin olduğu bölge ve ülkeye parasal getirisinin olması ve bu bölgelerde yaşayan inanların din ile pazar ekonomisi arasında bir ilişki kurarak bundan bir kazanç sağlaması gibi birçok durum dinî unsurların gün geçtikçe daha da metalaştığının göstergesidir. Dolayısıyla ne kadar unsur kapitalist düzene eklenirse bu düzen o kadar büyür ve mücadele edilemeyecek bir güce ulaşır. Başka bir ifade ile kapitalizmin en önemli unsuru olan piyasaya sınırsız bir alan tanıdığına, mekanizma belli bir zaman sonra her şeyi tüketim nesnesi olarak görüp çalışır ve nihayetinde tüketim üzerine kurulmuş bir sistem beraberinde kendi kendini de yok eder (Vatansever & Gezici Yalçın, 2022, s. 41). Bugün hedonizm ile tüketim arasında kurulan ilişki neticesinde sahip olduğumuz tüm yaşam alanları ile birlikte temel insani değerler de hızlıca erozyona uğramaktadır. Bu sebeptendir ki kurumsal alanlarda etkisi zayıflayan dinin manevi yönünün yerini Protestan, seküler ve laik anlayışlar almaktadır. Hatta modernleşmenin yaygın olduğu toplumlarda bu dindarlıkların yerini deizm, agnostizm, ateizm, apateizm gibi akımlar ve oluşumlar almaktadır. "2020 Türkiye Eğilimleri" araştırma raporuna göre, 2018 yılında Müslüman olduğunu belirtenlerin oranı %85.9, 2019 yılında Müslüman olduğunu belirtenlerin oranı %79.5 ve 2020 yılında Müslüman olduğunu belirtenlerin oranı %75.8 olduğu görülmüştür (Aydın vd., 2021, s. 23). Dünya genelinde bu araştırmanın sonucuna benzer birçok çalışma verisi mevcuttur ve dinî toplumlarda din hızlıca ya etkisini kaybetmekte ya da kapitalizm ve modern mantaliteye adaptasyon sağlamak için bir dizi değişim dönüşüm geçirmektedir. Özellikle dinî temsil eden ya da ettiği düşünülen kurum, kuruluş, dinî hareket ve din adamlarının dinî söylem ve politikaları neticesinde bu süreç daha da hızlanmıştır. Var olan manevi değerlerimizin erozyonunu engellemek ve her şeyi tüketim nesnesi olarak gören kapitalizmin önüne set çekmek için özgürce ve adilce karar verebilen, düşünen, eleştiren,

sorgulayan ve özeleştiriyeye açık bilinçli ve objektif değerlendirmeler yapan ya da yapabilen nesiller yetiştirmenin ve bir toplum inşa etmenin acil ve elzem bir durum olduğunu söyleyebiliriz. Dolayısıyla konu ile ilgili sorumluluğu olan herkesin yukarıda belirttiğimiz problemin çözümü için adil ve özgür toplumlar inşa edecek politikalar ve tezler üretmesi gerekir.

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A THEORETICAL STUDY ON CIGS SOLAR CELL PRODUCED USING PULSE LASER DEPOSITION TECHNIQUE

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ABSTRACT

$\text{CuIn}_{(x)}\text{Ga}_{(1-x)}\text{Se}_{(2)}$ (CIGS) thin-film solar cells have record efficiency. $\text{CuIn}_{(x)}\text{Ga}_{(1-x)}\text{Se}_{(2)}$ material is p type semiconductor that has a high absorption coefficient and high stability, and the band gap can vary between 1 eV and 1.7 eV depending on (x) value. Nowadays, second generation CIGS thin film solar cells are widely produced and high power conversion efficiency has been achieved. However, the difficulty in producing CIGS thin film solar cells is an undeniable fact. At this point, CIGS/n-Si heterojunction solar cells, which are very easy to produce, attract much attention. With this perspective, in this study, we produced Ag/CIGS/n-Si/Ag heterojunction solar cell. Firstly, we produced a very thin CIGS film on glass with the Pulse Laser Deposition (PLD) system. There are examined and interpreted that the crystal, optical and morphological properties of the thin film. Then, it was produced that Ag/CIGS/n-Si/Ag heterojunction solar cell. We determined the J_{sc} , V_{oc} , FF and efficiency photovoltaic values of the solar cell. SCAPS-1D simulation program was used to verify the efficiency of the CIGS/Si solar cell. By inputting the optical and electrical parameters of the CIGS thin film into the program, the solar cell was modeled and the photovoltaic parameters were calculated. As a result, experimental and theoretical results of CIGS/Si solar cell were found to be compatible with each other.

Keywords: CIGS, thin film, solar cell, SCAPS-1D program

INTRODUCTION

CIGS material, which is a p-type semiconductor, is used as an active layer in thin film solar cells. CIGS has a stable material with a high absorption coefficient. A typical CIGS thin film solar cell consists of Mo/CIGS/CdS/i-ZnO/AZO layers (Oulad Elhmaidi, Abd-Lefdil et al. 2020).

The difficulty in manufacturing these layers, the high energy and time consumption, the easy formation of defects and leakage paths due to the multiple layers that are disadvantages for thin film solar cells. To overcome this situation, Si-based solar cells attract attention as an alternative material. Especially, CIGS/Si heterojunction solar cells have some advantageous in terms of easy production, low energy consumption, and epitaxial growth of CIGS thin film onto Si wafer (Mahmoud, Eliwa et al. 2016, Hameed, El Radaf et al. 2018, Candan, Parlak et al. 2019).

The Pulse Laser Deposition (PLD) technique is the most desirable in the production of ideal thin films on Si wafers (Elhmaidi, Pandiyan et al. 2016, Gezgin and Kılıç 2019, Oulad Elhmaidi, Abd-Lefdil et al. 2020). Thanks to PLD system which has adjustable parameters such as laser flux, laser wavelength and pulse number, background gas pressure, therefore, thin films with desired electrical, morphological, crystalline and optical structures can be easily produced. This situation was observed in our previous studies (Gezgin, Houimi et al. 2019, Gezgin, Houimi et al. 2021, Gezgin and Kiliç 2022, Houimi, Gezgin et al. 2022).

SCAPS-1D simulation program is a powerful software frequently used to calculate the efficiency of thin film, perovskite, dye-sensitized solar cells (Alex Niemegeers 2020). Photovoltaic (PV) parameter calculations can be made by entering some physical parameters such as absorption coefficient file of the layers forming the solar cell, band gap, film thickness, their electrical parameters (Houimi, Gezgin et al. 2021).

In this study, Ag/CIGS/n-Si/Ag heterojunction solar cell was produced using PLD system. PV parameters of V_{oc} (open circuit voltage), J_{sc} (short current density), FF (fill factor) and η (power conversion efficiency) parameters were measured. Physical parameters of the layers forming the solar cell were input to SCAPS-1D program and PV parameters were calculated, theoretical and experimental results were compared and found to be compatible with each other

MATERIALS AND METHOD

The CIGS thin film production experiment was carried out as follows:

1- Two different substrates, namely Soda lime glass (SLG) and Si wafer, were used in the experiment. In order to deposit the thin films on the clean surface, these substrates were subjected to a cleaning process. Cleaning process of SLG substrates: SLG substrates were first cleaned with foamy soap. Then, they were subjected to cleaning again in an ultrasonic bath in acetone and isopropyl alcohol, respectively, at 15-minute intervals. Cleaning process of n-Si wafers: Si wafers were cleaned with soapy foam and then kept in isopropyl alcohol. Finally, all substrates were dried with nitrogen gas and made ready for thin film coating.

2- The laser system generated a laser beam with a wavelength of 1064 nm, a pulse width of 5 ns, a repetition rate of 10 Hz, and an energy of 20 mJ. CIGS sputtering target material with 99.99% purity was positioned on the target holder, SLG and n-Si wafer substrate holder, and then the internal pressure of the vacuum chamber decreased to $\sim 10^{-6}$ mbar first by rotary pump and then by turbo molecular pump. CIGS material was deposited on the bright (front) faces of

SLG and n-Si wafer with 86400 laser pulses. Ag metal contact was coated on the back face of n-Si wafer with PLD technique (in Figure 1a). CIGS coated SLG and n-Si wafer layers were annealed at 450° C for 5 min in a quartz tube furnace in a vacuum environment as shown in the figure. Ag finger contacts were deposited onto the CIGS thin films coated on the n-Si wafer and finally the Ag/CIGS/n-Si/Ag heterojunction solar cells shown in Figure 1b were produced.

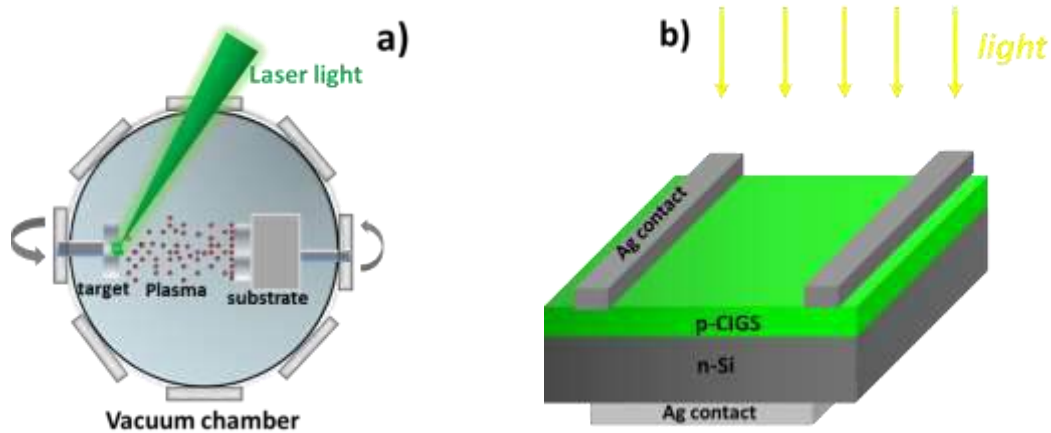


Figure 1. a) PLD vacuum chamber and b) The schematic image of CIGS/Si heterojunction solar cell

RESULTS AND DISCUSSION

CIGS semiconductor thin films are grown in polycrystalline structure. However, CIGS thin film produced in this study is constructed in monocrystalline structure according to XRD spectrum shown in Figure 2. The peak intensity of the thin film is high and is formed with (112) orientation on $2\theta = 27.4^\circ \pm 3$ degrees (Gezgin, Houimi et al. 2021, Gezgin 2022). This shows that the energy of atoms to form only (112) orientation is too low.

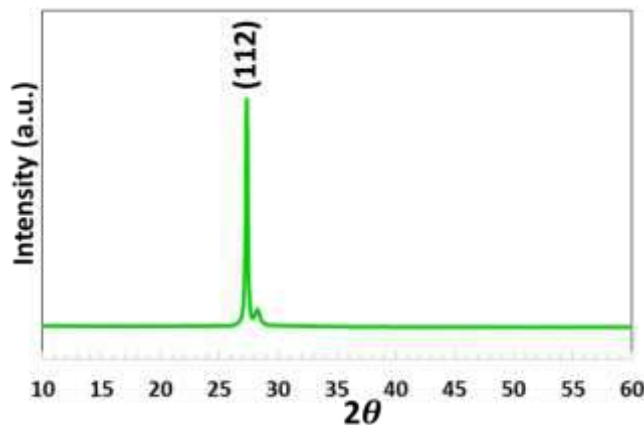


Figure 2. XRD pattern of CIGS thin film

The crystal size of the thin film was defined by the Scherrer equation expressed below.

$$D = 0.94\lambda/\beta\cos\theta \quad (1)$$

In order to calculate D (crystalline size), λ (wavelength of X-ray), θ (Bragg diffraction angle), β (the full-width at half-maximum of diffraction peak) parameters are used. The crystalline size of CIGS thin film was determined to be 43.14 nm.

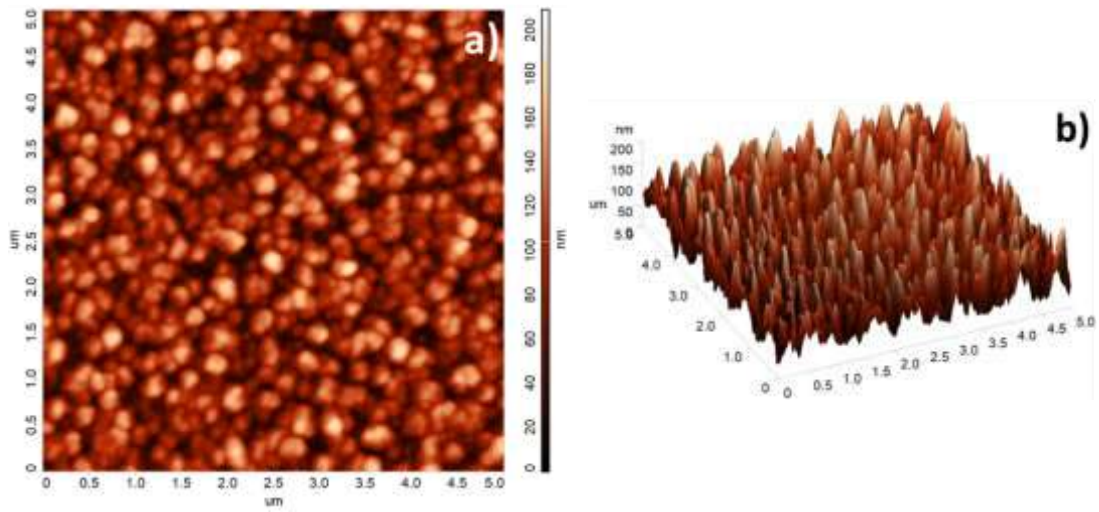


Figure 3. a) AFM image (5µm×5µm) and b) roughness of CIGS thin film

As can be seen from AFM image in figure 3a, CIGS thin film consists of partially homogeneous particle size distribution. The average roughness value of thin film was measured as 28.34 nm and the average ten peak height was measured as 104.10 nm.

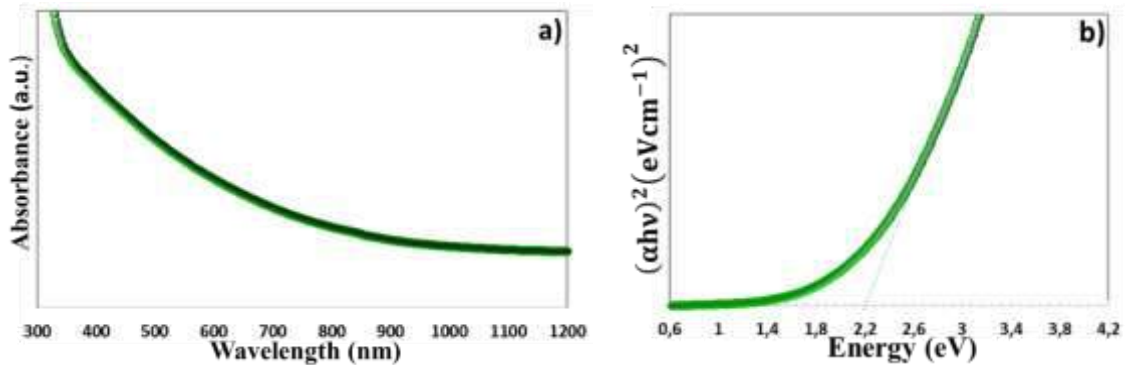


Figure 4. a) The absorption spectrum and b) Tauc Plot of CIGS thin film

According to the absorption spectrum of CIGS thin film in figure 4, thin film showed an increasing photon absorption trend from Vis to UV region. Its absorption amount is low in the near infrared region.

$$(\alpha hv) = A(hv - E_g)^{1/2} \quad (2)$$

The Tauc graph in figure 4 was obtained using Tauc equation given above. The direction that cuts the x-axis determines the energy band gap (E_g). The band gap of the thin film was obtained as 2.2 eV as given in the literature (Sohn, Han et al. 2014, AlZoubi and Moustafa 2019). Since the thin film absorbs gradually more photons from Vis region to UV region, the band gap is found slightly higher.

Modelling of Ag/CIGS/n-Si/Ag solar cell using SCAPS-1D program

The SCAPS-1D program is used to verify the operating performance of produced solar cells or to calculate the possible efficiencies of solar cells that will consist of many layers and be produced (Heriche, Rouabah et al. 2016, Bose, Cunha et al. 2019, Qu, Zhang et al. 2019). The working principle of this simulation program is expressed in Figure 5. As given in Table 1. electrical and optical parameters such as band gap of the semiconductor, thickness, dielectric coefficient, charge carrier density of semiconductors forming the solar cell are loaded into SCAPS-1D program. The thin film semiconductor's absorption coefficient file is obtained using equation of $\alpha = 2.303(A/w)$ (A =Absorbance, w = film thickness) (Gezgin 2022) and load into the program, and then PV parameters are calculated by running the program.



Figure 5. Working diagram of SCAPS-1D program

Table 1. Properties of CIGS and n-Si materials

Parameters of this layers	n-Si (Heriche, Rouabah et al. 2017, Kim, Gwak et al. 2017, Khan, Subhan et al. 2020)	CIGS (Murata, Hironiwa et al. 2014, Yan, Bai et al. 2018, Qu, Zhang et al. 2019)
Band Gap(eV)	1.12	2.2 (measured)
Electron affinity(eV)	4.05	3.9
Dielectric permittivity (relative)	11.9	6.5
Conduction band effective density of states(cm^{-3})	2.80 E+19	2.20 E+18
Valence band effective density of states(cm^{-3})	2.65 E+19	1.80 E+19
Electron thermal velocity(cm/s)	1.00 E+7	1.00 E+7

Hole thermal velocity(cm/s)	1.00 E+7	1.00 E+7
Electron mobility(cm ² /Vs)	1450	100
Hole mobility(cm ² /Vs)	500	10
Shallow donor density N _D (cm ⁻³)	1.50 E+16	0
Shallow acceptor density N _A (cm ⁻³)	0	1.00 E+16
Thickness	500 μm	154 nm (measured)

The physical parameters of n-Si and CIGS semiconductors are given in Table 1. All parameters were used as input to the program and the solar cell was modelled and PV parameters were calculated. The calculated PV parameters are $J_{sc}=0.32$ mA/cm², $V_{oc}=330$ mV, $FF=21.11\%$ and $\eta=0.0226\%$, while the experimentally determined parameters are $J_{sc}=0.31$ mA/cm², $V_{oc}=340$ mV, $FF=9.40\%$ and $\eta=0.0127\%$ (in Table 2).

Table 2. The calculated and Experimental parameters of CIGS/n-Si hetero junction solar cell

Thickness	154 nm			
Cell's parameters	V_{oc} (mV)	J_{sc} (mA/cm ²)	FF (%)	Eff (%)
Calculated	330	0.32	21.11	0.0226
Experimental	340	0.31	9.40	0.0127

The current density-voltage characteristics of the experimentally produced and modelled CIGS/n-Si solar cell are given comparatively in the figure 6. As a result, the theoretically calculated PV parameters are very compatible with the experimental parameters. This confirms the accuracy and safe operation of the produced CIGS/n-Si solar cell. The lower FF factor of the solar cell produced experimentally that is attributed to the sagging bands, trap structures, the leakage current and the pinholes inside the solar cell. In this sense, SCAPS-1D program can be somewhat inadequate in expressing structural formations such as pinholes and shunt paths, and the differences between the filling factors can be attributed to this situation(Houimi, Gezgin et al. 2021).

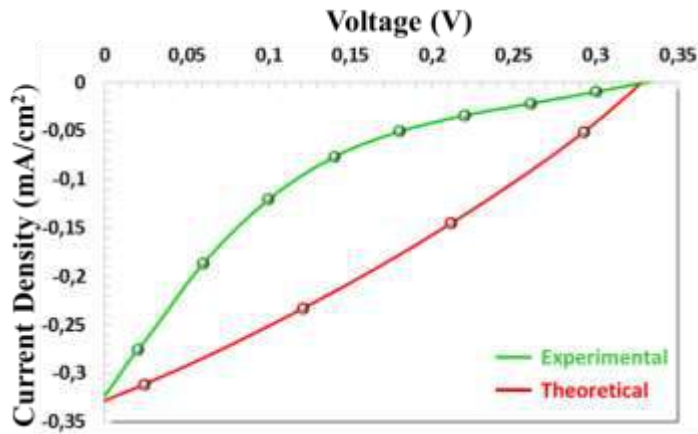


Figure 6. Current Density-Voltage characterisation of experimentally produced and modelled CIGS/n-Si solar cell

CONCLUSIONS

In this work, we have produced Ag/CIGS/n-Si/Ag solar cell by PLD system. The crystal size of CIGS thin film was determined as 43.14 nm, average roughness as 28.34 nm and band gap as 2.2 eV. PV parameters of the experimentally produced solar cell are $J_{sc}=0.31$ mA/cm², $V_{oc}=340$ mV, $FF=9.40\%$ and $\eta=0.0127\%$. We modelled Ag/CIGS/n-Si/Ag solar cell with SCAPS-1D program and calculated PV parameters as $J_{sc}=0.32$ mA/cm², $V_{oc}=330$ mV, $FF=21.11\%$ and $\eta=0.0226\%$. PV parameters of the experimentally produced solar cell are in good agreement with the theoretical parameters. This agreement confirms the operating performance of the produced solar cell.

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THE NONLINEARITY OF MoS₂ NANOPARTICLES DEPENDING ON FEMTOSECOND LASER BASED Z-SCANNING

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ABSTRACT

MoS₂ is a material of great interest in science due to its high capability on optical properties. The most powerful nonlinear optical properties include reverse saturation absorption, two-photon absorption, and saturation absorption. Applications for MoS₂ include optical limiting, laser technology, optical information and communication, and other fields.

In this work, the MoS₂ nanoparticle will be synthesized using femtosecond (fs) laser ablation. Morphological structure and UV-Vis absorption spectroscopy will be employed to analyse linear optical structure. Using fs laser-based z-scan techniques, an experimental procedure will be used to assess the material's nonlinear characteristics. The analysis of the nonlinear optical properties of MoS₂ nanoparticles will comprise nonlinear absorption coefficient, nonlinear refractive index, and third order nonlinear optical susceptibilities, depending on the fs laser z-scan method.

Keywords: Z-scan, femtosecond, laser, MoS₂, nonlinearity.

INTRODUCTION

The scientific community's main tactic is still the inventive creation of nanoparticles (NPs) and their application in semiconductor technology. It is possible to synthesize NPs using laser ablation technique in laser material interaction processes and apply it to technology by clearly defining the linear and nonlinear optical processes of nanoforms (Gundogdu et al., 2022; Kılıç et al., 2021).

Two-dimensional layered materials have been intensively studied in recent years. Molybdenum disulfide (MoS₂) has been studied extensively as a two-dimensional layered structure due to its chemical and physical properties. Since it is abundant in the world and has some advantages such as being affordable, research activities are carried out in various application areas including energy harvesting devices, optoelectronic sensors as well as biological applications.

For this reason, it is very important to determine the characteristic properties of the material by determining the method that is least harmful to the environment among the production techniques (Zamora-Romero et al., 2019; Zuo et al., 2023).

In industrial area based on semiconductor technology, transition metal dichalcogenides (TMDs) have a great interest due to their direct bandgap properties at electromagnetic wave frequencies fall in visible region of the spectrum as monolayer structure. For this reason, the optical, photonic and other properties of MoS₂ and graphene as monolayers have been compared and their advantages have been discussed by various researchers (Säynätjoki et al., 2017). In particular, third-order harmonic generation studies were experimentally obtained for graphene and MoS₂ to be 3.4 times larger than third-order harmonic generation studies under the same conditions (Woodward et al., 2016). Considering the nonlinear properties of MoS₂, which can be produced in single-layer and multi-layer structures, comparing one-dimensional and two-dimensional production, it has been shown that poorer symmetry of material is more strongly affected by second harmonic generation processes (Yin et al., 2014). This situation has been revealed by researchers as a very important process for ultrathin frequency doubling crystal production in lasing (Shi et al., 2017). Controllable fabrication of TMD materials is carried out by various methods including lithography masking (Park et al., 2021), ion beam patterning (Munkhbat et al., 2020) and laser ablation methods (Zuo et al., 2023).

Laser based NP production technique is known as effective method to obtain multifunctional nanostructures (Gündoğdu et al., 2019). This method give opportunities to product different forms NPs structures and morphology depending on laser parameters, solvent conditions and material properties. Laser ablation technique generally has carried out in liquid medium hence it depends on NP removing on target surface focusing ultrahigh laser beam in any preferred liquid (Gündoğdu, 2023a). NP production technique with laser ablation method can be carried out in two ways. While the first of these occurs by focusing the laser beam directly on any target in the liquid medium, in the second case, the particles in the fragmented medium are converted into nanoforms by laser focusing in the liquid. The nanoforms produced here may vary depending on the type of laser and the laser parameters used (Simakin et al., 2007).

Two-dimensional (2D) materials are novel nonlinear optical materials that have garnered a lot of interest because of their exceptional optical and electrical characteristics, along with other physical attributes. Here, using femtosecond laser based z-scan nonlinearity with open and closed aperture Z-scan approach, we examined the nonlinear optical response and mechanism of MoS₂ NPs depending on laser parameters. MoS₂ NP production was achieved using the femtosecond laser ablation method using NPs obtained by using a Mo target in S₂ and being exposed to the laser for half an hour. Then, the linear absorption spectra of the produced NPs were revealed by UV-vis absorption spectroscopy. SEM images of the produced Mo NPs are presented and femtosecond laser based nonlinear optical results are presented in detail.

MATERIALS AND METHOD

Femtosecond laser based MoS₂ NP production

The femtosecond laser system employed in the study was used for both NP production and z-scan nonlinear optical properties. The experimental setup has the infrastructure to allow both studies to be carried out. Using the Laser micro-processing unit, mixing with a magnetic stirrer and laser ablation were carried out on Mo target in the presence of S₂ in the liquid, with a focus of 11 cm, as shown in figure 2b. Then, MoS₂ NPs in the obtained liquid were placed in a quartz container and nonlinear optical data were experimentally obtained by moving them in the z axis between -100 mm and 100 mm from the focal point in the z-scan system, where closed and open slits are located simultaneously with a 50 cm focal point focusing lens. The femtosecond laser system used here is a femtosecond laser system with a wavelength of 800nm, a laser pulse duration of 90 fs and a repetition frequency of 1-3 kHz (Gundogdu et al., 2022; Gündoğdu, 2023a; Gündoğdu et al., 2019; Kılıç et al., 2021).

RESULTS AND DISCUSSION

Linear Absorption and SEM image of Mo and MoS₂ NP

In this study, linear absorbance parameters were obtained using UV-Vis spectroscopy technique for MoS₂ NPs linear optical performances. Spectra showing the absorbance across 400 nm–750 nm wavelength range are shown in Figure 2a. When it comes to Mo, the absorption intensity is higher in UV and Vis regions than that in IR region. As mentioned in equation 1, the photon energy band gap values were determined by applying Tauc equation to the obtained absorbance spectra. Equation 1 illustrates the method used to find the photon energy band gaps of NPs using Tauc technique.

$$(\alpha h\nu)^2 = A(h\nu - E_g)^{1/2} \quad (1)$$

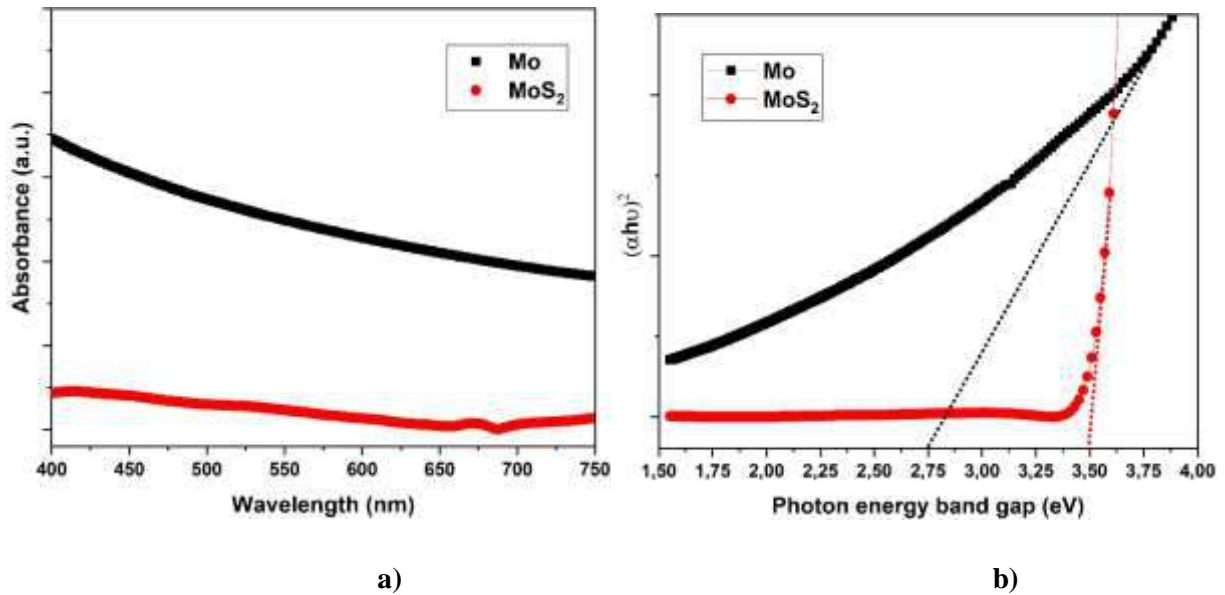


Figure 1 a) Linear absorbance of Mo and MoS₂ Nps, b) photon energy bandgap values of Mo and MoS₂

E_g is found by the straight line of $(\alpha h\nu)^2$ versus $(h\nu)$ in Tauc plot shown in Figure 1b. E_g is the energy band gap of NPs, where $h\nu$ and A are photon energy and area, respectively. These values used in this

equation are all constants. The energy band gap values have been measured using equation 1 to be equal to 2,75 eV and 3.5 eV for Mo and MoS₂, respectively.

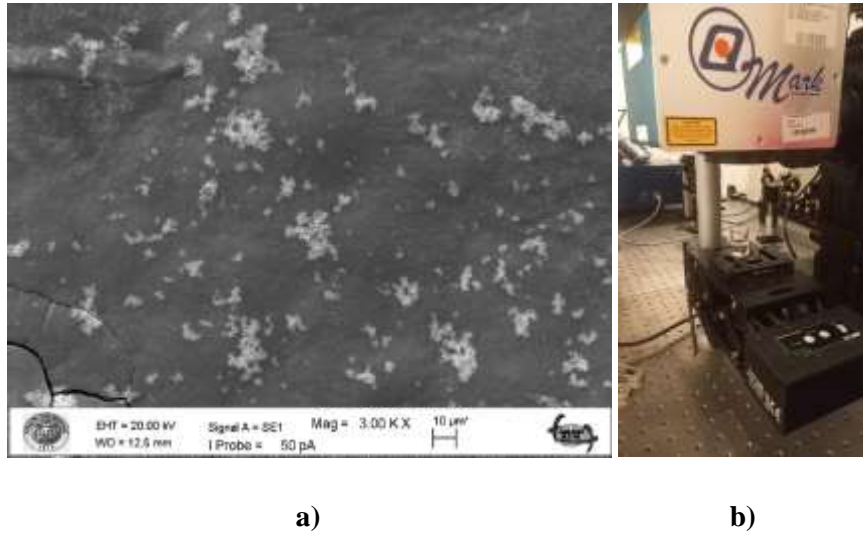


Figure 2 a) SEM image of produced Mo NPs in DMF medium, **b)** Femtosecond laser micromachining unit

Mo NPs were produced in dimethylformamide (DMF) within the scope of this study. 99.99% pure Mo target was used to ablation with 11 cm focus in the micromachining unit located in the femtosecond laser system and NP production was carried out. The structure obtained as a result of the aggregation of Mo NPs is shown by the SEM image presented in figure 2.

Nonlinear Absorption and Refraction of Mo and MoS₂ nanoparicles

The values given in table 1 have been fitted to equations (2) and (3) to produce how experimental and theoretical data support each other due to open and closed apertures signals (Sheik-Bahae et al., 1990).

$$T_{\text{open}}(x) = (\beta I_0 L_{\text{eff}} / 2.83)(1/x^2) \quad (2)$$

$$T_{\text{closed}}(x) = 1 + (4\Delta\Phi_0 x / (x^2 + 9)(x^2 + 1)) \quad (3)$$

L_{eff} is equal to the effective optical path length $(1 - e^{-\alpha L}) / \alpha$ (Wang et al., 2016). Equation 3, where z represents the sample position and $x = z / z_0$, was used to fit the closed aperture fs laser z-scan computation and calculate the Rayleigh range. $\Delta\Phi_0$ was calculated with the use of equation 4;

$$\Delta\Phi_0 = 2\pi / \lambda (n_2 I_0 L_{\text{eff}}) \quad (4)$$

The third order nonlinear optical properties acquired from curves generated from data collected from both the closed and open apertured detectors are calculated using the equations published by Shiek-Bahae et al. (Sheik-Bahae et al., 1989). Open aperture z-scan curves for Mo and MoS₂ as represented in Figure 3a and 3b, respectively. Saturable absorption (SA) mechanism is shown in figure 3.

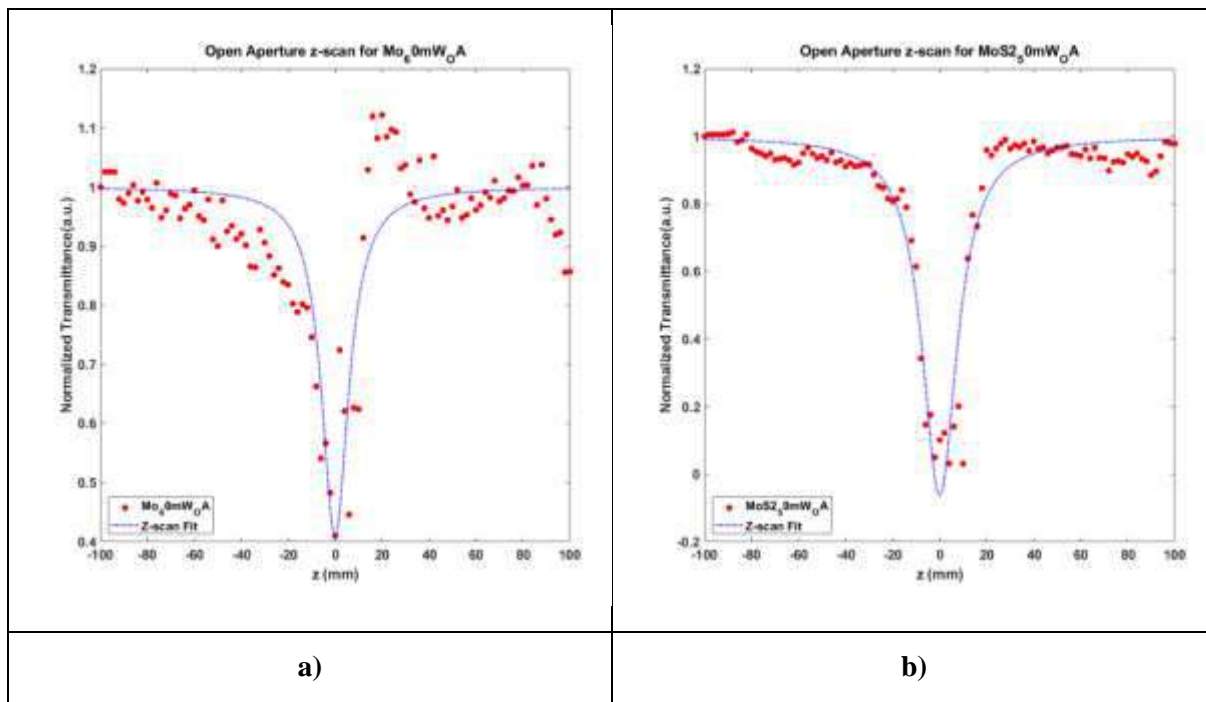


Figure 3. Open aperture z-scan fittings for **a) Mo, b) MoS₂**

In equations, I_0 is the intensity of the incident laser beam, w_0 is examined as the beam waist at the focal point of laser beam and α is known as the linear absorption coefficient (Gündođdu, 2023b).

Mo and MoS₂ NPs Closed Aperture Nonlinearity

Using closed aperture experimental data shown in Figure 4a and 4b. Table 1 shows numerical findings for NL absorption coefficients and refractive indexes using 90 fs laser pulses at 800 nm wavelength.

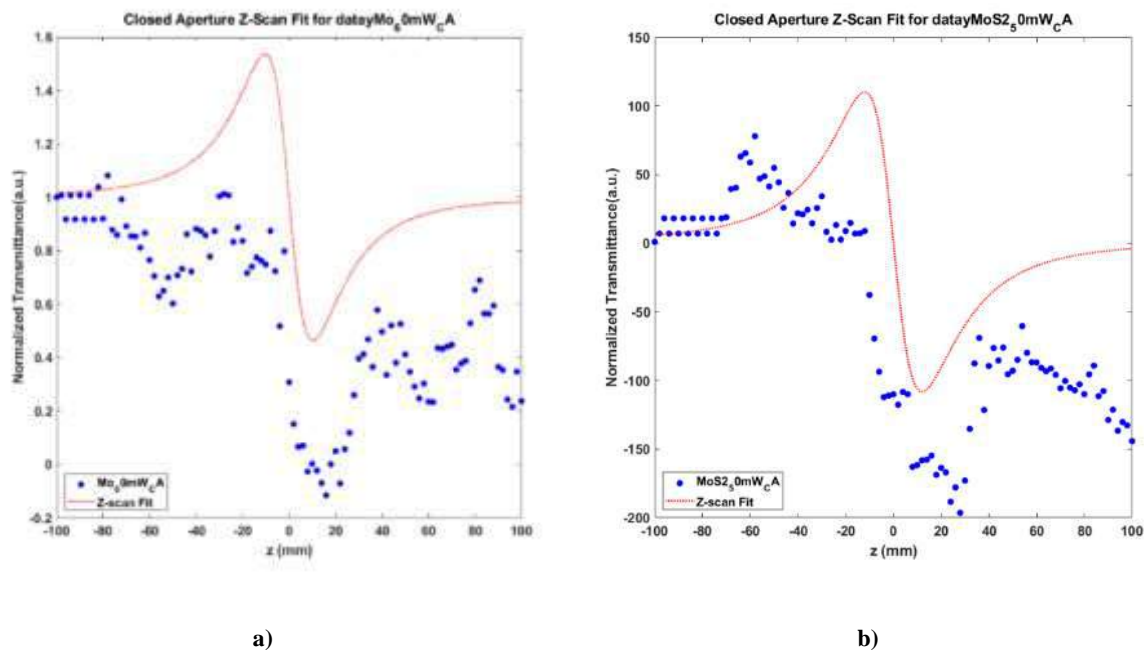


Figure 3. Closed aperture z-scan fittings for **a) Mo, b) MoS₂**

The data from closed aperture z-scan signal fitted have displayed in figure 3a and 3b. The refractive index n_2 of NPs display self-focusing effect and valley-peak shaped curves result in negative sign n_2 shown in Table 1.

Table 1. List of calculated β and n_2 parameters for pure Mo and MoS₂ NPs

Sample Name	β (x 10 ⁻¹⁰ cm/W)	n_2 (x 10 ⁻¹⁵ cm ² /W)
Mo	-0.549	-0.259
MoS ₂	-1.444	-3.814

Calculation of the real and imaginary parts of third order nonlinear optical susceptibility of NPs, equations 3, 4 and 5 have been used.

$$Re\chi^{(3)}(esu) = 10^{-4} \frac{\epsilon_0 c^2 n_0^2}{\pi} n_2 \quad (\text{cm}^2/\text{W}) \quad (3)$$

$$Im\chi^{(3)}(esu) = 10^{-2} \frac{\epsilon_0 c^2 n_0^2 \lambda}{4\pi^2} \beta \quad (\text{cm/W}) \quad (4)$$

$$|\chi^{(3)}| = \left[(Re(\chi^{(3)}))^2 + (Im(\chi^{(3)}))^2 \right]^{1/2} \quad (5)$$

where the parameters ϵ_0 and c are known as the vacuum permittivity and light velocity. The laser intensity was used 2.97×10^{11} W/cm². All calculated parameters on third order nonlinearities are displayed in Table 2.

Table 2. Reel and imaginary parts of produced Mo and MoS₂ Nps

Sample Name	$Re(X^{(3)})esu$	$Im(X^{(3)})esu$	$X^{(3)}esu$
Mo	-3.684 x 10 ⁻¹⁶	-4.973 x 10 ⁻¹⁴	4.973 x 10 ⁻¹⁴
MoS ₂	-3.504 x 10 ⁻¹⁴	-8.446 x 10 ⁻¹⁴	9.144 x 10 ⁻¹⁴

CONCLUSION

Within the scope of this study, the obtained NPs were subjected to laser ablation in liquid using Mo target. S₂ was added to Mo NPs in powder form in DMF by doping and subjected to laser ablation in a magnetic stirrer. When the UV-Vis linear absorption spectroscopy for the produced NPs is examined, it is seen that the absorption of the NPs decreases from 400 nm to 800 nm wavelength region. The energy band gap values have been measured using equation (1) to be equal to 2,75 eV and 3.5 eV for Mo and MoS₂, respectively.

Z-scan methodology is a useful method for looking at nonlinearities in NPs. Obtained nonlinear results of Mo and MoS₂ shows well agreement with the Z-scan method NL optical data (Anand et al., 2023; Jin et al., 2022). It will be expanded by introducing new applications such as optical limiting, lasing, optoelectronic and optical switching devices, and other NL devices.

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AN INVESTIGATION OF NONLINEAR OPTICAL PROPERTIES OF CDS THIN FILMS DEPOSITED BY PLD TECHNIQUE

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ÖZET

Bu çalışmada, CdS ince filmi Puls Laser Depozisyon yöntemi olarak adlandırılan yeşil üretim tekniği kullanılarak üretilmiştir. İnsanlığa daha iyi bir hayat konforu sunmak amaçlı olarak yeni malzemelere dayalı modern optik spektroskopi amacına yönelik ve yeni optic teknikler geliştirmeye yönelik çalışmalar daha fazla önem kazanmaktadır. Bilimin bu görünen yüzüyle, optic malzemeler olduğu kadar yarı iletken malzemeler daha az enerji kaybı ve daha yüksek verimlilik gibi arzulan özellikler ortaya koyacak bazı yeni hassas teknik ve yüksek teknoloji üretimi gerçekleştirecek üstün imkanlar sağlayacaktır. Herşeyden önce, oldukça yaygın bir kullanım alanı sunan bu CdS ince film üretimi, CdS malzemesinin farklı teknolojiler üretilmesine olanak sağlayıp sağlamayacağı hususunda temel bir çalışma amaçlanmıştır. CdS ince filmin yapısal, morfolojik, elektriksel ve optic özellikleri incelenmiş ve elde edilen sonuçlar daha önceki çalışmalarda tartışılmıştır.

CdS ince film yapının lineer olmayan optiksel özellikleri incelenmiş ve bu çalışma kapsamında ortaya konmuştur. Lineer soğurma bölgesi, lineer olmayan soğurma katsayısı, lineer olmayan absorpsiyon ve lineer olmayan kırılma indisinin yanı sıra üçüncü mertebe lineer olmayan susceptibilitesi incelenmiş ve sonuçlar üzerinde sonuç yorumları gerçekleştirilmiştir.

Keywords: Lineer olmayan optik, üçüncü mertebe susceptibilite, lineer olmayan soğurma katsayısı, Lineer olmayan kırılma indisi

ABSTRACT

In this work, CdS thin film have been developed by applying a green production technique called Pulsed Laser Deposition Technique. For optical spectroscopy purposes and development of novel techniques based on some novel materials gains more and more importance for life

relieves of peoples. In this view of science, semiconductor materials as well as optical materials give great opportunities to develop some novel product as well as techniques in high technology to present expected properties such as low energy consumption and high efficiency. The first of all, CdS thin films have been produced for whether we can open some novel applications for this very common material. Their structural, morphological, electrical and optical properties have been investigated and obtained results have been interpreted elsewhere.

Nonlinear optical properties of CdS thin film have been obtained and presented within the scope of this presentation. Linear absorbance range, nonlinear absorption coefficient, nonlinear refractive index as well as third order nonlinear susceptibility have been investigated and a conclusion due to these results have been given too.

Keywords: NL optics, third order susceptibility, NL absorption coefficient, NL refractive index

INTRODUCTION

Cadmium sulphide (CdS) is a n-type semiconductor with high photo-conductivity, a wide band gap in 2.4 eV and low electrical resistance (Moualkia, Hariech, & Aida, 2009). CdS thin film should be neither too thick to transmit photons to the absorber layer nor too thin to cause shorting due to pinholes in thin film (Moualkia et al., 2009) when it is used as a buffer layer for several combinations in thin film solar cells. CdS should be in appropriate thickness as a buffer layer to exhibit quantified optical, morphological and electrical properties to form an ideal p-n junction with some semiconductor materials (Yiğit Gezgin & Kiliç, 2019). CdS is an n-type semiconductor material and it is well known that electron-hole pairs can easily be produced in the case of photo excitation when exciting photons having energy enough or more than energy equal to the band gap of the material to fit band gap of material under consideration. It is also well known that CdS has attracted a great interests worldwide because of it has been realised to have a great potential for diverse applications. A common and intensive studies on CdS have been performed about production of CdS thin films due to several applications such as the photoluminescence, photocatalytic as well as photonic research and technologies. Therefore, we have found this spectacular material so interesting whether we can develop some idea to produce technology based on this materials or not (Gong, Kelley, & Kelley, 2017; Granata, Sites, Contreras-Puente, & Compaan, 1996; Ji et al., 2011; Wu, 2022; Yılmaz, Atasoy, Tomakin, & Bacaksız, 2015).

Nonlinear (NL) optics is a part of optical science and developed recently very fast and widen its application areas amazingly over the world. This branch of optics is related to various types of optical NLities in crystal, dielectric and semiconductor materials in applicatin for waveguids and fiber optics. It is well known that this phenomena is developed as laser intensity ingreases. If laser intensity is low, NL effects becomes very weak while it is obvious in the case of higher laser intensities. In the case of NL optical processes and their applications, NL frequency conversion is a very important concepts to study about the generating some new diverse optical

colours running some NL processes. The effects of optical nonlinearities may have created some opportunities of applications such as the organising and manipulating the propagation of intense laser beams throughout optical fibers, generation of supercontinuum, or some ways of processing optical signals. In other cases, NL optical phenomena may be a key measurement processes—for autocorrelation and optical characterisation processes for ultrafast optical phenomena.

Lasers are well known as the best photon generator with the narrowest band upto date, and a large number of laser types have been commercially available and uses laser active medium in gas, solid, dye and semiconductor materials (Han et al., 2021; Maiman, 1960). Optomechanics and optoelectronics become very important part of *photonics* at the present day and we try to develop several idea as well as technologies to contribute either scientific literature or technological developments which give some oppotunities to develop application technologies based on interaction of intense laser beam with any form materials for generation, transmission, control, detect, display, storage of photons (Diehl & Diehl, 2000; Mooradian, Jaeger, & Stokseth, 1976).

In this concepts, the production and investigation of new technological materials representing some nonlinearities are also areas of studies fall in photonics coverage. It can clearly be said that in order to obtain some sipefic NL prospects to develop some novel technologies, we need to develop some new material structure for future developments in this area (Boyd, 2020; Shen, 1984). Of course these novel materials must present some new properties and respons due to wavelength of light, operation temperatura as well as chemical and mechanical interaction with environment (Light, 1998).

MATERIALS AND METHODS

In this work, we have performed a great experimental work to present some important data about some linear and NL properties of CdS thin film to check whether we can open some new windows for some spectacular materials to investigate whether we can produce some beneficial materials for photonics applications or not.

Experimentally, firstly we have performed en experiment to produce CdS thin films by efforting PLD procedure and analised to give some characteristic data about CdS thin film such as UV-Vis spectroscopy and Z-Scan test forgetting linear absortion index and NL properties in some view has been clarified. All details of these procedure as well as results will be discussed below.

Production of CdS thin film Structures

CdS thin film has been produced by a house built Pulsed Laser Deposition (PLD) system which is a simple and user-friendly technique to install. It consists of a vacuum chamber and an outwork laser system (Gezgin, 2022; Gezgin, Houimi, Gündoğdu, Mercimek, & Kılıç, 2021). Materials can be initially ablated from target at high temperature, simultaneous evaporation and stoichiometric transfer occur by courtesy of laser intensity where evaporation taken place with

a temperature of $\sim 4000^\circ\text{K}$ in a laser pulse focal volume. In addition, the morphological, electrical, crystal and optical properties of the thin film can be controlled by using variable laser parameters, vacuum pressure and substrate temperature as well as distance between target and substrate (Akin et al., 2022; Gezgin & Kiliç, 2019; Gezgin & Kılıç, 2019).

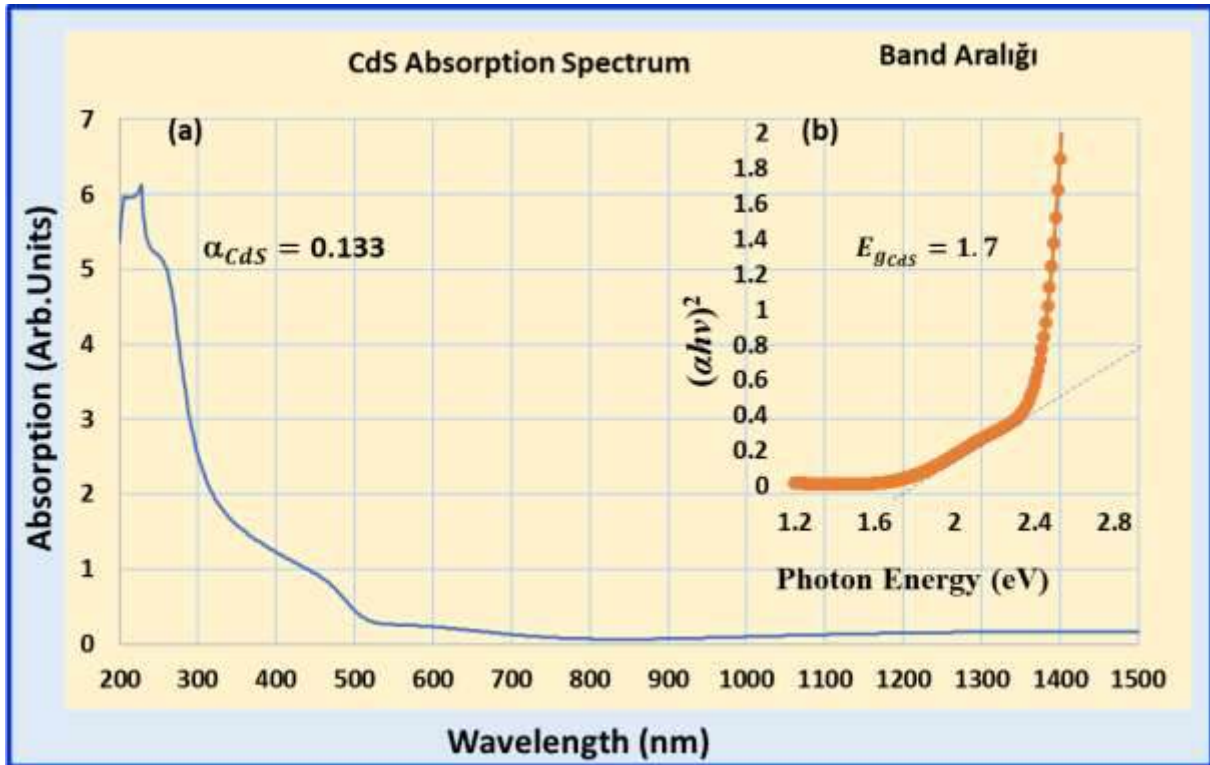
The laser beam used in this work was delivered at a fundamental wavelength of 1064 nm at 10 Hz repetition rate and 5 ns pulse width with 20 mJ energy per pulse. CdS sputtering target was used as a source of materials and thin film was produced on a SLG glass in a vacuum environment at 10^{-6} mbar pressure. This CdS thin film on SLG was annealed in a vacuum environment at 450°C temperature. The characteristics of CdS thin film apart from NL Optic (NLO) properties have been analysed in details and presented in the literature elsewhere (Gezgin & Kiliç, 2019).

Z-Scan System for Third Order NL Analysis

NLO is a very young area of scientific discipline but a promising branch of modern science and studied by a number of powerful technique such as Z-Scan and wave mixing. Z-Scan technique can be applied in many fields of research and technology as well as in several disciplines such as Physics, Chemistry, Biology and Engineering. The z-scan technique is a simple, popular and a powerful experimental technique for determination of both NL two photon absorption coefficient β and NL refraction index n_2 as well as measuring third order NL susceptibilities of materials, simultaneously, as a function of laser beam intensity using a single Gaussian laser beam. In our experimental apparatus, a femtosecond (fs) (titanium sapphire) laser system has been utilised to run z-scan experiments. Fs laser system consists of a Ti:light oscillator pumping an Integra-C amplifier (from Quantronix, NY, USA) delivering laser pulses at 800 nm wavelength at 90 fs pulse duration @1, 2&3 kHz repetition rates. Our Z-Scan experimental system gives us an opportunity to measure both of two photon NL absorption coefficient and NL refraction index simultaneously employing both open and closed aperture detectors, respectively, (Çadirci, Gündoğdu, Elibol, & Kılıç, 2020; Gundogdu et al., 2022; Kiliç, Gündoğdu, Kepceoğlu, & Durmuş, 2016). Experimental results are gathered *via* both detectors and then signals from these both detectors have been analysed theoretically by fitting these output signals to theoretical equations using different MATLAB codes and then determine these mentioned NLO parameters to give some special characteristics of materials (Çadirci et al., 2020; Gündoğdu, Kılıç, & Çadirci, 2021; Kiliç et al., 2016; Kılıç, Gündoğdu, Kılıç, & Gezgin, 2021)

RESULTS AND DISCUSSIONS

The optical absorption spectra of CdS thin film has been measured by using a UV-Vis spectrophotometer (JASCO, V-670 Spectrophotometer, Japan) and then all results obtained have been analysed and discussed below.



Şekil 1: (a) Absorption spectrum of CdS thin film structure, (b) $(ahv)^2$ energy diagram of CdS thin film material as a function of photon energy.

Absorption spectrum of CdS thin film is represented in Fig. 1(a) showing absorbance of CdS thin film over a spectral range from 200 nm to 1500 nm. Linear absorption coefficient, α_0 , of sample has been determined to be $\alpha_{0_{CdS}} = 0.133$ for CdS thin film. The absorption intensity in UV and Vis regions in spectrum is relatively higher than that in IR region for CdS thin film. Tauc equation has been used to determine energy band gap value of sample by using absorption spectrum as indicated in Eq.(1). The band gap of CdS thin film have been calculated using Tauc curve in Eq.(1),

$$(ahv)^2 = A(hv - E_g)^{1/2} \quad (1)$$

where E_g is band gap of materials under investigation, A is area illuminated and hv is photon energy. E_g value for CdS thin film have been determined by using a straight line of $(ahv)^2$ plotted against (hv) in Tauc plot in Figure 1(b) and determined by performing a calculation using Eq.(1) to be $E_g = 1.7$ eV and this values have been used to determine NL optical characteristic parameter values of CdS thin film as is discussed below.

It has been proposed by Sheik-Bahae *et al.* (Sheik-Bahae, Said, Wei, Hagan, & Van Stryland, 1990) and as we have performed that Z-Scan test and analysis promise an opportunity of measurement of both NL absorption coefficient and NL refraction index by using a single Gaussian laser beam and apply both detectors to get data as a measure of NL absorption coefficient β from open aperture detector and NL refraction index n from closed aperture detector.

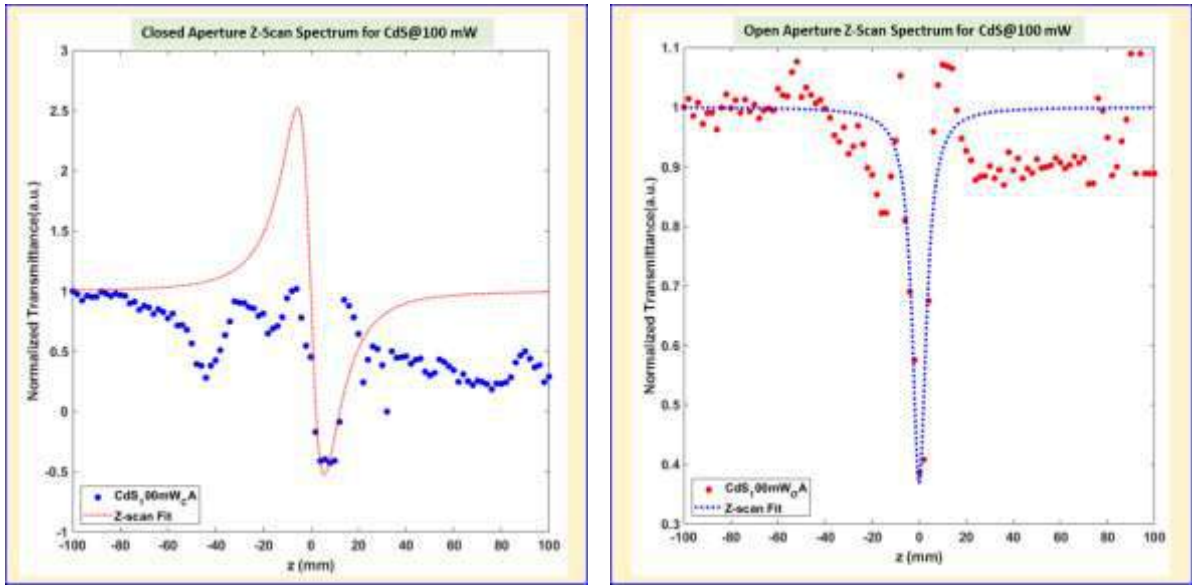


Figure 2. (a) Some NL optical properties of CdS thin film have been represented. Close aperture data gives information about NL refractive index n_2 taken from DII detector and represented, (b) Open aperture z-scan data represented giving information about NL two photon absorption coefficients for CdS thin film, respectively.

NLO properties of CdS thin film have been analysed by performing z-scan test applying both closed and open apertured detectors in same and suitable conditions. It is worthy to mention that, in the z-scan technique, measurement of normalized transmittance of intense laser beam are measured along z axis and z-scan curves of collected data from closed and open aperture detectors have been manipulated and analysed by fitting them to theoretically suitable formulas and then plotted as shown in Figure 2 using necessary codes in MATLAB programme. All details of theoretical background and process have been given elsewhere (Çadirci et al., 2020; Gundogdu et al., 2022; Gündoğdu et al., 2021; Kılıç, Gündoğdu, Kılıç, & Yiğit Gezgin, 2021).

The two photons absorption coefficient β and NL refractive index (n_2) have been taken from open and closed apertured detectors, respectively, and given in Table 1 for CdS thin film measured to be in an order of 10^{-12} cm/W and 10^{-15} cm²/W by using 2.376×10^{12} W/cm² laser intensity.

Table 1. NL two photons absorption (TPA) coefficient (β) and NL refractive index (n_2) parameters of CdS thin film as a function of laser intensities of 2.376×10^{12} W/cm².

Sample Name	β ($\times 10^{-12}$ cm/W)	n_2 (cm ² /W)
CdS	-2.024	-3.866×10^{-15}

Closed and Open aperture z-scan curves for CdS thin film are shown in [Figures 2a and b](#), respectively. Graphs presented in [Figures 2b](#) shows data from open aperture detector and represent characteristics of two photon absorption process (Mishra, Rawat, & Mehendale, 1997;

Wang, Guo, Fu, Wu, & Zhu, 2004) which can be concluded that transmitted signal measured after sample decreases and gives a valley of minimum as intensity of laser beam at the focal point increases (Kulyk et al., 2020).

The experimentally determined NL refractive index, n_2 , and NL-TPA coefficient, β , have been efforted to calculate third-order NL optical susceptibility ($\chi^{(3)}$) of CdS thin film. The third-order NLO properties of CdS thin film have been calculated by courtesy of experimental results gathered from running z-scan technique which gives opportunity to calculate real and imaginary portions of third order NL susceptibility by using a procedure given in details elsewhere (Geethakrishnan & Palanisamy, 2007; Gundogdu et al., 2022; Gündoğdu et al., 2021; Kiliç et al., 2016; Kılıç, Gündoğdu, Kılıç, & Yiğit Gezgin, 2021; Singh & Aghamkar, 2015; Yiğit Gezgin & Kiliç, 2019; Zidan, Allaf, Allahham, & Al-Zier, 2015) and the results obtained are given in Table 2.

Table 2. The real and imaginary parts of third order NL optical susceptibility of CdS.

Sample Name	$\chi_{Re}^{(3)}$ (esu)	$\chi_{Im}^{(3)}$ (esu)	$\chi^{(3)}$
CdS	-8.915×10^{-15}	-2.971×10^{-15}	9.397×10^{-15}

CONCLUSIONS

As a conclusion, NLO properties of CdS thin film are presented by data gathered from fs laser z-scan technique. The closed and opened apertured experimental results provides quite well data and make possible for us to determine third order NLO susceptibilities and NL refractive index as well as NL two photons absorption coefficients (Ganeev, Ryasnyansky, Kodirov, & Usmanov, 2000). It is seen from the data that NL two photons absorption coefficient β of CdS thin film give some clear information about optical behaviour but and NL refractive index n_2 opaque and these data suggest us to consider these materials to be good for some photonics devices in special applications.

The third order NLO properties of CdS thin film have been clarified by performing an experimental investigation and presenting real and imaginary parts of third order NL susceptibility $\chi^{(3)}$ to be 10^{-15} esu. β , n_2 and $\chi^{(3)}$ values for the sample have been calculated to be in orders of 10^{-12} cm/W, 10^{-15} cm²/W and 10^{-15} esu, respectively. Depending on NLO results of CdS thin film have not been visited and reported in literature yet, but it can be subjected to a meaningful discussion that this material have some potential of promising to be used as materials to produce some photonics applications as optical limiting (Sun et al., 2018; Veisi, Kazemi, & Mahmoudi, 2020) and optical switching (Dong, Saini, Echehoven, & Podila, 2016) technologies.

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INVESTIGATION OF 9Cr-1Mo % STEEL WELD METAL MICROSTRUCTURE AND MECHANICAL PROPERTIES

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ABSTRACT

In this study, all weld metal was produced with welding electrodes used to joining high Chromium (9%Wt.) Steel (T/P91) with SMAW (shielded metal arc welding). Welding electrodes are in the approximately E9015-B91 standard according to the American Welding Society (AWS A5.5) classification. Produced all weld metal is exposed to 760 °C 4h Post weld heat treatment (PWHT). Tensile test sample and impact test samples were prepared by machining method. Hardness measurements were performed before and after PWHT. Optical microscope (OM), Scanning Electron Microscopy (SEM) with EDX were used in microstructure analysis in the study. N/O analysis of the weld metal was also performed. Microstructure examinations have shown that weld metal containing 9Cr has a tempered martensitic structure. PAGB (Prior Austenite Grain Boundary) and martensite lathes decorated with precipitation phases were observed. No delta ferrite was detected in the weld metal microstructure. Fracture surface analysis showed a mixed fracture mode had cleavage and dimple. In addition, 350 ppm O and 375 ppm N were detected in the weld metal. Fracture surface analyses shown spherical oxide (TYPE I) inclusions of less than 2 microns were observed in the dimples. However, the impact test results were above 57 j at room temperature.

Keywords: High Chromium Weld Metal, All Weld Metal, Toughness.

INTRODUCTION

It is very important to use high temperature resistant materials in power generation facilities. Among the high creep resistance steels, ferritic-martensitic (FM) steels containing 9%Cr are used effectively today. In addition, these steels are also called creep strength enhanced ferritic (CSEF) steels (David, Siefert, & Feng, 2013). Compared to steels with lower chromium content, it has become possible for the material cross-section to be quite thinner with the use of steels containing 9 chromium. This situation has made it easier to produce these materials in certain forms, weldability and transfer them to different regions (Hilkes & Gross, 2013). However, it was possible to assemble parts with a thinner section with welding in a shorter time and more economically. Despite this, they are still not very thin cross-section, given the corrosion resistance and high temperature resistance expected from such steels. For this reason, the

welded joint are mostly carried out in the form of a multi-passed welding. Compared to unalloyed carbon steels, some precautions should be taken in the welding of 9Cr (FM) steels. Pre-heat before welding, inter-pass temperature during welding and post-welding heat treatment (PWHT) are important parameters that affect the mechanical properties of the welded joint. P91 weld metal can transform into martensite even with cooling in the air. After welding, it must be cooled to a temperature of 80 °C to complete the martensitic transformation (Rhode et al., 2023). This means that untempered martensite is prevented from remaining in the weld metal. Post welding heat treatment (PWHT) should be done below A_{c1} temperature in order to prevent untempered martensite (also named fresh martensite) from remaining in the microstructure (Kabakcı et al., 2021; Kumar, Pandey, & Goyal, 2021). It should be avoid the untempered martensite as it reduces the creep resistance and weld metal toughness (David et al., 2013). In present study, all weld metal was produced with welding electrodes used to joining high Chromium (9%Wt.) Steel (T/P91) with SMAW (shielded metal arc welding). Welding electrodes are in the approximately E9015-B91 standard according to the American Welding Society (AWS A5.5) classification. Detailed characterization studies were carried out regarding the microstructure and mechanical properties of the produced weld metal.

MATERIALS AND METHOD

All weld metal design (Figure 1) was produced in the form of multi-pass welding using unalloyed steel substrate material in accordance with the American Welding Society (AWS) standard (A5.5-96, 1996).



Figure 1. All weld metal design.

The substrate plate made of unalloyed steel was subjected to 200 °C preheating before welding. The welding process was carried out in a multi-passed way with inter-pass temperature of 240 °C. After the welding process, the weld was allowed to cool to room temperature so that there was no untempered martensite left, then heat treatment (PWHT) was performed after welding for 760 °C 4 hours. After the completion of post-weld heat treatment, the tensile test sample

and Charpy impact test sample for mechanical tests were prepared by machining from the all weld metal design. Test sample sizes were machined in accordance with AWS 5.5. Chemical composition of the all-weld metal is given in the Table.1. N-O analysis (Figure 2) also performed with LECO equipment in accordance with ASTM E-1019.

Table 1. Chemical composition of all weld metal.

C	Si	Mn	P	S	Ni	Cr	Mo	Nb	V	Ti	Fe	
0.08	0.35	0.76	0.015	0.010	0.71	9.08	0.95	0.06	0.28	0.008	Bal.	Wt. %

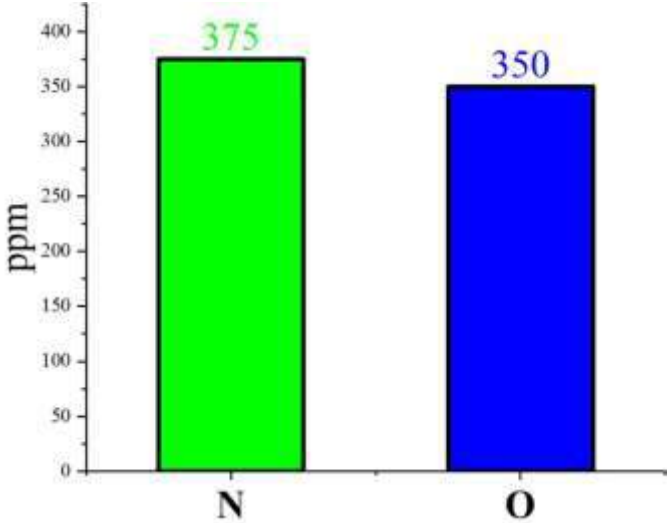


Figure 2. Results of the N-O analysis in the weld metal.

Microstructural characterization of the weld metal performed with KERN OLM1 optical invert microscope. Test specimens were subjected to grinding and polishing processes using conventional methods followed by etching with Picric HCl (2.5 picric acid+2.5 ml hydrochloric acid in 95% ethanol) (Onoro, 2006). In addition electrolytic method used with % 10 oxalic acid for 1.5 min. at 10 V applied. QUANTA 450 Field-emission Gun (FEG) Electron microscope (SEM) was used for microstructure analysis.

Hardness test, tensile test and Charpy impact test were performed to determine the mechanical properties of the welding metal. The hardness test was performed by applying a load of 980 N on the universal motorized (HARDWAY) device. Impact tests, were carried out using the Mohr-Federhaff 300 J capacity device with the Standard sizes (10x10x55 mm) at room temperature. The tensile test was carried out on the Mohr-Federhaff device according to ASTM E8 standard.

RESULTS AND DISCUSSION

It is seen in Figure 3 that the weld metal microstructure consists of tempered martensite. It was determined that the grain boundaries were not clear as a result of etching with Picric HCl. In

addition, the delta ferrite phase, which negatively affects mechanical properties (Kimura, Sawada, Kushima, & Toda, 2013; Zala et al., 2019), was not detected in the weld metal.

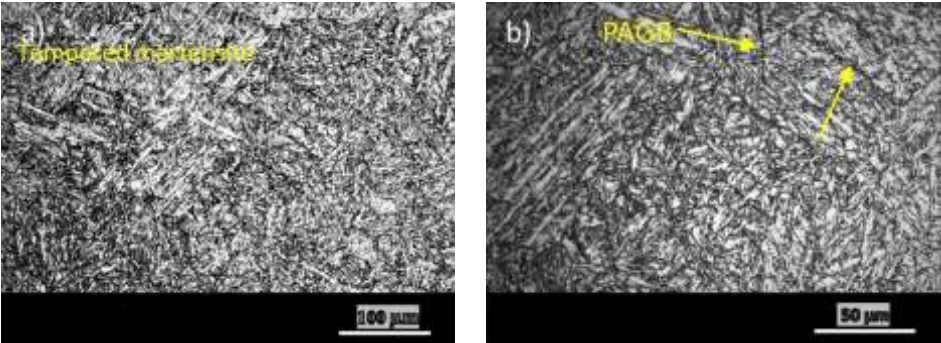


Figure 3. Optical microstructure of weld metal a) Lower mag. b) Higher mag. (etch. Picric HCl).

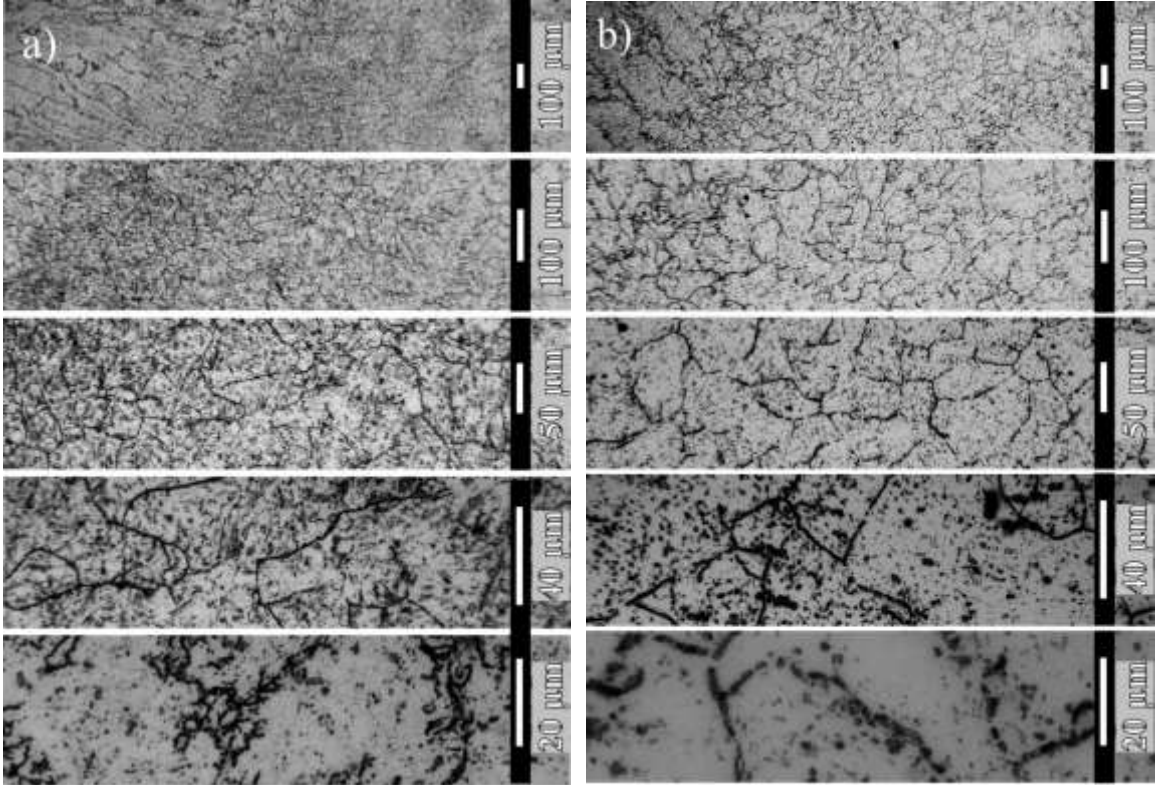


Figure 4. Optical microstructure of the weld metals a) As welded b) PWHT at 760 °C 4h (etch. Electrolytic with oxalic acid).

Figure 4 a) and b) show microstructures of tempered and untempered weld metals. In these microstructures, the etching process was done electrolytically. As can be seen from the Figure 4 in different magnifications, grain boundaries have emerged clearly as a result of electrolytic etching using oxalic acid. This applies to both tempered and untempered weld metal. Electrolytic etching may not be suitable for electron microscope examination due to excessive etching of Carbide/matrix interfaces in this weld metal microstructure examination. However, if the aim is to reveal the grain boundaries and to reveal the delta ferrite phase, it can be said

that electrolytic etching with oxalic acid is a suitable etching method. Figure 5 shows the weld metal SEM image. As seen in the figure, the microstructure consists of tempered martensitic structure and precipitate phases. These precipitates are in the form of $M_{23}C_6$ and MX, which provide strength by preventing the dislocation movement (Barrett, O'Donoghue, & Leen, 2014).

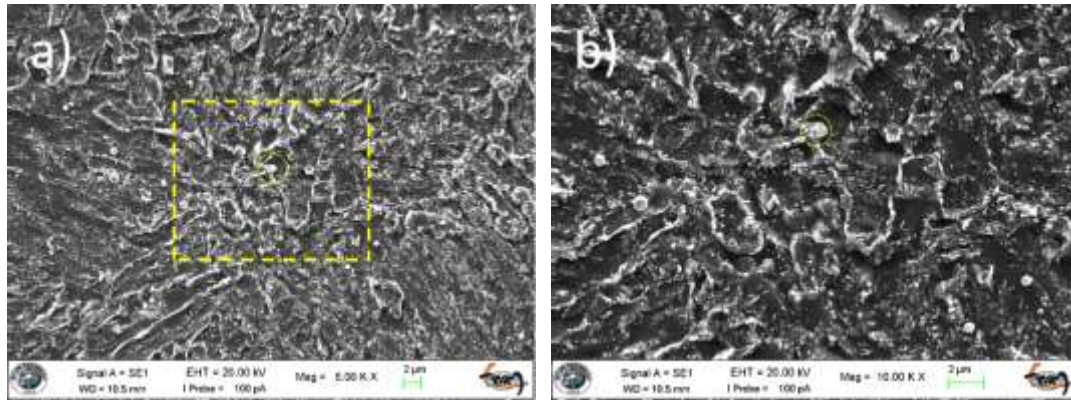


Figure 5. SEM microstructure of weld metal after PWHT at 760 °C 4h. a) Lower mag. and b) Higher mag, (etch. Picric HCl).

Spherical shaped TYPE-I oxide inclusions were also detected in the weld metal microstructure examination. Figure 6 show the oxide inclusions on the surface of the weld metal. Oxide inclusions consist of these elements %wt. O:22,06-Si:5,41-S:2,55-V:0,65-Cr:8,29-Mn:1,40-Fe:59,65 according to EDX result.

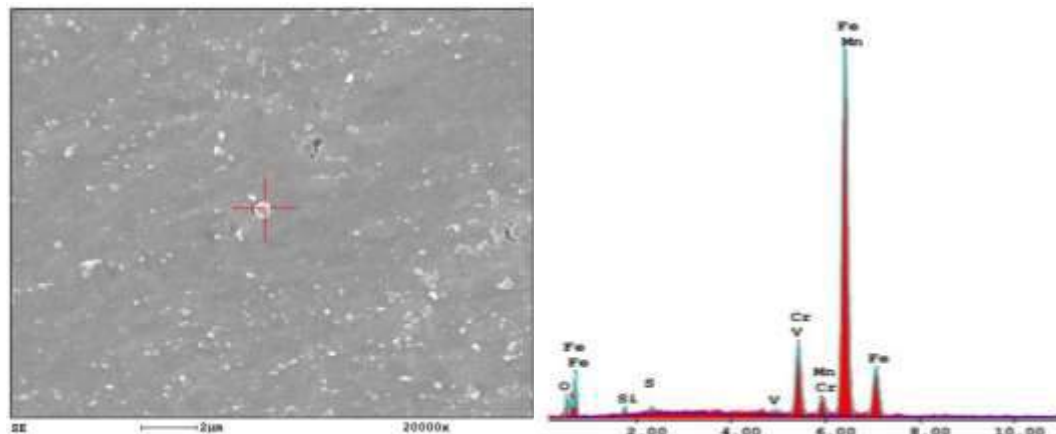


Figure 6. SEM-EDX analysis of oxide inclusion in the weld metal.

Figure 7 refers to weld metal hardness marks and hardness map of values. The hardness of the untempered weld metal is quite high, it is clear from both the hardness marks and the hardness maps. In addition, the presence of weld bead emerged more prominently as a result of untempered state etched with oxalic acid.

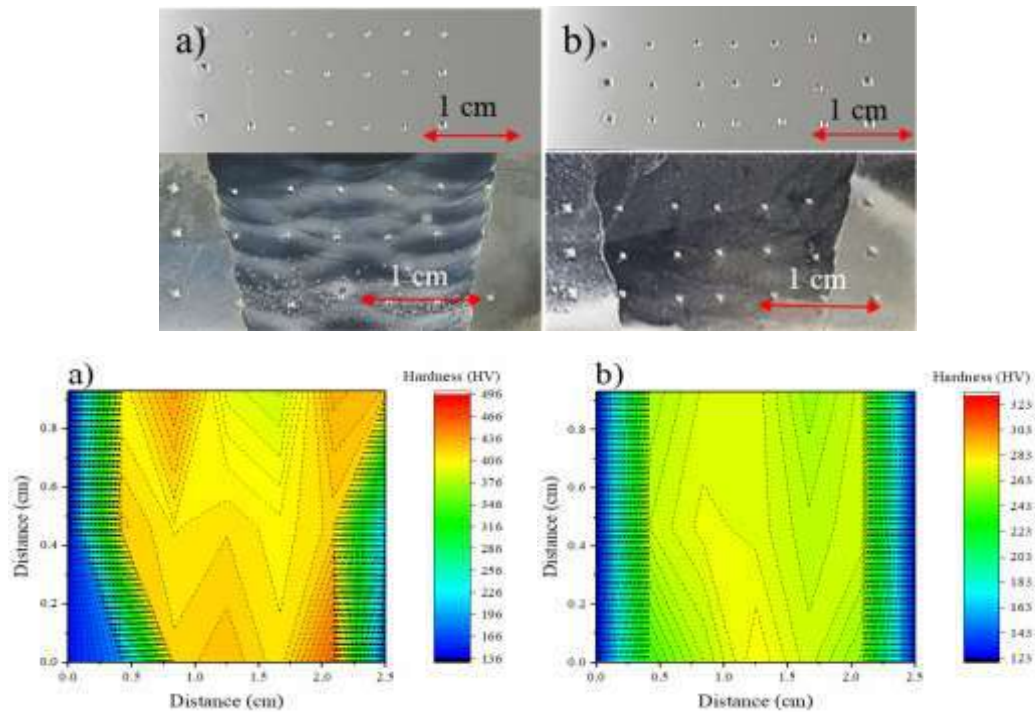


Figure 7. Hardness maps of weld metal a) As welded b) PWHT at 760 °C 4h. (980 N load applied)

The weld metal tensile test result is given in Table 2. It has been determined that the yield and tensile strength of the P91 weld metal is very higher than the yield and tensile strength of P91 steel in the standard (ASTM A335/A335M).

Table 2. Tensile test result of all weld metal.

Yield strength (MPa)	Tensile strength (MPa)	Elongation at rupture (%)
738	800	17

Weld metal Charpy impact test results are shown in Table 3. The average Charpy impact test value is 79J. Although this is considerably lower than the impact test value of P91 steel, it meets the minimum requirement of 47J (European specification EN1599:1997).

Table 3. Charpy impact test result of all weld metal at room temperature.

Test Number	Results (Joule)	Av. (Joule)
1	118	79
2	58	
3	60	



Figure 8. Fractured Charpy impact test specimens.

Table 4. Charpy impact test samples fractured surface analysis results.

Impact Energy (J)	Total Area (mm ²)	Brittle Area (mm ²)	(Brittle area/Total area) x100 = %brittle fracture	100-brittle fracture= %ductile fracture
118	86.57	33.77	39	61
60	79.34	40.81	51	49

It was determined that there was a large difference in the results of the impact test performed at room temperature. The macro examination of the fractured surface made for this purpose is given in Figure 8. The areas that were fractured brittle and ductile were calculated using the Image J program and given in Table 4. The Impact test sample with a value of 60J was 49% ductile fracture. From this situation, it can be stated that the weld metal Ductile-Brittle Transition temperature (DBTT) is around the room temperature. The difference in weld metal toughness values can be attributed to the instability in the DBTT. Figure 9 shows a SEM image of the fractured surface of the weld metal impact test sample with a value of 58 Joules. In the fracture surface examination, the presence of dimple areas, which are the expression of ductile fracture, as well as the brittle fractured cleavage zones, were also observed.

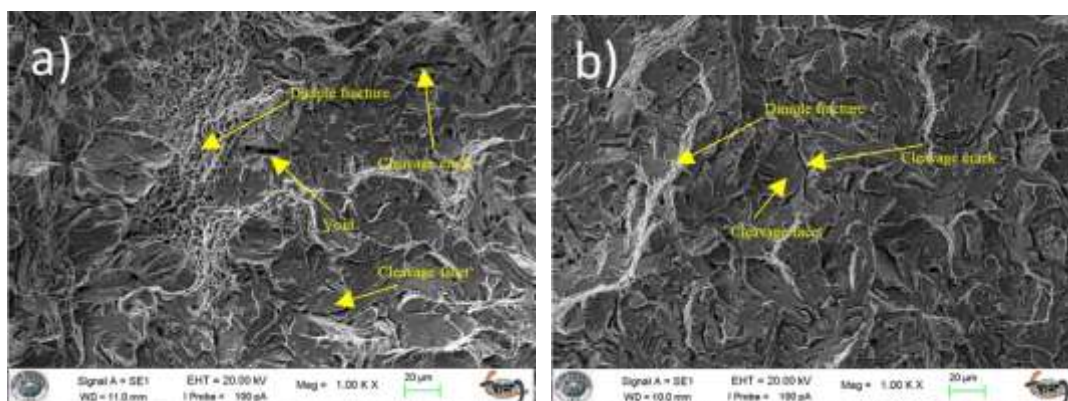


Figure 9. SEM micrograph of weld metal Fracture surface of impact test after PWHT at 760 °C 4h a) dimple density region b) cleavage fracture density region.

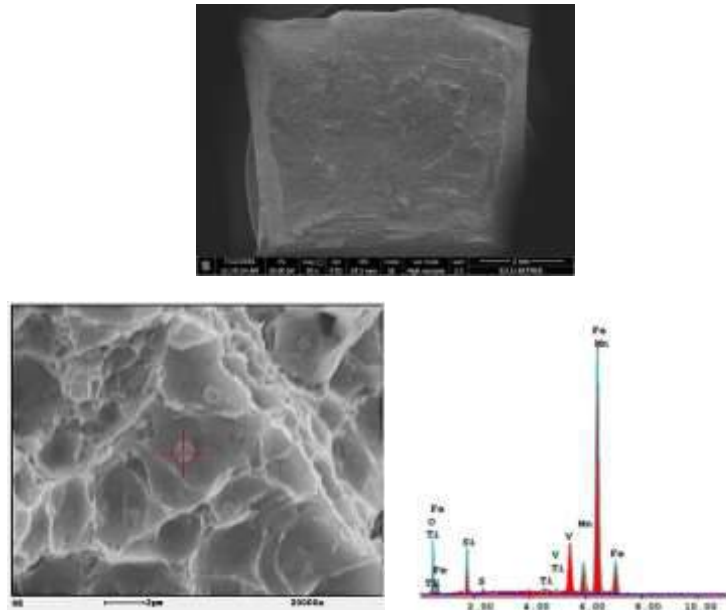


Figure 10. SEM-EDX analysis of oxide inclusion in the weld metal fracture surface.

Figure 10 shows the fractured surface SEM-EDX analysis of the impact test sample valued at 60 J. As seen from the microstructure, the presence of oxide inclusions was detected in dimple, but no carbide was observed. The detected oxide inclusion consists of the following elements according to the EDX analysis %wt. O:44,70-Si:17,15-S:1,54-Ti:0,81-V:0,46-Mn:4,03-Fe:31,31.

CONCLUSION

The amount of oxygen in the weld metal is higher than the casting part. For this reason, the toughness value of the weld metal is lower than the steel produced by the same type of casting. The amount of oxygen was measured as 350 ppm for this weld metal. The P91 weld metal has a tempered microstructure. Electrolytic etching with oxalic acid is a suitable method in making grain boundaries clear in the P91 weld metal microstructure. Type I-shaped spherical oxide inclusions were detected in the P91 weld metal. The hardness of the weld metal is quite high in the untempered condition, the hardness has decreased significantly with the tempering. The yield and tensile strength of the weld metal were measured well above the standard requirements. In the fractured surface macro examination, it was determined that the weld metal ductile-Brittle transition temperature was around the room temperature. This welding electrode, which is still in use in industry, has been evaluated to be suitable for toughness and tensile test data for the welded joint of P91 steel. A creep test may be required to determine the high temperature resistance of this P91 steel, which works at high temperature.

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ALFA KUŞAĞI ÖĞRENCİLERİNİN DİJİTAL OKURYAZARLIK BECERİLERİNİN İNCELENMESİ

EXAMINING OF DIGITAL LITERACY SKILLS OF ALPHA GENERATION STUDENTS

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ÖZET

Bu araştırmanın amacı Alfa kuşağı öğrencilerinin dijital okuryazarlık becerilerini çeşitli değişkenler açısından incelemektir. Araştırmada nicel araştırma yöntemlerinden biri olan ilişkisel tarama modeli kullanılmıştır. Araştırmanın örneklemini, 2023-2024 eğitim-öğretim yılı bahar döneminde, Yalova ilindeki dört devlet ortaokulunda öğrenim gören 271 beşinci sınıf öğrencisi oluşturmaktadır. Araştırmada Alfa kuşağı öğrencilerinin dijital okuryazarlık becerilerini incelemek amacı ile (Pala ve Başbüyük, 2020a) tarafından 10-12 yaş grubu öğrenciler için geliştirilen “Dijital Okuryazarlık Ölçeği” ve “Kişisel Bilgi Formu” kullanılmıştır. Araştırmadan elde edilen veriler SPSS (Statistical Package for Social Sciences) Windows 25.0 programı kullanılarak analiz edilmiştir. Verilerin öncelikle normal dağılıma uygunluğu test edilmiştir. Verilerin çarpıklık ve basıklık değerlerinin ± 3 arasında olması normal dağılıma sahip olduğunu göstermiştir. Niceliksel verilerin karşılaştırılmasında iki bağımsız grup arasındaki fark için bağımsız grup t testi, ikiden fazla bağımsız grubun karşılaştırılmasında tek yönlü varyans analizi, fark yaratan grubu belirlemek amacı ile Bonferroni testi uygulanmıştır. Araştırmadan elde edilen bulgulara göre, Alfa kuşağı öğrencilerinin dijital okuryazarlık düzeylerinin gün içi kullanılan ekran süresine, öğretmenlerin ödev verme tercihlerine, öğrencilerin ders çalışma tercihlerine, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumlarına göre farklılaştığı görülmüştür. Öğrenenlerin tablet ya da bilgisayarı kullanım amacına göre dijital okuryazarlık düzeyleri sadece ölçeğin problem çözme alt boyutunda anlamlı bir farklılık göstermiştir. Bu farklılık, kullanım amacı iletişim kurmak olan katılımcıların lehine sonuçlanmıştır. Alfa kuşağı öğrencilerinin dijital okuryazarlık düzeyleri cinsiyetlerine ve kendine ait bir tablet ya da bilgisayarı olma durumuna göre anlamlı bir farklılık göstermemiştir. Araştırma sonuçlarına göre öğretmenlerin öğrenme ortamında öğrencilerin dijital okuryazarlık becerilerinin gelişimini teşvik edecek onları konfor alanı dışına çıkaran etkinliklere daha fazla yer vermeleri önemlidir.

Anahtar Kelimeler: Alfa Kuşağı, Dijital Okuryazarlık, Dijital Okuryazarlık Becerileri, Eğitim Teknolojisi.

ABSTRACT

The aim of this study is to examine the digital literacy skills of alpha generation students in terms of various variables. The survey model, one of the quantitative research methods, was used in the study. The sample of the study consists of 271 fifth grade students in four public secondary schools in Yalova province, in the spring semester of the 2023-2024 academic year. In order to examine the digital literacy skills of alpha generation students, the “Digital Literacy Scale” developed by (Pala and Başıbüyük, 2020a) for students in the 10-12 age group and “Personal Information Form” were used in the study. The data obtained from the research were analyzed using the SPSS (Statistical Package for Social Sciences) Windows 25.0 program. The data was first tested for suitability for normal distribution. The fact that the skewness and kurtosis values of the data were between ± 3 showed that it had a normal distribution. In comparing quantitative data, independent groups t test was used for the difference between two independent groups and one-way analysis of variance was used to compare more than two independent groups and Bonferroni test was performed to identify the group that made the difference. According to the findings obtained from the research, it was observed that the digital literacy levels of Alpha generation students differ according to the screen time used during the day, teachers’ homework preferences, students’ study preferences, and teachers’ frequent assignments prepared in the digital environment. Students’ digital literacy levels showed a significant difference only in the problem solving sub-dimension of the scale, depending on the purpose of using the tablet or computer. This difference resulted in the favor of the participants whose purpose of use was to communicate. Alpha generation students’ digital literacy levels did not differ significantly according to their gender and whether they had their own tablet or computer. According to the research results, it is important for teachers to include more activities in the learning environment that will encourage the development of students’ digital literacy skills and take them out of their comfort zone.

Keywords: Generation Alpha, Digital Literacy, Digital Literacy Skills, Education Technology

1. GİRİŞ

Kuşak kavramı, birbirine bağlı gruplar tarafından oluşturulan, sosyal-tarihsel sürecin içine yerleştirilen, bir kimliktir (Mannheim, 1938). Howe ve Strauss (2000) “Kuşaklar” adlı araştırmasında, kuşak hakkında üç kriterden bahseder. Birincisi “algılanan üyeliktir”, yani kişinin kendisini bir grubun parçası olarak hissettiği, algıladığı anlamına gelir. İkincisi “aile, kariyer, din veya siyasi görüş gibi ortak inançlar ve davranış biçimleri” olarak adlandırılır. Üçüncüsü, çoğu grup üyesinin özel hayatında büyük etkisi olan, çocuklukları ve ergenlik çağında meydana gelen tüm tarihi olayları içeren “paylaşılan tarihtir.” Çeşitli çalışmalarda kuşaklar farklı tanımlanmıştır. (Pew Research Center [PRC], 2018) tarafından yapılan kuşak sınıflamasına göre, Alfa kuşağı öncesi kuşaklar şu şekilde sınıflandırılmıştır: (1) En büyük kuşak (1901-1927), (2) Sessiz kuşak (1928-1945), (3) Baby boomers kuşağı (1946-1964), (4) X kuşağı (1965-1980), (5) Y kuşağı (1981-1996), (6) Z kuşağı (1997-2009). Alfa kuşağı ise,

2010 yılından sonra doğan ve diğer kuşaklara göre dijital dünyaya en çok maruz kalan kuşak olarak tanımlanmaktadır (McCrindle ve Fell, 2020). Yeni başlangıçların sembolü olarak tanımlanan bu kuşağa Yunan alfabesinin ilk harfi olan “Alfa” adı verilmiştir (Nagy ve Kölcsey, 2017). McCaskey, Alfa kuşağını “Gelmiş geçmiş en resmi eğitilmiş, teknolojik açıdan en gelişmiş ve en zengin kuşak” olarak tanımlamaktadır (Williams, 2015). Y ve Z kuşağı teknoloji konusunda bilgili ve dijital olarak bağlantılı olsa da Alfa kuşağı, teknolojiyi hayatlarına sorunsuz bir şekilde entegre eden ilk kuşak olarak tanımlanmaktadır. Y ve Z kuşağı iPhone’lar ve sosyal medyadan önceki bir zamanı hatırlayacak olsa da tüm Alfa kuşağı için bu cihazlar çok erken yaşlardan itibaren hayatlarının ayrılmaz bir parçası olacaktır. Artan ekran süresi, daha kısa dikkat süresi ve dijital okuryazarlık gibi sonuçlar bu kuşağın dikkat çeken özellikleridir (McCrindle, 2019). Akıllı telefon ve tablet ile büyüyen bu kuşak, teknolojik araçlar ile doğmaları sebebi ile diğer kuşaklara göre teknolojiyi daha erken anlar ve teknolojik gelişmelere daha hızlı uyum sağlar (McCrindle ve Fell, 2020). Bu maruz kalma sebebi ile Alfa kuşağı öğrenenler için hızlı bilgi toplama ve çoklu görevleri yönetme temel bir beceri haline gelmiş, yeni öğretim yöntemlerini gerektiren öğrenme alışkanlıkları da değişmiştir (Nagy ve Kölcsey, 2017). Dolayısı ile geleneksel öğrenme ortamlarından ziyade teknolojik araçlar ve dijital öğrenme teknolojilerini daha fazla benimseme eğilimindedirler (Mıstık, 2019). Aynı zamanda, Alfa kuşağı öğrencileri, öğrenme ortamında yaratıcı ve yenilikçi fikirler ortaya koymak isterler (Beers, 2011). Bunun için, Alfa kuşağı öğrencilerinin, öğrenme materyallerine daha kolay erişimi ve öğrenme sürecinde daha etkileşimli bir deneyim yaşamaları sağlanmalıdır (Lancaster ve Stillman, 2002).

Aynı zamanda, bilgi yığınlarının arttığı günümüzde, öğrenenlerin gerekli bilgileri yönetebilmeleri için problem çözme ve eleştirel düşünme gibi 21. yüzyıl becerilerinin de gelişmiş olması gerekir (Irvin, 2007). Alfa kuşağı öğrencilerinin daha güçlü iş birliği ve bilgi paylaşım yapılarının geliştirilmesi amacı ile 21. yüzyıl becerilerinin de öğrenme ortamlarına entegrasyonu sağlanmalıdır (Voogt ve Roblin, 2010). Bilgi okuryazarlığı, medya okuryazarlığı, dijital okuryazarlık, bilgi ve iletişim teknolojileri okuryazarlığı becerileri 21. yüzyıl becerileri ile ortaya çıkan diğer becerilerdir (Kurt ve Orhan, 2015). Dijital okuryazarlık, dijitalleşmeye uyum sağlama ve gelişmekte olan teknolojilere adaptasyon olarak tanımlanmaktadır (Ng, 2012). Bir başka deyişle, dijital okuryazarlık, bilgi, medya ve teknolojiyi bulma, okuma, yaratma, uyum sağlama, sentezleme, değerlendirme ve paylaşma yeteneğidir (DQGSR, 2018). Dijital okuryazarlık becerilerinin gelişimi için öğretmenlerin geleneksel sınıf paradigmasının dışına çıkarak öğrenenlerin bağımsız öğrenenler olma sürecinin desteklemesi ve bağımsız öğrenme sürecinde dijital okuryazarlık becerilerinin gelişebilmesi için, öğretmenlerin mümkün olduğunca öğrenenleri konfor alanlarının dışına çıkaran etkinliklere yer vermeleri gerekmektedir. Konfor alanının dışına çıkmak her öğrenci için farklı tanımlanır. Örneğin, Hashtag’ler vasıtasıyla iletişim kurmak konusunda ustalaşmış bir öğrenci için konfor alanından çıkmak, fikirlerini blog yazısı aracılığıyla paylaşmak anlamına gelir (MEB, 2020). Alfa kuşağı öğrenenlerin dijital okuryazarlık becerileri okul sonrası öğretmen rehberliğinde web sitesi düzenleme, animasyon hazırlama vb. görevler verilerek geliştirilebilir (Avcı ve Adıgüzel,

2020). Öğrenmenin sadece okul içinde gerçekleşmediği günümüzde, okul dışı informal öğrenme kültürünün, Alfa kuşağı öğrenenlerin de hayatlarının ayrılmaz bir parçası olacağı ve öğrenmelerinin önemli bir kısmını oluşturacağı görülmektedir (Siemens, 2004).

ISTE (2017) tarafından belirlenen standartlarda öğretmenler, öğrenenlerin dijital okuryazarlık becerilerinin gelişimi için sanal ortamlarda, dijital platformlarda, sahada ve uygulamalı yapım alanlarında teknoloji ile öğrenmeyi teşvik eden bir rol oynamalıdır. Bunun için, teknolojiyi öğrencinin bilgiyi yapılandırması amacı ile kullanma yaklaşımı göz önüne alınmalıdır. Teknolojiyi öğrencinin bilgi yapılandırması amacı ile kullanan yapılandırmacı yaklaşımda, bilginin öğrenene teknoloji yardımı ile sunulması yerine bizzat öğrencinin teknolojiyi kullanarak bilgisini sergilemek için bir meteryal hazırlaması ya da çalışma yapması amaçlanır (Tezci ve Perkmen, 2016).

Özetle, Alfa kuşağı öğrencilerinin öğrenme kültürlerinin bağımsız öğrenme yönünde olacağı ve teknolojideki ilerlemelerin de onları etkileyeceği, teknolojiye bağımlı bir öğrenme kültürünün merkezde yer alacağı görülmektedir (Ziatdinov ve Cilliers, 2022). Literatüre paralel olarak, Alfa kuşağı öğrencilerinin bağımsız öğrenme süreçlerinin öğretmenler tarafından verilen informal etkinliklerle desteklenmesinin dijital okuryazarlık becerilerinin gelişimi üzerinde etkili olacağı düşünülmektedir. Bu sebeple, bu çalışmada günlük ekran süresi, öğrencilerin bilgisayar ya da tablet kullanım amacı, öğretmenlerin ödev verme tercihleri, öğrenenlerin ders çalışma tercihleri, dijital ortamda materyal hazırlama sıklığı değişkenleri temel alınarak dijital okuryazarlık becerilerinin gelişimi üzerine etkilerini incelemek amaçlanmıştır.

2. YÖNTEM

2.1. Araştırmanın Modeli

Bu çalışmada nicel araştırma yöntemlerinden ilişkisel tarama modeli kullanılmıştır. Tarama modelleri geçmişte ve halen varolan bir durumu var olduğu şekliyle betimlemeyi amaçlayan, araştırmaya konu olan nesne, birey veya olayı kendi bağlamı içinde tanımlamaya çalışan araştırma yaklaşımıdır. İlişkisel tarama modeli ise, iki ya da daha çok değişken arasında birlikte değişim varlığını ya da derecesini belirlemeyi amaçlayan araştırma modelidir (Karasar, 2000, s.77-81). Araştırmada iki ve daha fazla değişken arasında varolan değişim varlığı/derecesi tespit edilmek istendiği için ilişkisel tarama modeli tercih edilmiştir.

2.2. Evren ve Örneklem

Araştırmanın evreni Yalova ilindeki dört devlet ortaokulundan oluşturmaktadır. Çalışmanın örnekleme ise, 271 beşinci sınıf öğrencisinden oluşmaktadır. Nicel araştırmalarda, araştırmacı örnekleme belirlerken, koşullara uygun ve olanaklar ölçüsünde, temsilliğin en üst düzeye çıkarılmasını amaçlamalıdır (Scott ve Wertheimer, 1962). Araştırmada bu doğrultuda hareket edilerek, araştırma evrenini temsil ettiği düşünülen, amaçlı örnekleme yöntemlerinden biri olan, benzeşik (homojen) örnekleme yöntemi tercih edilmiştir. Benzeşik (homojen) örnekleme yönteminde amaç, küçük ve benzeşik bir örneklem oluşturma yolu ile belirgin bir alt grubu

tanımlamaktır (Yıldırım ve Şimşek, 2016, s.120). Araştırma sadece beşinci sınıf öğrencileri ile yapıldığı için tercih edilen örnekleme yönteminin uygun olduğu düşünülmektedir. Nicel araştırmalarda örneklem büyüklüğü belirlenirken standart bir sayı olmamasına rağmen, örneklem büyüklüğünün, 100'den aşağı olduğu durumlarda, yararlı bir uygulama olmayacağı düşünülmektedir (Moser ve Kalton, 1971). Bu bağlamda, çalışılan örneklem büyüklüğünün de uygun olduğu düşünülmektedir. Çalışmaya katılan öğrencilerin betimsel verilerine Tablo 1'de yer verilmiştir.

Tablo 1. Öğrencilerin Cinsiyetlerine İlişkin Betimsel Veriler

Cinsiyet	N	%
Kız	138	50.9
Erkek	133	49.1
Toplam	271	100

Tablo 1'e göre, çalışmaya katılan öğrencilerin %50.9'unun (138) kız, %49.1'inin (133) erkek olduğu ve katılımcıların cinsiyet değişkenine göre oranlarının birbirine yakın olduğu görülmektedir.

2.3. Veri Toplama Araçları

Araştırmada verilerin toplanması amacı ile (Pala ve Başbüyük, 2020a) tarafından 10-12 yaş grubu öğrenciler için geliştirilen "Dijital Okuryazarlık Ölçeği" (21 madde) ve "Kişisel Bilgi Formu" (7 madde) kullanılmıştır. 21 maddeden oluşan ölçek, "Her zaman = 5", "Çoğu zaman = 4", "Bazen = 3", "Nadiren = 2" ve "Hiçbir zaman = 1" şeklinde derecelendirilmiştir. Ölçekte ters madde yer almamaktadır.

2.4. Verilerin Analizi

Araştırmada benzeşik (homojen) örnekleme yöntemi kullanılarak, 2023-2024 eğitim-öğretim yılı bahar döneminde veriler toplanmıştır. Eksik doldurma sebebi ile yedi formun elenmesinin ardından kalan 271 form ile analizlere başlanmıştır. Araştırmada elde edilen veriler SPSS (Statistical Package for Social Sciences) for Windows 25.0 programı kullanılarak analiz edilmiştir. Verileri değerlendirilirken tanımlayıcı istatistiksel metotlar (sayı, yüzde, min-maks değerleri, ortalama, standart sapma) kullanılmıştır. Araştırmada kullanılan ölçeğin tanımlayıcı istatistiklerine Tablo 2'de yer verilmiştir.

Tablo 2. Ölçeğin Tanımlayıcı İstatistikleri

Ölçek ve Boyutları	Minimum	Maksimum	Ortalama	Standart Sapma
Bilgi İşlem Boyutu	1.60	5.00	3.54	0.81
İletişim Boyutu	1.00	5.00	3.09	1.06
Güvenlik Boyutu	1.17	5.00	3.77	0.83
Problem Çözme Boyutu	1.00	5.00	3.20	1.04
Dijital Okuryazarlık Becerileri Ölçeği	1.24	4.86	3.42	0.79

Tablo 2'e göre, bilgi işlem boyutu ortalamasının 3.54 ± 0.81 , iletişim boyutu ortalamasının 3.09 ± 1.06 , güvenlik boyutu ortalamasının 3.77 ± 0.83 , problem çözme boyutu ortalamasının 3.20 ± 1.04 ve dijital okuryazarlık becerileri ölçeği ortalamasının 3.42 ± 0.79 olduğu görülmektedir. Kullanılan verilerin normal dağılıma uygunluğu test edilmiştir. Normal dağılıma uygunluk Q-Q Plot çizimi ile incelenebilir (Chan, 2003, ss.280-285). Ayrıca, kullanılan verilerin normal dağılım göstermesi çarpıklık ve basıklık değerlerinin ± 3 arasında olmasına bağlıdır (Shao, 2002). Araştırmada kullanılan değişkenlerin normallik analizi sonuçlarına, Tablo 3'te yer verilmiştir.

Tablo 3. Ölçeğin Normallik Analizi Sonuçları

Ölçek ve Boyutları	Çarpıklık	Basıklık	Durum
Bilgi İşlem Boyutu	-0.178	-0.703	Normal
İletişim Boyutu	-0.083	-1.056	Normal
Güvenlik Boyutu	-0.818	-0.205	Normal
Problem Çözme Boyutu	-0.193	-0.922	Normal
Dijital Okuryazarlık Becerileri Ölçeği	-0.336	-0.780	Normal

Tablo 3'e göre, verilerin çarpıklık ve basıklık değerlerinin ± 3 arasında olması normal dağılıma sahip olduğunu göstermektedir. Araştırmada normal dağılıma sahip niceliksel verilerin karşılaştırılmasında iki bağımsız grup arasındaki fark için bağımsız grup t testi, ikiden fazla bağımsız grubun karşılaştırılmasında ise tek yönlü varyans analizi (ANOVA) uygulanmış ve fark bulunduğu durumda fark yaratan grubu bulmak için Bonferroni testi kullanılmıştır. Araştırmada kullanılan ölçeğin güvenilirlik analizi sonuçlarına Tablo 4'te yer verilmiştir. Ölçek ve boyut bazlı güvenilirlikler hesaplanmış ve iyi derecede güvenilirliğe sahip olduğu tespit edilmiştir. Cronbach Alfa değerlerinin 0.50'den büyük olması, kullanılan ölçeklerin güvenilir olduğunu göstermektedir. Bu da araştırmada kullanılan ölçeğin içsel tutarlılıklarının iyi olduğunu göstermektedir (Özdamar, 2016).

Tablo 4. Ölçeğin Güvenirlik Analizi Sonuçları

Ölçek ve Boyutları	Cronbach's Alpha
Bilgi İşlem Boyutu	0.744
İletişim Boyutu	0.808
Güvenlik Boyutu	0.757
Problem Çözme Boyutu	0.868
Dijital Okuryazarlık Becerileri Ölçeği	0.919

3. BULGULAR

Bu bölümde Alfa kuşağı öğrencilerinin cinsiyet, kendine ait bir tablet ya da bilgisayarı olma/olmama durumu, ekran süresi (gün içi tablet, telefon ya da bilgisayar kullanım süresi), tablet/telefon ya da bilgisayarı en fazla kullanım amacı, öğretmenlerin ödev verme tercihleri (sadece kitaplardan, sadece dijital olarak, her ikisi de), öğretmenlerin dijital ortamda hazırlanan görevler verme (örneğin, sunu hazırlama, afiş tasarlama, video hazırlama) sıklığı, öğrenenlerin en çok tercih ettikleri ders çalışma yöntemi (ders kitapları, dijital ortam) değişkenlerine göre dijital okuryazarlık ölçeği puanlarına ilişkin bulgulara yer verilmiştir.

3.1. Cinsiyet Değişkenine Göre Öğrencilerin Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Cinsiyet değişkenine göre öğrencilerin dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma, bağımsız grup t testi sonuçlarına, Tablo 5'te yer verilmiştir.

Tablo 5. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Cinsiyet Değişkenine Göre Farklılaşım Farklılaşmadığını Belirlemek Üzere Yapılan Bağımsız Grup T- Testi Sonuçları

Puan	Gruplar	N	\bar{X}	Ss	Sh _x	t Testi		
						t	Sd	P
DOÖ	Kız	138	3.39	0.78	0.067	-0.549	0.269	.584
	Erkek	133	3.44	0.80	0.070			

Tablo 5'te görüldüğü üzere, kız ve erkek öğrencilerin dijital okuryazarlık puanlarının birbirine yakın olduğu ve örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının cinsiyet değişkenine göre farklılaşım farklılaşmadığını belirlemek amacı ile yapılan bağımsız grup t testi sonucunda grupların aritmetik ortalamaları arasındaki farklılık istatistiksel olarak anlamlı bulunmamıştır ($t=-0.549$; $p>.05$).

3.2. Kendine Ait Tablet veya Bilgisayarı Olma Değişkenine Göre Öğrencilerin Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Kendine ait tablet veya bilgisayarı olma/olmama değişkenine göre öğrencilerin dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma, bağımsız grup t testi sonuçlarına, Tablo 6'da yer verilmiştir.

Tablo 6. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Kendine Ait Tablet veya Bilgisayarı Olma Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Bağımsız Grup T- Testi Sonuçları

Puan	Gruplar	N	\bar{X}	Ss	Sh _x	t Testi		
						t	Sd	P
DOÖ	Var	149	3.41	0.74	0.060	-0.153	0.269	.879
	Yok	122	3.42	0.85	0.077			

Tablo 6’da görüldüğü üzere, örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının kendine ait tablet ya da bilgisayarı olma/olmama durumuna göre farklılaşp farklılaşmadığını belirlemek amacı ile yapılan bağımsız grup t testi sonucunda grupların aritmetik ortalamaları arasındaki farklılık istatistiksel olarak anlamlı bulunmamıştır ($t=-0.153$; $p>.05$).

3.3. Ekran Süresi (Gün İçi Tablet/Telefon veya Bilgisayar Kullanım Süresi) Değişkenine Göre Öğrencilerin Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Gün içinde tablet, telefon veya bilgisayar kullanım süresi değişkenine göre bilgi işlem boyutu, iletişim boyutu, güvenlik boyutu, problem çözme boyutu ve dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma ve tek yönlü varyans analizi sonuçlarına aşağıda yer verilmiştir.

Tablo 7. DOÖ Bilgi İşlem Alt Boyutu Puanlarının Ekran Süresine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

f, x ve Ss Değerleri						ANOVA Sonuçları					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Bilgi İşlem	En fazla 1 saat (1)	55	3.68	0.83	G. Arası	6.389	3	2.130			
	1- 3 saat (2)	109	3.53	0.78	G. İçi	170.439	267	0.638	3.336	.020	4>3
	3 saatten fazla (3)	86	3.37	0.83	Toplam	176.828	270				
	Tüm gün (4)	21	3.90	0.69							

Tablo 7’e göre, ekran süresi tüm gün olan ($\bar{X}=3.90$) öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının ekran süresi değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasında istatistiksel olarak anlamlı bir fark olduğu görülmektedir ($p<0.05$). Fark yaratan grubu bulmak için uygulanan Bonferroni testine göre söz konusu farklılık, tablet/telefon ya da bilgisayar kullanım süresi tüm gün olan katılımcıların lehinedir.

Tablo 8. DOÖ İletişim Alt Boyutu Puanlarının Ekran Süresine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
İletişim	En fazla 1 saat (1)	55	3.20	1.11	G. Arası	9.760	3	3.253			
	1- 3 saat (2)	109	3.93	1.06	G. İçi	295.310	267	1.106	2.941	.034	4>2
	3 saatten fazla (3)	86	3.08	1.07	Toplam	305.070	270				
	Tüm gün (4)	21	3.64	0.67							

Tablo 8'e göre, ekran süresi 1-3 saat olan ($\bar{X}=3.93$) öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının ekran süresi değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasında istatistiksel olarak anlamlı bir fark olduğu görülmektedir ($p<0.05$). Dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının ekran süresine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre ekran süresi tüm gün olan grup ile ekran süresi 1-3 saat grup arasında söz konusu farklılık tüm gün olan katılımcıların lehinedir.

Tablo 9. DOÖ Güvenlik Alt Boyutu Puanlarının Ekran Süresine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Güvenlik	En fazla 1 saat (1)	55	3.97	0.75	G. Arası	6.019	3	2.006			
	1- 3 saat (2)	109	3.78	0.81	G. İçi	181.434	267	0.680	2.953	.033	1>3
	3 saatten fazla (3)	86	3.58	0.93	Toplam	187.453	270				
	Tüm gün (4)	21	3.98	0.56							

Tablo 9'a göre, ekran süresi tüm gün olan ($\bar{X}=3.98$) öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının ekran süresi değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasında istatistiksel olarak anlamlı bir fark olduğu görülmektedir ($p<0.05$). Dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının ekran süresine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre ekran süresi en fazla bir saat olan grup ile üç saatten fazla olan grup arasında söz konusu farklılık en fazla bir saat olan katılımcıların lehinedir.

Tablo 10. DOÖ Problem Çözme Alt Boyutu Puanlarının Ekran Süresine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Problem Çözme	En fazla 1 saat (1)	55	3.47	0.91	G. Arası	9.802	3	3.267	3.084	.028	1>2
	1- 3 saat (2)	109	3.04	1.02	G. İçi	282.877	267	1.059			
	3 saatten fazla (3)	86	3.13	1.11	Toplam	292.679	270				
	Tüm gün (4)	21	3.56	1.00							

Tablo 10'a göre, ekran süresi tüm gün olan ($\bar{X}=3.56$) öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının ekran süresi değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasında istatistiksel olarak anlamlı bir fark olduğu görülmektedir ($p<0.05$). Dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının ekran süresine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, ekran süresi en fazla bir saat olan grup ile 1-3 saat olan grup arasında söz konusu farklılık en fazla bir saat olan katılımcıların lehinedir.

Tablo 11. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Ekran Süresine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
DOÖ	En fazla 1 saat (1)	55	3.60	0.78	G. Arası	6.254	3	2.085	3.448	.017	4>3
	1- 3 saat (2)	109	3.34	0.76	G. İçi	161.443	267	0.605			
	3 saatten fazla (3)	86	3.30	0.86	Toplam	167.697	270				
	Tüm gün (4)	21	3.78	0.46							

Tablo 11'e göre, ekran süresi tüm gün olan ($\bar{X}=3.78$) öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının öğrencilerin kullandıkları ekran süresi değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla gerçekleştirilen tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<0.05$). Dijital okuryazarlık ölçeği toplam puanlarının ekran süresine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre, ekran süresi tüm gün olan grup ile üç saatten fazla olan grup arasında söz konusu farklılık tüm gün olan katılımcıların lehinedir.

3.4. Tablet, Telefon ve Bilgisayarı Kullanım Amacı Değişkenine Göre Öğrencilerin Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Öğrencilerin tablet, telefon ve bilgisayarı kullanım amacı değişkenine göre bilgi işlem boyutu, iletişim boyutu, güvenlik boyutu, problem çözme boyutu ve dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma ve tek yönlü varyans analizi sonuçlarına aşağıda yer verilmiştir.

Tablo 12. DOÖ Bilgi İşlem Alt Boyutu Puanlarının Tablet, Telefon, Bilgisayar Kullanım Amacına Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					<i>ANOVA Sonuçları</i>					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P
Bilgi İşlem	Oyun oynamak (1)	132	3.46	0.78	G. Arası	3.836	4	0.959	1.474	.210
	Video izlemek (2)	89	3.55	0.89	G. İçi	172.993	266	0.650		
	Ders çalışmak (3)	13	3.66	0.77	Toplam	176.828	270			
	Etkinlik yapmak (4)	13	3.51	0.91						
	İletişim kurmak (5)	24	3.88	0.59						

Tablo 12’de görüldüğü üzere, kullanım amacı iletişim kurmak olan ($\bar{X}=3.88$) öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının kullanım amacı değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır ($t=1.474$; $p>.05$).

Tablo 13. DOÖ İletişim Alt Boyutu Puanlarının Tablet, Telefon, Bilgisayar Kullanım Amacına Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					<i>ANOVA Sonuçları</i>					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P
İletişim	Oyun oynamak (1)	132	3.02	1.08	G. Arası	4.592	4	1.148	1.016	.399
	Video izlemek (2)	89	3.09	1.13	G. İçi	300.478	266	1.130		
	Ders çalışmak (3)	13	2.94	0.93	Toplam	305.070	270			
	Etkinlik yapmak (4)	13	3.31	0.63						
	İletişim kurmak (5)	24	3.44	0.93						

Tablo 13’te görüldüğü üzere, kullanım amacı iletişim kurmak olan ($\bar{X}=3.44$) öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının kullanım amacı değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır ($t=1.016$; $p>.05$).

Tablo 14. DOÖ Güvenlik Alt Boyutu Puanlarının Tablet, Telefon, Bilgisayar Kullanım Amacına Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P
Güvenlik	Oyun oynamak (1)	132	3.73	0.88	G. Arası	5.769	4	1.442	2.111	.080
	Video izlemek (2)	89	3.67	0.86	G. İçi	181.684	266	0.683		
	Ders çalışmak (3)	13	4.18	0.65	Toplam	187.453	270			
	Etkinlik yapmak (4)	13	3.78	0.62						
	İletişim kurmak (5)	24	4.10	0.47						

Tablo 14'te görüldüğü üzere, kullanım amacı ders çalışmak olan ($\bar{X}=4.18$) öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının kullanım amacı değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır ($t=2.111$; $p>.05$).

Tablo 15. DOÖ Problem Çözme Alt Boyutu Puanlarının Tablet, Telefon, Bilgisayar Kullanım Amacına Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Problem Çözme	Oyun oynamak (1)	132	3.15	0.99	G. Arası	11.939	4	2.985	2.828	.025	5>2
	Video izlemek (2)	89	3.04	1.13	G. İçi	280.740	266	1.055			
	Ders çalışmak (3)	13	3.45	0.94	Toplam	292.679	270				
	Etkinlik yapmak (4)	13	3.75	0.76							
	İletişim kurmak (5)	24	3.63	0.98							

Tablo 15'te görüldüğü üzere, kullanım amacı etkinlik yapmak olan ($\bar{X}=3.75$) öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının kullanım amacı değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.05$). Dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının kullanım amacına göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucuna göre, kullanım amacı iletişim kurmak olan grup ile video izlemek olan grup arasında söz konusu farklılık iletişim kurmak olan grup lehinedir.

Tablo 16. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Tablet, Telefon, Bilgisayar Kullanım Amacına Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					<i>ANOVA Sonuçları</i>					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P
DOÖ	Oyun oynamak (1)	132	3.36	0.79	G. Arası	4.758	4	1.189		
	Video izlemek (2)	89	3.35	0.84	G. İçi	162.939	266	0.613	1.942	.104
	Ders çalışmak (3)	13	3.59	0.70	Toplam	167.697	270			
	Etkinlik yapmak (4)	13	3.60	0.63						
	İletişim kurmak (5)	24	3.78	0.56						

Tablo 16’da görüldüğü üzere, kullanım amacı iletişim kurmak olan ($\bar{X}=3.78$) öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının öğrencilerin kullanım amacı değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla gerçekleştirilen tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmamıştır ($p>.05$).

3.5. Öğretmenlerin Ödev Verme Tercihleri Değişkenine Göre Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Öğretmenlerin ödev verme tercihleri değişkenine göre bilgi işlem boyutu, iletişim boyutu, güvenlik boyutu, problem çözme boyutu ve dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma ve tek yönlü varyans analizi sonuçlarına aşağıda yer verilmiştir.

Tablo 17. DOÖ Bilgi İşlem Alt Boyutu Puanlarının Öğretmenlerin Ödev Verme Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>					<i>ANOVA Sonuçları</i>						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Bilgi İşlem	Sadece kitaplardan (1)	117	3.28	0.84	G. Arası	16.545	2	8.272			
	Sadece dijital olarak (2)	19	4.07	0.71	G. İçi	160.284	268	0.598	13.832	.000	2>1,
	Her ikisi de (3)	135	3.69	0.72	Toplam	176.828	270				3>1

Tablo 17’de görüldüğü üzere, öğretmenlerin ödev verme tercihleri sadece dijital olarak olan öğrencilerin ($\bar{X}=4.07$) dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, sadece dijital olarak ve sadece kitaplardan

olan gruplar arasında sadece dijital olarak olan grup lehine, her ikisi de ve sadece kitaplardan olan gruplar arasında her ikisi de olan grup lehine olduğu görülmektedir.

Tablo 18. DOÖ İletişim Alt Boyutu Puanlarının Öğretmenlerin Ödev Verme Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

f, x ve Ss Değerleri					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
İletişim	Sadece kitaplardan (1)	117	2.84	1.00	G. Arası	30.411	2	15.205			
	Sadece dijital olarak (2)	19	4.19	0.40	G. İçi	274.459	268	1.025	14.837	.000	2>1,
	Her ikisi de (3)	135	3.14	1.08	Toplam	305.070	270				2>3

Tablo 18’de görüldüğü üzere, öğretmenlerin ödev verme tercihleri sadece dijital olarak olan öğrencilerin ($\bar{X}=4.19$) dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre, sadece dijital olarak ve sadece kitaplardan olan gruplar arasında sadece dijital olarak olan grup lehine, sadece dijital olarak ve her ikisi de olan gruplar arasında sadece dijital olarak grup lehine olduğu görülmektedir.

Tablo 19. DOÖ Güvenlik Alt Boyutu Puanlarının Öğretmenlerin Ödev Verme Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

f, x ve Ss Değerleri					ANOVA Sonuçları						
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Güvenlik	Sadece kitaplardan (1)	117	3.52	0.90	G. Arası	12.641	2	6.321			
	Sadece dijital olarak (2)	19	4.00	0.62	G. İçi	174.812	268	0.652	9.690	0.00	3>1
	Her ikisi de (3)	135	3.95	0.74	Toplam	187.453	270				

Tablo 19’da görüldüğü üzere, öğretmenlerin ödev verme tercihleri sadece dijital olarak olan öğrencilerin ($\bar{X}=4.00$) dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre, her ikisi de ve sadece kitaplardan olan gruplar arasında her ikisi de olan grup lehine olduğu görülmektedir.

Tablo 20. DOÖ Problem Çözme Alt Boyutu Puanlarının Öğretmenlerin Ödev Verme Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

		<i>f, x ve Ss Değerleri</i>				ANOVA Sonuçları					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Problem Çözme	Sadece kitaplardan (1)	117	2.87	1.01	G. Arası	29.596	2	14.798			2>1,
	Sadece dijital olarak (2)	19	4.04	0.78	G. İçi	263.083	268	0.982	15.074	.000	2>3
	Her ikisi de (3)	135	3.36	1.00	Toplam	292.679	270				3>1

Tablo 20’de görüldüğü üzere, öğretmenlerin ödev verme tercihleri sadece dijital olarak olan öğrencilerin ($\bar{X}=4.04$) dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, sadece dijital olarak ve sadece kitaplardan olan gruplar arasında sadece dijital olarak olan grup lehine; sadece dijital olarak ve her ikisi de olan gruplar arasında sadece dijital olarak olan grup lehine; her ikisi de ve sadece kitaplardan olan gruplar arasında her ikisi de olan grup lehine olduğu görülmektedir.

Tablo 21. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Öğretmenlerin Ödev Verme Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

		<i>f, x ve Ss Değerleri</i>				ANOVA Sonuçları					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
DOÖ	Sadece kitaplardan (1)	117	3.15	0.79	G. Arası	19.293	2	9.647			2>1,
	Sadece dijital olarak (2)	19	4.07	0.47	G. İçi	148.403	268	0.554	17.421	.000	2>3,
	Her ikisi de (3)	135	3.56	0.73	Toplam	167.697	270				3>1

Tablo 21’de görüldüğü üzere, öğretmenlerin ödev verme tercihleri sadece dijital olarak olan öğrencilerin ($\bar{X}=4.07$) dijital okuryazarlık ölçeği toplam puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği toplam puanlarının öğretmenlerin ödev verme tercihleri değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, sadece dijital olarak ve sadece kitaplardan olan gruplar arasında sadece dijital olarak olan grup lehine; sadece dijital olarak ve her ikisi de olan gruplar arasında sadece dijital olarak olan grup lehine; her ikisi de ve sadece kitaplardan olan gruplar arasında her ikisi de olan grup lehine olduğu görülmektedir.

3.6. Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Sıklığı Değişkenine Göre Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Öğretmenlerin dijital ortamda hazırlanan görevler verme sıklığı değişkenine göre bilgi işlem boyutu, iletişim boyutu, güvenlik boyutu, problem çözme boyutu ve dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma ve tek yönlü varyans analizi sonuçlarına aşağıda yer verilmiştir.

Tablo 22. DOÖ Bilgi İşlem Alt Boyutu Puanlarının Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>						<i>ANOVA Sonuçları</i>					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
Bilgi İşlem	Evet (1)	57	3.86	0.68	G. Arası	14.612	2	7.306			
	Hayır (2)	104	3.26	0.86	G. İçi	162.217	268	0.605	12.070	.000	1>2,
	Bazen (3)	110	3.63	0.74	Toplam	176.828	270				3>2

Tablo 22’de görüldüğü üzere, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumu evet olan ($\bar{X}=3.86$) öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği bilgi işlem alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, evet ve hayır olan gruplar arasında evet olan grup lehine, bazen ve hayır olan gruplar arasında bazen olan grup lehine olduğu görülmektedir.

Tablo 23. DOÖ İletişim Alt Boyutu Puanlarının Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

<i>f, x ve Ss Değerleri</i>						<i>ANOVA Sonuçları</i>					
Puan	Gruplar	N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
İletişim	Evet (1)	57	3.58	1.01	G. Arası	28.122	2	14.061			1>2,
	Hayır (2)	104	2.73	1.01	G. İçi	276.948	268	1.033	13.607	.000	1>3,
	Bazen (3)	110	3.17	1.03	Toplam	305.070	270				3>2

Tablo 23’te görüldüğü üzere, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumu evet olan ($\bar{X}=3.58$) öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların

aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p < .001$). Dijital okuryazarlık ölçeği iletişim alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, evet ve hayır olan gruplar arasında evet olan grup lehine, evet ve bazen olan gruplar arasında evet olan grup lehine, bazen ve hayır olan gruplar arasında bazen olan grup lehine olduğu görülmektedir.

Tablo 24. DOÖ Güvenlik Alt Boyutu Puanlarının Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

Puan	Gruplar	f, x ve Ss Değerleri				ANOVA Sonuçları						
		N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B	
Güvenlik	Evet (1)	57	4.04	0.55	G. Arası	21.296	2	10.648				
	Hayır (2)	104	3.42	0.94	G. İçi	166.157	268	0.620	17.175	.000	1>2,	
	Bazen (3)	110	3.97	0.74	Toplam	187.453	270				3>2	

Tablo 24'te görüldüğü üzere, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumu evet olan ($\bar{X}=4.04$) öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p < .001$). Dijital okuryazarlık ölçeği güvenlik alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, evet ve hayır olan gruplar arasında evet olan grup lehine, bazen ve hayır olan gruplar arasında bazen olan grup lehine olduğu görülmektedir.

Tablo 25. DOÖ Problem Çözme Alt Boyutu Puanlarının Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

Puan	Gruplar	f, x ve Ss Değerleri				Anova Sonuçları						
		N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B	
Problem Çözme	Evet (1)	57	3.75	0.91	G. Arası	35.352	2	17.676				
	Hayır (2)	104	2.80	1.08	G. İçi	257.327	268	0.960	18.409	.000	1>3,	
	Bazen (3)	110	3.29	0.92	Toplam	292.679	270				3>2	

Tablo 25'te görüldüğü üzere, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumu evet olan ($\bar{X}=3.75$) öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p < .001$). Dijital okuryazarlık ölçeği problem çözme alt boyutu puanlarının öğretmenlerin sık

sık dijital ortamda hazırlanan görevler verme değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testi sonucunda, evet ve hayır olan gruplar arasında evet olan grup lehine, evet ve bazen olan gruplar arasında evet olan grup lehine, bazen ve hayır olan gruplar arasında bazen olan grup lehine olduğu görülmektedir.

Tablo 26. Dijital Okuryazarlık Ölçeği Toplam Puanlarının Öğretmenlerin Dijital Ortamda Hazırlanan Görevler Verme Durumuna Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

Puan	Gruplar	f, x ve Ss Değerleri				Anova Sonuçları					
		N	\bar{X}	Ss	Var. K.	KT	Sd	KO	F	P	B
DOÖ	Evet (1)	57	3.82	0.61	G. Arası	23.388	2	11.694			
	Hayır (2)	104	3.07	0.83	G. İçi	144.308	268	0.538	21.718	.000	1>2,
	Bazen (3)	110	3.54	0.70	Toplam	167.697	270				3>2

Tablo 26’da görüldüğü üzere, öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme durumu evet olan ($\bar{X}=3.82$) öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının daha yüksek olduğu görülmektedir. Örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan tek yönlü varyans analizi (ANOVA) sonucunda, grupların aritmetik ortalamaları arasındaki fark istatistiksel olarak anlamlı bulunmuştur ($p<.001$). Dijital okuryazarlık ölçeği toplam puanlarının öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme değişkenine göre hangi gruplar arasında farklılaştığını belirlemek üzere yapılan Bonferroni testine göre, evet ve hayır olan gruplar arasında evet olan grup lehine, bazen ve hayır olan gruplar arasında bazen olan grup lehine olduğu görülmektedir.

3.7. Öğrencilerin Ders Çalışma Tercihleri Değişkenine Göre Dijital Okuryazarlık Ölçeği Puanlarına İlişkin Bulgular

Öğrencilerin ders çalışma tercihleri değişkenine göre dijital okuryazarlık ölçeği puanlarına ilişkin aritmetik ortalama, standart sapma, bağımsız grup t testi sonuçlarına Tablo 27’de yer verilmiştir.

Tablo 27. Dijital Okuryazarlık Ölçeği Puanlarının Öğrencilerin Ders Çalışma Tercihlerine Göre Farklılaşp Farklılaşmadığını Belirlemek Üzere Yapılan Bağımsız Grup T- Testi Sonuçları

Puan	Gruplar	N	\bar{X}	Ss	Sh _x	t Testi		
						t	Sd	P
DOÖ	Ders kitapları	184	3.29	0.78	0.058	-4.033	269	.000
	Dijital ortam	87	3.69	0.73	0.079			

Tablo 27’de görüldüğü üzere, örneklem grubunu oluşturan öğrencilerin dijital okuryazarlık ölçeği toplam puanlarının ders çalışma tercihlerine göre farklılaşp farklılaşmadığını belirlemek amacı ile yapılan bağımsız grup t testi sonucunda grupların aritmetik ortalamaları arasındaki

farklılık istatistiksel olarak anlamlı bulunmuştur ($t=-4.033$; $p<.001$). Ders çalışma tercihleri dijital ortam (EBA, Morpa Kampüs veya YouTube) olan katılımcıların dijital okuryazarlık ölçeği toplam puanlarının ders kitaplarından olan katılımcılara göre daha fazla olduğu görülmektedir.

4. SONUÇ, TARTIŞMA VE ÖNERİLER

Bu araştırmada, Alfa kuşağı öğrencilerinin dijital okuryazarlık becerileri, çeşitli değişkenler açısından (cinsiyet, kendine ait tablet ya da bilgisayar olma/olmama durumu, gün içi tablet/telefon veya bilgisayar kullanım süresi, tablet/telefon veya bilgisayar kullanım amacı, öğretmenlerin ödev verme tercihleri, öğretmenlerin dijital ortamda hazırlanan görevler verme sıklığı, öğrencilerin ders çalışma tercihleri) incelenmiştir. Araştırmanın bulgularına göre, Alfa kuşağı öğrencilerinin dijital okuryazarlık puanlarının genel olarak yüksek olduğu sonucuna varılmıştır. Bu durumun, Alfa kuşağı öğrencilerinin diğer kuşaklara göre daha fazla dijital teknolojiler ile büyümüş olması ve en fazla dijitalleşmeye maruz kalan kuşak olması sebebi ile dijital öğrenme teknolojilerini ve diğer teknolojik araçları daha fazla benimseme eğiliminde olmalarından kaynaklı olduğu düşünülmektedir (McCrinkle ve Fell, 2020; Mıstık, 2019).

Alfa kuşağı öğrencilerinin cinsiyetlerine göre dijital okuryazarlık puanlarına bakıldığında, dijital okuryazarlık puanlarının birbirine yakın olduğu ve anlamlı olarak farklılaşmadığı görülmüştür. Bu durum, günümüzde dijital teknolojilere maruz kalmanın kız ya da erkek öğrenciler için fark etmeksizin tüm öğrencilerin hayatlarının ayrılmaz bir parçası olması ile açıklanabilir. Aynı zamanda varılan sonuç, dijital okuryazarlık, bilgi ve iletişim teknolojileri okuryazarlığı, eğitim teknolojisi standartları kullanım becerilerinin cinsiyete göre anlamlı bir farklılık göstermediği diğer çalışmalar ile örtüşmektedir (Asan, Bozdağ ve Çalışkan, 2022; Kurt, Çoklar, Kılıçer ve Yıldırım, 2008; Pala ve Başbüyük, 2020b; Yılmaz ve Ersoy, 2014).

Çalışmada anlamlı farklılık göstermeyen diğer bir durum öğrenenlerin kendine ait bir tablet ya da bilgisayar olma/olmama durumudur. Gün içi tablet/telefon, bilgisayar kullanım süresi ve tablet/telefon, bilgisayarın en fazla kullanım amacının toplam ($N=271$) katılımcı tarafından belirtilmesi, tüm katılımcıların evlerinde dijital teknolojilere erişim imkanlarının olduğunu göstermektedir. Buna göre, öğrenenlerin kendilerine ait tablet/telefon ya da bilgisayar olmamasına rağmen, dijital okuryazarlığın gelişimi için evlerinde dijital teknolojilere erişim imkânına sahip olmalarının yeterli olabileceği söylenebilir. Aynı zamanda, öğrencilerin bilgisayara sahip olma durumlarının eğitim teknolojisi standartları kullanım becerilerini etkilediği (Kurt, Çoklar, Kılıçer ve Yıldırım, 2008) ve evde internet erişimi ile bilgisayara sahip olma durumlarının öğrenenlerin dijital okuryazarlık becerilerinin gelişimi üzerinde etkili olduğunu (Kuhlemeier ve Hemker, 2007) ortaya koyan çalışmalar da vardır. İlave olarak, Alfa kuşağı öğrencilerinin, dijital okuryazarlık becerileri gün içi tablet, telefon ve bilgisayar kullanım süresine (en fazla bir saat, bir/üç saat, üç saatten fazla, tüm gün) göre anlamlı bir farklılık göstermektedir. Bu farklılığın, ekran süresi tüm gün olan katılımcıların lehine olması, ekran süresinin öğrencilerin dijital okuryazarlık düzeylerini etkilediğini göstermiştir. Ortaokul öğrencilerinin, internete bağlanma sıklığı ile dijital okuryazarlık düzeylerinin farklılaştığı tespit

edilen, benzer sonuçların yer aldığı diğer çalışmalarla bu bulgunun desteklendiği düşünülmektedir (Çelik ve Kılıçoğlu, 2022; Kaya, 2020; Kaya ve Korucuk, 2020; Pala ve Başbüyük, 2020b).

Alfa kuşağı öğrencilerinin tablet, telefon ve bilgisayarı en fazla kullanım amacına (oyun oynamak, video izlemek, ders çalışmak, etkinlik yapmak, iletişim kurmak) göre dijital okuryazarlık puanları anlamlı farklılık göstermemektedir. Ölçeğin alt boyutlarından sadece problem çözme alt boyutunda dijital okuryazarlık puanlarının anlamlı farklılık gösterdiği görülmüştür. Problem çözme alt boyutunda ise, söz konusu farklılık kullanım amacı iletişim kurmak (Örneğin, WhatsApp) olan katılımcıların lehine sonuçlanmıştır. Tablet, telefon ve bilgisayarı iletişim kurmak amaçlı kullanan öğrencilerin problem çözme puanlarının arttığı sonucuna varılması, öğrencilerin teknik becerilerinin gelişimini desteklediğini göstermektedir. Dijital okuryazarlık becerilerinin gelişiminin, sadece teknik becerilerin gelişimi ile ilgili olmadığı düşünüldüğünde (Tomte, 2015; Redecker, 2017) kullanım amacının yalnız öğrenenlerin problem çözme becerileri üzerine olan etkisi yetersiz bulunmuştur. Ortaokul öğrencilerinin interneti kullanım amacına göre dijital okuryazarlık becerilerinin anlamlı farklılık göstermediği benzer çalışmalar vardır (Çelik ve Kılıçoğlu, 2022). Katılımcıların en fazla oyun oynamak amacı ile teknolojiyi kullandıklarını belirtmeleri, öğrencilerin dijital araçları kullandıklarını göstermektedir. Aynı zamanda çoğu öğrencinin dijital araçlara aşina olmalarına rağmen dijital teknolojileri kullanımlarının büyük ölçüde kendi kendine ve akran odaklı olduğu (Rizk ve Davies, 2021) belirtilmektedir. Ayrıca, dijital okuryazarlık becerileri sezgisel olarak öğrenilemediği için (MEB, 2020) öğrencilerin kendi öğrenmelerini desteklemek amaçlı kullanmaları önemlidir. Bu bakımdan, tablet, telefon veya bilgisayarın en fazla oyun oynamak amacı ile kullanılmasının dijital okuryazarlık becerilerini etkilemediği söylenebilir.

Öğretmenlerin ödev verme tercihlerine (sadece kitaplardan, sadece dijital olarak, her ikisi de) göre ölçeğin tüm alt boyutlarında ve dijital okuryazarlık ölçeği toplam puanlarında farklılık anlamlıdır. Bu sonuç, öğretmenlerin ödev verme tercihlerinin öğrencilerin dijital okuryazarlık düzeylerini etkilediğini göstermiştir. Bu farklılığın ölçeğin tüm alt boyutlarında ve dijital okuryazarlık ölçeği toplam puanlarında sadece dijital olarak olan katılımcıların lehine olması, dijital olarak verilen ödevlerin düzeyi arttıkça öğrencilerin dijital okuryazarlık becerilerinin arttığı şeklinde yorumlanabilir. Benzer şekilde, öğrencilerin ders çalışma tercihlerine göre (dijital ortam/ders kitapları) ölçeğin tüm alt boyutlarında ve dijital okuryazarlık ölçeği toplam puanlarında farklılık anlamlı bulunmuştur. Bu farklılığın, ders çalışma tercihleri dijital ortam (Örneğin, EBA, Morpa Kampüs veya YouTube vb.) olan katılımcıların lehine sonuçlanması, ödevleri dijital olarak yapmayı tercih eden öğrencilerin dijital okuryazarlık puanlarının daha yüksek olduğunu göstermiştir. Aynı zamanda, öğrencilerin mevcut müfredatı, teknoloji ile birleştirerek öğrenmelerinin ve pratik yapmalarının şu anki ve gelecekteki dijital ortama hazırlanmalarını sağladığını ortaya koyan çalışmalar da vardır (Erwin ve Mohammed, 2022; ISTE, 2016; İnan-Karagül, Şeker ve Aykut, 2021; Jan, 2018; Kusumo, Subali ve Sunarto, 2022; Rini, Mujiyati, Sukamto ve Hariri, 2022). Öğretmenlerin sık sık dijital ortamda hazırlanan görevler verme (örneğin, sunu hazırlama, afiş tasarlama, video hazırlama) durumuna göre Alfa

kuşığı öğrencilerinin dijital okuryazarlık düzeyleri anlamlı bir farklılık göstermektedir ve bu farklılık sık sık dijital ortamda hazırlanan görevler verilen katılımcıların lehinedir. Öğretmenlerin, öğrencileri sık sık konfor alanı dışına çıkaran etkinliklere yer vermelerinin ve dijital öğrenme ortamlarını yaratmanın dijital okuryazarlık becerilerini geliştirdiği düşünüldüğünde (ISTE, 2017; MEB, 2020; Purnamasari, Herlina, Distrik ve Andra, 2021) araştırma sonuçları literatüre paraleldir.

Araştırmadan elde edilen sonuçlara dayanarak, öğretmenler tarafından öğrencilerin bağımsız öğrenme süreçlerine rehberlik edilerek, dijital araçları oyun oynamak ve iletişim kurmak dışında kullanmaları ve gün içi ekran süresini etkili yönetmeleri sağlanabilir. Sık sık dijital ortamda hazırlanan görevler verilerek, dijital araçları daha fazla kullanmaları dijital okuryazarlık becerilerinin gelişimine katkı sağlayabilir. Ders kitaplarından ziyade dijital materyaller ile daha fazla ödevlendirilmeleri dijital okuryazarlık becerilerinin gelişimini destekleyebilir. Bu bağlamda, öğrencilerin dijital becerilerinin gelişimi için öğretmenlerin bilgiye erişim dışında bilgiyi oluşturmaları amacı ile öğrencilere rehberlik etmeleri önemlidir. Etkili teknoloji entegrasyonu noktasında öğretmenlerin mesleki gelişimlerine önem verilmelidir.

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**AFİNİTE KROMATOĞRAFİSİ İLE KARBONİK ANHİDRAZ SAFLAŞTIRILIRKEN
KARŞILAŞILABİLECEK DURUMLAR**
CONDITIONS THAT MAY BE ENCOUNTERED DURING PURIFICATION OF
CARBONIC ANHYDRATE BY AFFINITY CHROMATOGRAPHY

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ÖZET

Bu çalışmada araştırmacılar tarafından sıklıkla farklı dokulardan enzim saflaştırırken karşılaşılabilecekleri durumlar hakkında bilgi vererek bu durumla karşılaşan araştırmacılara yol göstermek amaçlıdır. Geçmişten günümüze kadar birçok canlının farklı kısımlarından karbonik anhidraz enzimi (E.C 4.2.2.1.1) afinite kromatografi tekniği ile saflaştırılmış ve karakterize edilmiştir. Bu süreçte farklı dokuların yapıları nedeniyle afinite kolonuna tatbik edildiğinde kolonun tıkanması, saflaştırma aşamalarında kullanılan çözeltilerin ve elüsyonların pH regülasyonunun doğru yapılamaması, dokuların çıkarılması saklanması esnasında soğuk zincire uyulmaması, kan çalışmalarında kan merkezlerinde alınan kanlarda numune tüplerinde bulunan kimyasalların aktivite kaybına neden olması gibi durumlar araştırmacıların sıklıkla karşılaşılabilecekleri durumlar arasında yer almaktadır. Bu durumların önceden bilinmesi hem örneklerin zıyan edilmesini, ekonomik kaybın önlenmesi ve en önemlisi zamandan tasarruf sağlanması gibi bilim insanlarına kolaylık sağlayarak, çalışmaların literatüre kazandırılması sürecine katkı sağlayacaktır.

Anahtar kelimeler: Afinite kromatografi, hCAI, hCAII

ABSTRACT

This study aims to guide researchers who encounter this situation by providing information about the situations that researchers may frequently encounter while purifying enzymes from different tissues. Carbonic anhydrase enzyme (E.C 4.2.2.1.1) has been purified and characterized from different parts of many living things from past to present by affinity chromatography technique. In this process, due to the structures of different tissues, the column may become clogged when applied to the affinity column, the pH regulation of the solutions and eluents used in the purification stages may not be done correctly, the cold chain may not be followed during the removal and storage of tissues, and the chemicals in the sample tubes of blood taken from blood centers in blood studies may cause loss of activity. Knowing these situations in advance will both prevent the wasting of samples, prevent economic loss and most importantly, save time, and contribute to the process of adding studies to the

literature.inhibition-activity graphs, the potential of these molecules as antiepileptic molecules will be discovered and added to the literature.

Keywords: Affinity chromatography, hCAI, hCAII

GİRİŞ

Afinite kromatografisi, iki molekül arasındaki oldukça spesifik biyolojik etkileşime dayalı olarak karmaşık karışımlardan bir molekülün veya molekül grubunun seçici olarak saflaştırılması için bir yöntemdir. Etkileşim tipik olarak geri dönüşümlüdür ve saflaştırma, moleküllerden birinin (ligand) bir yüzeye immobilize edilmişken, ortağının (hedef) karmaşık bir karışımın parçası olarak hareketli bir fazda olduğu iki fazlı bir etkileşim yoluyla elde edilir. Yakalama adımını genellikle yıkama ve elüsyon izler ve bu da oldukça saflaştırılmış proteinin geri kazanılmasıyla sonuçlanır. Oldukça seçici etkileşimler, birkaç yüz ila bin kat mertebesinde saflaştırma potansiyeline sahip hızlı, genellikle tek adımlı bir işleme izin verir. Afinite kromatografisinin ek kullanımları arasında düşük konsantrasyonda bulunan maddeleri konsantre etme yeteneği ve aktif bir formun inaktif formdan veya farklı biyolojik işleve sahip bir formdan ayrılabilirdiği biyolojik işlevlerine göre proteinleri ayırma yeteneği yer alır (Urh ve ark., 2009).

Bu yöntem, biyolojik olarak ilişkili bir ajanın bir numunenin veya kompleks karışımın bileşenlerini saflaştırmak veya analiz etmek için sabit bir faz olarak kullanıldığı bir sıvı kromatografisi türüdür. Bu yöntemin temel bileşenleri, genel bağlayıcı ajanların, desteklerin, immobilizasyon yöntemlerinin ve kullanılan numune uygulama veya elüsyon şemalarının genel bir bakışı dahil olmak üzere ele alınmaktadır. Daha sonra, hedef bileşikler veya kullandıkları uygulamalarla birlikte birkaç afinite kromatografisi türü açıklanmaktadır. Bu türler arasında biyoafinite kromatografisi, immünoafinite kromatografisi, boya-ligand veya biyomimetik afinite kromatografisi, immobilize metal-iyon afinite kromatografisi ve analitik afinite kromatografisi yer almaktadır. Bu alandaki diğer gelişmeler de dikkate alınmaktadır, örneğin kütle spektrometrisi ile afinite kromatografisinin kullanımı, aptamerlerden veya moleküler olarak basılmış polimerlerden oluşan bağlayıcı ajanlar ve kimyasal ayırma veya analiz için minyatürleştirilmiş sistemler (Hage ve ark., 2009).

Karbondiyoksit ve bikarbonatın birbirine dönüşümü tüm canlılarda büyük önem taşıyan biyokimyasal bir süreçtir (Osmaniye vd., 2022). Karbonik anhidraz enzimi (CA); bu dönüşümünü katalizleyen, aktif bölgesinde çinko (Zn^{2+}) iyonu bulunduran ve birçok dokuda görev alan bir metalloenzimdir. Fizyolojik açıdan oldukça büyük bir öneme sahip olan bu enzimin birçok izoformu bulunmaktadır. (Akkemik vd., 2017) Karbonik anhidrazlar vücudumuzda bulunduğu bölgeye göre 4 gruba ayrılır ve CA I'den XV'e kadar en az 16 farklı izoforma sahiptir (Suparan, 2008).

Bu enzimlerin prokaryotik organizmalardan ökaryotik gruplara kadar tüm canlılıkta temsil edildikleri görülmektedir. Sınıflandırmalarına bakıldığında literatürde genel olarak; α , β , γ , δ

karbonik anhidrazlar (CA) olarak adlandırılırlar. Bu sınıflandırmada, α -CA'lar omurgalılar, bakteriler, algler ve yeşil bitkilerin sitoplazmalarında bulunmaktadır. β -CA'lar baskın olarak bakterilerde bulunmakla birlikte, alglerde ve monokotil ve dikotil bitkilerin kloroplastlarında bulunurlar. γ -CA'ların ise başlıca arkelerde ve bakterilerde bulunduğu gözlenirken, δ -CA'ların bazı denizel kökenli diatomlarda bulunduğu tespit edilmiştir (Supuran, 2008).

YÖNTEM

Örnekler soğuk zincir koşulları altında laboratuvara ulaşmalıdır. Çalışmada kullanılmak üzere dokular -20 derecede depo edilmelidir. Karbonik anhidraz enziminin kromatografik saflaştırma işleminde Sepharose-4B-L-tirozin sülfanilamit afinite jeli kullanılmaktadır. Saflaştırma esnasında kulan düzenek Şekil 1 de verilmiştir. İşlemden önce Dengeleme tamponu (25 mM Tris-HCl/0,1 M Na₂SO₄) ile pH'sı 8,7'ye ayarlanır olan kolona saflaştırma yapılacak numunenin homojenatı peristaltik pompa yardımı ile kolona uygulanır, sonra kolon yıkama tamponu ile (400 mL 25 mM Tris-HCl/22 mM Na₂SO₄) (pH:8,7) yıkanarak diğer maddelerden arındırılır. Yıkanan kolona karbonik anhidraz enzimi elüe edilmesi için elüsyon tamponu kolona verilir. Numaralandırılmış ependorflara elüantlar 2'şer mL şeklinde toplanır ve sırayla 280nm' de absorbanslarına bakılır. İşlemden açığa çıkan elüsyonların saflık kontrolü %3 yürütücü, %8'lik ayırıcı jeller hazırlanarak Laemmli (1970)'e göre yerine getirilir.



Şekil 1. hCAI ve hCAII saflaştırma düzeneği

TARTIŞMA ve SONUÇ

Bu süreçte farklı dokuların yapıları nedeniyle afinite kolonuna tatbik edildiğinde kolonun tıkanması, saflaştırma aşamalarında kullanılan çözeltilerin ve elüsyonların pH regülasyonunun doğru yapılamaması, dokuların çıkarılması saklanması esnasında soğuk zincire uyulmaması, kan çalışmalarında kan merkezlerinde alınan kanlarda numune tüplerinde bulunan kimyasalların aktivite kaybına neden olması gibi durumlar araştırmacıların sıklıkla karşılaşabilecekleri durumlar arasında yer almaktadır. Bu durumların önceden bilinmesi hem örneklerin ziyan edilmesini, ekonomik kaybın önlenmesi ve en önemlisi zamandan tasarruf sağlanması gibi bilim insanlarına kolaylık sağlayarak, çalışmaların literatüre kazandırılması sürecine katkı sağlayacaktır.

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WOMEN ROLE AND IMPACT IN THE GOVERNANCE, RISK AND COMPLIANCE

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ABSTRACT

This article provides an overview of the role of women in governance, risk management, and compliance (GRC) and the challenges they face in advancing their careers in these fields. Through a review of recent literature on the topic, this article explores the specific contributions that women can bring to GRC, including their unique perspectives, skills, and experiences on corporate performance. However, despite these potential benefits, women continue to face numerous obstacles to career advancement in GRC, including unconscious bias, gender stereotypes, and a lack of opportunities for development and mentorship. To address these challenges, various strategies have been proposed, including the promotion of gender diversity in leadership positions, the implementation of flexible work arrangements, and the provision of targeted training and development programs for women. In addition to corporate voluntary strategies, we have provided an overview of European and United Nations regulations on gender diversity and women in governing, risk and compliance roles. Article concludes that efforts to promote gender diversity in GRC are essential not only for creating more inclusive and equitable workplaces, but also for enhancing the overall effectiveness of risk management and compliance practices and corporate performance.

JEL Codes: G41, J16, K38

Keywords: Governance, Compliance, Risk management, women leaders, regulatory.

1. Introduction

The role of women in governance, risk management, and compliance (GRC) has become an increasingly important topic in recent years. Despite efforts to promote gender diversity and inclusion in the workplace, women are still underrepresented in leadership positions in many industries, including GRC. This is particularly concerning given the critical role that GRC plays in ensuring the integrity and stability of financial systems.

Several studies have explored the challenges that women face in advancing their careers in GRC and the specific contributions that women can make to this field. Strategies to increase gender diversity and inclusion in GRC have also been identified, ranging from targeted recruitment and leadership development programs to policies promoting work-life balance and flexible scheduling.

This article provides a review of several recent studies on the topic of women in governance, risk management, compliance roles, highlighting key findings and recommendations for promoting gender diversity and inclusion in this field. Through a better understanding of the challenges facing women in GRC and the strategies that can help address these challenges, organizations can work to build a more diverse and effective GRC workforce for the future.

Representation of female at the governing, risk and supervisory (compliance) roles are still underrepresented in many countries around the world.

Numerous factors drive the research, such as: (a) low representation of women in the boards and governance levels which can change the current representation of women in other areas, (b) positive or negative impacts of female representations in the governance models and gender biases (c) changes in legislatives (EU resolution for female representation, UN-gender diversity goals)-Council Directive 2013/ EC. The Directive aims for gender balance among directors of listed companies. By mid-2026 every stock-listed company within the European Union needs to have at least 40% female non-executive directors or have a female representation of executive and non-executive of at least 33%.

Currently the state of female representation in European union is about 30% which is less than 40%.(Institute of Directors 2023)

This article objective is to answer on what are current gaps enabling women leaders in governing, risk management and compliance positions, how those gaps can be solved. Also, this article outlines what are the main areas where women leaders contributes to the organization.

This article provides an:

- Overview of the role of women in governance, risk management, and compliance (GRC)
- Explores the specific contributions that women can bring to GRC
- Obstacles that woman face
- strategies for gender diversity in leadership positions.

Problem which we aim to answer:

- Women face slow growth due to gender bias in GRC
- Women represents almost equal amount of population across the globe yet represents <40% representations in global decision-making agendas.

Goals & Objectives of this articles:

- Women (in leadership positions in GRC) are having significant contribution to corporate performance
- Women are facing obstacles in leadership positions (in GRC).

1.1.Governance, Risk and Compliance (GRC)

The Sarbanes-Oxley Act (SOX), Basel II and the other international and regional regulatory mandates resulted in the expansive adoption of GRC systems. (Anastasia Papazafeiropoulou & Konstantina Spanaki 2016)

With increasing impact of climate change, pandemics, financial distresses, technological changes, blockchain, cyberattacks, human capital movements and new age generations, and other risks which organizations are facing to their continuity and sustainability, implementation and maintenance of strong governance, risk and compliance system become one of the most important topics. However, there are challenges when it comes to its implementation and maintenance, ranging from not having internal team strong enough to sustain the system, having the complex core infrastructure or not having resources for implementation or for the maturity of such system that can in long-term benefit the organization structure and serve as preventive, protective and governing model. GRC acronym stands for Governance, Risk and Compliance as an integrated concept and describes different organizational activities, from arranging an annual audit to the establishment of internal continuous control monitoring procedures, to setting up roles and responsibilities in business processes and the system users, to data analytics procedures. The term GRC was initially introduced in 2004 by PricewaterhouseCoopers and since then is becoming a widely spread and important emerging solution for the business requirements of an organization (Gill and Purushottam 2008).

Governance, risk management, and compliance (GRC) is an integrated framework that aims to align business operations with regulatory requirements, mitigate risks and ensure that the organization is managed effectively, efficiently, and ethically. The GRC framework includes structures, processes, and tools to manage governance, risk management, and compliance requirements in a coordinated and streamlined manner. (Kolkowska and Heimann 2018)

While the literature refers to the GRC topic including different views regarding the different methodologies, which is analyzed (financial GRC, enterprise GRC, GRC IS etc.). This study focuses on the need to provide an overview of different GRC models from the organizational type by industry and size. Given the diversity of the opinions about GRC, the study will follow two sources of evidence. Initially a literature review will explore the academic research on GRC frameworks and implementations in different organizations.

1.2.Research Methodology

Research Type This research is qualitative research; in this study researcher used secondary data. Secondary data we get from literature study. We studied the literature from both books

and preliminary research from journals and proceedings on the topics of governance, risk and compliance.

1.3.Data Analysis Method

The data analysis used in this research is qualitative analysis. We use the literature review then present an explanatory account of how the implementation of governance risk and compliance in practice from the secondary data study research.

2. Literature Review

2.1.The Role of Women in Governance, Risk, and Compliance, Benefits and Challenges

(Maria Krambia-Kapardis 2019)discusses the role of women in GRC and the challenges and opportunities they face in the field.

(Maria Krambia-Kapardis 2019)argues that despite progress in gender equality, there is still a significant gender gap in the GRC industry. The article provides an overview of the various factors that contribute to this gap, including bias, stereotypes, and cultural norms. According to the article, women bring a unique perspective to GRC due to their diverse experiences and perspectives. Some specific contributions of women to GRC highlighted in the article include:

- **Emphasis on collaboration and relationship-building:** Women tend to place a greater emphasis on collaboration and relationship-building, which can lead to better communication and cooperation within GRC teams.
- **Attention to detail:** Women often have a keen attention to detail, which is essential in ensuring compliance with regulations and mitigating risks.
- **Ethical decision-making:** Women are often viewed as more ethical decision-makers and can bring a strong sense of integrity and ethics to GRC.
- **Innovative thinking:** Women can bring innovative thinking and fresh ideas to GRC, which can help to identify new risks and opportunities for improvement.

(Maria Krambia-Kapardis 2019)argues that increasing the participation of women in GRC roles can improve organizational performance and better address the complex risks and challenges facing modern businesses. Overall, provides a valuable analysis of the gender gap in GRC and highlights the potential benefits of increasing women's participation in the field.

Similarly, (Norma Meznar and Sonja S 2021) explores the role of women in leadership positions in the GRC field from a global perspective. The authors conducted a systematic literature review and analyzed 63 articles that focused on the representation of women in GRC leadership roles, as well as their impact on organizational performance and risk management. The results of the study revealed several key findings:

- **Women are underrepresented in leadership positions in the GRC field, particularly in executive-level roles.** However, companies with higher representation of women in

leadership roles tend to have better financial performance and stronger risk management practices.

- Women leaders in GRC bring unique skills and attributes to their roles, including greater empathy, communication skills, and the ability to manage complex stakeholder relationships.
- Women face significant challenges in advancing to leadership roles in the GRC field, including gender bias and discrimination, lack of role models, and work-life balance issues.

The authors conclude that increasing the representation of women in GRC leadership roles is not only a matter of gender equity, but also a strategic imperative for organizations seeking to enhance their risk management practices and overall performance. They suggest several strategies for promoting gender diversity in the GRC field, including targeted recruitment and development programs, supportive organizational cultures, and policies that promote work-life balance.

The article highlights several strategies that can help increase the representation of women in leadership positions in GRC. These strategies include:

- Implementing gender diversity targets and metrics
- Providing leadership training and development programs for women
- Encouraging sponsorship and mentorship programs
- Promoting flexible work arrangements
- Encouraging work-life balance
- Increasing visibility of women in leadership roles
- Developing a supportive organizational culture
- Conducting regular diversity and inclusion assessments.

Similar recommendation of the strategies are examined by (Alexandra Mihailescu and Victoria Santini 2019), the state of gender diversity in risk management and compliance (RMC) roles and identify strategies to increase diversity in these areas. The authors conducted a literature review and interviews with female RMC professionals to explore the challenges faced by women in this field and the strategies that could help increase gender diversity. The study found that while the number of women in RMC roles has increased in recent years, there is still a significant gender gap in senior leadership positions. The authors identified several challenges faced by women in this field, including unconscious bias, lack of support for work-life balance, and a lack of female role models and mentors. To increase diversity in RMC, the authors recommend several strategies, including:

- Creating a more inclusive culture that values diversity and inclusion.
- Encouraging senior leaders to champion diversity and set targets for gender diversity at all levels of the organization.

- Offering flexible work arrangements and promoting work-life balance to attract and retain female talent.
- Providing opportunities for training, development, and mentorship to support the career advancement of women in RMC.

Overall, the study suggests that increasing gender diversity in RMC is not only a matter of social justice, but it can also lead to better business outcomes by bringing diverse perspectives and experiences to risk management and compliance decision-making.

(Esther R. Sawyer 2020) presents a study that explores the factors that contribute to women's advancement in the field of Governance, Risk Management, and Compliance (GRC). The study is based on interviews with 18 women who work in GRC in the United States, as well as a review of relevant literature. The study found that women who advance in GRC tend to have strong interpersonal skills, including the ability to communicate effectively and build relationships with colleagues and stakeholders. They also tend to be proactive in seeking out opportunities for professional development and building their knowledge and skills.

However, the study also identified a number of challenges that women face in advancing in GRC. These include bias and discrimination, a lack of support from senior leaders, and a lack of access to mentors and sponsors. The study suggests that addressing these challenges will be critical to increasing the representation of women in leadership positions in GRC.

In her study, (Esther R. Sawyer 2020) suggests several strategies that could help women break the glass ceiling in GRC and advance their careers. These strategies include:

- Building networks and alliances: Women should build supportive networks and alliances both inside and outside their organizations to enhance their visibility, gain access to mentors, and promote their career development.
- Acquiring new skills and qualifications: Women should invest in acquiring new skills and qualifications that are relevant to their GRC roles, such as certifications in risk management or compliance, to enhance their value to their organizations.
- Challenging gender stereotypes and biases: Women should challenge gender stereotypes and biases that hinder their career advancement, such as the perception that women are less suited for leadership roles in GRC than men.
- Seeking out career development opportunities: Women should actively seek out career development opportunities, such as training, coaching, and mentoring, to enhance their skills, knowledge, and expertise in GRC.
- Negotiating for career advancement: Women should negotiate for career advancement and compensation that reflect their skills, experience, and contributions to their organizations.

2.2. Benefits That Women Add Being in Governing, Risk and Compliance roles

They are two levels from which we can overview this topic, first from the executive level and supervisory level from which the governance in particular organization operates.

Can demographic characteristics of directors actually have so much impact on the organization that its performance improves? (Mijntje Lučkerath-Rovers 2011) suggest two reasons why the composition of the governance models might affect the performance of a firm.

Firstly, the governance-boards has the most influence on a company's strategic decision-making. Secondly, the governance-boards also has a supervisory role, in that it represents the shareholders, must respond appropriately to takeover threats, and monitors the total value of the company.

In her study, she analyzed two studies from 2007, McKinsey and Catalyst, in which are shown where and how women might improve team performance,

Catalyst (2007) examines the relationship between women on corporate boards and their companies' financial performance in the United States. Catalyst ranked 520 companies according to the average percentage of women on those companies' boards in 2001 and 2003 and divided the companies into four quartiles, each comprising 130 companies. The study compares the financial performance of companies in the top quartile (those companies with the highest percentage of women on their boards) with that of the bottom quartile (companies with the lowest percentage of women on their boards). The financial measures used by Catalyst were return on equity (ROE), return on sales (ROS) and return on invested capital (ROIC). The financial performance of the top quartile is at least 41% higher (based on ROS) than that of the bottom quartile and is even higher (64%) for ROIC. Catalyst reported neither on statistical significance regarding the differences, nor on whether or not extreme values were taken into account, which would affect the accuracy of the averages for the two groups of companies. It is mentioned that the correlation between the presence of women on the board and financial performance does not necessarily imply a causal relationship between these two variables.

On other side, in the McKinsey (2007) report ("Women Matter" 2007) consists of two studies (one a qualitative and the other a quantitative study) of the relationship between women in top management teams and firm performance. The qualitative investigation was a large-scale survey of 115,000 employees, inquiring into why companies with women at the top might perform better than companies with no women in top management teams. However, media attention focuses mainly on the quantitative investigation in the report. The study compares the 89 European listed companies in the AMM/AEF data base with the best diversity score (scored by AMM/AEF) against their industry average. McKinsey (2007) does not compare companies on the basis of the percentage of women on the board, but rather compares the most gender-diversified companies against the average of the entire sector. The financial performance of these companies and the sector in which they operate was measured on the basis of return on equity (ROE), operating result (earnings before interest and taxes, EBIT) and stock price growth. The results showed that ROE was 11% higher for the more diverse companies), EBIT was 91% higher and stock price growth was 36% higher.

2.3. Governance, Risk and Compliance Representations on the Boards and Women Status in the Global Perspective

Deloitte 2021, issued global perspective on women in the boardroom. In the report, Deloitte 2021, it has been analyzed global, regional and country analysis covering 10,493 companies in 51 countries, in Asia, Americas, EMEA, overlooking six different industries: financial service, consumer business, technology, media & telecommunications, manufacturing, energy & resources, life science and health care.

The results are following:

- Women in C-suite that are CEOs 5%, CFOs 15.7%.
- Board seats held by women 19.7%, board chairs that are women 6.7%.
- Supervisory, women on boards committee presence: audit 24.8%, governance, 26.4%, nominating 23.2%, compensation 23%, risk, 26.2%.
- Supervisory, women on boards committee presence- chairs: audit 21.2%, governance, 23.7%, nominating 19%, compensation 20%, risk, 23.7%.
- Top industries with higher percentage of women on boards: 21.3% Life science & Health care, 21.2% Financial services, 20.8% consumer business. (Deloitte 2021)

There is no distinguishment in the study are those seats, executive or non-executive.

In addition to world review by Deloitte, (Institute of Directors 2023), reported study of female representations in European listed-companies stating that average 30% of non-executive female are represented in the boards in European union, not stating executive level representation.

2.4. Regulatory Changes in Support to Gender Gap

Resolutions that addresses gender diversity gap:

- DIRECTIVE (EU) 2022/2381 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 November 2022 on improving the gender balance among directors of listed companies and related measures

At the heart of the new directive lies a transparent selection process of the board members based on clear criteria and a comparison of the candidates' qualifications. Large listed EU companies that do not meet the target of 40 % among non-executive board members or 33% among all directors of the under-represented sex by 30 June 2026 have to ensure fair and transparent selection procedures for the selection of candidates for board positions. Such companies will be required to make appointments on the basis of a comparative analysis of the qualification of candidates by applying clear, gender-neutral and unambiguous criteria and to ensure that applicants are assessed objectively based on their individual merits, irrespective of gender.

This approach respects all candidates' qualifications and merit as the decisive criteria. The criteria for board positions are to be established by the companies themselves. Suitability, competence and professional performance, not gender, remains the key factors for the selection

process. Only when two candidates are equally qualified should the choice be made in favor of the underrepresented sex.

Large-listed EU companies also have to undertake individual commitments to reach gender balance among their executive board members.

Companies that fail to meet the objective of the directive must report the reasons and the measures they are taking to address this shortcoming.

Member States foresee penalties for companies that fail to comply with selection and reporting obligations. Such penalties must be effective, proportionate and dissuasive. They could include fines and nullity or annulment of the contested director's appointment. Member States are required to publish information on companies that are reaching targets, which would serve as peer-pressure to complement enforcement.

Member States have to transpose the Directive into national law within two years – by 28 December 2024.

Micro, small and medium-sized enterprises with up to 249 employees and an annual turnover not exceeding EUR 50 million (or equivalent) or an annual balance sheet total not exceeding EUR 43 million (or equivalent), will be excluded; Member States are of course able to extend the scope of their domestic legislation should they so wish.

- The United Nations General Assembly, through General Assembly resolution 64/289, decided to establish the United Nations Entity for Gender Equality and the Empowerment of Women, to be known as UN-Women a composite entity of the UN system from 1 January 2011.

The General Assembly also established the UN-Women Executive Board as the Governing Body of the Entity to provide intergovernmental support to and supervision of its operational activities.

The rules of procedure of the Executive Board (UNW/2011/6) were adopted by the Board in 2011. Functions and working methods of the Executive Board are described in the Informal Guide to the UN-Women Executive Board. There are seven principles for empowering women on board representations.

- Other countries around the world adjusted their public policies in order to address the gender gap issue, so for example:

Under the Canada Business Corporations Act, publicly traded corporations are required to disclose information on the number of women on their boards, and their diversity policies, targets and statistics in relation to the four employment equity groups for boards of directors and executive officer positions. Essentially, while it will not be mandatory for public corporations to adopt diversity policies or quotas, they will also be required to disclose whether they did so or not and—if not—to explain why.(Canada Statistics 2023). In 2015, the Australian Institute of Company Directors (AICD) called for the 200 largest listed companies in the

Australian Securities Exchange (ASX) to achieve 30 per cent representation of women on boards by the end of 2018 through quarterly reporting, awareness building and collaboration with supporters. Women represented 19.4 per cent of board members of ASX 200 companies in 2015. In addition, the Australian Council of Superannuation Investors (ACSI), an umbrella organization representing institutional investors and international asset owners, implemented a policy to vote against companies with no female directors. As a result of the voluntary measure, Australia witnessed an increase of more than 10 percentage points in December 2019, reaching 30 per cent women on the boards of ASX 200 companies. Both government and non-government bodies have been supporting businesses to advance gender diversity in the boardroom and in other levels of management. For example Australia's Workplace Gender Equality Agency (WGEA), a government agency created by legislation, delivers a mix of mandatory reporting from larger businesses (employers with 100 or more employees), data tracking, research and promotion.

In United States, California first initiated Senate Bill 826 (SB 826) in 2018, and required public companies headquartered in California to include a certain number of female directors on their boards, depending on the overall board size. By 31 December 2019, all public corporations headquartered in California were required to have at least one female director on their board. On 31 December 2021, the required minimum number of female directors was increased to two if the corporation has five directors and three if the corporation has six or more directors.

In 2020, in response to broader concerns about making boards more inclusive, the California legislature passed Assembly Bill 979 (AB 979), which required public companies headquartered in California to maintain a certain number of directors from an underrepresented community. By 31 December 2021, all public corporations headquartered in California were required to have a minimum of one director from an underrepresented community.⁷ On 31 December 2022, the law increased the required minimum number of underrepresented directors to two if the corporation has more than four but fewer than nine directors, and to three for a corporation with nine or more directors. AB 979 defined an individual from an underrepresented community as those who identify as Black, African American, Hispanic, Latino, Asian, Pacific Islander, Native American, Native Hawaiian or Alaska Native, or who self-identifies as gay, lesbian, bisexual or transgender.

Under both SB 826 and AB 979, the California Secretary of State had the ability to levy fines. A first violation would result in a US\$100,000 fine, while a subsequent violation would result in a US\$300,000 fine. Advocates of the laws emphasised that legislative action was necessary to correct discrepancies in the composition of boards, which data showed were disproportionately white and male. California's approach followed similar quota approaches taken outside the United States. For example, in 2003, Norway adopted a quota requiring at least 40 per cent female representation on boards. Other nations such as Germany, France, Belgium, Iceland and Italy adopted mandatory quotas on female representation. Approved by the Securities and Exchange Commission (SEC) in August 2021, Nasdaq's Rules 5605 and

5606 seek to address board diversity in two ways.²⁵ On an annual basis, companies are required to disclose a matrix of how their board members self-identify as relates to gender, certain race and ethnic categories and LGBTQ+ status, with more tailored meaning of these categories based on home countries for foreign private issuers(Polk Davis and Wardwell LLP 2023)

➤ Beyond Europe, Americas and Australia

Mandated gender quota laws have also been adopted in countries outside Europe. For example, Israel passed the Companies Law in 1999 requiring at least one female director for publicly listed companies. A 2014 report notes that 17.2 per cent women held board positions in the top 100 firms in Israel. In addition, 89 per cent companies had at least one women on the board.⁴⁶ Similar to the “at-least-one” quota in Israel, the 2013 Company Act in India required listed companies and other large public limited companies⁴⁷ to appoint at least one woman to their boards by 2015.⁴⁸ Non-compliant companies are met with a fine, ranging from INR 50,000 (approximately US\$790) to INR 142,000 (approximately US\$2,240) by the Securities and Exchange Board of India (SEBI). Unfortunately, evidence suggests that many companies in India have brought in only one female director to meet the minimum requirement, resulting in gender tokenism on “one-and-done” boards rather than progress toward gender equality. For instance, according to a 2017 research, the average number of female directors in India is just over one per board, and approximately 16 per cent of the 739 Indian companies in 2016 have more than one female.⁴⁹ Furthermore, nearly 25 per cent of female board appointments were known to be family members of the owners in 2017.⁵⁰ As a result, SEBI introduced an additional provision stipulating that the largest 500 firms listed on the National Stock Exchange of India (NSE) have at least one female independent director by April 2019. Approximately 10 per cent of NSE 500 did not comply with this deadline.(International Labour Organization [no date]).

3. Gap and How to Address

Gender gap cannot be solved only by giving the seats to women at the board, but enabling environment that can lead toward more sustainable and gender diversity and more inclusive environments. As summary average female representation around the world is 30% (<40% minimum target), with gap on an average of 10%. To target the gap effectively, we have tried to answer on four questions in order to understand GAP and bridge the GAP. The four questions are below:

1. Are women adequately represented at the governing, risk, and compliance levels?

(Deloitte 2021), (Institute of Directors 2023)studies both shown that women are underrepresented still in board governances, supervisory levels and C-levels, which on an average represents 30% or less board representations, while C-level is on average 5% compared to world population representation of 49% (women) and 51% (man).(INED France [no date])

After The United Nations General Assembly, through General Assembly resolution 64/289, decided to establish the United Nations Entity for Gender Equality and the Empowerment of Women, to be known as UN-Women a composite entity of the UN system from 1 January 2011. Many public policies related to gender diversity and board representations have been changed to address the issue of women underrepresentation. Major step has been taken by European Union DIRECTIVE (EU) 2022/2381 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 November 2022 on improving the gender balance among directors of listed companies and related measures

At the heart of the new directive lies a transparent selection process of the board members based on clear criteria and a comparison of the candidates' qualifications. Large listed EU companies that do not meet the target of 40 % among non-executive board members or 33% among all directors of the under-represented sex by 30 June 2026 have to ensure fair and transparent selection procedures for the selection of candidates for board positions.

2. Women engaged in governing, risk and compliance levels are significantly contributing to the organizations performance

(Mijntje Lu'ckerath-Rovers 2011), McKinsey (2007) and Catalist (2007) studied between (2001-2003 over 150K companies) came to conclusion that companies having female representation in governing, risk and compliance roles are performing better than companies which are not having. Main performance includes the next:

- Improved financial performance (improved return on sales, improved return on investment, EBIT, stock price growth)
- Improved operational performance (decreased litigation risks, decreased failure risks, reduction in systematic risks, reduction in total risk)
- Increased collaboration and relationship building
- Increased ethical decision making (women are tend to do more ethical decision).

3. Obstacles that woman face

Women face many obstacles on the way to the top, (Alexandra Mihailescu and Victoria Santini 2019; Maria Krambia-Kapardis 2019; Norma Meznar and Sonja S 2021) all stated following obstacles:

- Gender bias and discriminations
- Lack of support and lack of female roles
- Difficulties in work-life balance.

To address those challenges some of the main skills should be developed, like:

- Women should be proactive in searching opportunities
- Develop strong interpersonal skills
- Being able to manage complex stakeholder relationships

4. strategies for reducing gaps and improving gender diversity in leadership positions.

Strategies to reduce gap and improve gender diversity based on studies, we have divided into three:

- strategies for organizations
- strategies for women
- regulatory bodies.

Strategies for organizations Alexandra Mihailescu and Victoria Santini 2019; Maria Krambia-Kapardis 2019; Norma Meznar and Sonja S 2021):

- Implementing gender diversity targets and metrics
- Providing leadership trainings and diversity programs
- Promoting flexible working environments
- Increasing visibility of women leadership roles
- Conducting regular diversity and inclusion assessment.

Strategies for women Alexandra Mihailescu and Victoria Santini 2019; Maria Krambia-Kapardis 2019; Norma Meznar and Sonja S 2021):

- Building networks and alliances
- Acquiring new skills and qualifications
- Challenging gender stereotypes and biases
- Seeking out career developments
- Negotiating for career advancements
- Be proactive rather than reactive.

Strategies for regulators United Nations, EU Directives:

- Regular reporting on gender diversity
- Imposing penalties and fines
- Guide and support in gender diversity strategies
- Gender audit.

4. Conclusion

In conclusion, the studies on women in GRC suggest that there is a need for greater representation of women in leadership positions. While women have made significant progress in the field of GRC in recent years, they are still underrepresented in higher-level roles. The studies have identified several challenges that women face in advancing their careers in GRC, including gender bias and lack of networking opportunities. However, the studies also highlight several strategies that can help women overcome these challenges and advance their careers, including mentorship programs, training and development programs, and advocacy for diversity and inclusion. In addition, studies by McKinsey, Catalyst, Deloitte, highlight that

women representation in governance models does represent greater impact on corporate performance both in financial and supervisory terms.

5. Suggestion

Based on the findings of the studies, it is recommended that organizations in the GRC field take steps to increase diversity and representation of women in leadership positions. This can be achieved by implementing strategies such as mentorship programs, training and development programs, and advocacy for diversity and inclusion. Additionally, organizations can take steps to address gender bias and provide networking opportunities for women to help them advance their careers. By implementing these strategies, organizations can not only improve the representation of women in leadership positions but also benefit from the diverse perspectives and experiences that women bring to the field of GRC. In addition, development of laws and regulations by which women can be given priority to participate in matters that are important for both genders, and women does need to be equal part of the boards.

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INTEGRATING SUSTAINABLE PRACTICES IN AGRICULTURE: STRATEGIES FOR RURAL DEVELOPMENT IN RESPONSE TO GLOBAL ENVIRONMENTAL GOALS

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ABSTRACT

In response to global environmental goals, this article examines how rural development strategies in the European Union (EU) might incorporate sustainable agriculture techniques. The report illustrates how sustainable practices are becoming more and more common in EU agriculture through an examination of important variables, including crop diversity and the area covered by organic farming. In the European Union, organic farming grew from 9.5 million hectares to 16.9 million hectares between 2012 and 2022, accounting for 10.5% of all agricultural land. This growth is in line with the EU's Farm to Fork Strategy and Green Deal, which want to increase the percentage of organic farms to 25% by 2030. The data also shows how different EU member states have adopted organic agricultural practices; Sweden, Estonia, and Italy are the nations that produce the most organic cereals, while France and Finland are less advanced. Adoption is influenced by a number of factors, including market demand, national policy backing, and environmental factors. To achieve the EU's lofty sustainability targets, the essay highlights the need for ongoing governmental support, financial investment, and consumer awareness. The results indicate that although there has been progress, there are still major obstacles to overcome before sustainable agriculture techniques can be widely adopted. The EU can support global environmental sustainability initiatives, boost biodiversity, and encourage rural development by removing these obstacles.

Keywords: Sustainable Agriculture, Rural Development, Organic Farming, Crop Diversity, EU Agricultural Policy

Introduction

In order to effectively handle the complex issues brought forth by climate change, environmental degradation, and socioeconomic inequities, agriculture must incorporate sustainable techniques. In order to attain the Sustainable Development Goals (SDGs),

agricultural operations must both reduce their environmental impact and boost productivity and resilience on a global scale. This is especially important in rural regions, where agriculture continues to be a vital pillar of the local economy and way of life.

The notion of sustainable agriculture comprises strategies that optimise resource utilisation, strengthen resistance to environmental stressors, and elevate the standard of living for agricultural communities. The Food and Agriculture Organisation (FAO, 2017) defines sustainable farming systems as those that minimise the negative environmental consequences of farming methods while maximising ecological processes, fostering biodiversity, and conserving resources. By encouraging sustainable land use and integrated landscape management, this strategy indirectly promotes SDGs 13 ("Climate Action") and 15 ("Life on Land") and is crucial for guaranteeing food security, which is directly related to SDG 2 ("Zero Hunger").

The need to reconcile production with environmental and social sustainability highlights the significance of adopting sustainable agricultural techniques in Romania, where agriculture employs around 23.4% of the rural population (Eurostat, 2020). The Romanian government, with backing from the Common Agricultural Policy (CAP) of the European Union, has launched many initiatives with the objective of augmenting the sustainability of its agricultural domain. The protection of natural resources, precision agriculture, and organic farming are the main focuses of these projects (European Commission, 2020).

The rising trend in Romania towards organic farming, which has witnessed a rise in the area under cultivation from barely 0.5% of all agricultural land in 2010 to over 2.5% in 2019, is evidence of the efficacy of these tactics (Eurostat, 2021). This change promotes biodiversity and the health of the soil while providing Romanian farmers with new markets and a boost to the country's rural economy. Furthermore, in an effort to minimise the environmental effects of conventional farming methods and maximise resource efficiency, precision agricultural technologies have been encouraged.

But adopting sustainable agricultural methods is not without its difficulties. Widespread adoption is severely hampered by structural problems such as lack of access to contemporary technology, ignorance of best practices, and the financial sustainability of novel agricultural techniques. Furthermore, legislative frameworks that not only promote sustainable practices but also ensure that farmers, particularly smallholders, can successfully apply them are critically needed, as argued by Streimikis and Baležentis (2020).

Literature Review

The pursuit of integrating sustainable practices into agriculture to foster rural development in line with global environmental goals is a critical endeavour documented extensively in the academic and policy-making arenas. This literature review examines key studies, frameworks, and policy responses that address the integration of sustainability within agricultural practices,

emphasising their impact on rural development and alignment with broader environmental objectives.

Preservation of natural resources and environmental quality preservation are closely related to the idea of sustainable agriculture. Pretty (2008) asserts that resource conservation, social support, commercial competitiveness, and environmental friendliness are essential components of sustainable agriculture. According to the Food and Agriculture Organisation (FAO, 2018), attaining SDG 2 (Zero Hunger) and SDG 15 (Life on Land) depends on sustainable practices, which include energy saving, water management, and the reduction of chemical inputs.

Research by Horlings and Marsden (2011) provides a framework for understanding the role of agricultural sustainability in promoting resilience in rural areas, focusing on the capacity of these practices to enhance soil fertility and biodiversity, thus maintaining ecosystem services. Similarly, Tschardt et al. (2012) argue that agricultural landscapes should be designed to support biodiversity at multiple levels, from genes to ecosystems, to ensure long-term sustainability.

A theoretical framework for comprehending how agricultural sustainability contributes to resilience in rural regions is provided by research by Horlings and Marsden (2011). This research focuses on the potential of these practices to improve soil fertility and biodiversity, hence preserving ecosystem services. Tschardt et al. (2012) contend that in order to guarantee long-term sustainability, agricultural landscapes had to be planned to promote biodiversity at several levels, ranging from genes to ecosystems.

The degree to which sustainable agriculture methods are adopted varies greatly between locations. According to studies by Siebert et al. (2010), high initial costs and a lack of technical skills among farmers are the main obstacles to the adoption of precision agriculture, which uses information technology to make sure that the crops and soil receive exactly what they need for optimum health and productivity. According to Eurostat (2021), organic farming is gradually becoming more popular throughout the European Union. Over the previous ten years, the area dedicated to organic farming has more than doubled, suggesting a rising trend towards more environmentally friendly agricultural methods.

Sustainable practices have a significant influence on rural development. The European Network for Rural Development (ENRD, 2019) states that sustainable practices support rural vitality by creating economic opportunities through agritourism and regional food production systems, in addition to lowering carbon footprints and enhancing land and water management. Kremen and Miles (2012), who address how agricultural system diversification might boost rural communities' ecological and economic resilience, provide credence to this.

Policies play a critical role in supporting sustainable farming methods. According to the European Commission (2020), the Common Agricultural Policy (CAP) of the European Union has shifted its emphasis to include sustainability goals within its framework, promoting smallholder farms, organic farming, and the reduction of greenhouse gas emissions. However,

as Dwyer et al. (2010) point out, one of the difficulties in implementing policies is making sure that they are inclusive of small- to medium-sized farms and flexible enough to adjust to local conditions.

Data and Methodology

This chapter presents the data sources and methodologies used to analyse the trends in organic farming coverage and crop diversity within the European Union. The methodology proposed for this study employs quantitative approaches to perform descriptive statistics, summarising data sets and identifying trends, in order to provide a general understanding framework of the roles, relationships, and impacts in the field.

The data employed in this study were obtained from Eurostat, which provide comprehensive statistics on agricultural practices across EU member states. Specifically, two key indicators are examined: the proportion of agricultural land under organic farming from 2012 to 2022 and the share of organic cereal production across various EU countries in 2022.

The analysis of organic farming coverage provides insights into the growth of sustainable farming practices in the EU over the last decade, reflecting the increasing emphasis on environmental sustainability within agriculture. The crop diversity indicator, focusing on organic cereal production, offers a snapshot of how different countries have adopted organic farming methods for key crops, contributing to biodiversity and ecological balance.

This chapter employs descriptive statistical techniques to visualise the data through two key charts: Organic Farming Coverage (2012-2022) and Crop Diversity - Organic Cereal Production (2022). By analysing these charts, this study aims to identify significant trends in the EU's progress towards achieving its environmental and agricultural goals.

Sustainable Practices indicators

The data shows a clear upward trend in the organic farming area in the European Union from 2012 to 2022. Over this decade, the area devoted to organic farming has increased significantly, reflecting the EU's commitment to promoting sustainable agricultural practices and aligning with the goals of the European Green Deal and the Farm to Fork Strategy.

EU Organic Farming Area (Million Hectares) and % of Total Agricultural Area

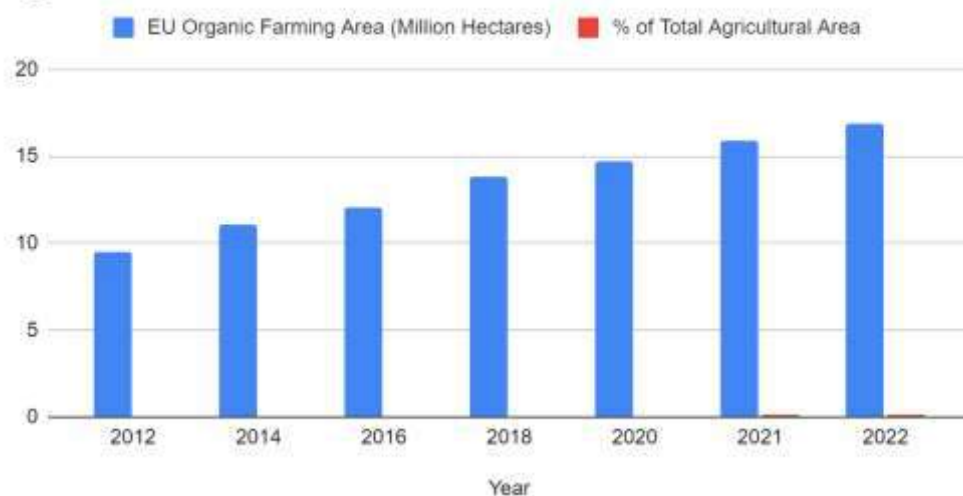


Figure 1: Organic Farming Coverage (2012-2022)

Source: Eurostat, 2023

Between 2016-2020 the EU saw a more significant increase, with organic farming area rising from 12.1 million hectares to 14.7 million hectares. This 21.5% growth can be attributed to heightened environmental awareness and growing efforts by member states to integrate sustainability in their national agricultural policies (Eurostat, 2021).

During 2020-2022 the sharpest increase occurred during this period, with an addition of 2.2 million hectares, representing a rise of 15%. The boost in organic farming during these years aligns with the EU's Green Deal targets, particularly the goal of having 25% of agricultural land under organic farming by 2030 (European Commission, 2020). This period also saw increased funding and incentives for organic farmers.

The European Commission's Farm to Fork Strategy and the Biodiversity Strategy for 2030 have played crucial roles in driving this expansion. These strategies are aimed at reducing pesticide use, fostering biodiversity, and promoting sustainable food systems by supporting organic farming (European Commission, 2020).

The EU's target to achieve 25% organic farmland by 2030 means that, despite the progress, there is still a long way to go. With 16.9 million hectares representing 10.5% of the total agricultural area in 2022, the EU needs to nearly double the organic farming area over the next eight years to meet this ambitious goal.

Although the overall trend is positive, the rate of organic farming adoption varies significantly across EU countries. Countries like Austria, Estonia, and Sweden have been leading the way, with organic farming accounting for over 20% of their UAA (Eurostat, 2022). Meanwhile, other countries, such as Bulgaria and Ireland, are lagging behind, with organic farming covering less than 5% of their UAA.

The differences in adoption rates can be attributed to various factors, including national policy priorities, consumer demand, and the availability of organic certification infrastructure in each country.

The steady rise in organic farming coverage in the EU over the last decade reflects the increasing importance of sustainability in agricultural policy and consumer preferences. However, achieving the EU’s ambitious target of 25% organic farming by 2030 will require continued investment, policy support, and market development to encourage further adoption, particularly in countries with lower current organic farming coverage.

The below figure presents the percentage of organic cereal production in five European Union countries for 2022. This data highlights the varying levels of organic cereal production across the EU, reflecting the differences in policy support, market demand, and agricultural practices between member states.

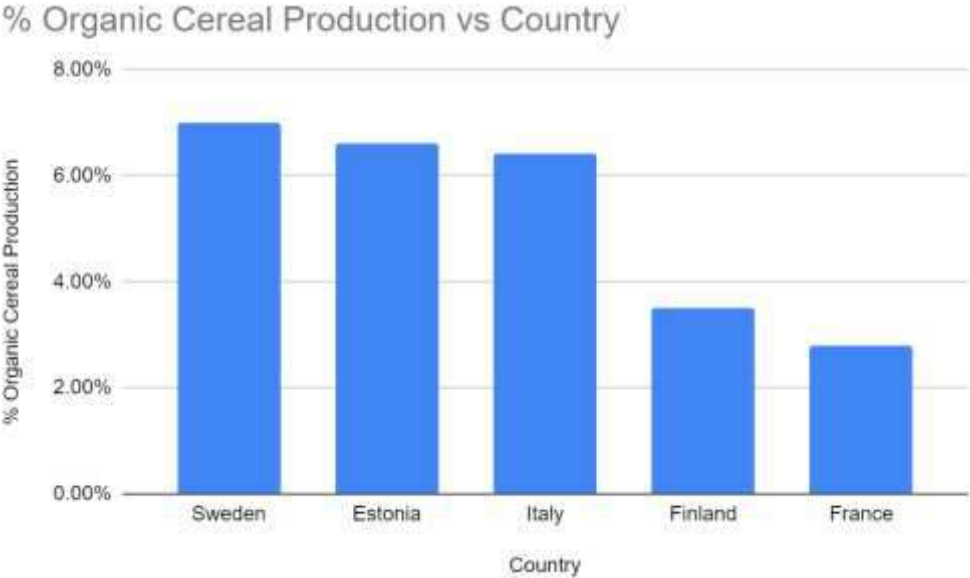


Figure 2: Crop Diversity - Organic Cereal Production (2022)

Source: Eurostat, 2022

Sweden leads with 7.0% of its cereal production being organic, followed closely by Estonia with 6.6% and Italy with 6.4%. These countries are at the forefront of organic cereal production in the EU, which is indicative of strong national policies supporting organic farming, as well as high levels of consumer demand for organic products.

Sweden’s leadership in organic farming is supported by favourable government policies, consumer awareness, and its commitment to sustainability goals (Eurostat, 2023). In addition, Sweden’s relatively low use of synthetic inputs historically has eased the transition to organic systems.

Estonia and Italy have also embraced organic farming as a key component of their national agricultural policies. In Estonia, organic farming covers over 20% of its utilised agricultural

area (UAA), making it one of the top EU countries for organic production (Eurostat, 2022). Estonia's success is attributed to government initiatives aimed at promoting sustainable agriculture, as well as its low population density and extensive grasslands that are suitable for organic farming practices.

Italy is a major player in organic farming overall, with a focus on Mediterranean crops, including cereals. Italy's organic sector has grown significantly, driven by a combination of EU subsidies, strong consumer demand, and a thriving export market. The country's large organic farming base is part of its strategy to reduce its environmental footprint and contribute to the EU's Farm to Fork Strategy.

The EU has set ambitious goals for increasing organic farming as part of its Green Deal and Farm to Fork Strategy, which aims to have 25% of total agricultural land under organic farming by 2030 (European Commission, 2020). While countries like Sweden and Estonia are progressing well towards these goals, others, such as France and Finland, will need to increase their efforts to meet the targets.

Organic cereal production is a key part of this strategy, as it plays a crucial role in food security, environmental sustainability, and biodiversity. The production of organic cereals is particularly important for reducing the reliance on synthetic inputs, improving soil health, and supporting rural economies.

Several factors influence the level of organic cereal production across different countries. Firstly, countries with strong national policies and subsidies for organic farming tend to have higher percentages of organic production. For example, Sweden and Estonia have robust frameworks that encourage farmers to adopt organic practices. Countries with higher consumer awareness and demand for organic products, like Italy, often have higher levels of organic production. The domestic and export markets for organic cereals are key drivers in these countries. Northern European countries, like Finland, face challenges related to shorter growing seasons, which can limit the adoption of organic practices for cereal production. However, these countries also benefit from less intensive conventional agriculture, making the transition to organic slightly easier.

This chart highlights the disparities in organic cereal production across different EU countries, with leaders like Sweden and Estonia making significant strides towards sustainable agricultural practices, while others, such as France, still have room for improvement. The data reflects the broader challenges and opportunities within the EU as it works towards achieving its ambitious sustainability goals under the Farm to Fork Strategy. With increased policy support and market demand, it is expected that more countries will ramp up their efforts to increase organic cereal production in the coming years.

Conclusion

Beyond being a reaction to international environmental goals, the adoption of sustainable agricultural methods is also an essential strategy for rural development, particularly in the

European Union (EU). The data in this analysis highlights the EU's commitment to reaching the challenging goals outlined in the European Green Deal and Farm to Fork Strategy by showing notable advancements in areas like crop diversification and the coverage of organic farming.

The area covered by organic farming in the EU increased significantly between 2012 and 2022, from 9.5 million hectares in 2012 to 16.9 million hectares in 2022, or 10.5% of the total agricultural area. This pattern is a blatant sign of the EU's increased focus on biodiversity preservation, sustainability, and lowering chemical inputs in agriculture. The EU still has obstacles to overcome before it can achieve its target of 25% of its agricultural land being used for organic farming by 2030, notwithstanding these advancements. Bridging this gap will need sustained regulatory support, rising consumer demand, and market expansion, particularly in nations where organic methods are less widely adopted.

The examination of crop diversification, in particular the production of organic cereals, reveals different adoption levels among the EU member states. Leaders in the production of organic cereals are Sweden, Estonia, and Italy, whose solid national regulations and high market demand have made them such. Conversely, nations such as Finland and France regress, highlighting the necessity of focused interventions and modified policies to encourage the broader use of organic agricultural practices.

Although there has been some improvement, the results emphasise the need for a more coordinated strategy to remove obstacles such as high upfront costs, a lack of technical expertise, and restricted access to infrastructure for organic certification. Moreover, differences in the rates of adoption of organic farming among the EU's member states indicate that customised solutions addressing particular regional issues are necessary to guarantee the EU's overall achievement of its sustainability objectives.

In summary, incorporating sustainable practices into agriculture has several advantages, from boosting rural economic development to enhancing soil health and water efficiency. However, continued cooperation between legislators, farmers, and market participants is necessary to realise the full potential of these activities. Through the Common Agricultural Policy (CAP), the EU must keep funding sustainable agriculture and make sure that the switch to organic farming is profitable for all parties concerned. With these initiatives, the EU can support rural development and food security while taking a leading role in tackling global environmental concerns.

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ADDRESSING LUDOPATHY AND CRIMINAL JUSTICE: A SYSTEMATIC REVIEW OF LITERATURE

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ABSTRACT

It is commonly known that there exists a significant correlation between ludopathic behavior and criminal behavior, as certain individuals turn to illegal actions to recover financial deficits arising from their gambling activities. Nevertheless, the literature lacks a comprehensive comprehension of the risk factors associated with the perpetration of crimes beyond mere financial pressures. The primary objective of this paper is therefore to explore the types of offenses committed by individuals struggling with ludopathic issues and the elements that contribute to the engagement in ludopathy-related criminal activities. A systematic literature analysis, following the protocol guidelines delineated for the PRISMA framework. The analytical method will use a scientific approach to explain the phenomenon by analyzing the studies of many influential scholars. Five top-rated platforms were used to select the most cited articles related to ludopathy and criminal justice.

After the thorough screening process and the application of predetermined exclusion criteria, a total of 30 articles were deemed suitable for inclusion. All the studies scrutinized focused on criminal acts committed by individuals with ludopathy, utilizing a validated assessment instrument for gauging the extent of problem gambling. The analysis put forth evidence indicating that offenses related to ludopathy typically involve non-violent but revenue-generating transgressions. Nonetheless, it also brought to light the possibility that ludopaths might engage in violent crimes at a higher rate than anticipated, a phenomenon that could have been obscured by both deliberate and inadvertent underreporting of these offenses. The causative link between ludopathy and violent criminal behavior, however, remains ambiguous. Drawing from the insights gleaned from this review, recommendations are proposed for better screening and prevention programs in terms of criminal justice to enhance comprehension of the connection between ludopathy and criminality and promote the more frequent utilization of therapeutic jurisprudence in the future.

Keywords: Ludopathy, Criminal Offenses, Criminal Justice, Screening, Prevention Programs

1. Introduction

Définitions de “ludopathie”: ***Trouble psychologique caractérisé par une addiction aux jeux, notamment de hasard ou d'argent.***

Mais Eurovegas apportera seulement plus de spéculation, de destruction environnementale, de ludopathie, de prostitution, de mafias et de blanchiment d'argent. — “Las Vegas megalomanie en Espagne”. Si l'Etat italien touche environ 54 % des revenus grâce aux taxes, les dégâts sociétaux engendrés par le jeu limitent les bénéfices. Près de 800.000 personnes s'adonnent à la pratique du jeu de manière compulsive et environ 2 millions sont à risque. Avec 24.000 italiens souffrant de ludopathie et se faisant soigner dans des établissements publics pour leur dépendance, les soins médicaux coûtent 7 milliards d'euros par an à l'Etat.

La ludopathie grimpe en flèche chez les jeunes Espagnols, attirés par les offres grandissantes de jeux de poker en ligne et tout l'éventail des paris sportifs. La colère gronde dans les associations de quartiers qui réclament un contrôle effectif des lieux et l'interdiction de l'accès aux mineurs.

According to scholarly experts, the notion of games, whether viewed as a ludic or economic endeavor, can be dated back to approximately 2000 years BC. Various ancient civilizations such as the Babylonians, Etruscans, Egyptians, Chinese, Pre-Columbian Indians, Greeks, and Romans, among others, participated in diverse forms of gambling activities, often considered a primary pursuit of the privileged class in ancient societies (Sulkunen et al., 2020; Tamminga et al., 2006). Numerous academics have explored games as a tool for social organization, capturing the interest of prominent researchers (Gordon & Reith, 2019; Abarbanel, 2018; Browne et al., 2016; Thomas & Thomas, 2015; Abarbanel, 2014; Tamminga et al., 2006). Aristotle, for example, linked happiness and virtue to play within his ethical framework, portraying games as a refined human activity devoid of the utilitarian characteristics of other behaviors (Sulkunen et al., 2020). Conversely, the eminent German philosopher Kant characterized games in relation to human aesthetic ingenuity. Romanticists have accentuated the historical and cultural importance of games, arguing that they encompass artistic qualities. In his renowned piece "Letters on The Aesthetic Education of Man," Kant (1997) famously declared: "only when a man plays is he truly a man." Max Weber, a distinguished German intellectual, classified human behaviors into traditional, emotional, purposive, and rational categories. A thorough comprehension of social actions differentiates these behaviors from emotional to traditional and rational, thus establishing a foundation for their examination (Berkers et al., 2017). Economists have incorporated Weber's concepts into economic frameworks to rationalize human conduct. The pursuit of financial gain through the utilization of resources clarifies various human actions. Modern society is largely steered by economic incentives, a trend that can be economically expounded, although with limitations in addressing abstract notions such as happiness, fate, and uncertainty (Sweldberg, 2003). Ludopathy holds the capacity to induce changes in the psychological and physical state, thereby stimulating and enhancing the psycho-physical aspect of the player (Esparza-

Reig,2023; Menchon et al.,2018). Engaging in wagering a specific amount of money with the aim of maximizing profits, or alternatively confronting the risk of losing everything, evokes sensations that can be exceedingly pleasurable for a substantial portion of individuals. Individuals demonstrating a heightened interest in gambling often display an increased tendency towards pursuing greater gratification through risk-taking and placing larger bets. In such scenarios, the anticipation of the result is characterized by heightened drive and an increased outlook on financial gains, compelling the individual to enter bets where the level of risk is considerably elevated (Esparza-Reig,2023). The legal discourse has also underscored the necessity of transcending the simplistic psychopathological-categorical framework to encompass a comprehensive understanding of the gambling individual within various social contexts. The degree of holistic adjustment achieved by individuals during their formative years serves as a crucial predictor of abstinent behaviors in later stages of life. In delving into the root causes and contributing factors behind behaviors that influence deviance and criminal tendencies, it becomes imperative to initially direct attention towards the psycho-social origins of this legal and economic issue. Addictive gamblers refrain from engaging in conflicts and disagreements with loved ones results in personal seclusion, pushing them towards exclusive emotional circles. This cycle subsequently heightens internal tension, discontent, and hopelessness, nurturing sentiments of victimization and markedly diminishing self-worth (Esparza-Reig,2023). The individual self-concept is nearly disintegrated, while the establishment of a coherent sense of self is brought into question, leading to heightened susceptibility to psychological distress and the likelihood of being influenced by aberrant conduct (Thurm et al.,2022;Calado & Griffiths,2016; Bergen et al.2011). The emergence of aberrant behavior serves as an unmistakable precursor to actions that challenge the sanctity of life. Equally prevalent among the youth are notions of attaining wealth effortlessly, necessitating swift enrichment devoid of labor. Ludopaths also challenge the notion of time, drawing motivation from the belief in imminent triumph!(Leonard & Williams,2016) Drawing insights from the experiences of healthcare professionals (including physicians, psychotherapists, psychologists, social workers, etc.) and law enforcement officials who have been involved in treating and devising protective measures for citizens over the past few decades, the motivational factor emerges as a pivotal element in achieving positive outcomes during the recovery process (Ukhova et al.,2024;Grant & Chamberlain,2016)! The current paper will examine the status of Ludopathy as seen by the lens of Law in Albania and in a recent systematic review relating “pathological gambling/ludopathy”, “mitigation role” and legal analysis of this treatment.

2. Ludopathy as a mental health issue

What distinguishes ordinary gambling (for recreational purposes) from pathological gambling or Ludopathy (due to compulsive need) is the escalation in frequency and financial investment, leading to increased complexities, loss of self-regulation, heightened distress, incapacity to refrain, reduced satisfaction, and lower thresholds for inhibition, yielding to any incitement (Thurm et al.,2022; Livingstone et al.,2017; Tamminga & Nestler,2006). More

specifically, the key elements of gambling addiction encompass persistent preoccupation with gambling, adoption of unbridled behaviors, and proneness to relapse (Binde et al.,2022).Ludopathy constitutes a behavioral disorder that was officially recognized as a distinct clinical entity with specific diagnostic criteria in the DSM-III-R (APA, 1987) and is presently classified in the DSM-V (APA, 2013) under impulse control disorders not classified elsewhere, alongside conditions like kleptomania, pyromania, and intermittent explosive disorder. Since its initial characterization as a conduct disorder, the precise classification of this clinical presentation has been a topic of considerable debate. Disagreement persists regarding its categorization, with the current psychiatric classification systems, DSM-V (APA, 2013) and ICD-11 of the World Health Organization (1992), defining it as an impulse control disorder while many scholars view it as a form of non-substance addiction(Mazar et al.,2020). The core symptomatology observed in individuals with gambling issues closely resembles that seen in individuals struggling with alcohol or drug dependence. Consequently, there has been a recent suggestion to classify Ludopathy as a psychological addiction (Mazar et al.,2020). The common features of these disorders include the inability to resist impulses, a heightened sense of tension or arousal before engaging in the behavior, and the experience of pleasure, satisfaction, or relief upon completion. Specifically, Ludopathy involves a persistent and progressive inability to resist the impulse to gamble, leading to significant disruption of personal, familial, and/or occupational objectives. Impulse can be defined as a compelling urge to engage in a specific behavior, usually without delay. The pathological nature of an impulse lies in the inability to resist it, indicating a compromised volitional capacity and often accompanied by subjective distress(Clark et al.,2013). Ludopathy transcends social boundaries and age groups, with a trend towards younger individuals seeking treatment for gambling-related issues(Gartner et al.,2022) . From a qualifying standpoint, various categories of Ludopaths have been suggested. *Ludopaths* struggle with loss of control or lack the ability to halt their gambling activities (Mazar et al.,2020). This leads to unbridled gambling characterized by a) an exceptionally high frequency of gambling and/or significant investment of time and money; b) betting amounts exceeding the initial plan; and c) persistent thoughts and an overwhelming urge to gamble, particularly after losses. The compulsive needs to gamble for the purpose of recovering lost funds, along with repeated inability to resist the temptation to gamble, are key features of pathological gambling. In Albania, Ludopathic individuals tend to exhibit a strong reliance on slot machines, either exclusively or in combination with other forms of gambling. This preference is influenced by various psychological factors related to the operation of slot machines, including their widespread availability, potential for significant winnings from small bets, immediate feedback on outcomes, and the illusion of control through personal interaction with the machine. The gaming environment further stimulates players through visual and auditory cues, creating a heightened emotional and physiological response(Molinaro et al.,2014). From a psychopathological standpoint, mood disorders, particularly depression and hypomania, as well as addictive tendencies, are commonly linked with pathological gambling (Mide et

al.,2023). Moreover, the prevalence of alcohol or other substance abuse among individuals with pathological gambling is estimated at approximately 15% (Leino et al.,2021). The use of addictive substances in this context may serve various purposes, including seeking heightened stimulation and pleasure, coping with gambling-related stressors, minimizing the impact of losses, or substituting one addiction for another. Family members, friends, and the professional environment are significantly influenced by the individual's gambling issues (Livingstone et al.,2017).

3. Ludopathy and commission of Crimes

The deficiency in regulating finances among individuals with gambling issues is associated with extravagant behaviors, characterized by excessive and disproportionate expenditure (quantitative aspect), unnecessary and unjustified outlay (qualitative aspect), and habitual disbursement (chronological aspect) (Grant et al.,2022). Ludopathic behavior can be correlated with the perpetration of criminal activities (see Table 1). A notable characteristic is that these individuals typically lack a prior criminal record or a history of violating established ethical standards. Initially, the criminal acts committed are typically centered around embezzlement within the family or workplace, albeit accompanied by guilt and the intention, unlike traditional offenders, to promptly repay fraudulently acquired funds to settle incurred debts. This sense of guilt induces a level of despair that is alleviated through gambling, thus creating a harmful cycle that proves challenging to break free from.

Table 1. Ludopathy and criminality

Mental disorder	Nosological category	Criminality
Ludopathy	Impulse control disorder	<ul style="list-style-type: none"> - Crimes against property - Scams - Theft/robbery - Forgery - Misappropriation - Embezzlement - Extortion
		<p style="text-align: center;"><i>Violent Behaviors</i></p> <ul style="list-style-type: none"> - Assaults on persons - Damage (destruction of objects)

However, as the addiction strengthens and the debts accumulate significantly, the gambler demonstrates an inability to control his actions in line with his own ethical beliefs. This leads to the commission of crimes in a calculated manner, devoid of any remorse: within the family environment, funds may be taken or valuable items and assets from the family's inheritance may be sold; within a professional setting, there could be instances of embezzlement or participation in deceitful financial dealings; and in public spaces, individuals may partake in fraudulent schemes or, in extreme scenarios, resort to acts of theft or robbery accompanied by threats of violence (Moreira et al.,2023;Menchon et al.,2018).

4. Mitigating factors and exemptions from criminal imputability in the Albanian Criminal Code

Exculpatory circumstances nullify criminal liability; mitigating factors reduce it Mental disturbances can be considered for criminal purposes in three ways as argued in Articles 64 and 65 of the Albanian Criminal Code. The abundance of factors influencing the social risk associated with criminal acts and their perpetrators is significant. However, in the interest of limiting judicial discretion, lawmakers have outlined certain mitigating and aggravating circumstances. These factors, as indicated by their names, are meant to be considered by the court when determining the appropriate sentence for the offender. Some of these factors relate to the nature of the crime and the degree of responsibility involved, while others focus on the potential threat posed by the offender. Certain elements encompass aspects of both categories. Despite the Albanian Criminal Code's comprehensive approach in addressing numerous mitigating and aggravating circumstances, it does not specify the relative significance of each factor in terms of mitigating or aggravating the sentence. Neither it does not encompass a psychopathological diagnosis as a mitigating measure in the Court. In this sense, no harmonization in European Law could allow Member States to treat gambling addiction as a state of non-immutability but forced treatment. In contrast, the Italian Penal Code, under Articles 64 and 65, stipulates that the presence of a deterrent or mitigating factor can increase or reduce the sentence by one-third of the initial penalty. Additionally, Articles 66, 67, and 68 of the same Code elaborate on the calculation process for sentences in situations involving aggravating factors, mitigating factors, or a combination of both. In a European level view, national laws should be deemed suitable only if they genuinely reflect a consistent and systematic effort to achieve these objectives (Vintro-Alcaraz et al.,2022;Littler,2007). This criterion is commonly referred to as the proportionality test(Moreira et al.,2024).In my view, the disparity between mitigating and aggravating factors does not solely pertain to each other in the criminal assessment. Rather, the significance of a particular factor may vary in different cases due to fluctuations in its intensity,including the examination of mitigation circumstances. Mitigating and aggravating circumstances are not exclusively considered when integrated into the specifications of the special section, or when acting as qualitative factors distinguishing one case from another (Moreira et al.,2024). In such instances, their influence on the verdict is deliberated by the legislator to confine judicial discretion. In the Albanian Criminal Code Article 50 introduces constraints to prevent an increase in aggravating factors

(see the Criminal Code,2017). In my analysis, the court has the authority to evaluate the societal risk associated with the crime and its perpetrator, along with any other pertinent circumstances it deems significant as evidenced by extensive literature. The mitigation factors outlined in Article 48 of the Albanian Criminal Code serve to reduce the severity of punishment in specific situations. Engagement in work driven by motives characterized by positive attitudes and social values may warrant consideration. This scenario may be relevant when an individual starts an action from morally sound motives but subsequently crosses a threshold of proportionality, resulting in a criminal act. In such instances, the court is advised to acknowledge these motives when adjusting the sentence. Motives rooted in positive moral and social values, such as compassion, love, and mercy, show a reduced level of social risk associated with the offender(Dunea,2015). Nevertheless, if a criminal act stems from motives related to factors like gender, race, ethnicity, or other specified characteristics, Article 48 precludes the application of this mitigating factor. Actions undertaken under the sway of a psychological shock induced by provocation or unjust behavior by the victim, or another party represent another significant mitigating circumstance. This factor carries considerable weight in reducing the sentence, suggesting the perpetrator's lack of inherent criminal tendencies. Psychological shock is revealed when external stimuli, such as aggression or provocation from the victim, lead the individual to lose substantial control over their actions (Kirkbride et al.,2024). While this factor holds a strong calming effect, its applicability is restricted to cases involving interpersonal interactions, particularly those targeting an individual's health or life. Instances where actions are influenced by directives or unjust commands from a superior also merit consideration. This circumstance is relevant solely in the context of criminal offenses committed in the line of duty. However, it is deemed to carry less mitigating weight compared to other factors, given that public officials are expected to be cognizant of the legality of their actions and refrain from violating laws(Kirkbride et al.,2024). When an offender exhibits profound remorse for their actions, it is considered a common extenuating circumstance in legal practice. This element pertains to the psychological attitude of the perpetrator towards their unlawful behavior after the fact. The expressions of deep regret vary, but typically involve the complete acknowledgment of the facts as presented by the prosecution, providing detailed and accurate descriptions of the crime, and cooperation with authorities. The assessment of deep remorse as a mitigating factor reflects the rehabilitative goals of criminal sentencing, highlighting the need for courts to carefully consider its impact on the differentiation of punishments for offenders who have committed similar offenses(Conder et al.,2023). Extenuating circumstance encompasses also the state when an offender has either compensated for the harm caused by their criminal act or actively contributed to reducing its consequences, it signifies a genuine repentance on the part of the perpetrator and a willingness to repair the relationship with the victim. When these two mitigating factors are combined, particularly in cases of reconciliation with the victim, a shift towards less punitive sentences is recommended to facilitate the rehabilitation of the offender. Additionally, an ease situation where the offender surrenders to the appropriate authorities following the commission of a

criminal offense. When there is a restoration of normal relations between the offender and the victim of the crime, it can influence sentencing considerations. While it is impossible to list all possible mitigating circumstances, Article 49 of the Criminal Code allows the court to consider any other relevant factors that support a reduction in the sentence. These factors may involve the nature of the offense or characteristics of the defendant. The key criterion for identifying a mitigating circumstance is its rationality, specifically how convincingly it indicates a lower risk associated with the offense or the offender, thus justifying a more lenient punishment.

5. The current study

Methodology

The current research will examine the current stance of ludopathy based on a literature review.

RQ₁ = What is the current stance of scientific literature that investigates the evolution of ludopathy?"

A systematic literature analysis, following the protocol guidelines delineated for the PRISMA framework was employed for conducting this research. Five top-rated platforms were used to select the most cited articles related to ludopathy and criminal justice (1) *Criminal Justice Abstract*; (2) *Medline*; (3) *Sociofile/Sociological Abstract*, (4) *ERIH PLUS* and *PsycINFO*. The original search was conducted from the 1st of May to the 30th of May 2024 . The other databases were excluded due to the lack of relevant articles. The keywords used to search the input into each database were “gambling” and “offence”.

After the thorough screening process and the application of predetermined exclusion criteria, a total of 30 articles were deemed suitable for inclusion.

Selection Criteria

The primary inclusion criteria employed by the Journal must: 1) Presented data on the type of reported crimes committed by ludopaths where the level of gambling behaviour is measured by a validated assessment tool, 2) published after 2000-2024; 2) peer-reviewed; 3) published in English; e) the research must include the following keywords: (TITLE-ABS-KEY) ("Gambling" , “Addiction” OR "Offence"). Articles that were not written in English, used data involving juvenile delinquents and did not report the type or motive of the criminal offence committed were excluded by the selection process.

6. Results

The current research performed a literature review of 1120 references; however, only 30 were retained for review, based on their titles and abstracts. All articles are in English. For the present work, we extracted 30 articles ($N=30$) that met all the selected inclusion criteria. All studies reviewed examined reported crimes committed by ludopaths, with a validated assessment tool measuring problem gambling. Nine studies examined problem gambling among incarcerated individuals (Widdinghoff et al.,2018; May-Chahal et al.,2016; Tessenyi &

Kovacs, 2016; Lloyd et al.,2014; Zurhold et al.,2013; Preston et al.,2012; Pastwa-Wojciechowska, 2011; Abbott et al., 2005; Abbott et al.,2005) and a further eight sampled from individuals seeking treatment for ludopathy from various sources including in- and out-patient facilities (Adolphe et al.,2018; Rudd & Thomas,2016; Granero et al.,2014; Martin et al.,2012; , Ledgerwood et al., 2007 Blaszczyński & McConaghy, 1994; Slutke et al.,2001;Schwarz,1992). Of the remaining studies, three used retrospective analysis of court files, police files and population surveys and statistics (Binde et al.,2021; Arthur et al.,2014; Kuoppamäki et al.,2013), two sampled gamblers identified in larger cohort studies (Gorsane et al., 2016; Laursen et al., 2016), and one was a review of relevant studies in English (Folino & Abait, 2009). Most of the studies (N=25) assessed whether participants had previously committed a crime (gambling-related or otherwise Binde et al.,2021; Widdinghoff et al.,2018; May-Chahal et al.,2016; Tessenjy & Kovacs,2016; Rudd & Thomas,2016; Laursen et al.,2016; Gorsane et al.,2016; Granero et al.,2014; Zuhold et al.,2013; Schwarz,1992).

7. Conclusive remarks

The issue of Ludopathy is not solely about the addiction itself, but rather the crimes committed to satisfy it (Kirkbride et al.,2024; Moreira et al.,2024; Ukhova et al.,2024; Conder et al.,2023; Mide et al.,2023;Esparza-Reig,2023; Gartner et al.,2022; Grant et al.,2022; Thurn et al.,2022; Binde et al.,2022; Vintro et al.,2022; Binde et al.,2021;Leino et al.,2021;Mazar et al.,2020; Adolphe et al.,2018; Gorsane et al.,2016;May-Chahal et al.,2016;Laursen et a.,2015; Pastwa-Wojciechowska,2011; Folino & Abat,2009). This paper focused on analyzing Ludopathy from the perspective of criminal responsibility and systematic review. For the purposes of civil matters, which are not examined in this study and can vary in complexity, the limitation of the individual's capacity to act should only be centered around economic aspects. Specifically, the declaration of prodigality, as outlined in article 10 of the Civil Code of Albania (see the Albanian Civil Code, pg.10), can be requested by the spouse or relatives who receive financial support from the individual or have the right to claim it. By declaring civil incapacity or implementing guardianship, the individual can be prevented from causing financial harm to themselves or their family and engaging in detrimental business ventures or commitments. The potential limitations on the Ludopathic imputability, based on impulsivity and the absence of inhibitory brakes - like those found in other addictions - are a matter of debate. The more premeditated the criminal behavior and the longer the time between planning and execution of the action (such as in cases of fraud or embezzlement), the higher the level of imputability and the less likely the behavior can be attributed solely to impulsivity . Generally, once the existence of the disorder has been proven through expert opinions and the connection between the criminal act and the pathology has been established, courts tend to apply similar mitigating measures Ludopathy, which is not addressed in the Albanian Criminal Law. Distinguishing between Ludopathy and economic gambling could facilitate the handling of criminal cases and tailor the treatment of these individuals to be as effective as possible. By analyzing the circumstances of the case and considering the mitigating circumstance outlined in the Penal Code, the specific penalty is determined, considering the

significance of problem gambling. Consequently, if the highly qualified mitigating circumstance is evaluated, the penalty that would have been imposed under different circumstances will be decreased by up to two degrees, resulting in a mitigated sentence. In numerous instances, this may even lead to the convicted individual avoiding imprisonment.

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EXAMINING THE CONCEPTS OF CLIMATE JUSTICE AND ECOLOGICAL SECURITY FROM THE PERSPECTIVE OF LANDSCAPE ARCHITECTURE
İKLİM ADALETİ VE EKOLOJİK GÜVENLİK KAVRAMLARININ PEYZAJ MİMARLIĞI PERSPEKTİFİNDEN İRDELENMESİ

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ABSTRACT

Physical, economic and social effects of increasing temperatures and extreme weather events have emerged in the world due to climate change. Policies implemented or not implemented in response to these impacts create new vulnerabilities in urban spaces and begin to deepen existing vulnerabilities. Therefore, climate change is also an issue of justice and security. However, although the physical, economic and social effects of climate change cause inequalities, they have not yet received sufficient significance in international, national and local policies. It is the natural right of every person to live in a good environment and good conditions, but economic/political systems and income differences do not give all people the opportunity to live in good and equal conditions. Landscape architecture, one of the professions closest to nature, undoubtedly has various effects both in the context of global climate change and in the implementation of the concepts of ecological security and climate justice. In this context, the study aims to examine the concepts of climate justice and ecological security in the discipline of landscape architecture, to investigate landscape design strategies to reduce the unfair effects of climate change, and to examine successful sustainable urban design projects implemented in the world and Turkey. In the research method, the descriptive analysis method was used, and academic articles, reports and books on climate justice and ecological security, research on sustainable landscape design projects, reports and guides published by international organizations (e.g. United Nations, IPCC) were examined. As a result, innovative approaches to the integration of climate justice and ecological security concepts into urban landscape design have been revealed, and guiding suggestions have been made for architects, urban planners and landscape architects. It is thought that this study will provide valuable information for both academic and practical applications and will make significant contributions to creating sustainable cities.

Keywords: Ecological Security, Climate Justice, Climate Change, Urban Landscape, Sustainability, Urban Design.

ÖZET

İklim değişikliğine bağlı olarak dünyada sıcaklığın artması ve aşırı hava olaylarının görülmesi fiziksel, ekonomik ve sosyal etkileri de ortaya çıkarmıştır. Bu etkiler karşısında uygulanan veya uygulanmayan politikalar, kentsel mekânlarda yeni kırılma noktaları oluşturmakta ve var olan kırılma noktaları derinleştirmeye başlamaktadır. Dolayısıyla, iklim değişikliği aynı zamanda bir adalet ve güvenlik sorunudur. Fakat iklim değişikliğinin getirdiği fiziksel, ekonomik ve sosyal etkiler her ne kadar eşitsizliklere neden olsa da uluslararası, ulusal ve yerel politikalarda yeterli önemi henüz görememiştir. İyi bir çevre ve iyi koşullarda yaşamak her insanın doğal hakkıdır ancak ekonomik/politik sistemler ve gelir farklılıkları tüm insanlara iyi ve eşit koşullarda yaşama fırsatını vermemektedir. Doğaya en yakın mesleklerden biri olan peyzaj mimarlığı, hem küresel iklim değişikliği bağlamında hem de ekolojik güvenlik ve iklim adaleti kavramlarının hayata geçirilmesinde şüphesiz çeşitli etkileri bulunmaktadır. Bu bağlamda, çalışmanın amacı, iklim adaleti ve ekolojik güvenlik kavramlarını peyzaj mimarlığı disiplini içinde incelemek, iklim değişikliğinin adil olmayan etkilerini azaltmaya yönelik peyzaj tasarım stratejilerini araştırmak, dünyada ve Türkiye’de uygulanmış başarılı sürdürülebilir kentsel tasarım projeleri üzerinden irdelemektir. Araştırma yönteminde, betimsel analiz yöntemi kullanılmış olup, iklim adaleti ve ekolojik güvenlik ile ilgili akademik makaleler, raporlar ve kitaplar, sürdürülebilir peyzaj tasarımı projeleri üzerine yapılan araştırmalar, uluslararası kuruluşların (ör. Birleşmiş Milletler, IPCC) yayınladığı raporlar ve kılavuzlar incelenmiştir. Sonuç olarak, iklim adaleti ve ekolojik güvenlik kavramlarının kentsel peyzaj tasarımına entegrasyonuna yönelik yenilikçi yaklaşımlar ortaya çıkarılmış, mimarlar, şehir plancıları ve peyzaj mimarları için rehber niteliğinde öneriler getirilmiştir. Bu çalışma konusunun, hem akademik hem de pratik uygulamalar için değerli bilgiler sunması ve sürdürülebilir şehirler inşa etme çabalarına önemli katkılarda bulunacağı düşünülmektedir.

Anahtar Kelimeler: Ekolojik Güvenlik, İklim Adaleti, İklim Değişikliği, Kentsel Peyzaj, Sürdürülebilirlik, Kentsel Tasarım.

INTRODUCTION

While the majority of the population currently lives in cities, the proportion of the human population living in cities is expected to increase to 68% by 2050 (Shi et al. 2022; Emilsson and Ode Sang, 2017; Lomba-Fernández et al. 2019). The rapidly increasing population, the rapid urbanization process and climate change are one of the biggest global problems of today's world. It has become necessary to make cities resilient and sustainable in order to absorb these risks in adaptation and mitigation processes against the negative effects of urbanization and climate change. The rapid increase in urbanization brings with it problems in urban areas. One of the most important problems is the effects of climate change on cities. According to the IPCC (Intergovernmental Panel on Climate Change Report), the seriousness of the effects of climate change is emphasized in the climate scenarios predicted for the next 30 years and it is stated that urgent action is needed to slow, reduce and counteract these effects (Lomba-Fernández et

al. 2019). In this process where both urban and rural areas are seriously affected, sustainable planning models are needed.

The basic approach in urban sustainability is that a city can sustain itself within a stable system in terms of energy and materials, with minimal damage to environmental resources (Tuğaç, 2019). Sustainable urbanization aims to establish a balance between production, consumption and waste, to adopt recycling models in energy systems, to protect natural areas and to reduce the ecological footprint (Özcan, 2012). The most current international documents, which are carried out within the scope of considering the city together with the concept of sustainability, establishing the relationship between global warming and the city, and underlining the issues of sustainable and climate change-resistant urbanization, are as follows: United Nations (UN) 2030 Agenda and Sustainable Development Goals, The Paris Climate Agreement adopted under the Framework Convention (UNFCCC), the New Urban Agenda adopted as a result of the HABITAT III Conference, and the Special Report on Climate Change Science and Cities (Tuğaç, 2019). Although there are many important international studies such as these regarding sustainable and climate change-resistant urbanization, it is seen that the world population continues to increase, cities continue to expand indefinitely, and they continue to be the source of excessive resource and energy consumption as well as greenhouse gas emissions that cause global warming.

In particular, the decreasing number of green areas in urban areas and the destruction of natural and historical texture make life increasingly difficult and disrupt human-nature relations, which leads to the emergence of increasing ecological problems in cities. These problems show that in today's cities, urban development is abandoned to uncontrolled development and change (Korkut et al. 2017). In this context, the importance of “*the landscape architecture*” discipline emerges. Issues related to urban sustainability consist of environment, economy, liminality, aesthetics, experience and ethics, which are also related to the urban landscape. The contribution of effective landscape planning and design strategies to sustainability for the development of the region on a local scale is significant. Sustainable landscape planning and design increases the physical quality of the landscape through the protection and provision of green infrastructure, provides economic benefits through increasing the number of visitors to the region, entrepreneurship, investment and tourism, aims socio-cultural development through the development of social relations (Harjanto and Hamka, 2021).

When urban landscape design is carried out by considering the functionality of open green areas, great steps will be taken in ensuring urban sustainability. The primary economic function of open green areas is energy saving. It reduces the amount of energy used for cooling and heating with functions such as creating shade areas and wind screens and preventing the formation of urban heat islands (Hassamancıoğlu, 2022). In addition, as the urban areas become attraction centers tourism and other job opportunities in the region increase, and it is observed that the property value of residences close to green areas improves (Hassamancıoğlu, 2022). At the same time, open green areas offer economic added value to cities with the production functions carried out in agricultural areas, forest areas and basins. Open green areas, with their ecological functions, form the basis of environmental sustainability in cities. Many ecological functions such as oxygen production, filtering of polluted air, regulation of temperature and relative air humidity, reducing the greenhouse gas effect by absorbing carbon, preventing

erosion, maintaining water balance, ecological restoration, protecting biodiversity and reducing noise indicate how important open green spaces are for urban ecology. From a social perspective, open green spaces have features that will improve the quality of life of urban residents by providing opportunities for educational and cultural activities, reducing the crime rate, creating opportunities for recreational activities, contributing to social development and protecting public health (Hassamancıoğlu, 2022). Stopping ecological degradation for real and sustainable processes is based on sensitivity to the entire ecosystem. Therefore, the destruction caused by humanity must be acknowledged and the position of humans within the ecosystem must be redefined. At this point, it would be correct to talk about climate justice and ecological security issues.

Climate change has consequences that directly affect human life, such as soil loss, increased access to clean water, damage to infrastructure facilities, damage to property, loss of agricultural lands, and extinction of living species. In this respect, it is directly linked to human rights and has consequences that violate it. Climate change can be associated with the concepts of environmental and social justice, as well as “*the concept of climate justice*”. Discussions within the framework of these concepts make visible the injustices that arise in the distribution of the effects of climate change among groups. In addition, “*the ecological security*” approach (Rogers, 1997), which deals with ecological degradation through a system approach instead of political stability and the creation of conditions that will meet the needs of society without disturbing the balance of nature, is based on the necessity of redefining humanity's place in the ecosystem and protecting and strengthening the function of the ecosystem. These concepts reveal that both the physical and social dimensions of place should be considered in preventing climate change and creating sustainable urban spaces.

In this context, this study aims to examine the concepts of “climate justice” and “ecological security” in the discipline of landscape architecture, to investigate landscape design strategies to reduce the unfair effects of climate change, and to examine successful sustainable urban design projects implemented in the world and Turkey. In the research method, the descriptive analysis method was used, and academic articles, reports and books on climate justice and ecological security, research on sustainable landscape design projects, reports and guides published by international organizations (e.g. United Nations, IPCC) were examined. Descriptive content analysis method is defined as a systematic compilation method carried out by the researcher in order to reveal the general trend and research results regarding any subject or discipline (Çalık and Sözbilir, 2014). In other words, descriptive content analysis is based on the process of selecting the literature on the subject to be researched according to certain criteria, regardless of whether it is quantitative, qualitative or mixed, revealing descriptive data about the selected literature and interpreting the obtained data (Çalık and Sözbilir, 2014). Thus, successful urban design projects that target and implement ecological security and climate justice in the urban landscape have been examined, innovative approaches have been revealed, and guiding suggestions have been made for architects, urban planners and landscape architects.

THE CONCEPTS OF CLIMATE JUSTICE AND ECOLOGICAL SECURITY

- **Climate Justice:**

Excessive use of resources and damage to the ecosystem has increased the global temperature and greatly changed the climate pattern. In this case, the fight for survival has become difficult for all living things, including humans (Kaçmaz and Özyayın, 2019).

Increasing temperatures due to climate change cause glaciers to melt. Therefore, sea levels are rising, and we are faced with extreme climatic events such as drought or floods and natural disasters more and more each day (Demir, 2022). Accordingly, with the decrease in agricultural areas, livelihoods are affected and food security is endangered (Demirbaş, 2021). While this situation leads to conflicts and instability, it also brings with it socio-economic consequences that will cause individuals to migrate and become displaced (IPPC, 2007). For example, in the study published by Paul Brown in the Guardian Weekly Magazine in 1999, it is mentioned that forests were destroyed in 1998, lands began to become infertile due to floods and drought, and approximately 25 million people had to migrate due to such problems. At the same time, it was emphasized that this situation is more than the number of people displaced due to wars so far. In the research report titled "Disasters in the World" (IPPC, 2007), it was stated that people who had to leave their lands due to the increase in natural disasters constitute 58% of the number of refugees in the world. The report also mentions climate change, the increase in forest fires and the ecological problems it causes (Kovel, 2004). In Turkey, in the 7.7 magnitude earthquake that occurred in February 2023, over millions of people had to migrate to other cities (Güneş Gölbeç, 2022) (Figure 1).



Figure 1. February earthquake in Turkey (Güneş Gölbeç, 2022)

The consequences of climate change extend over a long period of time. Climate change will negatively affect the health, economic peace and cultural life of future generations, and therefore the "issue of justice" between generations also comes to the fore. Scientists state that the fundamental rights of future generations, such as access to clean air and clean water and food security, are in danger due to the consequences of climate change (Demir, 2022). Although it is thought that the climate in the world is changing in the same way for all people, it makes the change feel more severe for people in an unequal, fair and unethical way (Demir, 2022). The regions that contribute the least to greenhouse gas emissions are the regions with the highest level of climate change vulnerability. This result became the focal point of

environmental movement groups and gave birth to the "climate justice movement" based on the environmental justice movement (Demirbaş, 2021).

The concept of climate justice, which was used for the first time in Weiss's book titled "In Fairness to Future Generations: International Law, Common Patrimony and Intergenerational Equity", published in 1989 (Schlosberg and Collins, 2014), has been used in international climate change issues since the 1990s. It was included in policies and issues such as historical responsibility (Schlosberg and Collins, 2014).

The principles of climate justice were listed at the Climate Change Environmental Justice Leadership Forum in 2009 (Ballibey, 2023): In the first principle, it was stated that a zero carbon economy should be established and targets for reducing greenhouse gas emissions by 25% by 2020 and 80% by 2050 have been set. In the second principle, it is stated that all people and communities of America should be equally protected without discrimination such as race, gender, nationality or socioeconomic status. The third principle mentions the need to ensure that carbon policies do not negatively impact public health and worsen existing health inequalities between communities. In the fourth principle, it is mentioned that those most responsible for climate change should be required to bear the cost of climate change proportionately - all environmental, health, social and economic costs of energy use. The fifth principle calls for a national target to transition from a fossil fuel economy to a green, clean and renewable energy economy by 2020. The sixth principle is to position the public sector to be a catalyst for change in the transition to a green, clean renewable energy economy by allocating a portion of revenues from carbon reduction strategies to support green, clean renewable energy initiatives. The seventh principle concerns creating the opportunity for all Americans, without discrimination, to participate in building and operating a green economy, especially people of color, indigenous peoples, and low-income people. Eighthly, provision of an economic and social safety net for vulnerable groups in the transition from fossil fuels to a renewable, clean and green economy was mentioned. The ninth principle involves providing job opportunities in the green economy for those who need to be retrained, those who have been historically underemployed, unemployed or excluded from unions. The tenth principle calls for ensuring that people of color, indigenous peoples, and low-income people who have been and continue to be disproportionately affected by climate change have the inalienable and inalienable right to have a say in the most important debate of the 21st century (Ballibey, 2023).

The concept of climate justice became the subject of public debate in 1999 with the report "Greenhouse Gas Gangsters and Climate Justice" by CorpWatch, which fights on the axis of environmental, social and human rights (Doğru, 2019). In this report, what climate justice is defined. Accordingly, climate justice means "removing the things that cause global warming and allowing the Earth to enrich our lives and the lives of all living things." This means radically reducing carbon dioxide and other greenhouse gases. In the USA, climate justice means that "the solutions put forward to prevent global warming should not hinder low-income people, people of color, or workers employed in the fossil fuel industry" (Doğru, 2019). Climate justice is providing assistance to communities threatened or affected by climate change. The best example of this issue is small island countries. According to research conducted by the World Resources Institute in 2013, least developed countries and Sub-Saharan African countries are among the regions with the lowest greenhouse gas emissions. In the 4th Assessment Report

published by the IPCC in 2007, it is mentioned that Small Island Countries are quite vulnerable to climate change. The evaluation in question was determined according to the regions' exposure to extreme weather events, the degree of sea level rise, and their capacity to protect themselves from the effects of climate change (Barnett and Cambell, 2010; IPCC, 2007).

As can be seen, there are a wide variety of approaches to the concept of climate justice. The common point of all of them is that climate change is caused by fossil fuels, and the attitude towards fossil fuels has become harsher over time, except for official documents. The necessity of reducing greenhouse gas emissions as soon as possible for the future of the planet has become even more important as a result of not taking any real measures to reduce fossil fuels. At this point, the discipline of landscape architecture is in direct relationship with natural life and resources. It is also highly affected by these negativities experienced in the world. It is able to plan, organize and repair by directly benefiting from natural elements in both planning and design studies at different scales. Today, ensuring the sustainability of natural life and resources and transferring them to future generations is among the primary duties of landscape architects (Güneş Gölbey, 2022).

- **Ecological Security:**

Ecology is defined as the relationships of organisms or groups of organisms with their environment (Acaroğlu, 1973). In today's ecology, the concept of “environmental security” should be reconsidered and the traditional environmental protectionist approach in order to ensure the natural balance in today's ecology, the continuation of the existence of the planet and the prevention of conflicts and to increase the capacity to adapt. In this sense, the concept of “ecological security” has been put forward (Kaya, 2019). Ecological security includes protecting the health of all living things, improving ecosystem services and much more (Lin et al., 2016; Çelik, 2017). There is a complex, continuous and reciprocal interaction between the living elements that make up the ecosystem and between living things and their non-living environment (Kaya, 2019). It aims at the degradation created by human beings on earth, its negative consequences and the elimination of these consequences. In terms of ecology, a secure ecosystem should maintain its structure over a certain time scale and at the same time be resistant and resilient to pressures (Xu et al., 2014; Çelik, 2017). In short, ecological security includes preserving the integrity of the ecosystem, making it resistant to degradation, restoring its degraded structure to a healthy state, and thus sustaining the lives of both humans and other beings, together, simultaneously and equally. For ecological security, the protection of wetlands, habitats, green areas and the survival of people are of equal importance.

Climate change is one of the most important factors that threatens all of humanity and leads to the acceptance of the deterioration of the natural balance on earth by all segments of society. In fact, it is stated that climate change defines as a new ecological process. In this context, studies on climate change also have an important place in the construction of ecological security (Uzun, 2022).

According to Timoshenko (1992), ecological security requires a new legal regime that is global, inclusive of all humanity, requires long-term awareness, and provides effective ecological protection. In this framework, ecological security is based on the principles of universality, justice and equality, covers the natural environment within and outside national borders,

interacts with other elements of security, takes into account the sovereignty rights of states, considers international cooperation as an indispensable condition, and suggests that international and national legal arrangements will be realized with the participation of intergovernmental and non-governmental organizations (Timoshenko, 1992).

In cities, ecological security focuses on two aspects of security: the security of the urban environment and the security of the future development of the city (Lin et al., 2016; Çelik, 2017). Global ecological security is becoming increasingly important due to serious pollution and ecosystem degradation, such as air pollution, water pollution, soil loss and degradation, desertification, reduction in forest cover, greenhouse effect, destruction of the ozone layer and reduction in species diversity (Çelik, 2017). Human beings have taken and continue to take many ecosystems under their sovereignty with their actions. There is strong evidence that humans have changed almost all ecosystems in the world. Half of the clean water in the world is used by humans. Again, almost half of the land is transformed by human actions to meet their own needs and desires. In addition to changing existing ecosystems, humans are also building new ecosystems. The most important ecosystems created by human actions are cities. Cities are techno-ecosystems that emerge with the reorganization of the natural system, consisting of interconnected subsystems, each with a unique function, and inhabited by industrial society. The fact that they change the structure of natural systems and occupy these areas causes cities to be defined as natural system parasites (Odum and Barrett, 2008). In particular, the concept of ecological security was developed from the theories and methods of landscape ecology. It is based on the pattern of landscape elements, their locations and spatial connections that are critical for the safety and health of ecological processes (Lin et al., 2016). In the 21st century, ensuring ecological security for humans has become an inevitable challenge in sustainable development efforts (Li et al., 2015).

THE RELATIONSHIP BETWEEN CLIMATE JUSTICE, ECOLOGICAL SECURITY AND LANDSCAPE ARCHITECTURE

Landscape is a socio-ecological system consisting of a mosaic of natural and human-based ecosystems. The structure of the land, vegetation, land use, ecological, historical, economic and cultural processes directly affect the structure of the landscape system (Sunderland, 2014). Landscape architects are a professional discipline that combines scientific and artistic principles and follows an interdisciplinary and holistic approach for the protection of natural areas and biodiversity, sustainable use of natural resources, and planning and designing healthier and livable spaces for the welfare of people. In other words, landscape architecture is a profession that should take an active role in the process of mitigating the ecological, economic and socio-cultural impacts of global climate change (Landscape Institute, 2008). In this framework, landscape architects can make a significant contribution to the fight against global climate change through landscape planning studies.

The productivity of the landscape system provides a range of ecosystem services to local communities. In this context, one of the most important ecosystem services provided by the landscape is the 'Carbon Footprint'. Carbon footprint refers to the amount of environmental damage caused by greenhouse gas emissions from human activities (e.g. the use of fossil fuels). However, trees are one of the smallest landscape components that absorb carbon dioxide and

produce oxygen. For this reason, landscape architects should carry out studies to understand and calculate the carbon footprint within the scope of current landscape planning and design studies. International organizations of landscape architects (e.g. IFLA and ASLA) have initiated collaborative efforts (e.g. resilient landscape design) to combat climate change and reduce carbon footprint (Conrad, 2018). In this context, a 'resilient landscape' approach can be an important initiative in combating climate change. Resilience refers to the capacity of a system (e.g. urban landscape) to cope with and adapt to disruptive factors (e.g. global climate change and warming) (Fadeyi and Maresova, 2020; Zhou et al., 2010).

Today, resilience theory has been integrated into many fields of study (e.g. economics, landscape and urban planning) by natural and social scientists (Plummer and Armitage, 2007). The resilience of the socio-ecological landscape system consists of the resilience of ecological and social systems (Walker and Salt, 2006). The main criteria that help us to assess the resilience of the ecological system are biodiversity, spatial heterogeneity, availability of genetic resources and connectivity. The main criteria that help us measure the resilience of the social system are food security, economic development, cultural heritage, knowledge production, education, infrastructure and connectedness (e.g. strengthening social networks and cooperation among individuals) (Walker and Salt, 2006). The resilience of the social system is directly and/or indirectly related to the resilience of the ecological system. The coadaptation of ecological and social systems contributes to the resilience of the socio-ecological landscape system (Walker and Salt, 2006). The resilient landscape approach refers to the capacity of the landscape system to cope and adapt to changes caused by global warming. In this context, landscape architects can contribute to the fight against global climate change on the basis of two interrelated issues: Climate change mitigation and climate change adaptation.

Mitigation of the impacts of climate change: Mitigation refers to activities to limit climate change by reducing greenhouse gas emissions and/or increasing the capacity of natural systems to sequester carbon (Fadeyi and Maresova, 2020; USGCRP, 2018). Mitigation focuses on addressing the root cause of climate change and global warming. The Paris Agreement aims to reduce global greenhouse gas emissions by 40% by 2030. Therefore, each country should prepare and implement its own national plan (USGCRP, 2018). For example, with the National Action Plan on Climate Change (2011-2023), Turkey has developed targets to limit GHG emissions from buildings (e.g. thermal insulation and efficient energy systems in buildings), transportation (e.g. promoting cycling and public transport), industry (e.g. using new technologies and energy sources to reduce GHG emissions), agriculture (e.g. identifying and increasing the amount of carbon sequestered in soil), land use and forest (e.g. forest, wetland and meadow-pasture). Within the framework of these targets, climate change policies are developed to reduce greenhouse gas emissions and increase the use of clean and renewable energy sources (e.g. solar and wind energy) (McHarg, 1969).

Adaptation to climate change: Adaptation refers to adjustments to natural and social systems to reduce the negative impacts of current and expected climate change (IPPC, 2007). Adaptation activities should aim to provide short- and long-term environmental, social and economic benefits. Even with current efforts to reduce greenhouse gas emissions and global warming, some change in climate is inevitable. Therefore, adaptation to climate change is a necessity. While efforts to mitigate the impacts of climate change can be achieved at the national and

global level, adaptation efforts can be realized at the local scale. Many adaptation-based planning processes include a range of policies to control the risks posed by expected environmental changes. Risk analysis aims to understand the potential impacts of climate change, changing conditions and vulnerabilities (Fadeyi & Maresova, 2020).

Along with climatic conditions, urban surfaces also significantly affect the quality of life and environmental conditions in urban areas. The scarcity of natural, permeable surfaces leads to significant air temperature increase in urban areas and increases the urban heat island effect (Acar and Yavuz, 2023). Impervious surfaces and the increase in precipitation caused by climate change pose significant challenges for urban watershed ecosystems. These conditions significantly alter the urban hydrological process, including the frequent occurrence of flood events and a rapid increase in runoff (Zhao and Huang, 2022). In contrast, forested areas help to mitigate adverse conditions by reducing or preventing the runoff rates of precipitation. Water bodies such as rivers and lakes act as storage carriers to store runoff. Impervious surfaces, on the other hand, prevent water from seeping into the soil (Zhao and Huang, 2022). Again, materials such as concrete, asphalt and stone used on the ground cause the environment to heat up more. Since these materials have low albedo and even absorb the sun's rays more when they are dark in color, they cause heating and heat their surroundings with terrestrial radiation. This is the reason for the increase in heat in cities (urban heat island). Since the rays emitted into the atmosphere by terrestrial radiation are also long wavelength, they are reflected by greenhouse gases towards the earth and global warming is increased (Croce and Vettorato, 2021).

Environmental problems that threaten human health, such as the urban heat island effect and air pollution, will be felt more acutely with global climate change (Jin et al. 2021). Many studies have confirmed the link between urban development and climate change, and the unique climate risks faced by urban areas, such as heat waves and flooding (Croce and Vettorato, 2021). As these negative impacts of climate change on our cities are felt, awareness has started to emerge. Increased awareness, coupled with increasing urbanization, has drawn attention to the inherent capacity of “Urban Design” to mitigate evolving social and environmental challenges. The United Nations “2030 Agenda for Sustainable Development” includes a series of measures aimed at balancing economic progress and protecting the environment (Acar and Yavuz, 2023). This plan for a more sustainable future for all consists of 17 goals and 169 targets and supports the urgency of sustainable and resilient management of urban open space. The main objective of Sustainable Development Goal (SDG) 11 “Sustainable Cities and Communities” is to “make cities and human settlements inclusive, safe, resilient and sustainable” (Acar and Yavuz, 2023). There are several strategies to achieve these SDGs and increase urban resilience, while promoting the appropriate design and construction of open spaces (parks, residential squares and plazas) as a component of green infrastructure. These strategies include a range of benefits, such as quality and fulfilling design, an urban environment that supports biodiversity, improving the urban hydrological system through stormwater management, and supporting human health by providing opportunities for social interaction (Wang and Foley, 2021).

In this context, nature-based solutions come to the forefront in ensuring the sustainability and resilience of cities in order to reconsider and maintain the human-nature-city relationship in a healthy way. Nature-based solutions that link ecosystems, climate, biodiversity, socioeconomic and sociocultural systems offer effective and feasible solutions to urban problems within a

socioecological framework. Ecosystem services and blue-green infrastructures as a source of ecosystem services within nature-based solutions are conceptual approaches that will improve and develop human-nature-urban relations in social, economic and ecological dimensions at different spatial scales.

INNOVATIVE APPROACHES USED IN URBAN LANDSCAPE DESIGN TO ACHIEVE CLIMATE JUSTICE AND ECOLOGICAL SECURITY

The fact that urbanization and economic development accompany each other in the historical process has led to the development of Western countries in the 17th and 18th centuries (Kaya and Susan, 2020). In this period, the agricultural society was replaced by the urban industrial society. Also, nature was seen as an unlimited resource, while cities in Western countries were growing with great migrations. This economic growth and development model was shown as a universal model to all countries of the world after World War II. Countries except for the West not only participated in the industrialization process in which the environment was polluted, but also had large urban areas as a result of the rapid urbanization processes they underwent while agricultural production decreased (Kaya and Susan, 2020).

In the period of economic restructuring that began with the globalization process, it is seen that developing countries that want to attract fluid capital in the global competitive environment - generally aiming for economic growth - host industries that destroy the environment. While the destruction of the environment continues in different ways, problems such as insufficient agricultural production and the increasing need for clean water to meet the food needs of the rapid increase in population are gradually increasing. However, today, environmental problems have reached a global scale, in other words, the destruction caused to the environment has become a threat to humanity. These situations show that climate justice and ecological security must be ensured.

As a matter of fact, increasingly crowded cities are expanding and growing uncontrollably for destroying the agricultural and forest areas around them and polluting water resources. Today, in cities, it is seen that environmentally damaging consumption styles have developed, such as the use of fossil fuel-consuming automobiles, which have become widespread with technological development to overcome the increasing travel distances between workplaces and residences (Kaya and Susan, 2020). However, the problems caused by this new lifestyle are not limited to air pollution and health problems, but also confront the world community with new problems such as global climate change due to the increase in carbon footprint. For this reason, it has become necessary to develop new urban landscape planning and design approaches against the concern of consuming and losing the natural environment, which is a source of life for all living things on earth, which has changed and continues to change in the 21st century (Emilsson and Ode Sang, 2017). There are various opinions about what a sustainable city should be its urbanization style and the city planning approaches to be developed in this direction (Table 1). When the landscape planning and design examples that have been carried out, are currently being implemented and are planned to be implemented regarding urban climate resilience are examined, two issues primarily stand out; (i) rainwater management and resilience to floods and (ii) conservation and enhancement of biodiversity (Kaymaz and Arslan, 2022).

Table 1. Design and planning approaches for sustainable cities planned within the framework of ecological security and climate justice.

Theorists	Planning and design considerations for resilient and sustainable cities/society
Lynch (1984)	Lynch (1984) talks about an urban form having qualities such as vital (safe, coherent and sustainable), logical (identifiable, structured, harmonious, transparent, legible, developable and significant), manageable, flexible, achievable (diverse, equitable, locally manageable) and controllable (harmonious, reliable, and he argues that these will be achieved through justice and internal efficiency).
Van Geenhuysen ve Nijkamp (1994)	They define sustainability in the urban context as the potential to reach a new level of socio-economic and technological development with environmental conditions that support the foundation of the urban system in the long term. In this context, the principles of sustainable urban development can be listed as strong economy, clean environment, social equality and participation.
Eryıldız (2011)	While a city meets the needs of its inhabitants, it should not, now or in the future, endanger the living conditions of other people and the biodiversity of the natural environment. Such a city should be able to feed safely from the rural area surrounding it and power itself with renewable energy sources.
Wheeler (2013)	Wheeler (2013) considers the factors such as compact and effective land use, less motor vehicle use, ease of access, effective resource use, less pollution and waste, restoration of natural systems, creation of quality shelter and living environments, healthy social ecology, preservation of local culture, sustainable economy and ensuring public participation for sustainable cities.
Çalışkan (2004)	It draws attention to the need to support urban design codes that facilitate pedestrian-oriented movement for the sustainable development of cities. The main reason for this is that sustainability prioritizes reducing the energy dependency of societies.

Ecological planning focuses on "mitigation" and "adaptation" and adopts the principle of meeting the needs of societies for a sustainable life without disturbing the balance of natural ecosystems (Leichenko, 2011). These action areas have been determined according to their maximum direct benefit to urban development, sensitivity to climate justice and ecological security, inclusion of natural-based solutions and their feasibility.

Within the scope of the built environment, "buildings, transportation, open spaces and infrastructure" are taken into account.

❖ **Buildings: The three most basic principles that stand out in buildings in the context of climate-sensitive cities are as follows: Efficiency, locality, circularity** (Rosenzweig, 2011).

- *Efficiency* refers to the efficient use of all resources consumed in order for a building to continue its life cycle. Here, the issues of energy efficiency and efficient use of water

resources come to the fore first. The more fossil fuel-based energy consumed is reduced, the lower carbon emissions will be. In this context, it is possible to develop different strategies for existing building stock and newly produced buildings. For example, while retrofitting interventions such as thermal insulation and roof insulation can be made in existing buildings, newly produced buildings can be designed with small volumes and practices that will ensure energy efficiency from construction to use can be implemented (Rosenzweig, 2011).

- *Locality* refers to the design of buildings suitable for the climatic conditions of the place where they are located, the use of materials suitable for local climatic conditions and the use of local resources (manufacturing, materials, human resources, etc.) in construction processes.
- The principle of *circularity*, which is a part of the principle of *efficiency*, refers to transforming the inputs the building receives from the environment after use and minimizing the waste it leaves to the environment after reuse (Rosenzweig, 2011). For example, it collects, stores and distributes energy. This process should be structured so that there is minimal energy loss.

Cyclic water use steps in the building (Rosenzweig, 2011):

- Dividing water into two for “hygiene” and “use”,
- Using tap water for drinking/cooking as hygienic water,
- Using the rainwater collected in tanks on the roof to flush fountains and toilets,
- Using the water used in the bathroom and sink for garden irrigation with a purification system to be installed at home,
- To use the gray water purified in the city treatment system for irrigation in city parks after purification.

Building location selection criteria (Rosenzweig, 2011):

- Position relative to the sun's angle,
- The climate, natural character and form of the place,
- Soil qualities,
- Groundwater characteristics.

Building elements (Williams, 2007):

- A shell that breathes, can keep water out, can cool by evaporation, and is closed against moisture and cold,
- Multi-layer composite material on the outer surface,
- Sheathing on the outer shell to increase the insulation level,
- Heat tank and pump for passive solar heating,
- The tanker where rainwater will accumulate and the cistern reached by the gutters that transport the rain,
- Purification system that cleans water and allows it to be reused.

In this context, "passive design and biophilic design" come to the fore. In passive design, all requirements and all waste to the environment are minimized, solar panels and insulation design are the most important design elements (Browning et al., 2014). However, it heats up without resorting to active heating and uses 90% less energy to heat than regular homes. Biophilic design, on the other hand, focuses on the natural bond between humans and all living systems, aims to establish permeable connections between nature and the human-made environment, incorporates natural systems into the structure, observes the continuity of plant systems in indoor and outdoor spaces, makes maximum use of natural light, prefers organic/natural materials and uses water elements (Browning et al., 2014). The best examples of these approaches are (Browning et al., 2014) (Figure 2):

BedZED, South London, England: The UK's first large-scale, mixed-use sustainable community comprises from 100 homes, office space, a school and community facilities. 15% of building materials were obtained from recycling.

The Solar Settlement, Freiburg, Germany: The "Solar Settlement" project consists of 59 residential buildings. All residences are built of wooden construction using only healthy building materials and all have a large photovoltaic module roof. The settlement has a covered underground car park and a well-organized car sharing system.



Figure 2. BedZED, England (a) and The Solar Settlement, Germany (b) (Browning et al., 2014).

- ❖ **Transportation: The three most basic principles that stand out in transportation in the context of climate-sensitive cities are as follows: Energy efficiency, accessibility** (Ahmad et al., 1989).
- *Energy efficiency* is associated with reducing the amount of energy consumed in urban transportation and keeping the energy used clean. The most basic strategy of the efficiency principle is to maximize the transition from private vehicle use to public transportation systems.
- *Accessibility* refers to the easy accessibility of different parts of the city, such as the central business district, residential areas, and working areas, by using alternative public transportation types (rail systems, seaway, bus, bicycle, pedestrian, etc.).

Steps to reduce private vehicle use (Ahmad et. al., 1989):

- Limiting urban parking lots,
- Constructing car parks at certain distances from the city center on public transportation axes,
- Charging for car use in city centres,
- Establishing shared private vehicle use systems.

Steps to popularize bicycle and pedestrian use (Ahmad et. al., 1989):

- Building safe roads for pedestrians and bicycles,
- Connecting pedestrian and bicycle paths with public transportation stops,
- Ensuring spatial maintenance of pedestrian and bicycle paths,
- Placing bicycle transport mechanisms in public transportation types,
- Increasing the number of common open spaces that allow free pedestrian use,
- To ensure accessibility of these areas to people of all ages, genders and physical conditions,
- To make areas safe for walking, pedestrian and bicycle use, as well as vehicle traffic, with traffic management and measures such as speed-reducing flooring differentiation and speed bumps,
- Organizing events to encourage urban residents to ride bicycles,
- To make cycling and walking an urban culture through different social activities (bicycle competition, cultural organizations in common areas, urban visual media, etc.).

Examples that take these approaches into consideration are as follows (Urban Research Institute, 2020) (Figure 3):

Amsterdam, Netherlands: Divided bicycle path application for safe driving in urban transportation.

Groningen, Netherlands: Pedestrian-oriented application at pavement-road intersections and examples of integrated solutions for pedestrians, bicycles and vehicles at intersections.

London, England: Bus lane application to encourage the use of public transportation by reducing the time spent in traffic in urban transportation.

Seoul, South Korea: Road diet app. Due to traffic congestion and health problems, the viaduct was demolished after its environmental connections were strengthened with rail systems, and the old stream bed was revived and opened to public use.



Figure 3. Amsterdam-bike lane application (a), Groningen-integrated solution proposals for vehicles (b), London-bus lane application (c), Seoul-road diet application (Kent Arařtırmaları Enstitüsü, 2020).

- ❖ **Common Open Spaces: Squares, sidewalks, parking lots, green areas, parks and gardens are defined as urban common open spaces. In the context of climate-sensitive cities, the two most basic principles that stand out in urban common open spaces are determined as follows: Continuity and permeability (McHarg, 1969).**
- The *continuity* of these areas ensures the balance between the structural masses and breathing spaces in the city. Pointed and unconnected open and green space applications, which have been converted from the areas left over from the construction of the city, cause a break in continuity throughout the city. This will significantly reduce the benefit of open and green areas to the city as a whole. In addition, unsustainable open spaces will cause unfair problems between different parts of the city, resulting from the lack of open and green space services (McHarg, 1969).
- The principle of *permeability* emphasizes the ground structure and properties of open areas and their structure that allows water to be absorbed within the city, creates a cooling effect through evaporation, absorbs carbon and cleans the air (McHarg, 1969). In other words, open spaces are urban breathing spaces.

Urban open spaces system steps (McHarg, 1969) (Figure 4):

- Afforesting unstructured areas as much as possible or providing them with appropriate vegetation structure,
- To popularize vegetable and fruit gardening in open areas such as building terraces, school gardens and neighborhood parks,
- To carry out urban gardening with the participation of the public as a means of social strengthening and healing,
- Connecting all green areas as a network, from parcel scale to district, neighborhood and city scales,

- Ensuring green continuity by afforestation along the road,
- Ensuring hard-soft ground balance in open areas,
- Avoiding surface covers that consume a lot of water, such as grass, in open areas,
- Using certification systems such as SITES4 for open spaces.



Figure 4. Tokyo, Japan - application of a square with high water permeability, offering pedestrian comfort with its shady areas, with a balanced hard-soft ground balance (a), Stockton, California, USA - an application example that allows social interaction while creating an urban coolness effect by using water elements in the square (b), Herning, Denmark - tree shade (c), Rotherham, England - planting roadsides and using meadow mixes to support wildlife (d) (Kent Arařtırmaları Enstitüsü, 2020).

- ❖ **Infrastructure: Climate-sensitive solutions for buildings, transportation, open and green areas, which are discussed under the title of urban built environment, create a need for infrastructure that can respond to climate change, beyond the traditional urban infrastructure understanding. The two most fundamental principles that stand out in urban infrastructure in the context of climate-sensitive cities: Circularity and compatibility with nature** (Emilsson and Ode Sang, 2017).
- *Circularity* refers to using urban waste as a resource again, through cycles such as reuse and recycling, and minimizing the waste left to nature after using resources.
- *Compatibility* with nature means being inspired by nature, using local natural resources and working in harmony with the rhythm of nature.

In this context, "nature-based solution searches" and "blue-green infrastructure" studies are on the agenda. Rainwater ditch, artificial wetland, infiltration pit, green damming for erosion control, edible garden, roof garden, urban orchard are some of these solutions.

Steps for cyclical use of water (McHarg, 1969):

- To protect infiltration areas such as green areas, agricultural areas, pastures and forests so that rainfall can form a groundwater layer (aquifer),

- Establishing rainwater collection systems,
- Harvesting rainwater.

Pennsylvania, USA: A typical rainwater harvesting system collects water into a storage tank for both potable and non-potable purposes (landscaping, toilets, flushing, etc.). Each square meter of the roof area collects an average of 7.37 liters of rainwater for one centimeter of rainfall (Arslantaş et al., 2020) (Figure 5).



Figure 5. Pennsylvania - a typical rainwater harvesting system (Kent Arařtırmaları Enstitüsü, 2020).

Steps for circular use of solid waste (Kent Arařtırmaları Enstitüsü, 2020):

- Rejecting waste by giving up using unnecessary resources,
- Reducing waste by reducing the need for resources,
- Using organic garbage as fertilizer and biogas,
- After cleaning urban wastewater from pollutants with biological methods, drying it and turning it into fertilizer,
- Converting old garbage areas into green areas.

Steps for circular use of energy (McHarg, 1969):

- Encouraging unlicensed electricity production in the electricity market,
- To guide the establishment of renewable energy cooperatives,
- To control the energy identity certificate in building use permit processes and to ensure the energy efficiency of buildings at the highest level.

Furniture Makers Renewable Energy Production Cooperative, Kayseri, Turkey: Turkey's first operational Renewable Energy Cooperative, established in Kayseri (Kent Arařtırmaları Enstitüsü, 2020) (Figure 6).



Figure 6. Furniture Makers Renewable Energy Production Cooperative, Kayseri (Kent Arařtırmaları Enstitüsü, 2020).

Blue-green infrastructure, on the other hand, combines urban hydrological functions with nature using landscape design and planning (Kaya and Susan, 2020). It uses blue (water) and green (vegetated landscape) together to avoid the effects of climate change, especially floods and floods.

Tanner Springs Park, Oregon, USA: The park, which is a blue-green infrastructure application, ensures the revitalization of the wetland that existed before the urban transformation in the region and also functions as a natural drainage area (Kruse, 2015). Urbanites have the chance to experience different pedestrian platforms depending on the amount of rainfall and changing water levels (Kruse, 2015) (Figure 7).



Figure 7. Tanner Springs Park's drainage system (a) and blue-green infrastructure application in the park (b) (Kruse, 2015).

This project, which won the 2022 ASLA Honor Award in the "Analysis and Planning" category, develops a new spatial fiction for Moakley Park in Boston. In the project prepared by Stoss Landscape Urbanism, it is aimed to combat the effects of sea level rise, as well as to re-establish the connection of the city with the port and to provide access to the park for all segments of society (ASLA, 2022). The main problems regarding the park area are defined as difficult

access, lack of diversity of use and exposure to regular floods. In this direction, the design team guided the design with strategies including increasing the accessibility of the park with safe connections, providing multifunctionality and diversity of use to the park, and finally flood protection and rainwater management (ASLA, 2022).

In the project, where resilience and multifunctionality form the basis of the design fiction, existing sports facilities are modernized, while innovative green infrastructure systems such as rainwater meadows, green corridors, and the use of permeable flooring materials are included in the context of climate-sensitive landscape design (Kaymaz and Arslan, 2022). The new topography proposed to prevent coastal floods also reveals a landscape design for recreation and socialization purposes. Restored dunes along the coast will soften the impact of wave action and provide habitat Function (Figure 8).



Figure 8. Moakley Park Resilience Plan-landscape design for coastal area flood risk reduction (ASLA, 2022).

Philadelphia is a city where water resources are polluted, and floods occur after rain. Green City Clean Water Project developed to address this problem aims ensuring the purification, using of rainwater by preventing the risk of floods and reusing of wasted rainwater (Green City Clean Water, 2022). For this, it recommends reducing the intensity of floods by connecting rainwater to existing drainage systems by using green infrastructures (Green City Clean Water, 2022). In this regard, the main aim of the project is to make local waterways clean and healthy, while increasing green areas at the neighborhood scale, creating healthy, vibrant and living spaces, and thus ensuring the sustainability of the city (Green City Clean Water, 2022). The project also aims to provide benefits in environmental, social and economic dimensions. The project, which was started by the Philadelphia Water Department in 2011 and has been continuing for 10 years, covers a 25-year plan. Blue-green infrastructure practices such as drainage wells to collect and store rainwater, plants to absorb rainwater, street trees, rain gardens, green roofs and sustainable drainage systems were used in the Project (Figure 9).



Figure 9. Examples of rain garden (a) and sustainable drainage system (b) (Green City Clean Water, 2022).

The principles of "*conservation and integrity*" are taken into consideration in protecting and sustaining the natural environment within the framework of ecological security and climate justice (Ahmad et.al., 1989).

- The principle of *conservation* refers to the protection of carbon-absorbing and water-permeable areas rich in ecological features on the periphery and inside of the city, and not allowing any construction that would disrupt the biodiversity balance in these areas.
- The principle of *integrity* unites the ecological regions within and around the city, and expresses the continuity of the functioning of the ecological order as a whole within the borders of the city-region. In other words, it refers to the integrated relationship of natural areas such as forests, wetlands, rivers and stream beds (Kent Arařtırmaları Enstitüsü, 2020).

Steps to integrate natural areas with the city (McHarg, 1969):

- Establishing wildlife corridors, wildlife parks and wildlife conservation areas,
- Using rainwater as accumulation, flood and storage area,
- Creating natural corridors in the city center where the temperature rises, solar radiation increases and wind speed decreases,
- Establishing a functional (recreation and relaxation) and aesthetic bond between the city and nature,
- To provide urban residents with direct access to nature.

Some of the best examples in this context are:

West Germany: Green belt application used in land use planning to surround agricultural land and determine the growth limit of adjacent urban areas (Shuman, 1998) (Figure 10).



Figure 10. Green belt application used in land use planning, West Germany (Shuman, 1998).

Wetland buffer, Bear Creek, Iowa, USA: Wetland buffers, consisting of natural or cultivated areas adjacent to bodies of water, reduce storm and polluted runoff, excessive sedimentation and erosion, and assist in groundwater recharge (Kent Arařtırmaları Enstitüsü, 2020) (Figure 11).



Figure 11. Wetland buffers, Bear Creek, USA (Kent Arařtırmaları Enstitüsü, 2020).

Establishing ecological balance is important in protecting and maintaining **agricultural areas**. It is necessary to design cities by taking food production processes into consideration. Industrial agricultural products that are cheap and transported from long distances cause environmental and social damage (Mougeot, 1999). Accordingly, drugged and genetically modified products (animal, fertilizer, seed chain) may deteriorate human health, increase the amount of carbon released, poor people cannot access food, and the poor people may regress in their learning, working and progress processes due to nutrition. In this context, two basic principles come to the fore. These are “*conservation and locality*” (Mougeot, 1999).

- *Conservation* refers to protecting food production areas on the urban periphery and/or within the city and ensuring their continuity in ecological balance. This principle is important in ensuring that agricultural lands are not sacrificed for urban construction. These areas, where food is supplied to the city, also have high carbon sequestration potential in terms of climate change (Mougeot, 1999).
- The principle of *locality* is the principle that agricultural production is carried out in the immediate surrounding geography using local resources (traditional seeds, production and networking methods, marketing, etc.) and that the products produced as a result are consumed in the same geography. This principle is also related to the protection of the agricultural biodiversity of the place where agricultural activity is carried out (Mougeot, 1999).

Steps to integrate agricultural areas with the city (Mougeot, 1999):

- To include agriculture as an alternative form of land use (such as community gardens) in urban plans, without pushing it completely out of the city,
- To use urban wastewater as input in agriculture after going through certain processes.

Detroit, Michigan, USA: Urban agriculture application carried out with public Participation (Figure 12).



Figure 12. Urban farming practice, Detroit, USA (Kent Arařtırmaları Enstitüsü, 2020).

The De Tuin Biodivers Project was developed as a result of a process that started in the municipal council and later turned into a social initiative, for the land where a building was planned to be built, but was abandoned due to the economic crisis (Arslantař et al., 2020). The garden created within the scope of the project is a local-scale urban agriculture and gathering area that can be called an urban kitchen garden. In the project, which has an area of 0.20 hectares, a design approach was adopted to preserve the local character without disturbing the existing natural structure. At the same time, the design of the garden (for example, roads) is shaped according to user experiences (Arslantař et al., 2020). The image below shows the layout plan of the garden (Figure 13).

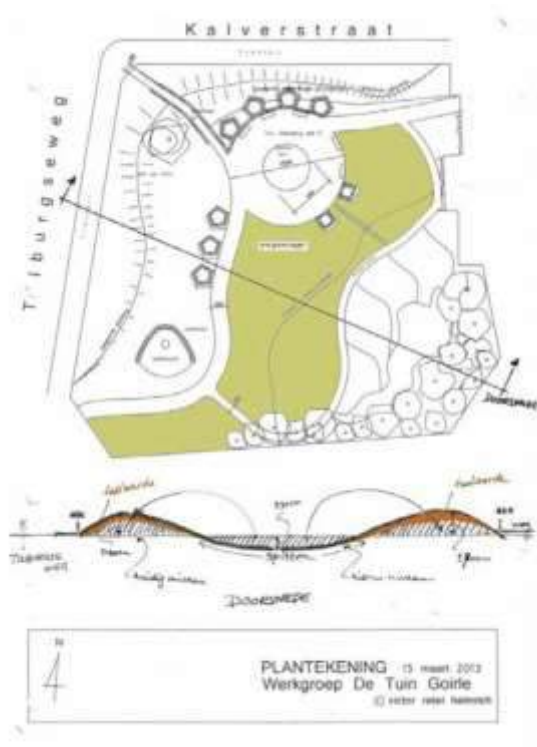


Figure 13. The De Tuin Biodivers project site plan (Arslantaş et al., 2020).

The garden is a part of the urban agriculture system that exists throughout the Netherlands. In this system, urban agriculture activities are carried out on pieces of land which is rented by the municipality and are open to public use (Arslantaş et al., 2020). These areas are managed by a team of local people and experts. The basic rule for the users of the garden is to produce with organic farming methods to prevent soil degradation, thus this situation will contribute to the protection of the ecosystem (Arslantaş et al., 2020). Apart from this rule, during each harvest period, users can share their experiences, excess products, etc. with other users. Thus, these areas also have the characteristics of public spaces. The use of rainwater was adopted as the basic principle in the design. Elevation differences in the land were also considered in the design to reduce irrigation needs (Arslantaş et al., 2020).

In addition, Landprocess, a Bangkok-based landscape architecture firm, designed the Thammasat University Urban Rooftop Farm in Thailand. The design team, repurposing an unused empty area of 22,000 square meters, built Asia's largest organic rooftop farm (Koca, 2021). The team integrated traditional rice terraces with modern green roof strategy have provided the city with a lush public space for sustainable food production, renewable energy and water management. The steps, which are inspired by traditional agricultural practices in the mountainous lands of Southeast Asia, provide suitable areas for growing food and minimize the risk of floods (Koca, 2021) (Figure 14). The project integrates landscape architecture with traditional rice terraces. It brings together sustainable food production, renewable energy, organic waste, water management and public space. The H-shaped architecture located on the main axis of the campus symbolizes egalitarianism and democracy. Each room, divided into four equally accessible sections, represents the concepts of "human being, freedom, equality and fraternity", which are the four basic elements of democracy (Koca, 2021). More than 40 edible species, including rice, local vegetables, herbs and fruit trees, grow at Thammasat

University's Urban Rooftop Farm. Each of the traits in the project from water tolerance to drought resistance can adapt to factors such as exposure to sunlight, curvature, water flow, ceiling height (Koca, 2021).



Figure 14. Thammasat University Urban Rooftop Farm roof section (a) and agricultural fields (b), Bangkok (Koca, 2021).

Today, in the context of climate change, the search for urban agriculture has begun again. Urban agriculture increases food security, creates a sense of belonging, ensures fresh and healthy food, provides learning opportunities, offers efficient land use.

Steps to organize urban food systems (Shuman, 1998):

- Establishing local food systems in a way that contributes to the formation of ecological/organic markets,
- Providing alternative food distribution and marketing opportunities (direct sales, sales points, markets, etc.) for ecological/organic farming practices,
- Establishing Consumer Cooperatives and Community Supported Food Networks that work through direct orders from farmers,
- Organizing training activities on permaculture,
- To support ecological farms that will offer urban residents the opportunity to experience natural food production through volunteering and being guests in village houses.

Local governments lead the way in marketing ecological/organic agricultural products adapted to biodiversity and regional conditions. Founded in Şişli in 2006, Buğday Ecological Life

Support Association today has 16 organic markets, 7 of which are 100% Ecological Market branded, and has increased fourfold in the last 16 years (Mougeot, 1999). In 2002, the number of farmers was 12,428; today it has exceeded 70,000 (Ayla and Altıntaş, 2017). “Organic Network” was established to develop organic production in Turkey. Thanks to food communities, nature-friendly local producers earn direct income, the city's access to healthy food becomes easier, and CO2 emissions are reduced when supplying food from long distances (Mougeot, 1999).

"Governance" has a great role in the implementation of all these approaches. The governing can conceive of local climate action as a process of social change. Four basic governance principles are adopted in the climate action process: *Participation, justice, inclusiveness and transparency* (Urban Research Institute, 2020).

- *Participation* refers to the full participation of relevant groups in decision-making processes in local climate action. In other words, participants have full rights in creating the decision (Reese, 2016).
- *Justice* means preventing poor and disadvantaged vulnerable communities, who have the least responsibility for experiencing climate change, cannot fully benefit from urban services, and are most affected groups by the consequences of climate change. The principle of justice also advocates an equitable distribution of the benefits (e.g. economic growth) and costs (e.g. environmental degradation) associated with climate change.
- *Inclusion* adopts a holistic human-centered approach. It refers to the situation of creating a “society for everyone”. It advocates embracing all segments of society and responding to everyone's needs (Reese, 2016).
- *Transparency* means that the decisions taken and steps taken in local climate action are visible, traceable and auditable. It is one of the most basic conditions for effective participation

The approaches and examples examined within the scope of the study show that they are created at various scales and qualities, from building scale to city scale. The study includes practices that are considered within the framework of ecological security and climate justice, some of which are spatialized as a result of policies developed at the country scale, and some of which are produced with local dynamics. In line with the examples examined, nature-based approaches, blue-green infrastructures, passive and biophilic designs and urban agriculture are seen that there are systems developed with collaborations involving different stakeholders in qualified, multifunctional, integrated and holistic structures. These approaches have a great importance in creating resilient and sustainable cities.

CONCLUSION AND SUGGESTIONS

In this study, the functions of urban green space components within the scope of urban climate resilience and the framework of ecological security and climate justice are exemplified through international practices. When both the literature review and project examples are considered, it is seen that urban green areas make a wide range of contributions to climate change adaptation and impact mitigation, both ecologically and socially. While current approaches focus especially on rainwater management (regulatory services), flood control (regulatory services)

and enrichment of urban biodiversity (supporting services), it is seen that urban agriculture (supply services) has also begun to be included in urban green space policies. In addition, equal and easy access of all social groups to public green spaces (cultural services) and the involvement of vulnerable groups against the effects of climate change in related activities and decision-making processes have formed the basis of many applications. In line with the data obtained, it becomes clear that it is necessary to consider the urban landscape and urban green as a holistic system and to evaluate it in terms of different ecosystem services. Also, strengthening interprofessional communication and cooperation and revising the spatial planning legislation for holistic planning are especially important for our country.

Our world is polluting, warming and changing at the same rate as the rapidly increasing population growth. Problems such as fossil fuel consumption, conformist needs of modern-day people, greenhouse gases, decreasing clean and potable water resources, environmental pollution, increasing forest fires await us today and in the future. In order for a sustainable world to be possible, it is necessary to struggle in many areas, and in this process, like all professional disciplines, the landscape architecture discipline, which best recognizes the relationship between nature and human beings and plays a role in shaping it, plays an important role. The role of the landscape architecture, which is involved in almost every scale of nature-based studies and creates environmental balances, cannot be denied. On the other hand, the world's sustainable development goals, which extend until 2030, have titles that directly concern the profession, such as creating sustainable cities, protecting terrestrial and aquatic ecosystems, and combating global climate changes.

Urban landscape, which is defined as a socio-ecological system, contributes to the improvement and development of the quality of life people's lives in environmental, economic and socio-cultural aspects. Unfortunately, intense urbanization activities cause various problems such as the fragmentation of the urban ecosystem and the decrease in the spatial heterogeneity of the urban landscape. There is a need to improve and develop the urban landscape ecology in order to reduce the effects of these problems and to sustain the benefits offered by the urban landscape. The improvement and sustainability of urban landscape ecology can be achieved by establishing a balance between the ecological and social processes that make up the urban system, and ensuring climate justice and ecological security. It is thought that the specified balance will contribute to the protection and sustainable management of natural resources and ecological processes, the improvement and enrichment of heterogeneity in the urban landscape, the establishment of connections between habitats and the self-renewal capacity of the space. Many areas where landscape architects work are considered as buffer zones used to slow down climate change. Examples of these areas are carbon sinks where carbon dioxide (CO₂) and other greenhouse gases released into the atmosphere are absorbed. Wetlands, nature conservation areas, forest areas, urban open green areas, gardens and parks, in which landscape architects take part in various tasks and stages, are the most effective weapons in the fight against global warming with the biomass they harbor (Yazıcı & Gülgün, 2021). Landscape architects have a say in the design, planning and protection of these areas with green infrastructure systems and similar proposals, which is one of today's new approaches, and can offer new solutions to ensure climate justice. On the other hand, these studies are effective in

the protection of endemic and rare species and in the formation and protection of habitats necessary for ensuring biodiversity.

In terms of landscape design practice;

- Choosing plants that are suitable for the urban microclimate and are moderate in terms of soil, water and care needs,
- Using rain gardens, ditches and permeable paving materials to increase the infiltration of water that passes into surface runoff with precipitation back into the soil,
- Using recycled or sustainably sourced materials,
- Developing systems that measure and encourage sustainable landscape design and implementation,
- Integrating urban agriculture into design will help strengthen urban climate resilience.

Globally, cities are exposed to disaster and climate-related risks at high rates. Therefore, continuity of urban growth increases both ecological and social vulnerability to the effects of climate change. In contrast, connected, multifunctional urban green spaces enable ecosystem services that support human well-being and quality of life, while also strengthening urban climate resilience.

The urban heat island effect and the unfair distribution of green areas are not only an environmental problem, but also create serious problems in terms of social justice and public health. Increasing the access of low-income and vulnerable groups to green areas and cooling services is of great importance in terms of both improving the quality of life and reducing health risks. Strategic steps need to be taken in urban planning to ensure environmental justice and create cities that are resilient to climate change. An equitable distribution of green and blue spaces should be at the center of these strategies. Sustainable urbanization policies should consider not only environmental sustainability but also social justice. In this context, it is of critical importance that local governments and urban planners take action to ensure equal distribution of green infrastructure. In the fight against climate change, eliminating inequalities in the socioeconomic structure of cities is indispensable for long-term sustainability and public health. The findings of this study provide guidance in shaping future policies and make an important contribution to ensuring environmental justice.

Climate change and urban inequalities are not only scientific and socioeconomic problems, but also complex issues that require urgent political interventions. Developing policies to address these problems is critical to ensuring environmental justice and protecting public health.

- *Green Space Planning:* Creating new green spaces and improving existing green spaces should be prioritized in low-income and vulnerable neighborhoods.
- *Urban Agriculture and Community Gardens:* Community gardens and urban agriculture projects can help address the lack of green space in low-income areas and also increase food security.
- *Green Corridors and Parks:* Increasing green corridors and parks throughout the city can protect against heat stress by reducing the heat island effect in the city.
- *Emergency Action Plans:* Emergency action plans should be created and implemented to protect the most vulnerable population groups during extreme heat waves.

- *Green Roof and Wall Applications:* Green roof and green wall applications should be encouraged in new buildings and in the renovation of existing buildings.
- *Community Participation:* Local people's participation should be ensured in the development of green area planning and climate adaptation strategies. Community-based projects can help develop solutions tailored to local needs.
- *Green Infrastructure Investments:* Economic support programs that encourage green infrastructure investments in low-income neighborhoods should be created.
- *Tax Incentives:* Tax incentives should be offered to property owners for the protection and expansion of green areas.

Although it is thought that the mentioned recommendations will contribute to the sustainability of the urban landscape, these innovative approaches need to be integrated into landscape planning and relevant planning policies. In this context, the following issues must be realized in order to ensure the expected benefits and sustainability:

- *By developing a green infrastructure planning strategy at the national level,* the legal framework needed for green infrastructure planning, protection, implementation and management studies can be created. While the national green infrastructure strategy provides information flow to national nature conservation, regional development plans, local master plans and sectoral plans, it can also contribute to the development of spatial patterns.
- *It is necessary to ensure the relationship between national, regional and local planning scales* and strengthen the existing ones. Linking the different scales specified strengthens the effectiveness of the benefits expected from green infrastructure (e.g. protection of natural resources and biodiversity). Additionally, ensuring integrity across scales in cross-border studies can directly and/or indirectly contribute to nature conservation and economic development.
- *By identifying the departments for the green infrastructure planning and management system,* preventing conflict of authority between institutions and ensuring transparency can be supported.
- *By developing cooperation among the departments which are responsible for planning scales,* it can be contributed to strengthening the mutual feedback between different sectors such as nature conservation, urban development, transportation, agriculture and tourism and the green infrastructure system.

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N-(SİKLOHEKZİL KARBAMOİL)-4-(5-(4-(4-SÜBSTİTÜEFENOKSİ)FENİL)-4,5-DİHİDRO-1H-PIROL-3-İL)BENZENSÜLFONAMİT BİLEŞİKLERİNİN SENTEZİ, BİYOLOJİK AKTİVİTELERİ VE *İN SİLİKO* ÇALIŞMALARI
SYNTHESIS, BIOLOGICAL ACTIVITIES AND *İN SİLİKO* STUDIES OF N-(CYCLOHEXYLCARBAMOYL)-4-(5-(4-(4-SUBSTITUTE PHENOXY)PHENYL)-4,5-DIHYDRO-1H-PYRROL-3-YL)BENZENESULFONAMIDE COMPOUNDS

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ÖZET

Pirazol iki azot atomu içeren beş üyeli heterosiklik bir halkadır. Farmakolojik özellikleri nedeniyle medisin kimya için önemli bir yeri vardır. Çünkü pirazol halkasındaki azot moleküllerinden dolayı biyolojik reseptörlere karşı yüksek oranda afinite göstermektedirler. Pirazol halkasına sahip bileşiklerin antidiyabetik, antiviral, antiparkinson, antifungal, antibakteriyel, antikanser, antiinflamatuvar ve antianaljezik, antimalarial, antialzheimer, antitüberküloz ve antioksidan gibi aktiviteler göstermektedirler. Pirazol, farmakofor grubunun bulunduğu tedavide kullanılan birçok ilaç bulunmaktadır. Bunlar, antipirin, fenilbutazon, oksifenbutazon, morazon, ramifenazon, fampropazon, aminofenazon, metamizol, edaravon, ibipinabant, aksitinib. Bundan dolayı bu çalışmada; çevre dostu mikrodalga yöntemiyle kalkonların metanollü ortamda hidrazinmonohidratla reaksiyona sokulmasıyla pirazol bileşikleri elde edildi. Sentezlenen bileşiklerin yapı karakterizasyonu elementel analiz, ¹H NMR, FT-IR spektroskopik yöntemlerle doğrulandı. Çalışmanın devamında, sentezlenen pirazol türevi bileşiklerin antikolinesteraz inhibitör aktivitesi (AChE ve BuChE) ve antioksidan aktivitesi (ABTS+, CUPRAC, DPPH testleri) *in vitro* boyutta araştırılmıştır. Ayrıca SwissADME programı kullanılarak *in siliko* çalışmaları yapılmıştır.

Anahtar Kelimeler: Pirazol, Antikolinesteraz İnhibitör Aktivitesi, Antioksidan Aktivite

ABSTRACT

Pyrazole is a five-membered heterocyclic ring containing two nitrogen atoms. It has an important place in medicinal chemistry due to its pharmacological properties. Because of the nitrogen atoms in the pyrazole ring, they show high affinity to biological receptors. Compounds with pyrazole ring show activities such as antidiabetic, antiviral, antiparkinson, antifungal, antibacterial, anticancer, anti-inflammatory and antianalgesic, antimalarial, antialzheimer, antituberculosis and antioxidant activities. There are many drugs used in the treatment of pyrazole pharmacophore group. These are antipyrine, phenylbutazone, oxyphenbutazone,

morazone, ramifenazone, fampropazone, aminophenazone, metamizole, edaravone, ibipinabant, axitinib. Therefore, in this study; pyrazole compounds were obtained by reacting chalcones with hydrazine monohydrate in methanol with environmentally friendly microwave method. The structure characterization of the synthesized compounds was confirmed by elemental analysis, ¹H NMR, FT-IR spectroscopic methods. In continuation of the study, anticholinesterase inhibitory activity (AChE and BuChE) and antioxidant activity (ABTS+, CUPRAC, DPPH tests) of the synthesized pyrazole derivative compounds were investigated in vitro. In addition, in silico studies were performed using the SwissADME program.

Keywords: Pyrazole, Anticholinesterase Inhibitor Activity, Antioxidant Activity.

GİRİŞ

Heterosiklik bileşikler yapılarındaki N, O ve S gibi heteroatom taşıdıklarından dolayı, çözünürlük, polarite, lipofilite ve hidrojen bağlanma kapasitesi gibi önemli özelliklerin optime edilmesini kolaylaştırmaktadır. (gülsen özli tez). İki azot atomu taşıyan beş üyeli heterosiklik yapı pirazol halkası, ilaç etken madde tasarımında önemli farmakolojik aktivite sergilemesi nedeniyle medisinal kimyada önemli bir yere sahiptir. Pirazol halkasının antiparkinson (Niswender vd., 2008), antidiyabetik (Manfredini vd., 1992), antifungal (Mert vd., 2014), antialzheimer (Kuduk vd., 2010), antiviral (Manfredini vd., 1992), antikanser (Zheng vd., 2010), antienflamatuar ve antianaljezik (Girisha vd., 2010), antibakteriyel (Mert vd., 2014), antimalarial (Karad vd., 2014), antitüberküloz ve antioksidan (Ahsan vd., 2011) aktiviteleri vardır. Klinik tedavi uygulamalarında pirazol iskeletine sahip selekoksib (COX-2 inhibitörü ve nonsteroid antiinflamatuvar ilacı), rimonabant (antiobezite ilacı), antipirin (analjezik ilacı), fenilbutazon (anti-inflamatuar ilacı), oksifenbutazon (anti-inflamatuar ilacı), morazon (ağrı kesici), aminofenazon (analjezik), metamizol (ağrı kesici ve ateş düşürücü), edaravon (felç ve amiyotrofik lateral skleroz (ALS)), ibipinabant (CB1 antagonisti) ve aksitinib (tirozin kinaz inhibitörü) gibi birçok ilaç bulunmaktadır. Pirazol halkasının geniş biyolojik aktiviteye sahip olması araştırmacıları bu alanda yoğunlaştırmıştır ve bileşiklere gerek katılma gerekse halkalaşma metodlarıyla pirazol grubu dâhil edilmektedir. Bundan dolayı, bu çalışmada kalkon bileşiklerinin halkalaşmasıyla pirazol bileşikleri elde edilmiştir. Elde edilen bileşiklerin antioksidan aktivite ile AChE ve BChE enzimlerine karşı antikolinesteraz inhibisyon aktiviteleri incelendi.

YÖNTEM

N-(sikloheksilkarbamoyl)-4-(5-(4-(4-sübstitütefenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamid Bileşiklerinin Sentez Yöntemi (1-6): Eş değer mol (*E*)-*N*-(sikloheksilkarbamoyl)-4-(3-(4-(4-substitütefenoksi)fenil)akriloil)benzensülfonamid ve hidrazin monohidrat ve birkaç damla asetik asit metanollü ortamda 700 W 70 °C’de mikro dalgada kırkbeş dakika karıştırıldı. Tamamlanan reaksiyon buz üzerine dökülerek, çöktürüldü ve bol suyla yıkandı. Elde edilen katı diklormetanda kristalleştirilerek saflaştırıldı. (Malhotra 2010).

Antikolinesteraz aktivite yöntemi

Sentezlenen; *(E)-N*-(sikloheksilkarbamoil)-4-(3-(4-(4-substitüfenoksi)fenil)akriloil)benzensülfonamit (**1-6**) bileşiklerinin, antikolinesteraz aktivitesi AChE ve BChE inhibisyon aktiviteleri (Ellman, 1961) metoduna göre tespit edildi. Her iki aktivite testi için pozitif kontrol olarak galantamin ve kontrol olarak deiyonize DMSO kullanıldı.

Antioksidan Aktivite Testleri

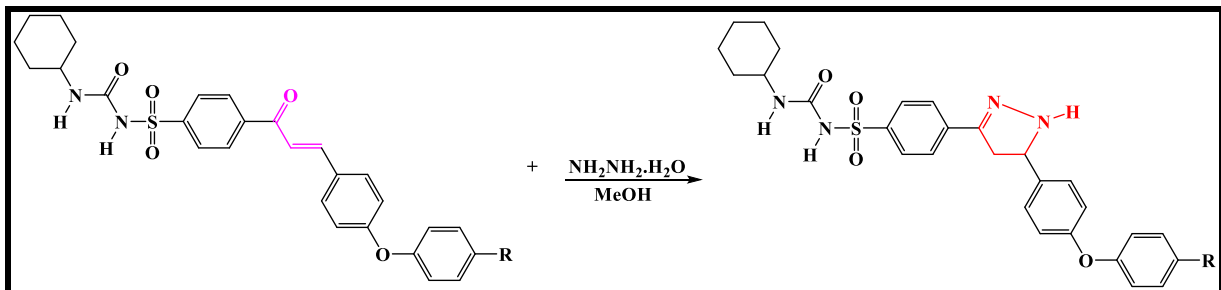
N-(sikloheksilkarbamoil)-4-(5-(4-(4-sübstitüfenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (**1-6**) bileşikleri DMSO içerisinde farklı konsantrasyonlardaki stok çözeltileri hazırlandı. Kontrol olarak DMSO kullanıldı.) β -Karoten-linoleik asit renk açılım aktivitesi Miller, 1971 literatüründeki metoda göre; DPPH serbest radikal giderim aktivite yöntemi Blois, 1958 literatüründeki metoda göre; ABTS katyon radikal giderim aktivitesi yöntemi Re 1989 literatüründeki metoda göre; CUPRAC aktivite yöntemi (Bakır (II) İndirgeme Gücü) Apak 2004 literatüründeki metoda göre yapılmıştır. (Miller 1971; Blois 1958; Re, 1989; Apak, 2004).

İn Siliko Farmakokinetik Analizler

N-(sikloheksilkarbamoil)-4-(5-(4-(4-sübstitüfenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit bileşiklerinin (**1-6**); İlaç olma adayı için en önemli olan molekül ağırlığı, TPSA, iLogP, H-bağı alıcı, H-bağı verici, BBB geçirgenlik, Lipinski, GI emilim, ilaç metabolizmasını etkileyen temel parametreleri ve Emilim, Dağılım, Metabolizma ve Atılım (ADME) özellikleri web tabanlı SwissADME programıyla tespit edildi (<http://www.swissadme.ch/>). Hesaplamalı Toksite Risk parametreleri (tümörrijenik, mutanejik, tahriş edici, üreme etkiler) Organic Chemistry Portal programı **1-6** bileşiklerinin risk değerleri hesaplandı (<https://www.organic-chemistry.org/>).

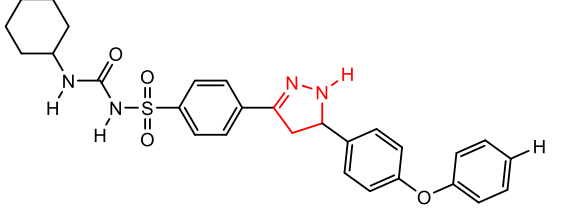
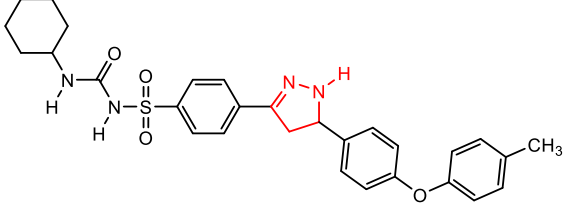
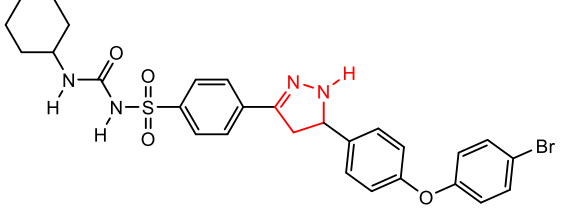
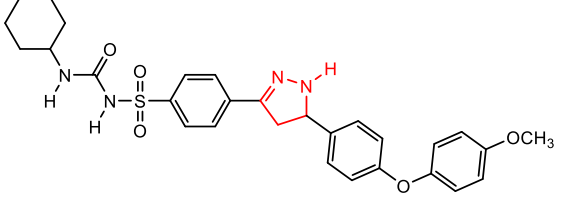
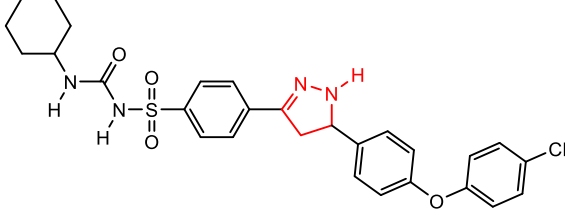
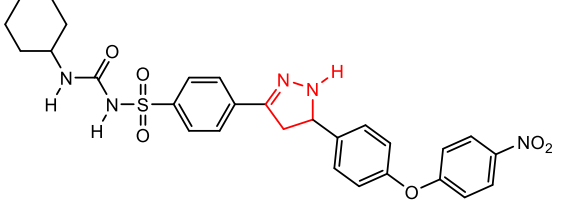
ARAŞTIRMA BULGULARI VE TARTIŞMA

Bu çalışmada, 6 tane orjinal pirazolin bileşiği % 40-53 verimle sentezlendi. Sentez şeması Şema 1 de verilmiştir.



Şema1. *(E)-N*-(sikloheksilkarbamoil)-4-(3-(4-(4-substitüfenoksi)fenil)akriloil)benzensülfonamit (**1-6**) Bileşiklerinin Sentez Şeması

Tablo 1. (*E*)-*N*-(sikloheksilkarbamoil)-4-(3-(4-(4-substitüefenoksi)fenil)akriloil)benzensülfonamit (**1-6**) Bileşiklerinin Molekül Formülleri

 <p>1 Bileşik</p>	 <p>4 Bileşik</p>
 <p>2 Bileşik</p>	 <p>5 Bileşik</p>
 <p>3 Bileşik</p>	 <p>6 Bileşik</p>

***N*-(sikloheksilkarbamoil)-4-(5-(4-fenoksifenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (1)**

Sarı renkli katı. Verim: % 40. Erime noktası: 110-112 °C. C₂₈H₃₀N₄O₄S (Molekül Ağırlığı: 518.63 g/mol): Hesaplanan 64.85; H 5.83; N 10.80; S 6.18. Bulunan: C 64.90; H 5.87; N 10.90; S 6.21 . **FT-IR (νmaks, cm⁻¹):** 3347 (N-H gerilme bandı); 2930 (aromatik C-H gerilme bandı); 1667 (C=O gerilme bandı); 1586, 1538, 1505, 1488 (aromatik halkaya ait C=C gerilme bandı); 1339 (asimetrik SO₂ gerilme bandı); 1160 (simetrik SO₂ gerilme bandı). **¹H NMR (400 MHz) (DMSO-d₆/TMS):** δ 1.23-1.25 (m, 5H), 1.70 (s, 5H), 1.85 (s, 1H), 2.85 (s, 1H), 3.19 (s, 2H), 4.91 (s, 1H), 6.62 (s, 1H, NH), 7.01-7.45 (m, 9H), 7.80-8.04 (m, 4H), 8.21 (s, 1H, NH),

***N*-(sikloheksilkarbamoil)-4-(5-(4-bromofenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (2)**

Krem renkli katı. Verim: % 43. Erime noktası: 98-100 °C. C₂₈H₂₉BrN₄O₄S (Molekül Ağırlığı: 597.53 g/mol): Hesaplanan 56.28; H 4.89; N 9.38; S 5.37. Bulunan: C 56.32; H 4.96; N 9.45;

S 5.41 . **FT-IR (νmaks, cm⁻¹):** 3359 (N-H gerilme bandı); 2930 (aromatik C-H gerilme bandı); 1683(C=O gerilme bandı); 1584, 1449, 1500, 1403 (aromatik halkaya ait C=C gerilme bandı); 1338 (asimetrik SO₂ gerilme bandı); 1161 (simetrik SO₂ gerilme bandı). **¹H NMR (400 MHz) (DMSO-d₆/TMS):** δ 1.07-1.24 (m, 5H), 1.50 (s, 1H), 1.62-1.71 (m, 4H), 1.88-1.92 (m, 1H), 2.88 (s, 1H), 3.23 (s, 1H), 3.44 (1H DMSO su pikinin içinde), 4.89 (d, 1H, *J*=8.00), 6.14 (s, 1H, NH), 6.89-6.96 (m, 4H), 7.19 (d, 4H, *J*=8.00), 7.37 (d, 4H, *J*=8.00), 7.69-7.83 (m, 4H), 7.91 (s, 1H, NH),

***N*-(sikloheksilkarbamoil)-4-(5-(4-(4-klorofenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (3)**

Sarı renkli katı. Verim: % 50. Erime noktası: 74-75 °C. C₂₈H₂₉ClN₄O₄S (Molekül Ağırlığı: 553.07 g/mol): Hesaplanan 60.81; H 5.29; N 10.13; S 5.80. Bulunan: C 60.85; H 5.33; N 10.17; S 5.85 **FT-IR (νmaks, cm⁻¹):** 3356 (N-H gerilme bandı); 2930 (aromatik C-H gerilme bandı); 1682 (C=O gerilme bandı); 1584, 1505, 1484, 1449 (aromatik halkaya ait C=C gerilme bandı); 1322 (asimetrik SO₂ gerilme bandı); 1160 (simetrik SO₂ gerilme bandı). **¹H NMR (400 MHz) (DMSO-d₆/TMS):** δ 1.03-1.23 (m, 5H), 1.47-1.75 (m, 4H), 1.91 (s, 1H), 2.84-2.91 93 (dd, 1H, *J*₁=12, *J*₂=12), 3.24 (s, 1H), 3.44-3.48 (dd, 1H, *J*₁=8, *J*₂=4), 4.89 (t, 1H), 6.07 (s, 1H, NH), 7.00-7.04 (m, 4H), 7.40-7.47 (m, 4H), 7.67 (d, 2H, *J*=8.00), 7.77 (d, 2H, *J*=8.00), 7.88 (s, 1H, NH).

***N*-(sikloheksilkarbamoil)-4-(5-(4-(*p*-toliloksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (4)**

Sarı renkli katı. Verim: % 53. Erime noktası: 92-94 °C. C₂₉H₃₂N₄O₄S (Molekül Ağırlığı 532.66 g/mol): Hesaplanan 65.39; H 6.06; N 10.52; S 6.02. Bulunan: C 65.44; H 6.12; N 10.57; S 6.07 **FT-IR (νmaks, cm⁻¹):** 3355 (N-H gerilme bandı); 2930 (aromatik C-H gerilme bandı); 1682 (C=O gerilme bandı); 1598, 1532, 1500, 1449 (aromatik halkaya ait C=C gerilme bandı); 1342 (asimetrik SO₂ gerilme bandı); 1160 (simetrik SO₂ gerilme bandı). **¹H NMR (400 MHz) (DMSO-d₆/TMS):** δ 1.09-1.23 (m, 5H), 1.47 (s, 1H), 1.57-1.66 (m, 4H), 2.29 (s, 3H, CH₃), 2.86-2.93 (dd, 1H, *J*₁=8, *J*₂=12), 3.37 (s, 1H), 3.44-3.51 (dd, 1H, *J*₁=28, *J*₂=12), 4.91 (t, 1H), 6.35 (d, 1H, *J*=8.00, NH), 6.91 (d, 2H, *J*=12.00), 6.95 (d, 2H, *J*=8.00), 7.19 (d, 2H, *J*=8.00), 7.37 (d, 2H, *J*=8.00), 7.77 (d, 2H, *J*=8.00), 7.92 (d, 2H, *J*=8.00), 7.97 (s, 1H, NH).

***N*-(sikloheksilkarbamoil)-4-(5-(4-(4-metoksifenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (5)**

Sarı renkli katı. Verim: % 49. Erime noktası: 147-149 °C. C₂₉H₃₂N₄O₅S (Molekül Ağırlığı: 548.66 g/mol): Hesaplanan 63.49; H 5.88; N 10.21; S 5.84. Bulunan: C 63.51; H 5.93; N 10.25; S 5.87. **FT-IR (νmaks, cm⁻¹):** 3359 (N-H gerilme bandı); 2936 (aromatik C-H gerilme bandı); 1681 (C=O gerilme bandı); 1532, 1499, 1450 (aromatik halkaya ait C=C gerilme bandı); 1340 (asimetrik SO₂ gerilme bandı); 1160 (simetrik SO₂ gerilme bandı). **¹H NMR (400 MHz) (DMSO-d₆/TMS):** δ 1.20 (s, 5H), 1.58-1.69 (s, 5H), 1.85 (s, 1H), 2.87 (s, 1H), 3.75 (s, 5H),

4.88 (s, 1H), 6.62 (s, 1H, NH), 6.90-6.98 (m, 8H), 7.35 (d, 2H, $J=8.00$), 7.79 (d, 2H, $J=8.00$), 7.88 (s, 1H).

***N*-(sikloheksilkarbamoil)-4-(5-(4-(4-nitrofenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit (6)**

Sarı renkli katı. Verim: % 45. Erime noktası: 43-45 °C. $C_{28}H_{29}N_5O_6S$ (Molekül Ağırlığı: 563.63 g/mol): Hesaplanan 59.67; H 5.19; N 12.43; S 5.69. Bulunan: C 59.71; H 5.23; N 12.49; S 5.73. **FT-IR (vmax, cm^{-1}):** 3350 (N-H gerilme bandı); 2930 (aromatik C-H gerilme bandı); 1682 (C=O gerilme bandı); 1587, 1506, 1488, 1450 (aromatik halkaya ait C=C gerilme bandı); 1341 (asimetrik SO_2 gerilme bandı); 1162 (simetrik SO_2 gerilme bandı). **1H NMR (400 MHz) (DMSO- d_6 /TMS):** δ 1.08-1.24 (m, 5H), 1.51-1.70 (m, 4H), 1.90 (d, 1H, $J=12.00$), 2.34 (s, 1H), 3.17 (s, 1H), 3.49 (s, 1H), 4.97 (s, 1H), 6.84 (s, 1H, NH), 7.11-7.21 (m, 6H), 7.51 (d, 2H, $J=8.00$), 7.81 (d, 2H, $J=4.00$), 7.98 (s, 1H, NH), 8.27 (d, 2H, $J=12.00$).

***N*-(sikloheksilkarbamoil)-4-(5-(4-(4-süstitütefenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit bileşiklerinin (1-6) FT-IR spektrum verileri incelendiğinde;** N-H gerilme bandı 3347-3359; aromatik C-H gerilme bandı 2930-2936; C=O gerilme bandı 1667-1683; C=C gerilme bandı 1532-1488; asimetrik SO_2 gerilme bandı 1322-1342; simetrik SO_2 gerilme bandı 1160-1162 aralığında olduğu tespit edilmiştir. Tüm veriler literatürle uyum sağlamaktadır.

***N*-(sikloheksilkarbamoil)-4-(5-(4-(4-süstitütefenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit bileşiklerinin 1H NMR spektrum verileri incelendiğinde;** pirazol halkasına ait CH protonu 4.97-4.88 ppm aralığında; pirazol halkasına ait CH_2 protonları 2.34-3.19 ve 3.44-3.75 ppm aralığında tespit edilmiştir.

Biyolojik Aktivite

Sentezlenen *N*-(sikloheksilkarbamoil)-4-(5-(4-(4-süstitütefenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamit bileşiklerinin (1-6) antikolinesteraz inhibisyon aktiviteleri (BChE ve AChE) incelendiğinde standart olarak kullanılan Galantaminin, BChE inhibisyon aktivitesi IC_{50} (μM)=4.62 \pm 0.12 ve AChE inhibisyon aktivitesi IC_{50} (μM)= 1.82 \pm 0.30 olarak tespit edilirken sentezlenen bileşiklerin (1-6) antikolinesteraz inhibisyon aktivitesinin olmadığı tespit edildi. Sentezlenen bileşiklerin (1-6) antioksidan aktivite (ABTS⁺, DPPH, CUPRAC testleri) sonuçları Tablo 2’de verilmiştir. Pirazol bileşiklerinin antioksidant aktiviteleri incelendiğinde ABTS⁺ testinde **BHA>3>2>5>6>4>1**; CUPRAC testinde **BHA>6>2>3>4>5>1**; DPPH testinde **BHA>2>3>6>4>5>1** şeklinde aktiflik göstermiştir.

Table 2. Antioksidant inhibitör aktivitesi 1-6^a

Bileşikler	ABTS ⁺ assay IC_{50} (μM)	CUPRAC $A_{0.5}$ (μM)	DPPH assay IC_{50} (μM)
------------	--	---------------------------------	-------------------------------------

1 (H)	18.04±0.25	327.20±0.01	414.17±0.51
2 (Br)	9.77±0.21	183.31±0.00	11.33±0.40
3 (Cl)	9.10±0.05	216.85±0.00	12.25±0.77
4 (CH₃)	10.52±0.47	221.40±0.01	134.86±0.31
5 (OCH₃)	11.29±0.34	230.47±0.01	250.59±0.43
6 (NO₂)	12.33±0.14	168.00±0.01	18.69±0.39
BHA^b	2.21±0.09	6.14±0.13	5.09 ± 0.22

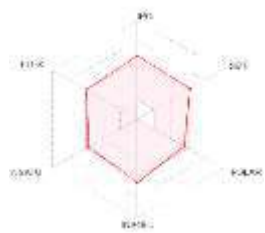
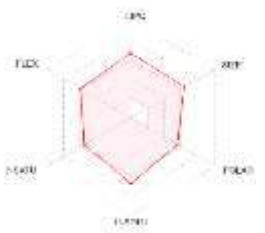
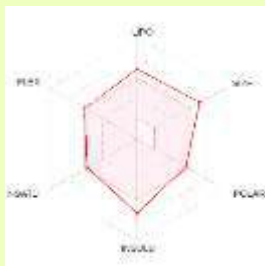
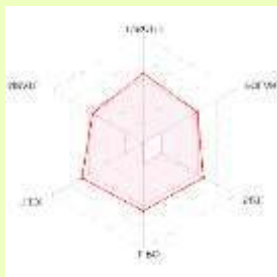
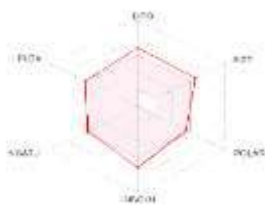
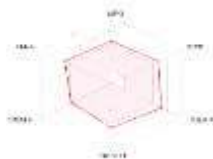
In Silico Çalışmalar

Bir bileşiğin ilaç etken maddesi olabilmesi için *in silico* çalışmalar yapılarak fizikokimyasal özellikleri ve ADME parametre değerlerinin hesaplanması gerekmektedir. (<http://www.swissadme.ch/>). Hesaplamalı Toksikite Risk parametreleriyle; üreme etkisi, tümörjenik etkisi, mutajenik etkisi ve tahriş edici etkisi hesaplandı. Pirazol bileşiklerinin fizikokimyasal özellikleri incelendiğinde; molekül ağırlığının 518.63-597.52 g/mol aralığında olup kabul edilen değer aralığından yüksektir (150g/mol<MA<500 g/mol). Hidrojen donörlerin sayısı tüm pirazol bileşiklerinde 3 değerinde tespit edildi (n-OHNH<5). Hidrojen bağ alıcıların sayısı 5-7 aralığında olup kabul edilen değer aralığındadır (n-ON<10). Topolojik polar yüzey alanı pirazol bileşiklerinde 117.27-163.09 Å² aralığında olup olması gereken değer çok üzerindedir (TPSA<70 Å²). Pirazol bileşiklerinin iLog P değeri 3.53-4.27 aralığında olduğu tespit edildi. Pirazol bileşiklerinin hepsi kan beyin bariyerini geçemediği için merkezi sinir sistemine zarar vermeyecektir (Tablo 3, Şekil 1).

Tablo 3. Pirazol bileşiklerinin (1-6) SwissADME programı ile hesaplanan fizikokimyasal özellikleri ve ADME parametre değerleri

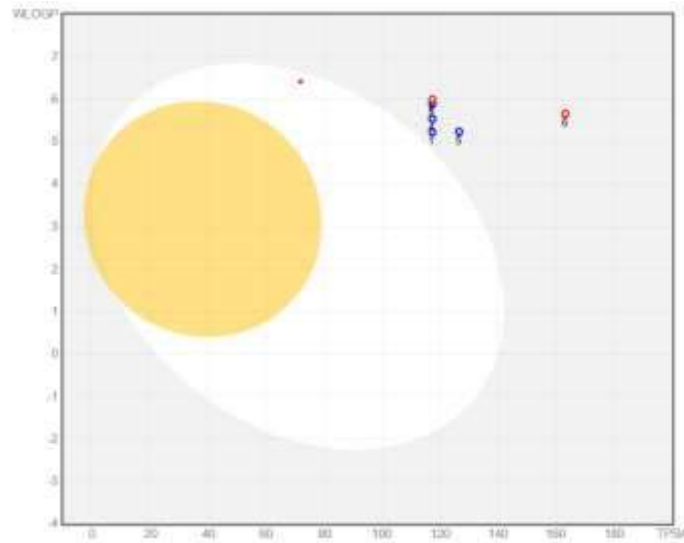
Bileşik	1 (H)	2 (Br)	3 (Cl)	4 (CH₃)	5 (OCH₃)	6 (NO₂)
Formül	C ₂₈ H ₃₀ N ₄ S	C ₂₈ H ₂₉ BrN ₄ O ₄ S	C ₂₈ H ₂₉ ClN ₄ O ₄ S	C ₂₉ H ₃₂ N ₄ O ₄ S	C ₂₉ H ₃₂ N ₄ O ₅ S	C ₂₈ H ₂₉ N ₅ O ₆ S
Moleküler ağırlık (g/mol)	518.63	597.52	553.07	532.65	548.65	563.62

n-ON	5	5	5	5	6	7
n-OHNH	3	3	3	3	3	3
TPSA Å²	117.27	117.27	117.27	117.27	126.50	163.09
Lipinski	Evet	Evet	Evet	Evet	Evet	Hayır
iLogP	3.53	3.88	4.18	4.27	3.69	3.72
GI emilim	Düşük	Düşük	Düşük	Düşük	Düşük	Düşük
BBB geçirgenlik	Hayır	Hayır	Hayır	Hayır	Hayır	Hayır

Bileşik 1		Bileşik 4	
Bileşik 2		Bileşik 5	
Bileşik 3		Bileşik 6	

Şekil 1. Pirazol bileşiklerinin ilaca benzerliği, ve biyoyararlanım radarları ((LIPO: Lipofiliklik, INSATU: sp3 hibridizasyonundaki karbon fraksiyonuna göre doymamışlık SIZE: Moleküler ağırlık, FLEX: dönebilen bağlara göre esneklik) INSOLU: log S ölçeğine göre suda çözünürlük, POLAR: Toplam Polar Yüzey Alanı)

Beyin veya Bağırsak Tahmini Geçirgenlik yöntemiyle, moleküllerin polaritesini ve lipofilitesini hesaplayabilmem grafiksel bir modeldir. BU modeller elde ettiğimiz tahmin sonucunda, ilaç adaylarının oral emilim potansiyeli açısından ipucu sağlar (Daina 2016). Bu tahmine göre bileşikler gri bölgede oldupu için zayıf bağırsak emilimi göstermesi tahmin edilmektedir (Şekil 2). (sarı daire güçlü bağırsak emilimini, gri bölge zayıf bağırsak emilimi)(Daina & Zoete, 2016, Sıcak 2021)



Şekil 2. Sentezlenen bileşiklerin BOILED-EGG tahmin modeline göre grafiksel dağılımı

N-(sikloheksilkarbamoyl)-4-(5-(4-(4-sübstütüfenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzenülfonamit bileşiklerinin (1-6) toksisite risk parametreleri incelendiğinde; 4 bileşiğin tahriş edici özelliği yüksek risk taşıması haricinde, tüm bileşiklerin mutajenik etki, tümörjenik etki, tahriş edici etki, üreme etkisi incelendiğinde hiçbir risk olmadığı tespit edilmiştir (Tablo 4).

Tablo 4. Hesaplamalı Toksikite Risk parametreleri (Mutajenik etki, Tümörjenik etki, Tahriş edici etki, Üreme etkisi) (1-6).

Bileşik	Mutajenik	Tümörjenik	Tahriş Edici	Üreme Etki
1	Risk yok	Risk yok	Risk yok	Risk yok
2	Risk yok	Risk yok	Risk yok	Risk yok
3	Risk yok	Risk yok	Risk yok	Risk yok

4	Risk yok	Risk yok	Yüksek risk var	Risk yok
5	Risk yok	Risk yok	Risk yok	Risk yok
6	Risk yok	Risk yok	Risk yok	Risk yok

SONUÇ

N-(sikloheksilkarbamoyl)-4-(5-(4-(4-sübstitütefenoksi)fenil)-4,5-dihidro-1H-pirazol-3-il)benzensülfonamid (**1-6**) orijinal bileşikleri sentezlendi ve yapı karakterizasyonu yapıldı. Antikolinesteraz inhibisyon aktiviteleri (BChE ve AChE) incelendiğinde; sentezlenen bileşiklerin (**1-6**) inhibisyon aktivite göstermediği tespit edildi. Antioksidant aktiviteleri incelendiğinde; ABTS testinde bileşik **3**, CUPRAC testinde bileşik **6** ve DPPH testinde bileşik **2** en yüksek aktiviteyi göstermiştir. Sentezlenen bileşikler kan beyin bariyerini geçemeyeceği için merkezi sinir sisteminde zarar veremeyecektir. Bileşik **4**'ün tahriş edici etkisi haricinde diğer bileşiklerin toksisiteleri olmadığı tespit edildi.

TEŞEKKÜR

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**CERRAHİDE PRANAYAMA SOLUNUM EGZERSİZLERİ VE HEMŞİRELİK
BAKIMI: SİSTEMATİK DERLEME**
PRANAYAMA BREATHING EXERCISES AND NURSING CARE IN SURGERY: A
SYSTEMATIC REVIEW

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ÖZET

Pranayama; yaşam nefesi veya hayat enerjisi anlamına gelen “prana” ile ilerleme, düzenleme veya kontrol anlamına gelen “ayama” kelimelerinin birleşmesiyle oluşmaktadır. Yoga bilimine göre bireyler “prana”yı “kontrol” “etmeyi öğrenebilirse, bedenini, zihnini ve ruhunu da kontrol edebilmektedir. Pranayama solunum egzersizleri bireylerin solunum, kardiyovasküler, nörolojik ve immün yanıt gibi sistemlere olumlu etkisiyle iyileşme sağlarken, nefes alma konusunda farkındalığını artırarak öz kontrollerini ve psikolojik iyilik halini artırmaktadır. Bu yöntemlerin ameliyat öncesi ve sonrası süreçte hemşirelik bakımına dahil edilmesiyle hastaların iyileşme sürecine pozitif katkı sağlanacağı düşünülmektedir. Bu sistematik derlemenin amacı cerrahi süreçte pranayama solunum egzersizlerinin hemşirelik bakımında kullanımını incelemektir. 2004-2024 yılları arasında Pubmed, Science Direct, Google Scholar ve Cochrane veri tabanları "pranayama", "yogic breathing", "perioperative", "postoperative", "preoperative", "surgery" ve "nursing" anahtar kelimeleri ile taranmıştır. Ulaşılan 1835 araştırmadan dahil edilme kriterleri uyan 6 araştırma çalışmaya dahil edilmiştir. Literatürdeki çalışmalar incelendiğinde cerrahi süreçte pranayama solunum egzersizlerinin hemşirelik bakımında genellikle ameliyat öncesi dönem, kolesistektomi, bariyatri, meme kanseri ve kardiyovasküler sistem cerrahilerinde ve ameliyat öncesi dönemde uygulandığı görülmektedir. Bu çalışmalar incelendiğinde cerrahi süreçte hemşirelik bakımında Pranayama solunum egzersizlerinin kullanılması ile hastaların yaşam bulguları, gastrointestinal sistem aktiviteleri, solunum fonksiyonları iyileşmekte, anesteziden daha hızlı uyanmakta ve anksiyeteleri, ağrı şiddetleri, yorgunluk seviyeleri azalabilmektedir. Pranayama solunum egzersizlerinin tamamlayıcı ve alternatif yaklaşımlar olarak uygulanması önerilmektedir.

Anahtar kelimeler: Pranayama, Cerrahi, Hemşirelik, Hemşirelik Bakımı.

ABSTRACT

Pranayama is formed by combining the words “prana”, which means life breath or life energy, and “ayama”, which means progress, regulation or control. According to the science of yoga, if individuals can learn to “control” “prana”, they can also control their body, mind and spirit. Pranayama breathing exercises provide recovery with their positive effects on systems such as respiratory, cardiovascular, neurological and immune response, while increasing their awareness of breathing and increasing their self-control and psychological well-being. It is thought that including these methods in nursing care before and after surgery will positively contribute to the recovery process of patients. The aim of this systematic review is to examine the use of pranayama breathing exercises in nursing care during the surgical process. Pubmed, Science Direct, Google Scholar and Cochrane databases were searched between 2004-2024 with the keywords “pranayama”, “yogic breathing”, “perioperative”, “postoperative”, “preoperative”, “surgery” and “nursing”. Of the 1835 studies reached, 6 studies that met the inclusion criteria were included in the study. When the studies in the literature are examined, it is seen that pranayama breathing exercises are generally applied in nursing care during the preoperative period, cholecystectomy, bariatric, breast cancer and cardiovascular system surgeries and in the preoperative period. When these studies are examined, it is seen that with the use of pranayama breathing exercises in nursing care during the surgical process, patients' vital signs, gastrointestinal system activities, respiratory functions improve, they wake up from anesthesia faster and their anxiety, pain intensity and fatigue levels decrease. It is recommended that pranayama breathing exercises be applied as complementary and alternative approaches.

Keywords: Pranayama, Surgery, Nursing, Nursing Care.

GİRİŞ

Yoga; Asana olarak bilinen çeşitli fiziksel duruşlar, Pranayama olarak nefes egzersizleri ve Dhyana olarak meditasyon uygulamalarını içermektedir. Diğer bir ifadeyle Pranayama yoganın ikinci adımını oluşturmaktadır (Dhaniwala ve ark., 2020).

Pranayama; yaşam nefesi veya hayat enerjisi anlamına gelen “prana” ile ilerleme, düzenleme veya kontrol anlamına gelen “ayama” kelimelerinin birleşmesiyle oluşmaktadır. (Jayawardena et al., 2020) Yoga bilimine göre bireyler “prana”yı “kontrol” “etmeyi öğrenebilirse, bedenini, zihnini ve ruhunu da kontrol edebilmektedir (İlter ve Ovayolu, 2021).

Pranayama solunum egzersizleri; Puraka (yavaş inspirasyon, nefes alma), Rechaka (yavaş ekspirasyon, soluk verme) ve Kumbhaka (nefes aldıktan sonra nefes tutma) olarak her solunum döngüsü 3 adımdan oluşmaktadır. Bu adımlar Pranayama türüne bağlı olarak tek ya da birlikte uygulanabilmektedir. Pranayama'nın uygulama süresine ve türüne göre birçok farklı tipi vardır. Nadi Shodhan, Kapalbhata, Bhastrika, Ujjayi, Bhramari, Sheetal, Sheetkari, Suryabhedana bu tipler arasında en çok bilinenlerdendir (Dhaniwala ve ark., 2020; İlter ve Ovayolu, 2021).

Nadi Shodhan; dönüşümlü burun deliği solunumunu içermektedir. Yogada burun delikleri, Nadi olarak bilinen ince enerji kanallarını temsil etmektedir. Bu Pranayama yönteminde bir burun deliği baş parmakla diğer burun deliği yüzük parmağı ile kapatılmaktadır. Sağ burun deliğinden tam bir nefes alınırken sol burun deliği kapatılmakta, tam bir nefes alındıktan sonra sağ burun deliği kapatılarak sol burun deliğinden nefes verilmektedir. Ardından solunum süresi sol burun deliğinden nefes alınması ve sağ burun deliğinden nefes verilmesiyle dönüşümlü olarak devam etmektedir. Hızı ve ritmi bireysel olarak değişebilmekte ve en az günlük 10 dakika uygulanması önerilmektedir (Dhaniwala ve ark., 2020; İlder ve Ovayolu, 2021).

Kapalbhati; hem nefes tekniği hem de yogada arınma olarak bilinen Shatkarma uygulaması yöntemidir. Ekspirasyon aşaması; karın kaslarının güçlü, aktif ve ani kasılmalarıyla yapılmakta, inspirasyon ise karın kaslarını gevşeterek yavaş ve pasif bir şekilde yapılmaktadır (İlder ve Ovayolu, 2021).

Bhastrika (körük nefesi); kısa, keskin, eşit inspirasyon ve ekspirasyon yapılan solunumu içermektedir. Akciğerleri tamamen havayla doldurmak için zorlu inspirasyonun ardından, karın kaslarının hızlı ve güçlü bir şekilde içeri çekilmesi ve diyaframın yukarı itilmesiyle ekspirasyon gerçekleştirilmektedir. En az 10 kez tekrarlanması önerilmektedir (Dhaniwala ve ark., 2020; İlder ve Ovayolu, 2021).

Ujjayi; derin inspirasyonun ardından boğazı hafif kasarak burundan ekspirasyon uygulandığı yöntemdir. Bu Pranayama solunum egzersizinin zihni sakinleştirmeye fayda sağladığı düşünülmektedir (Dhaniwala ve ark., 2020).

Bhramari; vızıldayan ya da büyük arı olarak da bilinmektedir. Bu Pranayama egzersizinde ağız kapalıyken burundan derin bir nefes alınmakta ve kapalı ağızdan uğultu sesi çıkarılarak nefes verilmektedir. En az 5 kez tekrarlanmalıdır (Dhaniwala ve ark., 2020).

Sheetali, dilin uzunlamasına kıvrılması ve yarı tüp şekline getirilirken ağızdan dışarı çıkarılmasıyla inhalasyonun ağızdan yapılmasını içermektedir. Nefes verme aşaması her iki burun deliğinin de kullanılmasıyla gerçekleştirilmektedir (Dhaniwala ve ark., 2020; İlder ve Ovayolu, 2021).

Sheetkari; dilin geriye ve yumuşak damağa doğru yerleştirildikten sonra dudaklar ve dişlerin sıkıştırılmasıyla yapılmaktadır. Nefes dişlerin arasından alınırken, nefes verme her iki burun deliği ile gerçekleştirilmektedir (İlder ve Ovayolu, 2021).

Suryabhedana; nefes almanın sadece sağ burun deliğinden ve nefes vermenin sadece sol burun deliğinden gerçekleştiği Pranayama egzersiz yöntemidir. Bu teknikte nefes alma ve verme için her zaman aynı taraf kullanılmaktadır. Tüm bedensel işlevleri harekete geçirdiği düşünülen bir yöntemdir (Dhaniwala ve ark., 2020; İlder ve Ovayolu, 2021).

Pranayama solunum egzersizleri bireylerin solunum, kardiyovasküler, nörolojik ve immün sistemlerinde olumlu etkisiyle iyileşme sağlarken, nefes alma konusunda farkındalığını artırarak öz kontrollerini ve psikolojik iyilik halini artırmaktadır (Dhaniwala ve ark., 2020; İlder

ve Ovayolu, 2021). Bu yöntemlerin ameliyat öncesi ve sonrası süreçte hemşirelik bakımına dahil edilmesiyle hastaların iyileşme sürecine pozitif katkı sağlanacağı düşünülmektedir.

YÖNTEM

Bu sistematik derlemenin amacı cerrahi süreçte pranayama solunum egzersizlerinin hemşirelik bakımında kullanımını incelemektir. 2004-2024 yılları arasında Pubmed, Science Direct, Google Scholar ve Cochrane veri tabanları "pranayama", "yogic breathing", "perioperative", "postoperative", "preoperative", "surgery" ve "nursing" anahtar kelimeleri ile taranmıştır. Ulaşılan 1835 araştırmadan dahil edilme kriterleri uyan 6 araştırma çalışmaya dahil edilmiştir.

ARAŞTIRMA BULGULARI VE TARTIŞMA

Literatürdeki çalışmalar incelendiğinde pranayama solunum egzersizlerinin hemşirelik bakımında genellikle ameliyat öncesi dönem, kolesistektomi, bariyatri, meme kanseri ve kardiyovasküler sistem cerrahilerinde ve ameliyat öncesi dönemde uygulandığı görülmektedir.

Khairy ve ark. (2022), ameliyat öncesi dönemde pranayama egzersizinin hastaların kan basıncı ve anksiyete üzerine etkisini inceledikleri yarı deneysel bir çalışma yapmıştır. Çalışmada bir gruba rutin hemşirelik bakımı verilirken, diğer gruba rutin bakıma ek olarak pranayama egzersizleri uygulanmıştır. Pranayama egzersiz grubundaki hastalara ameliyattan en az 2 gün önce; 5-10 dakikalık teorik eğitim ve yaklaşık 20 dakika süren uygulamalı eğitim ile pranayama solunum egzersizleri eğitimi verilmiştir. Uygulama öncesinde ve sonrasında her iki grubun anksiyete seviyeleri ve kan basınçları ölçülmüştür. Uygulama sonrasında iki grup karşılaştırıldığında pranayama solunum egzersizi uygulayan grubun anksiyete seviyesi anlamlı derecede daha düşük ve kan basıncı ölçümlerinde anlamlı derecede iyileşme belirlenmiştir (Khairy ve ark., 2022).

Verma ve ark. (2022), laparoskopik kolesistektomi cerrahisinde pranayama solunum egzersizlerinin etkisini inceleyen randomize kontrollü bir çalışma yapmıştır. Bu çalışmada kontrol grubuna rutin bakım verilirken, deney grubuna ameliyattan 2 hafta önce başlamak üzere her gün ve günde 2 kez, her biri 10 dakika süresince pranayama solunum egzersizlerini yapmaları önerilmiştir. Ek olarak ameliyat günü ameliyattan önce 20 dakika boyunca bu egzersizleri uygulamaları yapılmıştır. Deney grubundaki hastalara ameliyat sonrası ilk 2 saatte 10 dakika, 2-6 ve 6-10. Saatler arasında da 10'ar dakika hafif derin solunum egzersizleri uygulanması; ameliyat sonrası 1.günden itibaren sabah ve akşam rutinine pranayama solunum egzersizlerinin dahil edilmesi önerilmiştir. Çalışmanın 2, 6 ve 10.saatlerinin sonunda iki grubun ağrı şiddeti karşılaştırılmıştır. Çalışmanın sonunda iki grup karşılaştırıldığında ameliyat sonrası 2.saatte ağrı düzeylerinde anlamlı bir farklılık bulunmazken, 6 ve 10.saatlerde deney grubundaki hastaların ağrı düzeyleri ve analjezik ihtiyacında anlamlı derecede daha düşük olarak belirlenmiştir. Ayrıca ameliyat sonrası dönemde bağırsak fonksiyonlarının geri dönüşü için bağırsak sesleri değerlendirilmiştir. Çalışmanın sonucunda kontrol grubuna göre deney grubunda anlamlı derecede daha kısa sürede bağırsak sesleri oskültasyonu yapılmıştır. Bununla birlikte deney grubundaki hastaların yaşam bulgularının kontrol grubuna göre daha stabil

olduğu ve ameliyat sonrası 1.saatte anesteziden uyanma oranının da daha fazla olduğu belirlenmiştir (Verma et ve ark., 2022).

Güneş ve ark. (2024), bariatric cerrahide pranayama solunum egzersizlerinin hastaların akciğer fonksiyonlarına ve erken klinik sonuçlarına etkisini inceleyen randomize kontrollü bir çalışma yapmıştır. Deney ve kontrol grubuna ameliyat öncesi akciğer fonksiyon testi, akciğer grafisi, 6 dakikalık yürüme testi uygulanmıştır ve oksijen saturasyonu ölçülmüştür. Kontrol grubuna rutin hemşirelik bakımı verilmiştir. Deney grubuna ise ameliyattan 3 gün önce ve ameliyattan 7 gün sonrasını kapsayacak şekilde her gün toplamda 10 pranayama solunum (yoga) seansı uygulanmıştır. Bu uygulamaların her biri yaklaşık 40 dakika sürmüştür. Seanslar 3-5 hastadan oluşan gruplar halinde sabah saatlerinde sessiz, sakin, pencereli ve doğal ışık alan klinik odasında uygulanmıştır. Uygulamaların sonunda iki grup karşılaştırıldığında; solunum fonksiyon testi ve akciğer grafisinde deney grubunda anlamlı bir iyileşme bulunurken, 6 dakikalık yürüme testi ve oksijen saturasyonu da istatistiksel olarak anlamlı derecede yüksek bulunmuştur (Güneş ve ark., 2024).

Chakrabarty ve ark. (2015), meme kanseri cerrahisinden sonra radyoterapi tedavisi uygulanan kadınlarda pranayama solunum egzersizlerinin yorgunluk üzerine etkisini inceleyen randomize kontrollü bir çalışma yapmıştır. Kontrol grubuna rutin hemşirelik bakımı verilirken, deney grubuna rutin hemşirelik bakımına ek olarak pranayama solunum egzersizleri uygulanmıştır. Bu egzersiz sabah ve akşam olmak üzere haftada 5 gün şeklinde, 6 hafta boyunca uygulanmıştır. Uygulama sonrasında hastaların yorgunluk seviyeleri ölçüldüğünde, deney grubunun kontrol grubuna göre puanları anlamlı derecede daha düşük olarak belirlenmiştir (Chakrabarty ve ark., 2015).

Chandrababu ve ark. (2019), pranayama solunum egzersizlerinin kardiyovasküler sistem cerrahisinden sonra hastaların anksiyete ve ağrı seviyeleri üzerine etkisini değerlendiren bir çalışma yapmıştır. Randomize kontrollü olarak yapılan bu çalışmada kontrol grubuna rutin hemşirelik bakımı verilirken, deney grubuna rutin hemşirelik bakımı ve pranayama solunum egzersizleri uygulanmıştır. Deney grubundaki hastalara ameliyattan 2 gün önce pranayama solunum egzersizleri eğitimi ve egzersiz hakkında broşür verilmiştir. Hastaların egzersizi doğru yapma durumları kontrol edilmiştir ve geri bildirim verilmiştir. Hastalar ameliyat sonrası 3.günden 5.güne kadar günde 1 kez 15 dakikalık pranayama solunum egzersizi yapmıştır. Her uygulama öncesi ve sonrasında iki grupta ağrı seviyeleri ölçülmüştür. Ameliyat sonrası 5.günde iki gruptaki hastaların da anksiyete seviyeleri ölçülmüştür. Çalışmanın sonucunda deney grubundaki hastaların anksiyete puanları kontrol grubuna göre istatistiksel olarak daha düşük bulunmuştur. Bununla birlikte ağrı düzeyi de deney grubunda kontrol grubuna göre daha düşük belirlenirken bu fark istatistiksel olarak anlamlı bulunmamıştır (Chandrababu ve ark., 2019).

Kardiyovasküler sistem cerrahisinde yarı deneysel benzer bir çalışmada Ramesh ve ark. (2013), pranayama solunum egzersizleri ve enstrümental müziğin hastaların ağrı ve anksiyetelerine etkisini incelemiştir. Kontrol grubuna rutin bakım verilmiştir. Deney grubuna ise pranayama

solunum egzersizleri ve enstrümental müzik uygulanmıştır. Deney ve kontrol grubundaki hastaların anksiyete seviyeleri ameliyattan 2 gün önce ölçülmüştür. Pranayama solunum egzersizleri de ameliyattan önceki 2 gece boyunca deney grubundaki hastalara uygulamaları olarak öğretilmiştir. Deney grubuna ameliyat sonrası 3.günden 5.güne kadar, ardışık 3 gün boyunca sabah ve akşam olarak pranayama solunum egzersizleri ve enstrümental müzik uygulanmıştır. Bu uygulama 5 dakika pranayama solunum egzersizleri ve 20 dakika enstrümental müzik olarak 25 dakika sürmüştür. Her uygulamadan önce ve sonra iki gruptaki hastaların ağrı seviyeleri ölçülmüştür. Ameliyat sonrası 3.gün sabah uygulamasından önce ve ameliyat sonrası 5.gün akşam uygulamasından sonra olmak üzere iki grupta anksiyete seviyeleri ölçülmüştür. Çalışmanın sonucunda kontrol grubuna göre deney grubundaki hastaların ağrı ve anksiyete seviyelerinin anlamlı derecede düşük olduğu belirlenmiştir (Ramesh ve ark., 2013).

Tablo 1. Sistematik Derlemeye Dahil Edilen Araştırmaların Genel Özellikleri

Yazarlar	Örneklem	Araştırma Tipi	Sonuçlar
Khairy ve ark. (2022)	N:100	Yarı deneysel çalışma	Pranayama solunum egzersizleri grubundaki hastaların rutin bakım alan hasta grubuna göre anksiyete seviyesi anlamlı derecede daha düşük ve kan basıncı ölçümlerinde anlamlı derecede iyileşme azaldığı belirlenmiştir.
Verma ve ark., (2022)	N:40	Randomize Kontrollü Çalışma	Pranayama solunum egzersizi uygulayan grubun ağrı düzeylerinin daha az olduğu, bağırsak fonksiyonlarının daha hızlı geri döndüğü, yaşam bulgularının stabil olduğu ve anesteziden uyanma süresinin daha kısa olduğu istatistiksel olarak anlamlı bulunmuştur.
Güneş ve ark. (2024)	N:100	Randomize Kontrollü Çalışma	Pranayama solunum (yoga) egzersizleri uygulanan deney grubundaki hastaların kontrol grubuna göre solunum fonksiyon testi ve akciğer grafisinde anlamlı derecede iyileşme ve 6 dakikalık yürüme testi ve oksijen satürasyonu anlamlı derecede yüksek bulunmuştur.
Chakrabarty ve ark. (2015)	N:160	Randomize Kontrollü Çalışma	Pranayama solunum egzersizi uygulayan grubun yorgunluk seviyesi kontrol grubuna göre anlamlı derecede düşük olarak belirlenmiştir.
Chandraba bu ve ark. (2019)	N:48	Randomize Kontrollü Çalışma	Pranayama solunum egzersizleri uygulanan hastalarda kardiyovasküler sistem cerrahisinden sonra anksiyete puanları anlamlı derecede düşüken, ağrı düzeyindeki azalma istatistiksel olarak anlamlı bulunmamıştır.
Ramesh ve ark. (2013)	N:40	Yarı deneysel çalışma	Pranayama solunum egzersizleri ve enstrümental müzik uygulanan hastalarda ağrı ve anksiyete seviyelerinin anlamlı derecede düşük olduğu belirlenmiştir.

SONUÇ

Pranayama solunum egzersizleri, yoganın bir parçası olarak uzun yıllardır uygulanmaktadır. Literatürdeki çalışmalar incelendiğinde cerrahi süreçte hemşirelik bakımında Pranayama solunum egzersizlerinin kullanılması ile hastaların yaşam bulguları, gastrointestinal sistem

aktiviteleri, solunum fonksiyonları iyileşmekte, anesteziden daha hızlı uyanmakta ve anksiyeteleri, ağrı şiddetleri, yorgunluk seviyeleri azalabilmektedir. Pranayama solunum egzersizlerinin tamamlayıcı ve alternatif yaklaşımlar olarak uygulanması önerilmektedir.

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ZEBRA BALIĞI KALP HASTALIKLARINA ÇARE OLABİLİR Mİ? CAN ZEBRAFISH BE A CURE FOR HEART DISEASE?

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ÖZET

Kalp hastalıkları, Dünya genelinde önemli bir ölüm nedenidir. Yetişkin memeli kalplerinde rejenerasyon oldukça sınırlıdır fakat zebra balığının kalp rejenerasyon yeteneğinin altında yatan hücrel ve moleküler mekanizmaları önemli derecede ortaya çıkmaktadır. Zebra balıklarının (*Danio rerio*) yüksek doğurganlığa ve şeffaf emriyo yapısına sahip olması nedeniyle birçok kalp hastalığı araştırmalarında ve çalışmalarında önemli bir model organizma olarak kullanılmaktadır. Zebra balığı emriyolarının şeffaf yapıya sahip olması nedeniyle kardiyovasküler sistemlerin gerçek zamanlı görselleşmesinde kolaylık sağlar. Zebra balıklarının kalp rejenerasyon yeteneğine sahip olmaları araştırmacılar için değerli bilgiler sunmaktadır. Bu balık türünün kalbi insan kalbine benzer şekilde çalışmaktadır bu nedenle hastalık modelleri oluşturmak için uygundur. Zebra balıklarında, kalp hastalıklarını incelemek için çeşitli genetik araçlar kullanılabilir. Kalp hastalığına neden olan genetik mutasyonları tanımlamak için CRISPR/Cas9 gibi genetik mühendislik teknikleri kullanılmaktadır. İnsanlardaki kardiyomiyopati, kalp yetmezliği ve aritmi gibi hastalıkların moleküler mekanizmalarını anlamamızda zebra balıkları yardımcı olmaktadır. Bu balıklarda kalp hücrelerinin (kardiyomiyositlerin) artması, bölünerek çoğalması ve farklılaşması, rejeneratif süreçlerin temeli olarak görülmektedir. Zebra balığındaki bu rejeneratif süreçler, insandaki kalp hastalıklarının anlaşılmasında ve tedavi edilmesinde yeni yaklaşımların elde edilmesine yol açabilir. Özellikle, bu balıklarda belirlenen rejeneratif genlerin ve sinyal yollarının, insan hücrelerindeki benzer rejeneratif tepkimelerin uyarılmasında da kullanılabilir. Bu alandaki araştırmalar, gen terapileri, farmakolojik müdahaleler ve kök hücre tedavileri gibi tedavi yöntemlerinin geliştirilmesine katkı sunmaktadır. Sonuç olarak, zebra balığı, kalp hastalıklarının genetik ve rejeneratif yönlerini anlamak için güçlü bir model

organizma olarak hizmet vermektedir. Zebra balığı arařtırmaları, kalp hastalıklarının temel mekanizmalarının anlaşılmasında ve kalp hastalıklarının tedavilerinde yeni yöntemlerin geliştirilmesine önemli katkıları sağlamaktadır.

Anahtar Kelimeler: Kalp hastalığı, kalp yenilenmesi, şeffaf embriyo, Zebra balığı

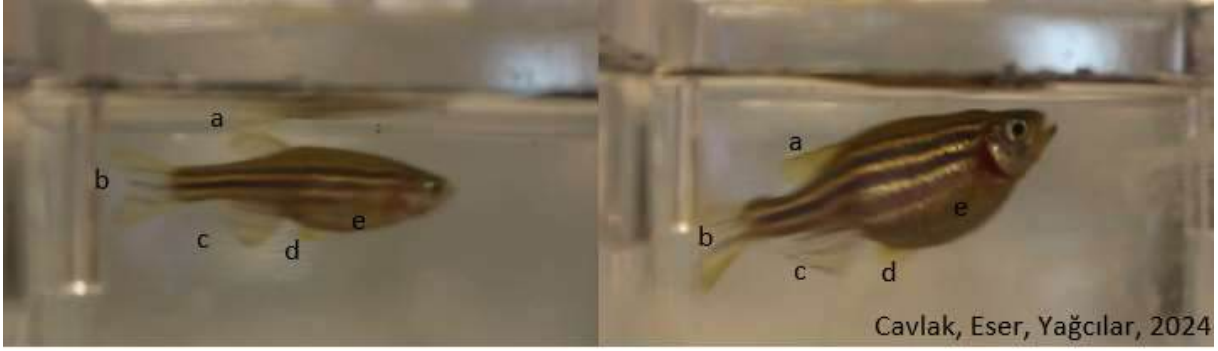
ABSTRACT

Heart disease is a major cause of death worldwide. Regeneration in adult mammalian hearts is severely limited, but the cellular and molecular mechanisms underlying the ability of zebrafish hearts to regenerate are being revealed at an important level. Zebrafish (*Danio rerio*) are used as an important model organism in many heart disease research and studies due to their high fecundity and transparent embryo structure. The transparent structure of zebrafish embryos facilitates real-time visualization of cardiovascular systems. The ability of zebrafish to regenerate the heart provides valuable information for researchers. The heart of this fish species works in a similar way to the human heart and is therefore suitable for creating disease models. In zebrafish, various genetic tools can be used to study heart disease. Genetic engineering techniques such as CRISPR/Cas9 are being used to identify genetic mutations that cause heart disease. Zebrafish help us understand the molecular mechanisms of diseases such as cardiomyopathy, heart failure and arrhythmia in humans. In these fish, the increase, division, proliferation and differentiation of heart cells (cardiomyocytes) is seen as the basis of regenerative processes. These regenerative processes in zebrafish could lead to new approaches to understanding and treating heart disease in humans. In particular, the regenerative genes and signaling pathways identified in these fish can also be used to stimulate similar regenerative responses in human cells. In conclusion, zebrafish serve as a powerful model organism for understanding genetic and regenerative aspects of heart disease. Zebrafish research is making important contributions to the understanding of the basic mechanisms of heart disease and the development of new methods to treat heart disease.

Keywords: Heart disease, heart regeneration, transparent embryo, zebrafish.

GİRİŞ

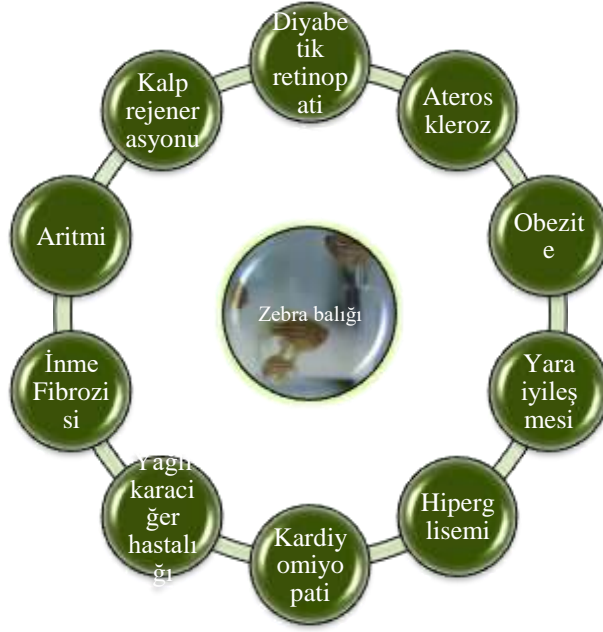
Zebra balığı (*Danio Rerio*) sazangiller familyasına ait olan Güney Asya' dan gelen sığ göllerde, göletlerde ve bol bitki örtüsü ile kaplı berrak su habitatlarında yaşayan küçük bir vücut yapısına sahip tatlı su balığıdır (Meyers, 2018; Spence vd., 2006). Zebra balıklarının dış morfolojisine bakıldığında bir adet sırt, kuyruk, anal yüzgeç ve çift halinde pektoral, pelvik yüzgeçler yer almaktadır (Gupta ve Mullins, 2010) (Şekil 1).



a)Sırt yüzgeci, b)Kuyruk yüzgeci, c)Anal yüzgeç, d)Pelvik yüzgeç, e)Pektoral yüzgeç

Şekil 1. Yetişkin erkek ve dişi zebra balığı

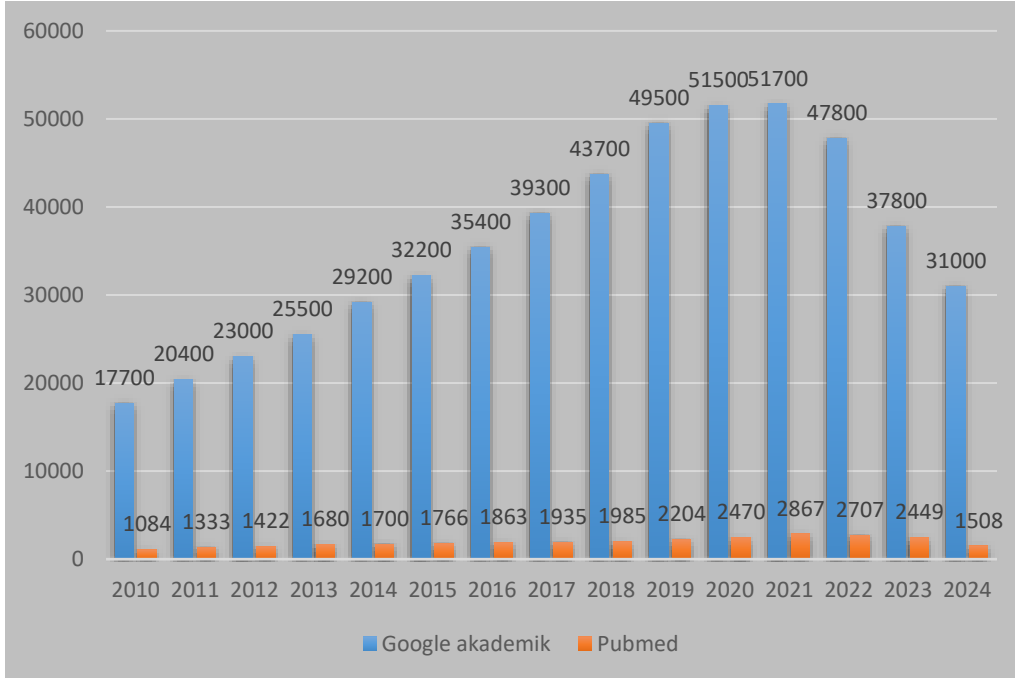
Balıklar soğukkanlı canlılar olup zebra balıkları tropikal bir tür olarak gelişim aşamalarında yaygın olarak 28.5 °C su sıcaklığını tercih etmektedirler (Aleström vd., 2020). Dr. George Streisinger'in 1980 yılında ilk kez zebra balığını laboratuvar ortamında kullanmasıyla birlikte zebra balığı genetik, yaşlanma ve insan hastalıkları için yaygın bir model organizma olarak tercih edilmeye başlamıştır (Jørgensen, 2020). Yetiştirme kolaylığı, yüksek üreme kapasitesi, küçük boyutlu olması, hızlı gelişim göstermesi, yumurtaların şeffaf olması gibi özelliklerinden dolayı birçok farklı çalışmada kullanılmakta aynı zamanda çiftleşmeden sonra dış döllenme ile yüzlerce embriyo oluşumu ile döllenmeden sonra 48 ila 72 saat arasında gastrointestinal sistemdeki organlar dışında çoğu organ gelişiminin tamamlanması ve 76 saat sonunda karaciğer, pankreas ve bağırsağın gelişimi ile birlikte 96 saatte gastrointestinalin tamamen oluşumunun tamamlanması gerçekleşmektedir (Cassar vd., 2019). Zebra balığı birçok hastalıkta model organizma olarak kullanılmasının yanında özellikle; metabolizma, kardiyovasküler, nörolojik, bulaşıcı hastalıklar ve bağışıklık, fibrotik hastalıkların incelenmesinde önemli bir rol almaktadır (Ingham, 2009). Genel olarak farmakoloji ve toksikoloji (ekotoksikoloji, nörotoksikoloji ve toksikogenomik) yanında genetik, sinirbilim, gelişim, fizyoloji, biyotıp, ilaç geliştirme, hastalık modellemesi, ilaç taraması alanlarında da çalışmak için kullanılan önemli bir model organizma haline gelmiştir (Hu, Sedmera, Yost, ve Clark, 2000; Teame, vd., 2019) (Şekil 2).



Şekil 2. Zebra balığı hastalık modellenmeleri

ARAŞTIRMA BULGULARI VE TARTIŞMA

Biyomedikal araştırmalar için deneysel hayvan modellerinin kullanımı gerekli olmakla birlikte son yıllarda zebra balığının kullanımı ile yapılan çalışmalarda yıllık yayın sayısı giderek artış göstermektedir (Şekil 3,4).

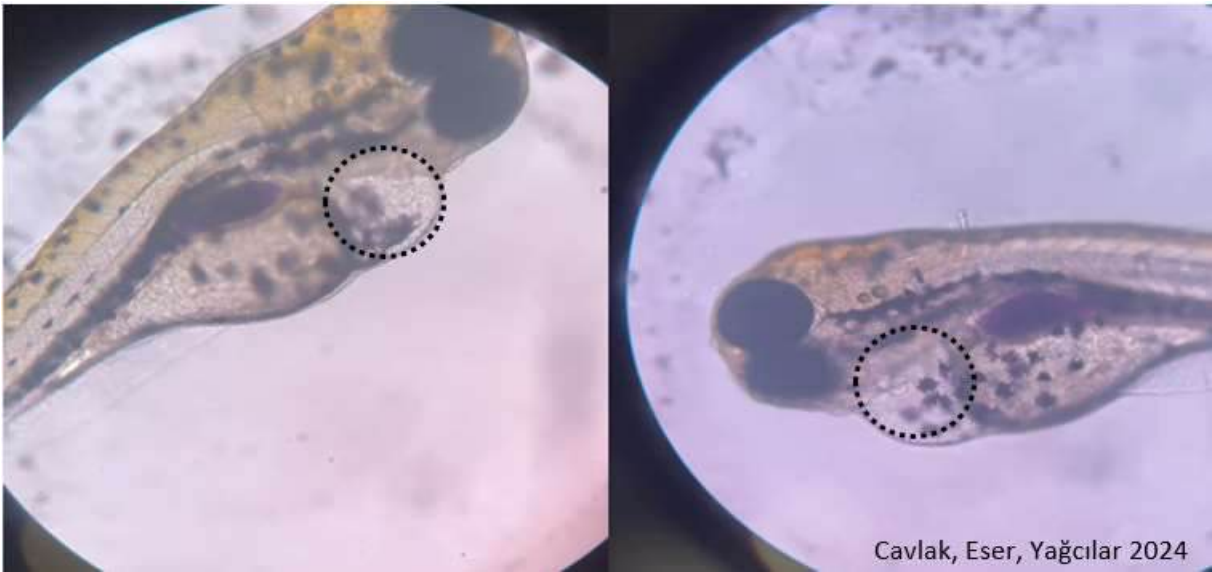


Şekil 3. "Zebra balığı" anahtar kelime ile arama yapıldığında Google akademik ve PubMed'deki yıllık yayın sayısı.



Şekil 4. "Zebra balığı kalp hastalıkları" anahtar kelime ile arama yapıldığında Google akademik ve PubMed' de yıllık yayın sayısı.

Zebra balığı embriyosu şeffaf oluşu sayesinde kolay gözlenebilirliği ile kan akışı, kardiyak kasılma, damar boyutunun mikroskop altında kolay incelenmesine olanak sağlamaktadır (Chico, Ingham, ve Crossman, 2008) (Şekil 5). Zebra balıkları embriolarında gelişimlerinin kardiyovasküler sisteme bağlı olmayışı ve oksijenin embrioların tüm dokularına pasif difüzyon yardımı ile iletilmesi nedeniyle kardiyovasküler hastalıkların kolayca analiz edilmesine yardımcı olmaktadır (Bakkers, 2011) (Şekil 6). Bu sayede insanlardaki kardiyovasküler hastalıklar ile ilgili sorunların belirlenmesinde zebra embrioları kullanılarak yapılan çalışmaların sayısı giderek artış göstermektedir (Jyothika vd., 2024).



Şekil 5. Zebra balığı embriosunun mikroskop altında kalp görüntüsü

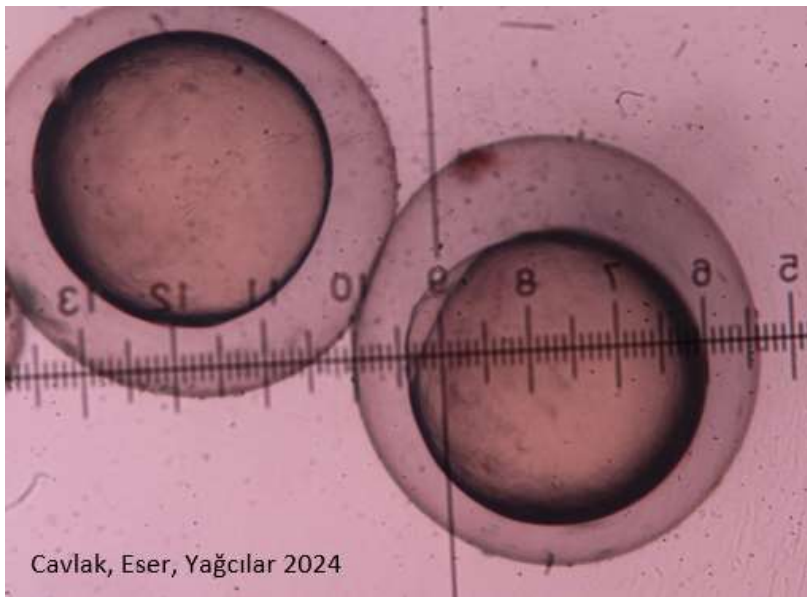


Şekil 6. Zebra embriyolarında oksijen iletimi

Zebra balığı embriyolarıda hem kalp anormalliklerinin hem de normal kalp gelişiminin anlaşılmasında yumurta gelişim safhalarının bilinmesi önem oluşturmaktadır. Bu gelişim safhaları altı aşamadan oluşmaktadır.

1.Zigot aşaması (döllenmeden sonraki ilk 45 dakika)

Zebra balıklarında kalp gelişimi döllenmeden hemen sonra başlar ve embriyoda hücreler hızla bölünür fakat boyutlarında bir değişiklik olmaz. Zigotun, döllenme sırasında çapı yaklaşık olarak 0,7 mm'dir (Jyothika vd., 2024; Kimmel, Ballard, Kimmel, Ullmann, ve Schilling, 1995) (Şekil 7).



Şekil 7. Bir hücre aşamasında zigot dönemindeki zebra balığı embriyosu

2. Blastula (döllenmeden sonraki 2.25-5.25 saat)

Döllenmiş yumurtanın ilk gelişim safhası olan blastula aşaması 15 ila 30 dakikalık arasında gerçekleşen bölünmeler ile 1000 hücreye kadar çoğalan bölümleri kapsamaktadır (Ergül ve Kutan, 2023; Kimmel vd., 1995; Pelegri, 2003) (Şekil 8). Blastomer aşamasından türetilen kolonun hücreleri gastrulasyon aşamasında birbirlerinden ayrılır ve gelişimin birbirini takip etmesi ile ilerleyen nesillerde genellikle embriyonun çeşitli doku tiplerine dağılmış halde bulunur (Kimmel ve Warga, 1986). Midblastula (MBT) evresinde hücreler etkileşime girmeyi ve göç etmeye başlarlar. Hücre soyları net şekilde belirginleşmeye başladığı için gastrulasyona hazırlık başlar (Kimmel ve Warga, 1986).



Şekil 8. Blastula dönemindeki zebra balığı embriyosu

3. Gastrula (döllenmeden sonraki 5. Saat)

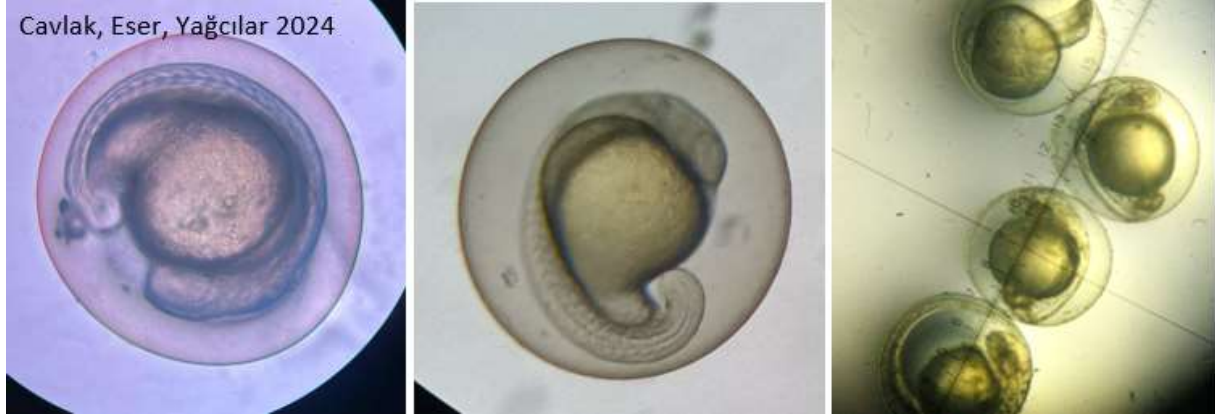
Gastrulasyon evresinde germ tabakaları olan ektoderm, mezoderm ve endoderm belirginleşmeye başlar ve genel vücut organizasyonu oluşmaya başlar (Melby, Warga, ve Kimmel, 1996) (Şekil 9).



Şekil 9. Gastrula dönemindeki zebra balığı embriyosu

4. Segmentasyon süresi (döllenmeden sonraki 10-24 Saat)

Morfolojik olarak hareketlenmelerin başladığı evredir. Birincil organların temelleri görünmeye başlamaya birlikte kuyruk tomurcukları daha belirgin hal alır, embriyolar uzamaya başlar ve ilk vücut hareketleri meydana gelmektedir (Kimmel vd., 1995) (Şekil 10).



Şekil 10. Segmentasyon aşamasındaki zebra balığı embriyosu

5. Zebra balığında gençlik (juvenile) dönem (döllenmeden sonraki 30. Gün)

Zebra balığı larvaları 29. günün sonunda 7.8 mm uzunluğa ulaşmış bulunmaktadır (Parichy, Elizondo, Mills, Gordon, ve Engeszer, 2009) (Şekil 11).



Şekil 11. Gençlik aşamasındaki zebra balığı

6. Yetişkin dönem (döllenmeden sonraki 90. Gün)

Cinsel olgunluğa ulaştığı dönem, döllenmeden sonraki 90. günde meydana gelir. Yetişkinlik dönemi 2 yıla kadar devam etmektedir (Hu, Yost, ve Clark, 2001) (Şekil 12).



Şekil 10. Yetişkin zebra balığı

SONUÇ

İnsanlara yüksek derecede genetik özelliğe sahip klasik bir omurgalı olan zebra balığı, kalp hastalıklarının altında yatan genleri ve mekanizmaları incelemek için değerli bir uygulama aracı sunmaktadır. Araştırmacılar, genetik ve moleküler teknolojileri kullanarak, insan kalp hastalıklarının altında yatan genetik temelini verimli bir şekilde tarayabilir ve anlayabilme fırsatı sağlayabilir. İnsan kalp hastalıklarında bir model oluşturmak için kardiyak çalışmalarda zebra balıklarının kullanımı bu balıkların güçlü yönlerinden yararlanmak, bu koşulları destekleyen mekanizmaları aydınlatmak ve bunların tedavisi ve yönetimi için yenilikçi yaklaşımlar üretmeye yardımcı olabilmektedir.

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RELATIONSHIP BETWEEN BLOOD UREA NITROGEN (BUN) ALBUMIN RATIO WITH ACUTE KIDNEY INJURY AND MORTALITY IN PATIENTS WITH CIRRHOSIS

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ABSTRACT

Liver cirrhosis remains a major health problem, causing morbidity and mortality. Elevated blood urea nitrogen (BUN) to serum albumin (BAR) ratio has been identified as a risk factor associated with mortality in pneumonia, sepsis, COVID-19 disease. In this study, we aimed to investigate whether this clinical index can predict clinical outcomes such as acute kidney injury and mortality in cirrhotic patients. In this retrospective study, patients over the age of 18 years who were admitted to the internal medicine intensive care unit and/or gastroenterology clinic of Necmettin Erbakan University with a diagnosis of liver cirrhosis were included. The study included 246 cirrhotic patients. When the etiologies of cirrhosis of the patients included in the study were analyzed, HBV, cryptogenic and HCV-associated cirrhosis were the most common etiologies. The most common reasons for hospitalization were refractory ascites, hepatic encephalopathy and GI bleeding, respectively. Acute kidney injury (AKI) developed in 75 of these patients. 56.5% of the patients were male and the mean age was 61.8 ± 13.2 years. The median BUN/albumin ratio was significantly higher in patients with acute kidney injury (15.2) compared to patients without AKI (5.45) ($p < 0.001$). Similarly, the median BUN/albumin ratio of patients who ended in mortality (16.3) was significantly higher than that of living patients (6.2) ($p < 0.001$). Spearman correlation analysis showed that BUN/albumin ratio correlated with Child score ($r: 0.498$, $p < 0.001$) and MELD score ($r: 0.484$, $p < 0.001$). Factors associated with mortality were determined by univariate analysis. Bilirubin, INR, albumin, sodium, encephalopathy, ascites and BUN/albumin ratio were included in the analysis. In multivariate logistic regression analysis, BUN/albumin ratio (OR 1.069; 95% CI 1.020-1.121; $P = 0.006$), bilirubin (OR 1.097; 95% CI 1.028-1.172; $P = 0.005$), encephalopathy (OR 8.640; 95% CI 3.261-22.888; $P < 0.001$) and ascites (OR 10.794; 95% CI 1.362-85.555; $P < 0.024$) were independent predictors of mortality.

Keywords: Cirrhosis, Acute kidney injury, BUN/albumin ratio, Mortality.

GİRİŞ

Sirozlu hastalar, hastane içi morbidite ve mortalitede belirgin artışla ilişkili bir komplikasyon olan akut böbrek hasarı (ABH) geliştirmeye eğilimlidir. Akut dekompanseasyon nedeniyle hastaneye yatırılan sirotik hastalarda ABH insidansı %20-50 arasında değişir. Hastaneye yatırılan sirotik hastaların hem yatarak hem de taburcu olduktan sonra yüksek bir mortalite oranı vardır. Sirozun kendisi, önemli hacim kaymaları ve artmış vazodilatasyon nedeniyle önemli morbiditeye neden olan karmaşık bir hastalık sürecidir (Gupta et al. 2021).

BUN albümin oranı (BAO) son zamanlarda ortaya atılmış, BUN değerinin albümine bölünmesi ile elde edilen yeni bir belirteçdir. Çeşitli hastalıklarda mortalite ile ilişkisi bildirilmiştir. Kardiyak cerrahi geçiren hastalarda (Ye et al. 2022), akut gastrointestinal kanaması olan hastalarda (Bae et al. 2021) ve ST elevasyonlu miyokard enfarktüsü geçiren hastalarda mortaliteyi predikte ettiği bildirilmiştir (Balcik et al. 2023).

Albümin, karaciğerin sentez fonksiyonunu yansıtır ve hipoalbuminemisinin sirozlu hastalarda kötü prognozla ilişkili olduğu bilinmektedir (Cai et al. 2021). BUN hastaların volüm durumunu yansıtır.

BAO'nun sirotik hastalarda prognostik performansını değerlendiren çok az çalışma vardır (Shen J, Shan Z (2023)). Biz de bu çalışmada, bu klinik indeksin sirotik hastaların akut böbrek hasarı ve mortalite gibi klinik sonuçlarını tahmin edip edemeyeceğini araştırmayı amaçladık.

MATERYAL VE METOD

Necmettin Erbakan Üniversitesi Tıp Fakültesinde yapılan bu retrospektif çalışmaya, karaciğer sirozu tanısı ile gastroenteroloji kliniği veya iç hastalıkları yoğun bakım ünitesine yatırılan erişkin hastalar alındı. Çalışma dışında tutulma kriterleri ise hastanın kabulde bakılan kreatinin değerlerinin ≥ 4 mg/dl olması, eksik verilerinin olması ve yatış süresinin 2 günden az olması olarak belirlendi.

Çalışmaya alınan hastaların yaş, cinsiyet, yatış süreleri, yatış nedenleri, siroz etyolojileri, komorbid hastalıkları, hemodiyaliz ve mekanik ventilatör ihtiyacı, mortalite durumu, yatış esnasında bakılan hemogram, glukoz, üre, kreatinin, sodyum, potasyum, alanin aminotransferaz, aspartat aminotransferaz, total ve direkt bilirubin, albumin ve INR değerleri hastane veri tabanından kaydedildi. BAO değeri (mg/g), BUN düzeyinin (mg/l) albümin düzeyine (g/l) bölünmesiyle elde edildi. Hastalar, hastane içi mortalite olup olmamasına göre sağ kalan veya sağ kalmayan grubuna atandı.

Hastaların MELD (Model For End-Stage Liver Disease) ve Child Pugh skorları hesaplandı. Child skoru hesaplanırken serum total bilirubin, albumin, INR değerleri ile asit, hepatik ensefalopati durumu dikkate alındı. MELD skoru ise hastaların INR, total bilirubin ve kreatinin değerleri ile hesaplandı.

Hastaların tüm yatış süresince kreatinin değerleri kaydedilerek, KDIGO (Kidney Disease Improving Global Outcomes) kriterlerine göre akut böbrek hasarı tanı ve evrelemesi yapıldı.

Kaydedilen verilerin istatistiksel analizi SPSS 22.0 paket programı (SPSS Inc., Chicago, IL) kullanılarak yapıldı. Verilerin normallik analizleri histogram ve Kolmogorov-Smirnov testi kullanılarak yapıldı. İstatistiksel sürekli değişkenler ortalama \pm standart sapma, normal dağılmayan sürekli değişkenler ortanca (minimum-maksimum) ve kategorik veriler de yüzde olarak gösterildi. Grupların karşılaştırıldığı analizlerde kategorik değişkenler için ki-kare, sürekli değişkenler için t-testi ve normal dağılmayan verilerde Mann Whitney U-testi yapıldı.

Mortalite gelişimi için bağımsız etkili faktörleri göstermek için Backward Multivariate Regresyon analizi yapıldı. p değeri 0.05'in altı anlamlı olarak kabul edildi..

BULGULAR VE TARTIŞMA

Bu çalışmaya 246 hasta dahil edildi. Hastaların % 43,9'u kadındı ve ortalama yaş 61,7±13,3'di. ABH gelişen ve gelişmeyen hastalara bakıldığında yaş, cinsiyet ve siroz etyolojisi açısından anlamlı fark yoktu. Yatış etyolojisi açısından bakıldığında ABH gelişen hastalarda hepatik ensefalopati ve refrakter asit ile yatış oranlarının fazla olduğu görüldü (Tablo 1).

ABH gelişen hastalarda Child Pugh skoru ve MELD skoru anlamlı olarak yüksekti. ABH gelişmeyen hastalarla kıyaslandığında ABH gelişen hastalarda sodyum ve albümin değerleri anlamlı olarak düşükken INR, bilirübin, WBC, trombosit ve AST değerleri anlamlı olarak yüksek bulundu. Median BAO ise ABH gelişenlerde (15,2) ABH gelişmeyenlere (5,45) göre anlamlı olarak yüksekti ($p<0,001$) (Tablo 2).

Mortalite ile sonuçlanan hastaların median BAO (16,3) yaşayanlara (6,2) göre anlamlı olarak yüksek bulundu ($p<0,001$). Ayrıca mortal seyreden hastaların Child pugh skoru, MELD skoru, BUN, kreatinin, INR, bilirübin, WBC, AST değerleri yaşayan hastalara göre anlamlı olarak yüksek, sodyum ve albümin değerleri ise anlamlı olarak düşüktü (Tablo 3).

Spearman korelasyon analizinde BUN/albumin oranının Child skoru ($r:0,498$, $p<0,001$) ve MELD skoru ($r:0,484$, $p<0,001$) ile korele olduğu görüldü.

Univariate analiz yapılarak mortalite ile ilişkili faktörler belirlendi. Anlamlı bulunan bilirübin, INR, albumin, sodyum, ensefalopati varlığı, asit varlığı ve BUN/albumin oranı analize dahil edildi. Yapılan multivariate lojistik regresyon analizinde BUN/albumin oranı (OR 1.069; 95% CI 1.020-1.121; $P= 0.006$) bilirübin (OR 1.097; 95% CI 1.028-1.172; $P= 0.005$), ensefalopati (OR 8.640; 95% CI 3.261-22.888; $P < 0.001$) ve asit varlığı (OR 10.794; 95% CI 1.362-85.555; $P < 0.024$) mortalitenin bağımsız prediktörleri idi (Tablo 4).

Sonuç olarak, bu çalışmadaki BAO düzeyleri mortalite ile seyreden grupta hayatta kalan gruptan anlamlı olarak daha yüksekti. Ayrıca sirotik hasta grubunda BAO Child ve MELD skoru ile korele ve mortalite için bağımsız prediktör idi.

Zhang ve arkadaşları hepatit B virüsüyle ilişkili dekompanse sirozu olan 161 hastayı dahil ettikleri çalışmalarında BAO'nun 30 günlük mortalite ile ilişkisini araştırmışlardır. Mortal seyreden hastalarda BAO 2.95 ve yaşayan hastalarda 1.71 olarak bulunmuş ve aradaki farkın istatistiksel olarak anlamlı olduğu bildirilmiştir ($p<0.001$). BAO değerlerinin bizim çalışmamızdaki değerlerle farklı olmasının nedeni bu çalışmada BUN değerini mmol/L birimiyle kullanmaları bizim ise mg/dL olarak kullanmamıza bağlı olduğunu düşündük. Bu çalışmada dekompanse sirozlu hastalarda 30 günlük mortaliteyi predikte etmede BAO kesme değeri 2.32 ve AUC değeri 0.752 olarak bulunmuştur. (Zhang et al. 2022).

Tablo 1: Hastaların demografik, klinik özellikleri ve bunların akut böbrek hasarı ile ilişkisi

Shen ve arkadaşlarının HBV ile ilişkili dekompanse sirozda BAO'nun öngörücü rolünü araştırdıkları çalışmalarında BAO seviyeleri sağ kalanlar ve sağ kalmayanlar arasında belirgin şekilde farklı bulunmuştur. Ayrıca BAO multivariate analizle mortalitenin bağımsız prognostik göstergesi olduğu bildirilmiştir. Çalışmamızın bulguları bu iki çalışma ile uyumludur.

	ABH (+)	ABH (-)	P değeri
N	75	171	
Yaş (yıl) ort±SD	61,5±12,5	61,9±13,5	0,857
Cinsiyet, n(%)			
Kadın	30 (40)	77 (45)	0,464
Erkek	45 (60)	94 (55)	
Siroz etyolojisi, n (%)			
HBV	29 (38,7)	47 (27,5)	0,104
HCV	16 (21,3)	34 (19,9)	
Alkol	1 (1,3)	7 (4,1)	
Otoimmün	1 (1,3)	10 (5,8)	
Kriptojenik	19 (25,3)	53 (31)	
Diğer	9 (12)	20 (11,7)	
Yatış nedeni, n (%)			
Hepatik ensefalopati	21 (28)	35 (20,5)	0.048
Refrakter asit	22 (29,3)	42 (24,6)	
GİS kanaması	9 (12)	38 (22,2)	
SBP	5 (6,7)	10 (5,8)	
SBP dışı enfeksiyon	7 (9,3)	5 (2,9)	
Diğer	11 (14,7)	41 (24)	

Çalışmamızın bazı kısıtlılıkları vardır. Çalışmamıza tek merkezden hastalar retrospektif olarak taranarak alındı. Hastaların yatış BAO değerleri değerlendirmeye alındı. Yatış süresi boyunca bu değerlerde değişiklikleri olabilir, bunu değerlendirmedik. Albumin değerlerinin beslenme

ve enfeksiyon durumundan da etkilendiği bilinmektedir. Yatış öncesi albümin değerlerini ve beslenme durumunu değerlendiremedik.

Tablo 2: Hastaların laboratuvar, klinik özellikleri ve bunların akut böbrek hasarı ile ilişkisi

	ABH (+) n:75	ABH (-) n:171	P değeri
Hastaneye kabulde			
Child Pugh Skor	10,7±2,2	8,3±2,2	<0,001
MELD	22,3±6,7	13,6±3,2	<0,001
Hemoglobin (g/l)	10,6±2,2	10,5±2,01	0,834
Serum kreatinin (mg/dl)	1,6±1,2	0,9±0,3	<0,001
Sodyum (mEq/L)	132,8±5,4	136,5±2,8	<0,001
BUN (mg/dL)	40,2 (20,8-130,8)	16,8 (3,3-33,2)	<0,001
Albumin (g/dl)	2,6±0,54	2,9±0,52	<0,001
INR	1,84±0,68	1,51±0,35	<0,001
T. bilirubin (mg/dl)	6,4±4,8	2,3±2,1	<0,001
WBC (IU/mm ³)	9,2±5,4	5,8±2,9	<0,001
PLT (10 ³ /mm ³)	132,2±85	111,5±61,2	0,032
AST (U/L)	70 (10-940)	53 (14-781)	0,034
ALT (U/L)	34 (5-1743)	30 (6-545)	0,310
BUN albümin ratio	15.2 (2,04-61,6)	5.45 (1,2-28,6)	<0,001
MV gereksinimi, n(%)	15 (20)	1 (0,6)	<0,001
YB kalış süresi (gün)	5,1±7,7	1,5±2,20	<0,001
Hospitalizasyon süresi (gün)	12,2±8,1	10,2±5,2	<0,001
Hastane mortalitesi, n(%)	37 (49,3)	5 (2,9)	<0,001

Tablo 3: Hastaların laboratuvar, klinik özellikleri ve bunların hastane mortalitesi ile ilişkisi

	Ölen	Yaşayan	P değeri
n, (%)	42 (17)	204 (83)	
Yaş (yıl), ortalama±SD	61,4±12,3	61,9±13,2	0,959
Cinsiyet, n(%)			
Kadın	14 (33,3)	93 (45,6)	0,145
Erkek	28 (66,7)	111 (54,4)	
Hastaneye kabulde			
Child Pugh Skor	12,0±2,2	8,5±2,2	<0,001
MELD	24,1±7,4	14,6±5,4	<0,001
Hemoglobin (g/l)	10,5±2,5	10,7±1,9	0,819
Kreatinin (mg/dl)	1,76±1,3	1,0±0,5	<0,001
Sodyum (mEq/L)	132,0±5,3	135,8±4,3	<0,001
BUN (mg/dL)	107±45	50,1±34	<0,001
Albumin (g/dl)	2,5±0,4	2,9±0,5	<0,001
INR	2,0±0,7	1,5±0,4	<0,001
T. bilirubin (mg/dl)	8,0±5,6	2,6±3,2	<0,001
WBC (IU/mm ³)	10,4±6,0	6,1±3,3	<0,001
PLT (10 ³ /mm ³)	117,1±63	117,9±71	0,943
AST (U/L)	82,5 (24-918)	53 (10-940)	0,001
ALT (U/L)	40 (10-1743)	29,5 (5-545)	0,055
BUN albümin ratio	16,3 (2-61,6)	6,2 (1,2-34,4)	<0,001
MV gereksinimi, n(%)	16 (38,1)	0	<0,001
YB kalış süresi (gün)	8,4±8,4	1,4±3,1	<0,001
Hospitalizasyon süresi (gün)	9,5±6,3	12±5,8	<0,001

Tablo 4 Karaciğer sirozu olan hastalarda mortalite gelişimini predikte eden faktörler için multivariate regresyon analizi

Değişken	OR	Güven aralığı	p
Bilirübin	1.097	1.028-1.172	0.005
Ensefalopati varlığı	8.640	3.261-22.888	<0.001
Asit varlığı	10.794	1.362-85.555	0.024
BAR	1.069	1.020-1.121	0.006

SONUÇ

BAO sirotik hastalarda ucuz, kolay ulařılabilir ve pratik bir belirteçtir. Bu hasta grubunda mortalitenin bağımsız bir belirteçidir. Prognozla ilgili skortlama sistemlerine entegre edilebilir. Bunun için prospektif kontrollü çalışmalara ihtiyaç vardır.

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**DEEP LEARNING APPROACHES FOR GASTROINTESTINAL DISEASE
CLASSIFICATION**
GASTROİNTESTİNAL HASTALIKLARIN SINIFLANDIRILMASINDA DERİN
ÖĞRENME YAKLAŞIMLARI

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ABSTRACT

This study investigates the use of deep learning techniques for the classification of gastrointestinal system findings using the Kvasir v2 dataset. A total of eight different network architectures, named Net-1 to Net-8, were evaluated for their performance. It was found that the optimal performance was typically achieved between 30 and 35 epochs of training. While adding more convolutional layers to the basic network structure led to limited improvements in performance, significant gains were observed by doubling the number of filters. Notably, the network called Net-5 in the study achieved a test accuracy of 87.33%, along with strong performance metrics such as a precision of 87.50%, recall of 86.73%, and an F1-score of 87.11%. These results suggest that increasing network complexity can indeed enhance performance; however, there exists a threshold beyond which additional layers and filters do not provide further benefits. This study's findings are consistent with existing research, which reports accuracy rates ranging from 84.6% to 99.61%. This highlights the significant potential of deep learning techniques for effective classification of gastrointestinal diseases. For future research, it is recommended to focus on fine-tuning network parameters, employing more sophisticated feature engineering techniques, and integrating advanced methodologies to achieve further enhancements in performance. Additionally, exploring other deep learning architectures and approaches could provide new insights and further improve classification accuracy.

Keywords: Deep Learning, Gastrointestinal Classification, Kvasir v2 Dataset, CNN Architectures, Performance Metrics

ÖZET

Bu çalışma, Kvasir v2 veri seti kullanılarak gastrointestinal sistem bulgularının sınıflandırılması için derin öğrenme tekniklerinin uygulanmasını araştırmaktadır. Performansları değerlendirilmek üzere Net-1'den Net-8'e kadar adlandırılan toplam sekiz farklı ağ mimarisi incelenmiştir. Optimal performansın genellikle 30 ila 35 eğitim epoch'u arasında elde edildiği bulunmuştur. Temel ağ yapısına daha fazla konvolüsyon katmanı eklemek, performansta sınırlı iyileşmelere yol açarken, filtre sayısını ikiye katlayarak önemli kazanımlar elde edilmiştir. Özellikle, çalışmada Net-5 olarak adlandırılan ağ, %87.33 test doğruluğu, %87.50 hassasiyet, %86.73 duyarlılık ve %87.11 F1-skoru gibi güçlü performans metrikleri ile dikkat çekmiştir. Bu sonuçlar, ağ karmaşıklığını artırmanın performansı gerçekten artırabileceğini, ancak ek katmanlar ve filtrelerin daha fazla fayda sağlamadığı bir eşik olduğunu göstermektedir. Bu çalışmanın bulguları, %84.6 ile %99.61 arasında doğruluk oranları bildiren mevcut araştırmalarla tutarlıdır. Bu durum, derin öğrenme tekniklerinin gastrointestinal hastalıkların etkili sınıflandırılması için önemli bir potansiyele sahip olduğunu vurgulamaktadır. Gelecekteki araştırmalar için, ağ parametrelerinin ince ayarına, daha karmaşık özellik mühendisliği tekniklerinin kullanılmasına ve performansı daha da artırmak için ileri metodolojilerin entegrasyonuna odaklanılması önerilmektedir. Ayrıca, diğer derin öğrenme mimarilerini ve yaklaşımlarını keşfetmek, yeni bilgiler sağlayabilir ve sınıflandırma doğruluğunu daha da artırabilir.

Anahtar Kelimeler: Derin Öğrenme, Gastrointestinal Sınıflandırma, Kvasir v2 Veri Seti, CNN Mimarileri, Performans Metrikleri.

INTRODUCTION

Gastrointestinal diseases are prevalent worldwide, posing significant health challenges. Early diagnosis and accurate classification of these diseases are crucial for guiding patient treatment pathways. Endoscopic imaging techniques enable detailed examination of the gastrointestinal tract's internal structures and play a critical role in diagnosing various conditions. However, manual inspection of these images is time-consuming and prone to errors.

Recent advancements in artificial intelligence and deep learning techniques have made automated analysis and classification of medical images feasible. In this context, the Kvasir dataset, available in various versions, stands out as one of the most comprehensive datasets used for diagnosing and classifying gastrointestinal findings. Kvasir encompasses a variety of endoscopic images, providing researchers with a wide range of data.

Studies in the literature, conducted by Noha et al. (2019), Khan et al. (2022), Mohapatra et al. (2020), Wang et al. (2021), Yoshioka et al. (2023), Asperti and Mastronardo (2017), and Al-Adhaileh et al. (2021), highlight the successes of various deep learning models in diagnosing gastrointestinal diseases, particularly achieving high accuracy rates on datasets like Kvasir. These models have played a significant role in clinical applications.

This study focuses on the classification of gastrointestinal endoscopic images using the Kvasir Version 2 dataset and eight convolutional neural network (CNN) models, named from Net-1 to Net-8. The study addresses different classes representing anatomical landmarks and pathological conditions across various regions of the gastrointestinal system, such as esophagitis, normal cecum, normal pylorus, normal Z-line, polyps, and ulcerative colitis. The results obtained are promising for guiding future research endeavors.

METHOD

Dataset

The Kvasir version 2 (Kvasir v2) dataset (Pogorelov et al., 2017) is an open-access resource containing anatomical landmarks and pathological findings within the gastrointestinal system. In this study, a total of 6000 endoscopic images from 6 different classes in Kvasir v2, namely Z line, cecum, pylorus, esophagitis, polyp and ulcerative colitis, were used. As depicted in Figure 1, the Z line, cecum, and pylorus serve as critical anatomical landmarks in the gastrointestinal system, playing a pivotal role in disease diagnosis. Similarly, examples of polyps, ulcerative colitis, and esophagitis, also shown in the figure, represent common pathological conditions encountered in the gastrointestinal tract. The detection of these anatomical markers and pathological features is crucial for early diagnosis and accurate treatment planning of gastrointestinal diseases.

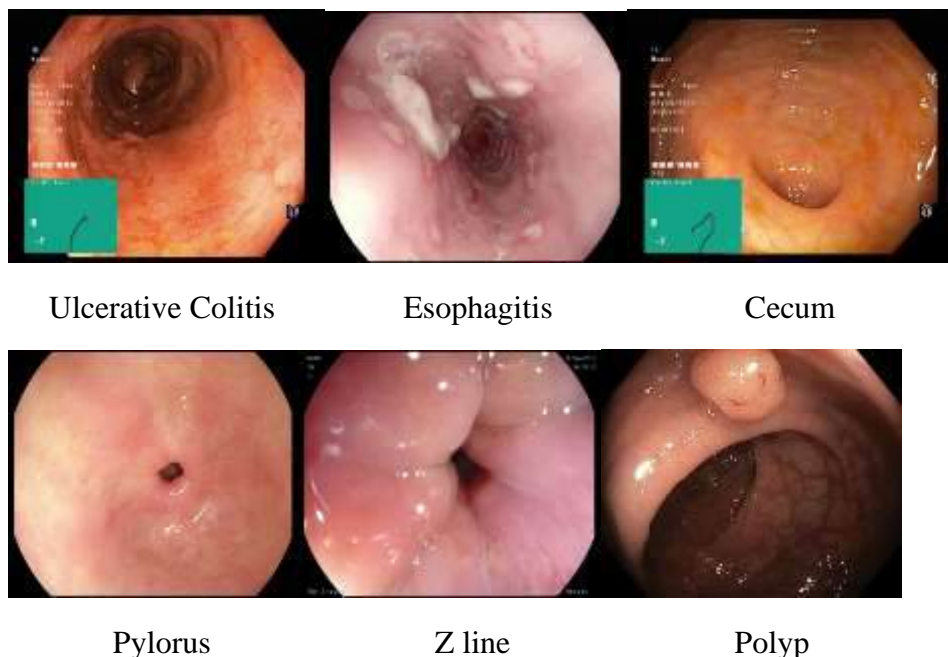


Figure 1. Images of different anatomical markers and pathological findings in Kvasir v2

Data Preprocessing

In this study, a series of image pre-processing techniques were used to prepare the dataset for classification with CNN models.

Some images in the dataset have text on them, and some images have green areas in the lower left corner. To prevent these elements from adversely affecting the training process of CNNs, the first step involved removing the text from the images using OpenCV functions. Subsequently, images with green areas in the bottom left corner were cleaned using the Cleanup.pictures website. After these cleaning steps, any irrelevant black artifacts along the edges of the images were cropped out, as they did not contain meaningful information. Following this, the images were resized to 224x224 pixels to ensure consistent input dimensions for the model. Post-resizing, the Contrast Limited Adaptive Histogram Equalization (CLAHE) technique was applied to enhance the local contrast of the images, thereby highlighting important details. The pixel values of the images were then scaled from the original range of 0 to 255 to a normalized range of 0 to 1. Lastly, data augmentation techniques were employed to expand the training dataset by applying random transformations to existing images.

These comprehensive preprocessing steps were implemented to facilitate more efficient training of the deep learning model and to enhance its generalization capabilities.

Classification

CNN models were utilized to classify the preprocessed images into six different classes. During the classification process, the dataset was randomly divided into 70% for training, 20% for validation, and 10% for testing.

Initially, a simple CNN structure named Net-1 by us, as depicted in Figure 2, was constructed for the classification task.

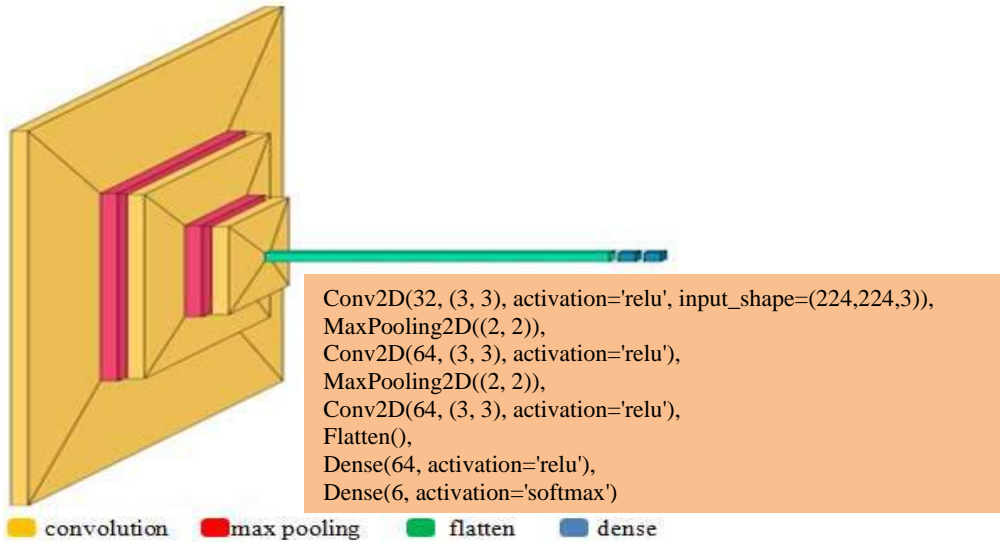


Figure 2. The structure of Net-1

Following this initial classification, three additional networks (Net-2, Net-3, and Net-4) were created by adding convolutional layers between different layers of Net-1. The purpose of this was to enhance the learning capability of the neural network and improve feature extraction.

Figure 3 shows the structure of Net-2, Figure 4 shows the structure of Net-3, and Figure 5 shows the structure of Net-4.

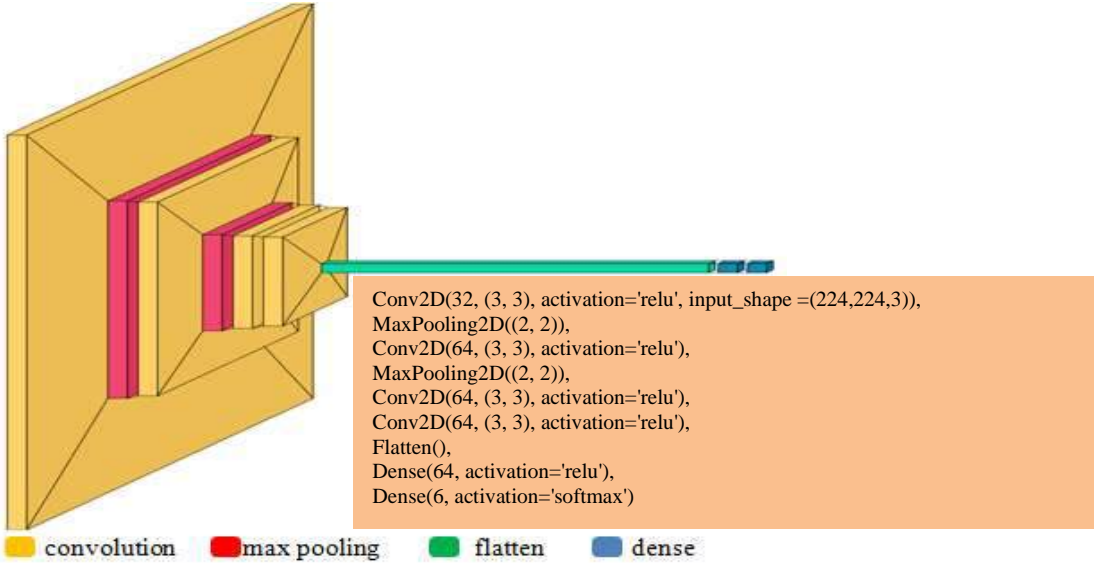


Figure 3. The structure of Net-2

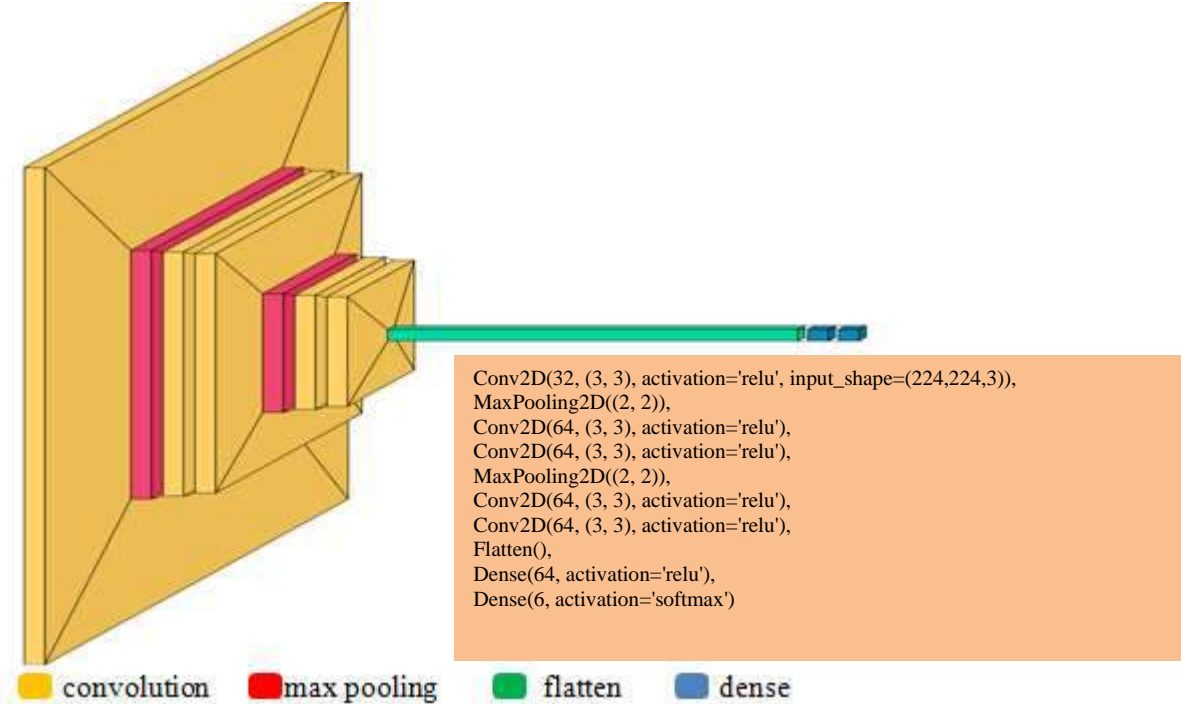


Figure 4. The structure of Net-3

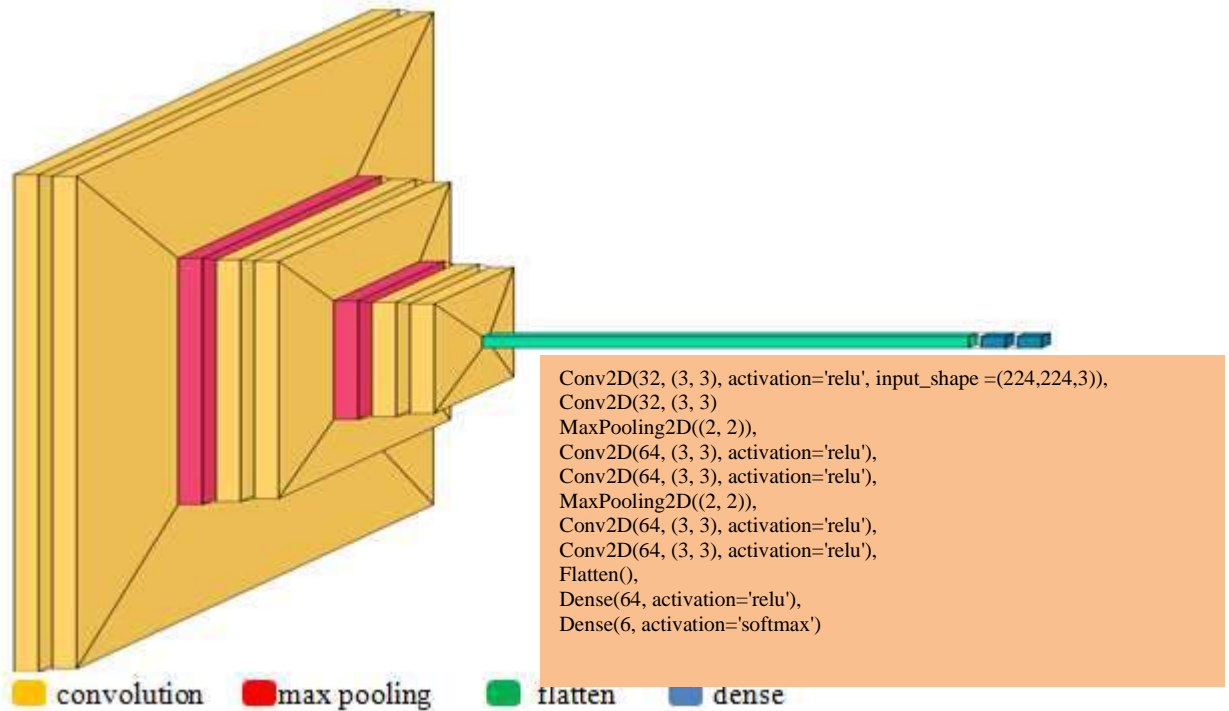
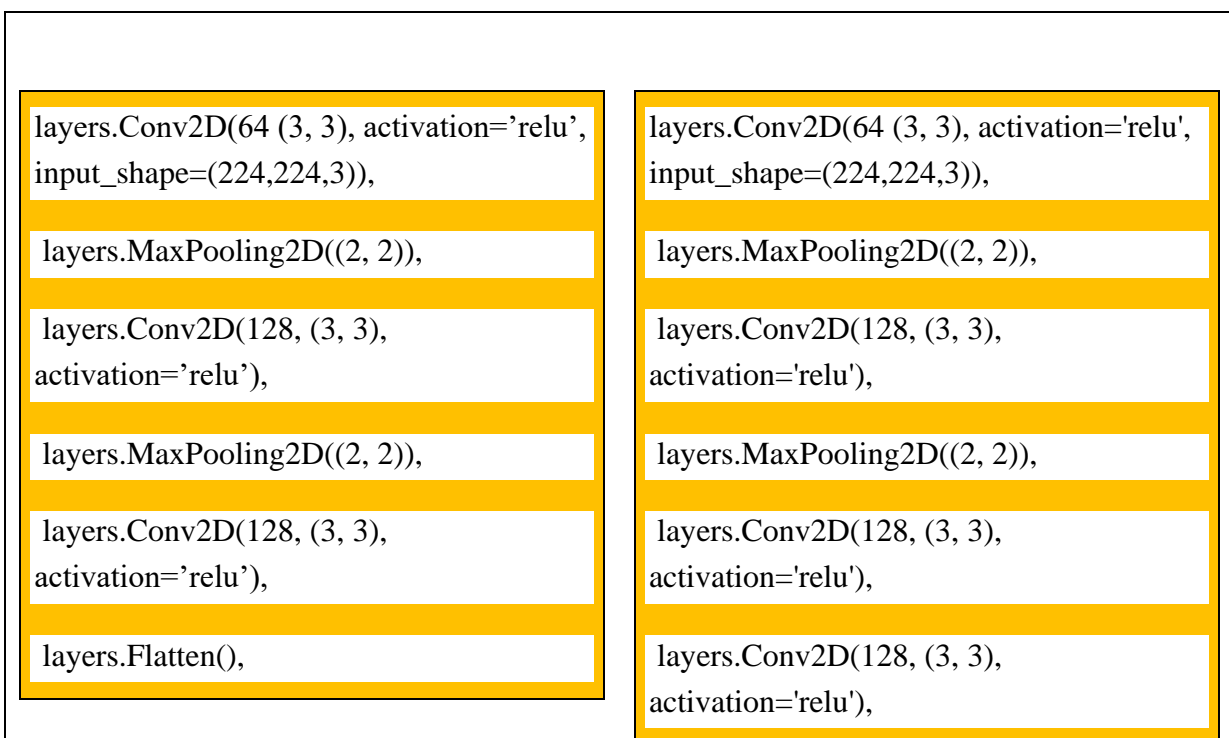


Figure 5. The structure of Net-4

To enhance classification performance, the number of filters in all layers of the Net-1, Net-2, Net-3, and Net-4 networks was doubled and these networks were renamed as Net-5, Net-6, Net-7, Net-8 respectively.

Adjusting the number of filters is a common strategy to understand its impact on the learning process and the performance of neural networks. The aim was to observe how this modification would affect the results. Structures of these networks are shown in Figure 6.



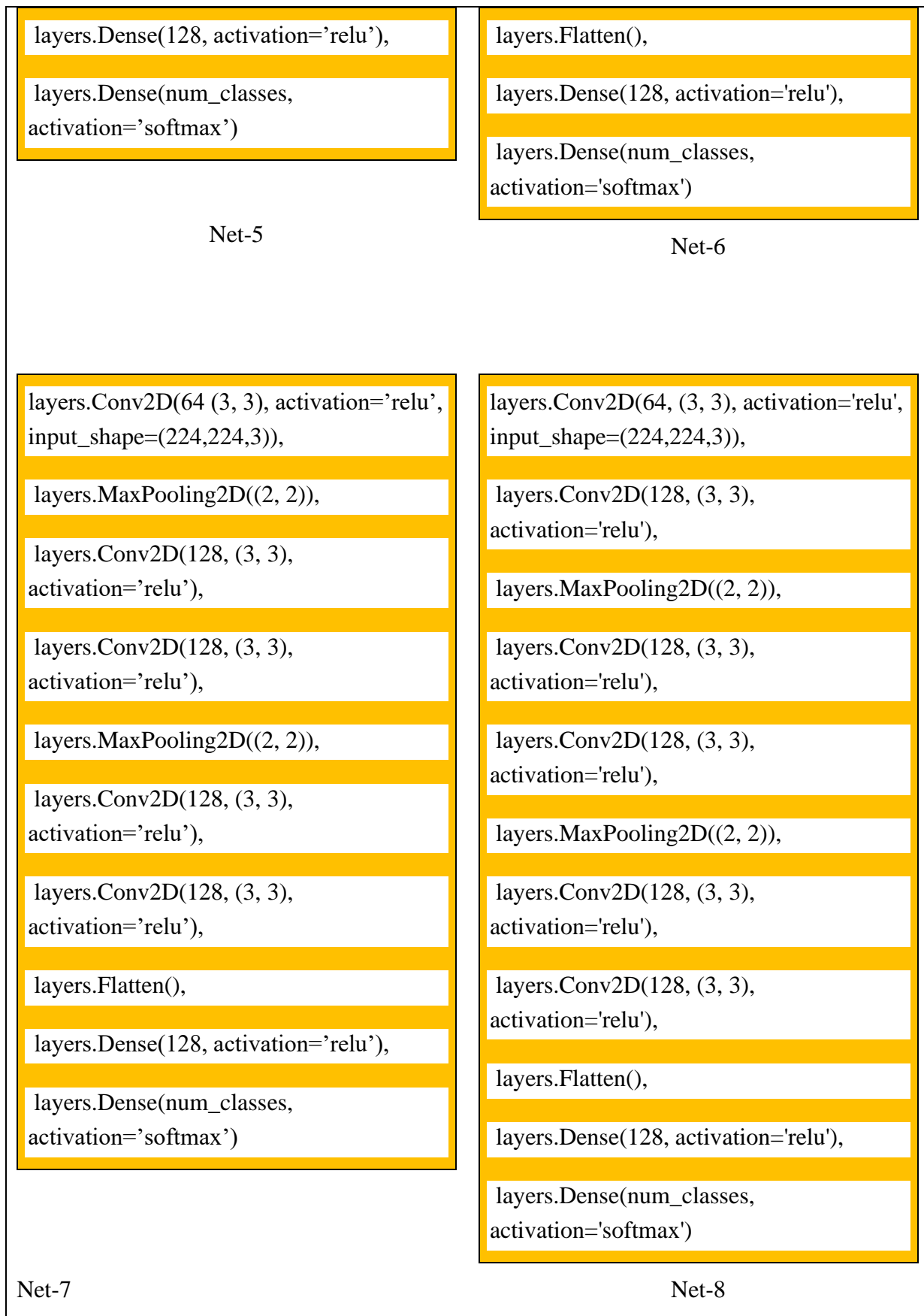


Figure 6. Structures of Net-5, Net-6, Net-7 and Net-8 networks

All networks were trained over 10, 20, 30, 35, 40, and 45 epochs. The 'Adam' optimization algorithm was employed as the optimization method.

RESULTS AND DISCUSSION

The training, validation, and test results for the network architectures from Net-1 to Net-8, created for the purpose of classifying gastrointestinal system findings, are shown in Table 1. The table only presents the best results achieved by the networks and indicates the number of epochs after which these results were obtained.

Table 1. Classification Results of All Networks

Net	Number of Epoch	Results of Training and Validation	Results of Test
Net-1	35	Training Loss: 0.2491 Training Accuracy: 0.8995 Validation Loss: 0.5710 Validation Accuracy: 0.8250	Accuracy: 0.8500 Loss: 0.4167 Recall: 0.8492 Precision: 0.8534 F1-Score :0.8512
Net-2	30	Training Loss: 0.2693 Training Accuracy: 0.8895 Validation Loss: 0.4962 Validation Accuracy: 0.8275	Accuracy: 0.8566 Loss: 0.3956 Recall: 0.8566 Precision: 0.8599 F1-Score: 0.8569
Net-3	35	Training Loss: 0.3001 Training Accuracy: 0.8767 Validation Loss: 0.5696 Validation Accuracy: 0.7992	Accuracy: 0.8216 Loss: 0.4626 Recall: 0.8216 Precision: 0.8419

			F1-Score: 0.8236
Net-4	30	Training Loss: 0.3333 Training Accuracy: 0.8652 Validation Loss: 0.4875 Validation Accuracy: 0.8192	Accuracy: 0.845 Loss: 0.4237 Recall: 0.8449 Precision: 0.8472 F1-Score: 0.8440
Net-5	35	Training Loss: 0.2467 Training Accuracy: 0.9031 Validation Loss: 0.5148 Validation Accuracy: 0.8467	Accuracy: 0.8733 Loss: 0.3958 Recall: 0.8673 Precision: 0.8750 F1-Score: 0.8711
Net-6	35	Training Loss: 0.2749 Training Accuracy: 0.8902 Validation Loss: 0.4498 Validation Accuracy: 0.8317	Accuracy: 0.8299 Loss: 0.4044 Recall: 0.8278 Precision: 0.8345 F1-Score: 0.8311
Net-7	35	Training Loss: 0.2808 Training Accuracy: 0.8855 Validation Loss: 0.5589 Validation Accuracy: 0.7900	Accuracy: 0.8166 Loss: 0.4676 Recall: 0.8114 Precision: 0.8200 F1-Score:

			0.8156
Net-8	30	Training Loss: 0.3191 Training Accuracy: 0.8683 Validation Loss: 0.4551 Validation Accuracy: 0.8233	Accuracy: 0.8299 Loss: 0.4118 Recall: 0.8229 Precision: 0.8364 F1-Score: 0.8294

Initially, a simple CNN structure named Net-1 was constructed for the classification task. Subsequently, to enhance learning capability and improve feature extraction, three additional networks (Net-2, Net-3, and Net-4) were created by adding convolutional layers between different layers of Net-1. As seen in Table 1, the performance with Net-2 showed a slight improvement over Net-1, but increasing the convolutional layers did not yield as high a performance increase as expected.

To further improve classification performance, the number of filters in all layers of Net-1, Net-2, Net-3, and Net-4 networks was doubled, resulting in networks renamed as Net-5, Net-6, Net-7, and Net-8, respectively. These adjustments aimed to observe the impact of increasing filter numbers on learning and performance. The results indicate that Net-5 achieved the highest accuracy among all networks, with training accuracy of 90.31%, validation accuracy of 84.67%, and test accuracy of 87.33%, along with superior metrics (recall, precision, and F1-score), highlighting its excellent generalization capability. The detailed results of the classification on the test data using Net-5 are shown in Figure 7.

	precision	recall	f1-score	support
esophagitis	0.83	0.71	0.76	100
normal-cecum	0.89	0.95	0.92	100
normal-pylorus	0.94	0.97	0.96	100
polyps	0.86	0.89	0.87	100
ulcerative-colitis	0.98	0.87	0.92	100
z-line	0.77	0.85	0.81	100
accuracy			0.87	600
macro avg	0.88	0.87	0.87	600
weighted avg	0.88	0.87	0.87	600

Figure 7. The detailed results of the classification on the test data using Net-5

The classification performance of the Net-5 model on the test dataset is generally quite impressive. The model demonstrates high precision, recall, and f1-score values in categories such as normal-cecum, normal-pylorus, and ulcerative-colitis. Notably, the model achieves near-perfect performance in the normal-pylorus category. However, it shows relatively lower precision in the esophagitis and z-line categories, although the recall values in these

categories remain satisfactory. Overall, the model exhibits balanced performance across all categories, as evidenced by its high average precision, recall, and f1-score values. This contributes positively to the overall accuracy rate of 87%. While there is room for improvement in the performance for the esophagitis and z-line categories, the model's overall success level is promising.

When examining the results in Table 1, it is observed that optimal results are generally achieved around 30 or 35 epochs. This indicates that the model's performance peaks at these epochs, and additional training does not provide further benefits.

Based on the classification results, it can be stated that efforts to add layers and increase the number of filters initially provided limited performance improvement. However, the addition of excessive layers and filters led to a performance decline beyond expectations.

Studies conducted between 2017 and 2023 have utilized various deep learning techniques for the detection and classification of gastrointestinal diseases, making significant advancements in this field. These studies have typically focused on 2 to 8 different classes. Different versions of the Kvasir Dataset were used in these studies. Methods employed include GoogLeNet, ResNet-50, MobileNet, AlexNet, Convolutional Capsule Network, DenseNet-based Faster R-CNN, wavelet transformation, and CNN-based systems. These studies have achieved accuracy rates ranging from 84.6% to 99.61% (Yoshiok et al., 2023; Al-Adhaileh et al., 2021; Wang et al., 2022; Noha et al., 2019; Khan et al., 2022; Mohapatra et al., 2020; Wang et al., 2021; Asperti and Mastronardo, 2017).

In the conducted study, a classification process with 6 classes using the Kvasir v2 (version 2) dataset achieved the highest accuracy of 87.33% and an F1-score of 87.11%. Although a direct comparison with the literature cannot be made due to the use of different versions of the dataset and different numbers of classes, it is observed that the performance of the study falls within the ranges reported in the literature.

CONCLUSION

This study evaluated various deep learning network architectures, from Net-1 to Net-8, for the classification of gastrointestinal system findings. Optimal performance was generally achieved between 30 and 35 epochs. While adding convolutional layers to the basic Net-1 structure initially improved performance, excessive layers and filters did not yield significant benefits and sometimes even reduced performance. The most notable improvement was observed with Net-5, which doubled the number of filters in all layers and achieved the highest test accuracy of 87.33%. Additionally, Net-5 demonstrated excellent generalization capability, with high precision, recall, and F1-score values across most categories, particularly excelling in the normal-pylorus category.

Overall, the findings align with existing literature, where deep learning techniques have achieved accuracy rates between 84.6% and 99.61% for gastrointestinal disease classification. This study's performance falls within these ranges, indicating robustness. Future research

could focus on fine-tuning network parameters, feature engineering and exploring advanced techniques to further enhance classification accuracy.

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AN IMPROVED HYBRID APPROACH FOR THE PREDICTION OF BLOOD-BRAIN BARRIER PENETRATION USING DEEP LEARNING

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ABSTRACT

Blood-brain barrier (BBB) penetration prediction plays an essential role in the development of novel medications for the treatment of central nervous system disorders. A hybrid Deep Learning approach for the prediction of blood-brain barrier penetration using the Recursive Feature Elimination (RFE) algorithm and Long Short Term Memory (LSTM) model has been implemented. The suggested technique uses RFE algorithm for useful feature selection and to improve the model's accuracy while LSTM has been used for capturing complex patterns and dependencies of sequential data within the selected features. The proposed model has been implemented for two different dataset types: the LightBBB dataset, and the B3DB dataset. The model's performance results have been compared and validated with the previously available models.

1. Introduction

In the last few decades, brain disorders like Neurocognitive, Parkinson's disease, and brain tumors have become major concern for human's health. These conditions leading causes of physical challenges, gaining significant focus from medical researchers. So far, neurological therapist has not been able to come up with effective treatments for the major illness. Most drugs, whether they are large or mini molecules, cannot get through a barrier called the blood-brain-barrier [1]. The blood-brain-barrier is a major challenge in treating central nervous system (CNS) illness. It acts as monitor; blocking drugs from crossing into the CNS and reaching the brain to help treat these conditions [2]. Various methods have been tried over the years to improve how drugs across the blood-brain-barrier and researchers are still working hard on this challenge. However, there are ongoing concerns about how effective these efficient these algorithms are and how accurate their outcomes are for developing new drugs.

The blood-brain-barrier works as protective shield that separated the blood from the brain. The barrier is made up of brain endothelial cells, which can block almost all the massive molecules

(100%) and the most mini molecules (98%) from entering the central nervous system. It only facilitates water, lipid-soluble molecules, and few specific molecules to pass through [3]. The blood-brain barrier is categorized into two types: blood-brain positive (BBB+) and blood-brain-barrier negative (BBB-). The BBB is more open in BBB+ cases, meaning it allow more substances to pass through. In BBB- cases have less open barrier, allowing fewer substances to get through. To implement a classification model, you need a detailed information and thorough knowledge of the issues related to BBB permeability. This means you have to know exactly how the BBB functions and what factors affect its flow capacity. These problems mostly come from the choice of models and the dataset used for the evaluations. These issues with models include the limited coverage, overtraining, and minimum accuracy when predicting molecular compounds, especially those with BBB- permeability. Issues with the dataset include biased distribution of the class labels, which significantly affects the accuracy of the outcomes in BBB studies [4, 5].

LogBB is the measure used to compare the concentration of a drug compound in the brain to its focus in the blood [1],

$$\text{LogBB} = \frac{\text{Compound in the brain}}{\text{Compound in the blood}}$$

Positive logBB values show selective concentration in the brain, indicating possible BBB penetration, whereas negative values show limited access. As a result, accurate logBB prediction is a critical step in evaluating potential drugs for neuro pharmacological applications.

2. Literature Study

The blood-brain-barrier is a growing field of research that plays an important role in drug discovery. Over the past few decades, various techniques to studying the blood-brain-barrier have been suggested. These methods use the machine learning models and follow specific techniques and approaches. These methods differ based on the count of compounds used and how important attributes to these chemicals are selected. The proposed method will provide results on the basis of evaluation metrics and how the testing scores.

DL technique for BBB permeability was employed using an algorithms named as “FFDNN”, “CNN”. The dataset included two thousand five hundred molecular substances and six thousand three hundred ninety four chemical metrics. KPCA was utilized to identify the most relevant metrics. The researcher compared the DL algorithm with traditional ML algorithms and found that DL algorithm delivered more reliable and consistent outcomes. The FFDNN and CNN algorithms gained best accuracy outcomes with the evaluation metrics of having 98.11% and 99.87 specificity, 96.78% and 96.76% sensitivity. The AUC was calculated as 97.7 and 99.71, while the MCC was 95.55 and 92.85 [5].

A method for predicting BBB peptides using sequence-based techniques combined with attribute from data, and using LR for classification was introduced. In this research, the researcher utilized a dataset of having compounds of one hundred and nineteen BBP and applied sixteen different attributes descriptors based on protein chain. A three-step attributes selecting

process was employed, which involved F1-score, Rank correlation coefficient, and SFS technique, to identify the best attributes. In this research work compared various ML models, including ERT, eXtreme Gradient Boost, Logistic Regression, Multilayer Perceptron, Random Forest, and Support Vector Machine. When comparing the outcomes of each algorithm the LR showed the best prediction performance [6].

Hongliang Zou detected BBB peptides by integrating the physical chemical attributes of amino acid with feature combination approach. In this research support vector machine was employed to a dataset consisting of hundred samples of BBPs and hundred samples of non-BBPs. The peptide chain was represented using ten different physical chemical attributes descriptors. To choose the most distinguishing attributes, the fisher algorithm was utilized. The model achieved perfect scores with 100% results in evaluation metrics and also scored 1.00 for MCC and the area and AUC [3].

Deeksha Saxena et al. presented a ML model for predicting how easily substances can pass through BBB. In this research work Support Vector Machine, K-Nearest Neighbors, Random Forest and Naïve Bayes algorithms were applied to one thousands nine hundred and seventy eight substances. From this, one thousand nine hundred and seventeen attribute representations were created, capturing details like physical chemical attributes, MACCS molecular patterns. The outcomes indicate that the Support Vector Machine model using the RBF kernel outperformed the other ML models, achieving an accuracy of 96.77% [7].

Vinod Kumar et al. introduced using random forest method to predict the BBB permeability with the help of peptide compounds. Various models were employed including Decision Tree, Random Forest, Logistic Regression, K-Nearest Neighbors, Gaussian Naïve Bayes, XGBoost, and Support Vector Classifier [8]. The researcher gathered four hundred sixty five peptides from the B3Pdb dataset. In this research work, three dataset were utilized. Dataset-1 included two hundred sixty nine B3PPs and CPPs. Dataset-2 contained two hundred sixty nine B3PPs and two hundred sixty nine non B3PPs, while Dataset-3 had two hundred sixty nine B3PPs and two thousand six hundred ninety non-B3PPs. The RF algorithm performed best outcomes of their evaluation metrics of accuracy, recall and precision of 85.08%, 85.08%, and 86.97%. The MCC and AUC were calculated as 0.51 and 0.93 [9, 10].

Ralph Saber et al. proposed a comparative analysis to evaluate different ML models. The models tested included Support Vector Machine with various kernels such as linear, polynomial and RBF, LDA, Quadratic Discriminant Analysis and K-Nearest Neighbors. These were applied to one thousand five hundred and ninety three drugs substances, using eight molecular features selected through the integration of features and genetic models. The outcomes represent that the genetic model integrated with Support Vector Machine outperformed the other algorithms, achieving the accuracy of 96.23% [11].

Krzysztof Ciura et al. proposed another approach about BBB. This research targets on MEKC and involves using two and three dimensional molecular features from the set of forty five commercially available drugs [12]. The researchers applied both Multiple Linear Regression

and Support Vector Machine to the dataset, and found that both algorithms have comparable predictive abilities. They produced nearly identical RMS error values with 0.310 for MLR and 0.314 for SVM, showing similar performance during cross-validation [13, 14].

Lili Liu et al. proposed a research study of using the ML models for predicting the BBB permeability. In this research work the author worked with one thousand seven hundred fifty seven chemical substances. The attributed of these substances were created utilizing the PaDEL-Descriptor Software, which provided molecular patterns as well as two and three dimensional features. These models were employed such as Support Vector Machine, Random Forest, and eXtreme Gradient Boost. Among them Random Forest gained the maximum outcomes of their evaluation metrics accuracy is 0.910% [15]

In 2020, Zhiwen Shi and colleagues introduced a new approach about predicting the BBB permeable compounds. In this approach, two thousands three hundred and fifty four drug substances of SMILE dataset were used with thirty three molecular features. 10-fold cross-validation was used and 6 types of methods were used for training of imbalance dataset [16].

Author Hiroshi Sakiyama et al. introduced a method about predicting the BBB in 2021. The dataset from this research work included one thousand nine hundred fifty seven SMILES substances and two hundred twelve molecular features. The research work applied Random Forest, Cat Boost, and a four layer FSDNN to this dataset, which was divided into hundred scaffold segment partitions. DNN have proven effective in identifying molecular features. The outcomes represent that RF model was best and provide the accurate results in terms of evaluation metrics such as ROC and AUV of 0.773. The researchers also noted that free form dataset slightly outcome the BBB dataset [17].

Other research studies were proposed using different machine learning and deep learning algorithms for the BBB penetration prediction [18- 20].

3. Methodology

The aim of this study is to improve the effectiveness of the prediction concerning drug penetration through BBB. A hybrid neural network model has been proposed utilizing Recursive Feature Elimination (RFE) algorithm and Long Short Term Memory (LSTM) model. Two large datasets i.e. LightBBB [1] and B3DB [2] have been considered for training and testing. These databases include a wide variety of drug compounds with numerical logBB targets and categorical labels indicating BBB permeability, allowing for both qualitative and quantitative modeling of BBB penetration. RFE has been used to enhance the prediction of BBB Penetration through most relevant features selection. LSTM effectively capture long-term dependencies and patterns within sequential data. LSTMs is also capable of handling the complexities and interdependencies within the selected features.

4. Results and Discussion

The research has been implemented using Python, a versatile programming language renowned for its robust libraries and frameworks in data science and machine learning. The

implementation was conducted on a desktop PC running Windows 10, equipped with an Intel Core i7-10700K CPU operating at 3.80GHz, 32 GB of RAM, and an NVIDIA GeForce RTX 3070 graphics card. This hardware configuration provided ample computational power for data-intensive tasks and accelerated model training. Key Python libraries utilized included numpy for efficient numerical computations, pandas for data manipulation and analysis, matplotlib for visualizations, and scikit-learn for machine learning algorithms and metrics.

Table 1: Comparative Analysis of various models for Dataset- 1

Model	Accuracy	Sensitivity (TPR)	Specificity (TNR)	AUC
RFE-LSTM (Proposed)	95.00%	93.00%	96.00%	0.95
Random Forest	87.50%	85.00%	90.00%	0.88
Support Vector Machine	84.00%	81.50%	86.50%	0.84
Logistic Regression	82.00%	78.50%	85.50%	0.82
Neural Network	89.00%	87.00%	91.00%	0.89

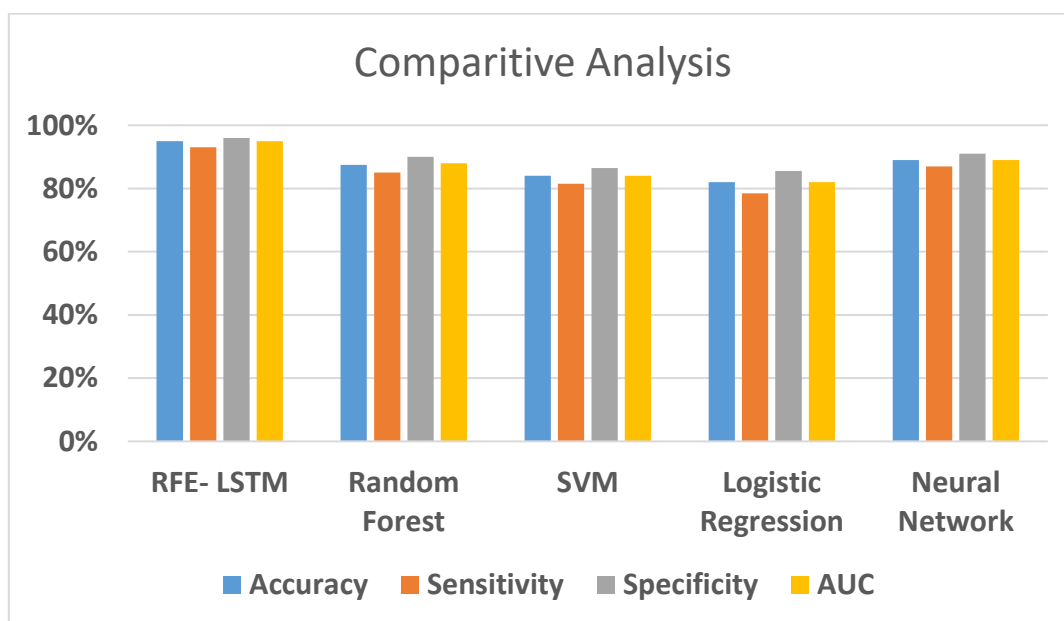


Figure 1: Comparative Analysis of various models with proposed framework for Dataset- 1

Results for the comparative analysis of various models for Dataset- 1 have been detailed in Table 1 and graphical representation has been shown in Figure 1. It is noticeable that the proposed (RFE- LSTM) model shows promising results in terms of accuracy, sensitivity, specificity, and AUC. Accuracy for the proposed model has been noticed upto 95% showing

the models effectiveness and performance. Table 2 shows the comparative results of the proposed RFE- LSTM method with the previously available models for dataset- 2. The proposed model achieved the highest accuracy of 96 % showing the supremacy over the other models.

Table 2: Comparative Analysis of various models for Dataset- 2

Model	Accuracy	Sensitivity (TPR)	Specificity (TNR)	AUC
RFE-LSTM (Proposed)	96.00%	94.00%	95.00%	0.96
Random Forest	90.00%	90.00%	92.00%	0.90
Support Vector Machine	86.00%	83.50%	84.50%	0.86
Logistic Regression	82.00%	80.50%	82.50%	0.82
Neural Network	89.00%	88.00%	90.00%	0.89

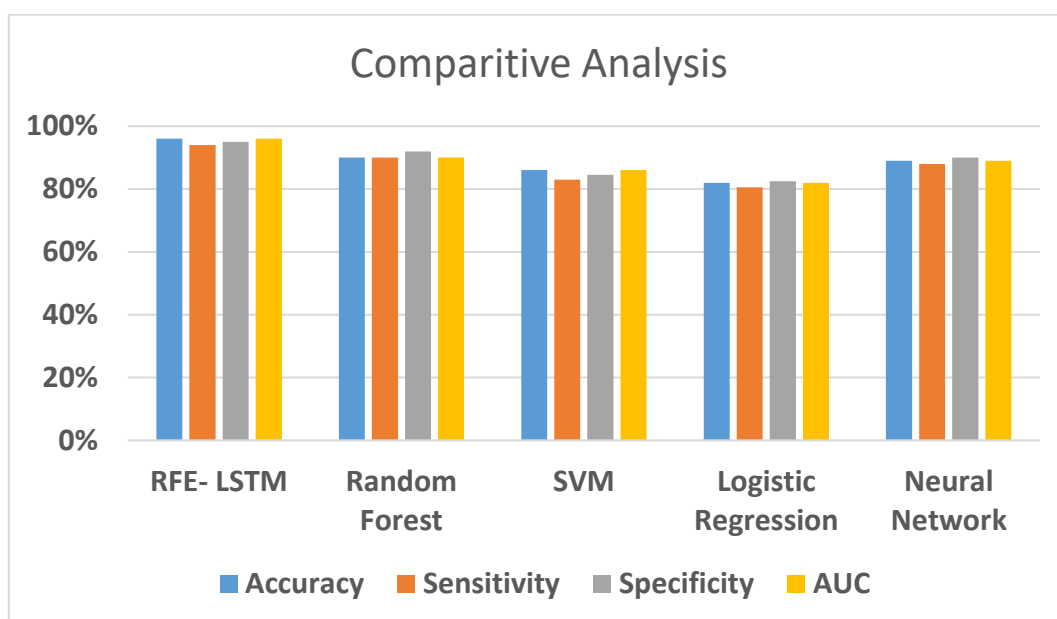


Figure 2: Comparative Analysis of various models with proposed framework for Dataset- 2

Conclusion:

Blood brain barrier (BBB) penetration prediction plays a vital role for drug discovery of brain diseases. A novel hybrid neural network approach has been proposed by implementing a Recursive Feature Elimination (RFE) algorithm and Long Short Term Memory (LSTM) model. The suggested technique generates varied and accurate classifiers across training sets through classifiers training with the (near) optimum classifier numbers and different training sets. Furthermore, training duplicate and alike classifiers are avoided by choosing the number of

training sets. The experimental findings obtained in this work revealed that the suggested method outperformed all the individual classifiers and the ensemble methods employed in the tests performed worse when compared to the proposed approach. In the future, various optimization algorithms may also be applied and compared for multiple datasets in the BBB prediction.

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LAW ON ONLINE COMMERCIAL DISPUTE RESOLUTION OUT OF COURT

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ABSTRACT

E-commerce disputes are increasingly common and often have small dispute values, requiring quick, compact and effective dispute resolution. The article analyzes the advantages of online dispute resolution and recommends additional legal regulations on online dispute resolution using commercial arbitration and commercial mediation.

Keywords: online dispute resolution, commercial arbitration, commercial mediation

INTRODUCE

Electronic commerce (EC/E. Commerce) is a concept used to describe the process of buying and selling or trading products, services and information through computer networks; In the narrow sense, it means buying and selling online. Characteristics of e-commerce include (i) Not displaying transaction documents on paper, helping to reduce storage and search costs, providing confidentiality but must ensure security and safety in commercial transactions . electronic ; (ii) Depends on technology and information technology level of the user; (iii) Depends on the level of digitalization of the economy and the ability to integrate digitally with the global economy; (iv) Has a fast speed.

Most e-commerce transactions are of small value and the parties want convenience when transacting over the internet, therefore, arising disputes (if any) are also expected to be handled by the parties in accordance with the law. fastest and most convenient way to ensure your rights. Therefore, the current method of resolving disputes in court in Vietnam according to current legal regulations, the order and procedures for resolving disputes is lengthy and expensive, so it is not suitable for resolving disputes. e-commerce disputes. Therefore, to ensure an effective legal environment for e-commerce activities to develop, we need to encourage and create conditions to develop online dispute resolution organizations outside of court.

Building and developing an online dispute resolution platform in Vietnam positively contributes to the development of the digital economy in Vietnam. As a judicial agency participating in mediation and arbitration of transactions in the online environment, it will help ensure a better legal environment on the internet for subjects participating in digital economic activities, Through this, people's confidence in participating in activities in the online environment will be better.

MATERIALS AND METHODS

This article is based on the following analytical methods: (1) Documents, reports, and data provided by research agencies (2) Legal reports and research documents; magazines and the Internet related to methods of resolving e-commerce disputes online outside of court .

The article also uses the method of analyzing the advantages and limitations of the online method of resolving e-commerce disputes outside of court, thereby researching and making recommendations to improve the law.

The author has reviewed personal documents and consulted with experts, prosecutors, and lawyers to learn about content related to legal adjustments on methods of resolving e-commerce disputes by means of e-commerce dispute resolution. Online form outside the Court .

RESULTS AND DISCUSSION

ASEAN is currently the region considered to have the highest e-commerce growth rate today with total e-commerce revenue in 2022 of nearly 200 billion US dollars, estimated to reach 330 billion US dollars by 2022. 2025 according to e-Conomy SEA 2022 Report (Google and Temasek, 2022) ¹. According to the latest report of market research company Euromonitor, the growth potential of the e-commerce market in the Asia-Pacific region is very large, by 2025, e-commerce sales of this region , including Australia will have a growth potential of 68.5 billion USD, becoming the leading global e-commerce market. In the report, “Retail in Transformation: Future E-Commerce Opportunities for Asia-Pacific and Australia,” Euromonitor estimates online sales for the entire region. will expand, accounting for over 45% of global e-commerce growth. The report emphasizes that the growth of the e-commerce market in the Asia-Pacific region is mainly driven by the COVID-19 epidemic. In 2020, e-commerce sales in the Asia-Pacific region increased by about 187.2 billion USD, while Australia's growth was 5.3 billion USD. Of these, the most obvious growth comes from more developed markets such as China and Korea. In addition, although Thailand and India are still e-commerce markets in the early stages of development, they grew the highest over the same period, reaching 80% and 60% respectively. Singapore is also a fast-growing e-commerce market, recording a 51.4% increase in sales in 2020 ².

In 2022, according to investigations and surveys by the Ministry of Industry and Trade, retail e-commerce revenue in Vietnam will grow by 20% compared to 2021, reaching 16.4 billion USD, accounting for 7.5% of retail revenue. goods and services consumed nationwide. A report published by eMarketer in January 2022 pointed out that Vietnam is ranked among the top 5 countries with the world's leading e-commerce growth rate and leading digital

¹Reference source <https://moit.gov.vn/tin-tuc/bao-chi-voi-nguoi-dan/asean-thuc-day-bao-ve-nguoi-tieu-dung-trong-thuong-mai-dien-tu.html> accessed February 23, 2023

²Department of E-commerce and Digital Economy (2021), Asia-Pacific e-commerce market will lead globally by 2025. Reference source https://idea.gov.vn/default.aspx?page=news&do=detail&category_id=5b40b58c-9d99-4679-acb4-8deae9436815&id=29d23adf-37fe-456d-b505-d68bdfd2c51b accessed September 4, 2023

transformation in businesses ³. The situation of receiving requests, feedback and complaints from consumers at the Ministry of Industry and Trade in recent years shows that requests, feedback and complaints from consumers in the field of e-commerce are increasing. increase continuously. During the period 2019-2021, on average each year, over 200 complaints and requests in the field of e-commerce were received and processed. Some behaviors that are frequently reported and complained about include: Goods received are different from those advertised; Consumer transaction information is used by a third party to impersonate delivery; automatically cancel orders; Consumers cannot purchase products at advertised prices or accompanying promotional items; selling counterfeit goods, used goods, goods of unknown origin, infringing intellectual property rights; Extend the time to resolve complaints... ⁴.

ODR system (Online Dispute Resolution) is a software system built by ODR organizations to provide online dispute resolution services to parties when a dispute arises, especially suitable for commercial disputes. e-commerce, small value consumer disputes and other civil and economic disputes where the parties are geographically distant. Depending on the function and scope of each ODR organization, the ODR system will allow parties to carry out procedures to resolve their disputes by one, two or all three of the following methods:

- (i) Online negotiation between disputing parties;
- (ii) Mediate online disputes between parties with the participation of mediators from the ODR organization;
- (iii) Trial the case according to online arbitration procedures if the ODR organization has an arbitration function.

Online dispute resolution (hereinafter—ODR) is a branch of dispute resolution which uses technology to facilitate the resolution of disputes between parties. It mainly involves negotiation, mediation or arbitration, or a combination of all three. In this respect it is often seen as being the online equivalent of alternative dispute resolution (hereinafter—ADR). However, ODR can also augment these traditional means of resolving disputes by applying innovative techniques and online technologies to the process ⁵.

ODR is a wide field, which may be applied to a range of disputes; from interpersonal disputes including consumer to consumer disputes (C2C) or marital separation; to court disputes and interstate conflicts ⁶. It is believed that efficient mechanisms to resolve online disputes will impact in the development of e-commerce. While the application of ODR is not limited to disputes arising out of business to consumer (B2C) online transactions, it seems to be

³ Reference source <https://idea.gov.vn/default.aspx?page=news&do=detail&id=a486088d-fa18-4186-b6aa-38b8cdfa749b> accessed February 23, 2023

⁴Reference source <https://moit.gov.vn/bao-ve-nen-tang-tu-tuong-cua-dang/tang-cuong-bao-ve-nguoi-tieu-dung-tren-cac-hoat-dong-thuong-mai-dien-tu.html> accessed February 23, 2023

⁵ Feliksas Petrauskas, Eglė Kybartienė (2011), *Online dispute resolution in consumer disputes*, Mykolas Romeris University

⁶ National Center for Technology and Dispute Resolution, Standards of Practice [interactive]. [accessed June 14, 2011]. <www.odr.info>.

particularly apt for these disputes, since it is logical to use the same medium (the internet) for the resolution of e-commerce disputes when parties are frequently located far from one another⁷.

When compared with traditional dispute resolution, online dispute resolution at ODR organizations will have the following advantages:

Firstly, the ODR dispute resolution system allows parties to carry out the entire case handling process from submitting a request for trial, submitting documents and evidence; communication between the ODR organization and the disputing parties and between the disputing parties; to organize conciliation and arbitration meetings between the parties; issue conciliation minutes, arbitration decisions, etc. on the online ODR platform to which the parties are granted access. The application of technology to such steps, processes and procedures for dispute resolution makes dispute resolution very convenient, promoting the case resolution process much faster and more effectively. compared to traditional dispute resolution methods in court.

Currently, with the development of technology, checking and authenticating data and documents for dispute resolution can be supported by AI technology (artificial intelligence), so checking, reviewing Reviewing documents and evidence submitted by the parties to the ODR organization will also be greatly supported by technology. For documents that need further verification and authentication, the ODR organization can request the disputing parties to provide the original, certified copy or digitally sign the document to confirm and take responsibility. legal responsibility. In addition, transactions on the internet are always required to use the services of network infrastructure and internet service providers, such as server providers, hosting, mail services, and e-commerce platform services. ... so these transactions can keep track of data, which can be a source of inspection and authentication to help ODR organizations perform effective dispute resolution.

Second, the ODR system allows disputing parties to meet online to negotiate, conciliate, and arbitrate in the form of text communication (exchange of messages, chat) or video conference (online meeting). route) is very convenient, helping to speed up dispute resolution for the parties. A notable point is that the ODR system also provides additional functions to support dispute management such as reminding parties to perform required work, ensuring that the process and proceedings are agreed upon by the parties. Implemented on time and according to legal regulations, connecting to other state judicial systems so that the parties can use them (if necessary).

Third, the advantage of online dispute resolution is the cost of resolving the case. Because the entire dispute resolution procedure can be carried out via the internet, the fees for online mediation or arbitration services of ODR organizations are quite low compared to traditional

⁷ Bygrave, L. Online Dispute Resolution—What it Means for Consumers. *Paper presented at a conference entitled "Domain Name Systems and Internet Governance" Grace Hotel, Sydney, 7 May 2002, p. 2.*

dispute resolution methods. Currently, the majority of e-commerce disputes take place on e-commerce websites and applications in which the parties are forced to comply with regulations and standards in buying, selling and transactions organized by the organization. Providing regulated e-commerce platform services in accordance with legal regulations such as regulations on returns and refunds... Therefore, the handling of disputes arising here also becomes easier. It becomes easier when the dispute resolution options have pre-determined situations that the parties have agreed on from the beginning according to the regulations of the e-commerce platform. In case a dispute arises here, the ODR organization will be an independent agency designated by the e-commerce platform or the parties choose to have the authority to review the case and make a decision to apply the situation. any predetermined reason or other decision to resolve the case quickly within a certain time according to the agreement of the parties and the regulations of the ODR organization.

Fourth, the ODR system can develop and integrate more modern technologies to become intelligent and capable of handling simple disputes on its own to help resolve a large number of commercial disputes. small value e-commerce. Currently, image recognition technologies and analysis of the originality of data and documents; Secure locking technology using digital certificates or blockchain technology to ensure the integrity of original data; Deep learning technology and artificial intelligence (AI) can be applied to ODR systems to help mediators and arbitrators more conveniently check and verify data and documents. , evidence of the case is provided by the parties when giving opinions and judgments. There are even many ODR organizations that have used artificial intelligence (AI) technology with self-learning capabilities to resolve many small e-commerce disputes without the need to intervene. human greeting card. It can be seen that, by applying and integrating these new technologies into their ODR system, ODR organizations are also the units participating in promoting technology development and helping to strengthen the legal environment. healthy for buying and selling activities, transactions on the internet are increasingly convenient and transparent, bringing many benefits to people ⁸.

Currently, online dispute resolution in e-commerce has gradually become popular in many countries. In Vietnam, the People's Court is allowed to hold online trials for first instance and appeal trials in criminal, civil, and administrative cases with simple details and nature; Documents and evidence in case files are clear, except in cases of criminal, civil, and administrative cases related to state secrets; criminal case for one of the crimes of infringing upon national security specified in Chapter XIII of the Penal Code ; criminal case for one of the crimes of undermining peace, crimes against humanity and war crimes specified in Chapter XXVI of the Penal Code . An online trial is a trial held in the courtroom, using electronic devices connected to each other through the network environment, allowing defendants, victims, litigants, and other participants in the proceedings to Participate in the

⁸ Tran Anh Huy and Dao Thi Ha Anh (2021), *Online Mediation and Arbitration (ODR)* . Ministry of Information and Communications. Document source <https://cspl.mic.gov.vn/Pages/TinTuc/tinchitiet.aspx?tintucid=138275> accessed November 25, 2023

trial at a location outside the courtroom decided by the Court but still ensure full direct monitoring of images and sounds and participate in the trial's proceedings and proceedings verbally and physically. proceedings continuously, publicly, at the same time⁹. State agencies have issued Joint Circular No. 05/2021/TTLT-TANDTC-VKSNDTC-BCA-BQP-BTP dated December 15, 2021 detailing and guiding the implementation of online court proceedings . Determining and guiding the consideration and decision to open an online trial; requirements for online court hearings; Responsibilities of agencies, organizations, and competent persons in organizing online court hearings; prepare for online court hearings; online trial.

Regarding the resolution of commercial disputes, including the resolution of e-commerce disputes, in addition to dispute resolution by court, other methods such as commercial arbitration and commercial mediation are not yet available. There are specific regulations on online dispute resolution. However, currently, some commercial mediation centers have organized online mediation sessions and issued online mediation rules such as the Vietnam Mediation Center under the Vietnam International Arbitration Center. Accordingly, the Online Mediation Rules of the Vietnam Mediation Center under the Vietnam International Arbitration Center (hereinafter referred to as " Online Rules ") are applied to resolve disputes through mediation. through the online mediation platform at the Vietnam Mediation Center¹⁰.

In addition, the 2010 Commercial Arbitration Law does not have regulations on resolving commercial disputes online. This has caused difficulties for parties who want to resolve disputes in their e-commerce in the online form, as Clause 8, Article 3 of the 2010 Commercial Arbitration Law stipulates: "Place of resolution Dispute resolution is where the Arbitration Council resolves the dispute according to the agreement of the parties or decided by the Arbitration Council if the parties do not have an agreement. If the location for dispute resolution is in the territory of Vietnam, the award must be deemed to be pronounced in Vietnam regardless of where the Arbitration Council held the meeting to make that decision. Thus, if a dispute in e-commerce is resolved by commercial arbitration via online form , in many cases it is impossible to determine the place for resolving the dispute.

RECOMMENDATION

Vietnam has issued an electronic transaction law and has many legal regulations on e-commerce but there is no specific regulation for the operations of ODR organizations in Vietnam. If Vietnam does not encourage ODR organizations to develop, e-commerce activities as well as the convenience and safety that technology brings to people will be affected. Therefore, the Vietnamese Government needs to take appropriate measures to encourage and develop ODR organizations, specifically with the following solutions:

⁹Resolution No. 33/2021/QH15 dated November 12, 2021 of the National Assembly on organizing online trials and

¹⁰Article 1 Online mediation rules of the Vietnam Mediation Center under the Vietnam International Arbitration Center take effect from April 1, 2021

(i) Carry out propaganda activities to help businesses and consumers understand the importance of using online dispute resolution mechanisms in participating in e-commerce activities.

(ii) Issue regulations requiring organizations and individuals participating in sales on the internet, including units providing e-commerce platform services and e-commerce applications, to notify their selection. on organizing online dispute resolution to ensure consumer rights, transparency and a safe environment for everyone as the European Union has done since 2016.

(iii) Provide tax incentive policies to develop the activities of ODR organizations. Currently, according to the provisions of Commercial Arbitration Law No. 54/2010/QH12 and Decree 22/2017/ND-CP on commercial mediation, mediation and commercial arbitration organizations are both dispute resolution organizations. operates not for profit.

(iv) The Government and State of Vietnam need to issue an action plan to develop e-commerce as well as Vietnam's economy during the 4.0 industrial revolution, which sets out requirements to improve the environment. policies and regulations on the development of forms of e-commerce and technology and promote the development of conciliation organizations, online arbitration or other judicial support organizations to promote Control and protect individuals participating in transactions on the internet environment ¹¹.

CONCLUSION

E-commerce disputes are increasingly common, often have small dispute values, and require quick, compact and effective resolution. Current regulations on traditional commercial dispute resolution are not suitable for types of e-commerce disputes, so there needs to be additional regulations on online commercial dispute resolution (ODR) for Vietnam. Commercial Arbitration and Commercial Mediation.

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REPRESENTATION OF ANTHROPOMORPHIC CULTURAL CODE BY MEANS OF ABSTRACT LEXICON IN ANTHROPONYMS (ON THE MATERIAL OF AZERBAIJANI AND RUSSIAN LANGUAGES)

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ÖZET

Diğer dil birimleri gibi antroponimler de dil-kültür çalışmalarında, kültürlerarası iletişimde, etnolinguistikte, yani dil ile halkın manevi kültürü arasındaki ilişkiyi inceleyen disiplinlerde araştırma konusu olabilir. Herhangi bir dilin antroponim fonu, ulusal isimlerden ve dile diğer kültürlerden gelen isimlerden oluşur. Bununla birlikte, halkın tarihini, ulusal karakterini ve kültürünü yansıtan "kültürel hafızasının" koruyucusu olduğu için belirgin bir ulusal özgüllüğe sahiptir.

Makale, iki farklı dilin - Azerice ve Rusça - onomastik alanının bir parçasının incelenmesine yönelik dil-kültürel bir yaklaşım sunmaktadır. Nesne, onomastik birimlerdir - Rus ve İngiliz dillerinin "soyutluk" bileşenine sahip kişi adları ve soyadları. Çalışmanın amacı, Rusça ve Azerice antroponimlerdeki soyut kelime dağarcığı aracılığıyla kültürün antropomorfik kodunun üretkenliğinin izini sürmektir. Belirlenen hedef, belirli görevlerin aralığını belirler: 1. Soyut söz varlığının incelenen dillerin antroponimisi üzerindeki etkisini belirlemek; 2. İncelenen dillerin antroponimisinde işleyen antropomorfik kültürel kodun özelliklerini dikkate almak; 3. Azerbaycan ve Rus dillerinin antroponimlerinde soyut söz varlığının antropomorfik kültürel kod aracılığıyla kavranmasının özgüllüğünü ortaya çıkarmak. Görevi çözmek için yazar tanımlayıcı, karşılaştırmalı-tarihsel ve karşılaştırmalı yöntemler kullanmıştır.

Araştırma sırasında antropomorfik kültür kodunda soyut kelimelerin sözelleştirilme yolları ortaya çıkarılmış ve tanımlanmıştır. Antroponimi kodunda nesnelleştirmenin hem olumlu hem de olumsuz çağrışımlarla temsil edildiği tespit edilmiştir. Rusçanın aksine, Azericede "soyutluk" bileşenine sahip çok sayıda kişi adı ortaya çıkmıştır ve analiz edilen onomastik birimlerin, incelenen dillerin zihniyet ve ulusal kültürünün bir tür bağlantı halkası olarak hizmet ettiği belirtilmelidir.

Anahtar kelimeler: antropomorfik kültür kodu, Azeri, Rus, antroponimler, soyut söz

ABSTRACT

Anthroponyms, like other language units, can be the object of research in linguocultural studies, intercultural communication, ethnolinguistics, i.e. disciplines that study the relationship between language and spiritual culture of the people. The fund of anthroponyms of any language consists of national names and names that came into the language from other cultures. However, it has a distinct national specificity, as it is the keeper of the "cultural memory" of the people, reflecting their history, national character and culture.

The article presents a linguocultural approach to the study of a fragment of onomastic space of two dissimilar languages - Azerbaijani and Russian. The object was onomastic units - personal names and surnames with the component of "abstractness" of Russian and English languages. The aim of the work is to trace the productivity of anthropomorphic code of culture through abstract vocabulary in Russian and Azerbaijani anthroponyms. The set goal determines the range of certain tasks: 1. To determine the influence of abstract lexicon on the anthroponymy of the languages under study; 2. To consider the peculiarities of anthropomorphic cultural code functioning in the anthroponymy of the languages under study; 3. To reveal the specificity of comprehension of abstract lexicon in anthroponyms of Azerbaijani and Russian languages through anthropomorphic cultural code. To solve the task the author used descriptive, comparative-historical and comparative methods.

In the course of the research the ways of verbalisation of abstract vocabulary in the anthropomorphic code of culture were revealed and described. It has been established that in the anthroponymy code objectification is represented in both positive and negative connotation. In contrast to the Russian language, in Azerbaijani a huge number of personal names with the component of "abstractness" is revealed, and it should be noted that the analysed onomastic units serve as a kind of connecting link of mentality and national culture of the languages under study.

Keywords: anthropomorphic code of culture, Azerbaijani, Russian, anthroponyms, abstract words

Introduction

Language, as an important element of culture, embodies these categories and serves as a means for their transmission. It provides speakers with a set of tools to express relevant concepts and relationships, reflecting cultural heritage and life realities. The vocabulary, grammar and stylistic features of a language influence the way its speakers perceive the world and themselves in it. Abstract vocabulary arises at the highest stage of thinking development and reflects the system of worldview values, a person's ideas about the world, himself and relations with others. It reflects the perception of good and evil, as well as expresses the intellectual, spiritual and emotional activity of the individual. Abstract terms do not point to a specific something, but rather to concepts such as love, justice, beauty, and others. They are a metaphorical construct

that encapsulates not only individual characteristics but also universal ideas (Shcherbak A.S. 2009).

The concept of 'cultural code' is manifested through the process of categorisation, which helps to order the diversity of the world around us. Categorisation is the process by which we compress and structure information, which is just one step in our interaction with reality. Each category is formed in our minds according to the unique requirements and values of a particular culture. This means that different cultures may have different category systems reflecting their priorities and life experiences (Careva E.A. 2017). Proper names as part of the onomastic space form a unique fragment of the linguistic picture of the world, which reflects the worldview and world understanding of the people, their history and culture. This leads to the reflection of various cultural codes, including the anthropomorphic code of culture. Proper names reflect the linguistic picture of the world, being a 'code of codes', and also serve as a keeper and explicator of historical and cultural information transmitted through other linguistic constructions.

Materials and Methods

The object of this study is a fragment of the anthroponymic space of Azerbaijani and Russian languages expressed through abstract vocabulary. The aim of the article is to analyse the anthroponyms of two different languages - Azerbaijani and Russian - with the element of abstractness and to identify the ways of verbalising the anthropomorphic code of culture.

The material of the study was anthroponyms reflected in the following dictionaries: A. Paşayev, A. Bəşirova *Azərbaycan şəxs adlarının izahlı lüğəti* (Bakı, 2011); N.A. Petrovsky *Dictionary of Russian Personal Names* (Moscow, 1966). All onomastic units were selected by solid sampling method, the material was analysed and processed using descriptive and comparative methods.

Findings and Discussion

The formation and development of the anthroponymic system of the Turkic languages is connected with the cultural traditions of the ancient Turks. The worship of natural phenomena, as well as totemistic and animistic ideas became the basis of spiritual culture. In the names of that period there was a close connection between the subject, name and personality, which made it possible to consider the name as a part of individuality. Anthroponymic usus in traditional Turkic culture is determined by mythical ideas about the nature of a name: there is an identification of the name and its bearer, a belief in an intimate connection between the name and the person, and a belief that the name can 'replace' the personality. The name is perceived as an eternal sign connecting its bearer with ancestors and descendants, which gives it the meaning of immortality. Two forms of beliefs dominate in Turkic pagan naming - totemism and animism, which became the basis for the further development of the anthroponymic system of the Turks.

In Azerbaijani, as in other languages, proper names are elements of the vocabulary and are often subject to changes. They reflect traces of historical events and social structure. In this context,

anthroponyms are products of social life. A. Akhundov rightly notes that 'national historical onomastic units are not limited to the status of linguistic signs that play a role in distinguishing the singular from the common. They are also a valuable source reflecting the historical destiny of the nation' (Axundov A. 2008).

The anthropomorphic code of culture is very vividly represented in the studied Azerbaijani anthroponyms through such abstract lexemes symbolising human beings as love, happiness, freedom, independence. In other words, abstract nominations act as a means of representation of the antropomorphic code of culture in Azerbaijani anthroponymy.

Male names:

- Anthroponyms characterizing freedom and independence: Erkin, Erkinər, Qurtuluş,
- Anthroponyms characterising peace and security: Amar, Amran, İmran
- Anthroponyms characterising ascent, power: Hun.

Female names with abstract nomination mainly express inner feelings and experiences of women and in the percentage ratio such anthroponyms as Könül, Sevqi, Sevqiladə (qeyri-adi sevqi), Sevqiyyə, Sevinc, Sayqı are much more frequent.

The socio-political life of the country did not have a deep enough influence on the traditional way of life of the Turkic people, in particular, on such a phenomenon as the choice of name. Names borrowed from Arabic and Persian languages have firmly and organically entered the lexical composition of the Turkic language. The historicity of proper names is unconditional, because in many cases it is the onymic lexicon that preserves traces of disappeared words that are not used nowadays. As can be seen from the examples, a very small part of Turkic anthroponyms denoting states and desires is reflected in anthroponymic dictionaries.

In the course of the analysis, it has been established that in Russian anthroponymy with elements of abstractness the anthropomorphic code of culture is realised in two main categories:

I. Pre-Christian (non-canonical) names with elements of abstractness. In the anthroponymy of the Old Russian language two groups of anthroponyms are distinguished, thus distinguishing personal names and nicknames. The first group includes 'primary' names given to a newborn. These names reflect: a) the baby's features (Vereshchaga, Pinay, Gryaznushka); b) the time and order of birth (Pervoy, Veshnyak, Podosen, Postnik, Shabbat); c) the parents' attitude to the child (Vazhen, Nechay, Lyubim); d) protective names to protect from evil eye and spoilage (Nevzor, Nekras, Neupokoy, Nesvetai) and names of foreign language origin (Mansur, Shalam, Murat). The second group includes names given to a person during his life in addition to his personal name. These names are connected with a) Features of appearance, behaviour and speech (Brukhan, Sukhoy, Shadra); b) Attitude to work and other people (Dyak, Leatherworker, Konoval); c) Social features (Golysh, Selya, Selyanik). The term 'nicknames' is most often applied to this group (Veselovskij S. B. 2004).

Our material shows that the most numerous group by quantitative feature is formed by feminine and masculine non-canonical names with an element of abstractness, let us consider specific examples:

- **Лада** – an Old Slavic female name derived from the word ‘lad’, which mean ‘peace, tranquility’. In modern Russian language this word is used in the context of solving important cases, and in the past ‘ladnik’ was called an agreement regarding dowry. Also used were obsolete terms, now out of use: ‘lady’ - engagement, ‘ladilo’ - matchmaker, ‘ladkanya’ - wedding song. The first mention of the name Lada as a proper name was found in the dictionary of Old Russian names by N. Tupikov, where it was designated as a male name or nickname (Lada, Ladka, Latka). According to some researchers in Slavic mythology and pagan beliefs tell about the wife of Perun, the goddess of love and beauty named Lada, hence the name. The name Lada has become independent, but often acts as a shortening of various names. It is a diminutive form of both female (Vladlena, Ellada, Vlada, Milada, Pallada, Vladislava) and male names (Vladimir, Laodikiy, Virilad, Palladiy, Elladiy)

- **Краса/Краси** – an Old Slavic female name derived from the word ‘krasa’, i.e. red or beauty. Also, there is a male name of Slavic origin - Krasi - one of the most popular in Russia. It has a deep symbolic meaning and is associated with a strong and spiritual person. The name Krasi comes from the word ‘krasa’, which in Russian means beauty, grace and dignity. It symbolises harmony, growth, development and well-being. The nomination Krasa is not marked in the modern naming dictionary.

- **Миро/ Мира** – the word ‘peace’ is pan-Slavic and has three basic meanings: people, nation; peace, harmony; light, universe. Slavs strived for peace, which is reflected in the names Zhdimir and Budimir. Other names expressed the ideas of creating and strengthening peace: Krepimir, Tworemir and Ratemir. It should also be noted that ‘Mir’ is an ending in compound names such as Mirodar, Ludimir, etc., but all of these endings also make up the indigenous Slavic names Mir from the Slavic name Miro. The name ‘Miro’ was used by the ancient Slavs as a name and was associated with qualities such as peace, harmony and integrity.

- **Рада / Рад** – ending of a compound masculine and feminine name meaning ‘joy’. Rada comes from a short form of the adjective ‘joyful’ (Southern Russian - rady) - rad. The name Rada is used as a diminutive form of some feminine (Radost, Ariadna, Radislav, Radmila, Radomira, Radana, Radosveta, Radoslav, Radostina) and masculine names (Milorad, Radislav, Radomir). The short form of Ada is also an independent name. There is also the Muslim name Rada, which has several translation variants. The most common translation is ‘beautiful girl’, in the meaning close to the notion of ‘slender, graceful’, but there is also a version - ‘strong wind, whirlwind’.

All the listed names, based on the roots ‘mir’ and ‘rad’, do belong to purely Slavic names. Probably, in ancient times they were used as patrilineal names, which indicates the number of primitive Slavic patrilineal names. This emphasises the richness and diversity of the Slavic naming tradition, reflecting the social structure and cultural values of the time. Such names not

only denoted individuals, but also carried a meaning associated with general well-being and harmony.

- **Славяна** – female name has its roots in the Slavic language and comes from the word ‘slava’, which means ‘praise’. The name symbolises the girl's strength of spirit and character. Despite the fact that Slavyana is not a very common name in modern Russia, it has a deep meaning associated with the heroes of the Slavic epic.

II. Christian (canonical) names with elements of abstractness. Three female names with the element of abstractness can be referred to this group: Вера, Надежда, Любовь (kindness, mercy, compassion).

The names Вера, Надежда, Любовь in the Christian nomenclature are connected with the martyrs-sisters, executed about 120 (or 137) years by order of Emperor Hadrian. The legend of St Sophia (whose name translates as ‘wisdom’) and her daughters became widespread in the early Middle Ages. However, the first evidence of saint worship dates back only to the 7th century, and the earliest hagiographies date from the 7th to the 8th centuries. These circumstances raised doubts among researchers as to the reality of the personages. The Bollandists believed that Faith, Hope, Love and Sophia were not historical persons, but allegorical personifications of Christian virtues.

In the 9th century, when the liturgical books were translated into Church Slavonic, the names of the sisters were translated, which is an exceptional case; it was then that the nominative word ‘faith’ was transformed into a personal name. Most of the saints' names retained their original sound, adapting to the peculiarities of the Slavic languages. The fact of the translation was interpreted as indirect evidence of the mythical nature of the personages: it was clear to the medieval translator that this was an allegorical story. In later translations, the name of the mother of the martyrs was also calquised in Ancient Russia — Премудрость, but a similar tradition for this name has not developed.

Conclusion and Recommendations

Thus, we can conclude that in personal names of the languages under study there is a close connection between man and the surrounding world, which is expressed in the anthropomorphic modelling of the anthroponymic space of the Azerbaijani and Russian languages.

Unlike Russian, in Azerbaijani language personal names with abstract nomination are among the priority ones, because it is in the semantics of anthroponyms that national-ethnic orientations and cultural representations of the Turkic world are reflected. For example, when considering male personal names in the material such qualities of Turkic peoples as independence and peaceful coexistence with neighbours of the people are fixed, and in female personal names the delicate nature, loving-kindness and meekness of eastern women are observed.

The majority of Russian personal names, both female and male, with an element of abstraction were lost as a result of Christianity, and only three female names personifying Christian benefactors (faith, love, hope) are active in use.

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2023 ISRAEL- PALESTINE EVENT IN THE ECONOMY- POLITICS- ENERGY TRIANGLE

2023 İSRAIL-FILISTIN OLAYLARI EKONOMİ - SIYASET - ENERJİ ÜÇGENİ

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ABSTRACT

In this article, the impact of the Israel- Palestine conflict, which started in October 2023, on Brent oil prices will be analyzed with the theory of interdependence by Robert Keohane and Joseph Nye. By analyzing the interdependence between economic outcomes of individual states during the political conflict in the region, which can be affected globally in the short term, this article aims to determine an understanding of several consequences of political conflict on the Brent price trend as a global efficient oil supply. In this article, daily Brent oil prices from the Platts database between March 7, 2023, and May 7, 2024, will be analyzed to investigate the effect of the Israel- Palestine conflict, which began on October 7, 2023, on Brent oil prices. Data processing is conducted using RStudio. Firstly, we check the stability of the time series by employing Augmented Dickey-Fuller (ADF). After the data was manipulated, a t-test was performed to assess whether the mean oil prices changed after this geopolitical event and if these changes were significant. The result shows no substantial change in Brent price before and after the conflict. The stability in the Brent price shows economic interdependence among oil producers/ supplier states and states with high levels of oil demand. This circumstance influences their strategic decisions to maintain a stable oil supply. In the sense of globalization, the current global order prioritized economic interests over political consideration.

Keywords: Israel- Palestine Conflict 2023, Brent Oil Prices, Economic Interdependency, Market Responses, Multinational Companies.

ÖZET

Bu makalede, Ekim 2023'te başlayan İsrail-Filistin çatışmasının Brent petrol fiyatları üzerindeki etkisi Robert Keohane ve Joseph Nye'in karşılıklı bağımlılık teorisi ile analiz

edilecektir. Bu makale, kısa vadede küresel olarak etkilenebilecek olan bölgedeki siyasi çatışma sırasında bireysel devletlerin ekonomik sonuçları arasındaki karşılıklı bağımlılığı analiz ederek, küresel verimli bir petrol arzı olarak Brent fiyat eğilimi üzerindeki siyasi çatışmanın çeşitli sonuçlarının anlaşılmasını belirlemeyi amaçlamaktadır.

Bu makalede, 7 Ekim 2023 tarihinde başlayan İsrail-Filistin çatışmasının Brent petrol fiyatları üzerindeki etkisini araştırmak için Platts veri tabanından 7 Mart 2023 ve 7 Mayıs 2024 tarihleri arasındaki günlük Brent petrol fiyatları analiz edilecektir. Veri işleme RStudio kullanılarak gerçekleştirilmiştir. İlk olarak, Augmented Dickey-Fuller (ADF) kullanılarak zaman serilerinin kararlılığı kontrol edilmiştir. Veriler manipüle edildikten sonra, bu jeopolitik olaydan sonra ortalama petrol fiyatlarının değişip değişmediğini ve bu değişikliklerin anlamlı olup olmadığını değerlendirmek için bir t-testi yapılmıştır. Sonuç, çatışma öncesi ve sonrasında Brent fiyatında önemli bir değişiklik olmadığını göstermektedir. Brent fiyatındaki istikrar, petrol üreticisi/tedarikçisi devletler ile yüksek düzeyde petrol talebi olan devletler arasındaki ekonomik karşılıklı bağımlılığı göstermektedir. Bu durum, istikrarlı bir petrol arzını sürdürmek için stratejik kararlarını etkilemektedir. Küreselleşme anlamında, mevcut küresel düzen ekonomik çıkarları siyasi düşüncelerin önüne geçirmiştir.

Anahtar Kelimeler: İsrail-Filistin Çatışması 2023, Brent Petrol Fiyatları, Ekonomik Karşılıklı Bağımlılık, Piyasa Tepkileri, Çok Uluslu Şirketler.

INTRODUCTION

The Israel-Palestine conflict is an example of how regional challenges can easily resonate and have consequences on economic interdependence globally. The conflict not only disrupts local economies but has ripple effects on international markets, specifically in the petroleum industry. Significantly, the region is the key player in oil production and the global supply chain - any instability there can cause massive disruptions to worldwide economies. In the light of interdependence theory, this article aims to underline the increasing effect of the interconnectedness of nations over global economic stability in the case of regional conflicts. By this way, this article determines the significance of understanding the relationship between geopolitical conflicts and global economic order.

In 1948 the establishment date of the state of Israel caused several interactions and also political and military conflicts with its neighbors such as Iran, Egypt, and Syria. The fourth Arab- Israeli War is a vital example of the regional political conflict and increasing tension in the region that affected the global economic order negatively over the oil price. In 1973, oil producers in Arab countries decided to decrease the oil supply to the world as a protest against the Palestine policy of Israel. Thereafter, oil market had shockwave and the global economic order got into a crisis. This historical background determines the groundwork for analyzing effects of the Israel-Palestine conflict which end up with ascending tension in the region from October 7, 2023.

The strong linkage between global economics and regional conflicts affects geopolitical landscape which can only be analyzed by interdependence theory. This theory suggests that the economic interdependencies between nations can both mitigate and exacerbate conflicts, depending on the nature and level of economic connectivity. This article focuses on vital events in the international and global economic order, such as the Israel-Palestine conflict, especially examining its impact on the Brent oil market, which heavily depends on global economic stability. In the context of this article, the interdependence theory will be employed to review the changes in Brent oil prices, which is a benchmark for global economic reactions to geopolitical tensions. The recent economic volatility and vulnerabilities of result of this volatility makes this research area as an inevitable area of study. Despite the deepening cooperation in trade, investments, and common resources, the ever-evolving roles of regional aggression and economic turmoil influence beyond a nation's territorial borders. It is crucial that understand these interdependencies among nations to develop economic policies and several strategies to eliminate the potential risk of conflict. This study aims to investigate the multifaceted nature of these economic linkages, exploring how geopolitical tensions, such as the Israel-Palestine conflict, create vulnerabilities within the global economic system. By examining the pathways through which these disruptions propagate, we can better anticipate and respond to future economic challenges. This research not only contributes to the academic discourse on economic interdependence but also provides valuable insights for policymakers and stakeholders engaged in fostering global economic stability and resilience. Since, Our research aims to dissect the extent to which global oil prices, particularly Brent crude, are influenced by the heightened geopolitical tensions following the outbreak of the conflict in October 2023.

The study is structured around two principal hypotheses:

H₀: There is no significant difference in the mean Brent oil prices before and after the Palestine-Israel conflict.

H₁: There is a significant difference in the mean Brent oil prices before and after the Palestine-Israel conflict.

These two hypotheses will be tested by the methodological framework. employing statistical tools to help critically analyze Brent oil price data which is published by Plats during the conflict. This tool provide validation of the interdependence theory within this context and clear understanding about how global economic systems adapt to political change in the region.

Following the introduction part of the article, in the first chapter, existing literature on economic interdependence will be underlined. After the literature review, the Methodology will be explained through the methods employed for data collection and analysis. This section explains the use of statistical tools and techniques for hypothesis testing and justifies the choice of Brent oil prices as a benchmark for this analysis. Subsequently, chapters on Analysis and Discussion present the results of our statistical analysis, interpreting these findings through the lens of

economic interdependence. The final chapter, Conclusion, summarizes the key findings of the study.

RETHINKING CONFLICT: THE PRIMACY OF ECONOMIC CONCERN OF GLOBAL ACTORS IN INTERDEPENDENCY THEORY

Interdependence theory provides a comprehensive framework to understand how states and non-state actors are interconnected and influence their economic and political stability. The interdependence theory highlights how changes in one state can affect others through the examination of strong linkage in economy, and politics. For this reason, this article is structured within the theory of interdependence which provides an analysis of how interdependent relationships among states shape their economic dynamics in case of political conflict in the region and promote mutual stability. By capitalizing on insights into Interdependence Theory, this article aims to present a wide understanding of the mechanism that underscores international cooperation and conflict, and valuable perspectives on the recent global order. Robert Keohane and Joseph Nye notably advanced interdependence theory in their joint work, "Power and Interdependence" (1977), which challenged the dominant realist perspective in international relations. According to Keohane and Nye, global interactions were becoming highly complex with multiple interaction channels and several forms of interdependence beyond military power (Keohane, Nye, 1977). The Framework of Keohane and Nye's argument contains concepts of sensitivity and vulnerability. These two concepts describe that how political or economic volatility in one country affect another. In terms of sensitivity, an economic regression in significant economies can cause volatility in global markets, and negatively impact international trade, and financial stability in other countries. In this case, sensitive economies become more vulnerable over external economic regression which shows the tight economic networks and interdependencies, especially in their economic relations.

On the other hand, vulnerability shows how countries are affected by external economic volatility and their maneuverability capacity in case of economic regression. If a state is highly sensitive to global economic changes, has no strong economic policies, or lacks diversification in main industries, the sensitive state might have difficulty keeping its economy stable.

The main suggestion of the theory is that states and non-state actors are interconnected through various economic, environmental, and social networks. Multinational companies are among the most significant non-state actors that obtain a high level of influence on international politics. These companies obtain significant economic power and operate across multiple countries. For this reason, multinational companies play a vital role in shaping global economic policies and strategies. According to Friedman's argument, this interconnectedness depends on the capital flow, the mobility of labor, and the developing technology. The role of multinational companies is highly crucial in the process of spreading investments and supply chains for multiple countries (Friedman, 1999). The influence of multinational companies spread beyond economic policies by integration with individual state politics. This integration of multinational

companies and individual states provides a high level of interdependence between each other's policies in an economic sense. This circumstance has caused dynamic relations in international relations. Ballor, Aydin, and Yildirim argued in their joint work called "Multinational Corporations and the Politics of International Trade in Multidisciplinary Perspective" that the growing political influence of multinational companies within the global economic order allows the companies to affect economic policies and strategies within the industry (Grace, Ballor, Aydin, & Yildirim, 2020). Consequently, the capability of multinational companies to shape policies extends as long as influence continues over the individual state. This circumstance allows companies to grow and expand their dominance over the regulators and decision-makers. The core concept of this theory is Economic interdependence. According to this theory, trade and financial relations between states can influence their political relations. The liberalist point of view, or interdependence theory, states that when relationships between countries become economic, the prospect of their conflict decreases because they need to defend their economic gains (Oneal & Russett, 1997). Research has indicated that nation, which conducts many and frequent foreign investments and exports are less inclined to fight because in other words the loss incurs high costs to the rival side (Barbieri, 1996). Saez (2008) contributed that strong business links promote strong relations between trading partners and their trading partners. Whenever countries depend upon other countries for products to consume, products to buy, and markets to sell in, they also acquire a stake in the other country's future. This integration has a negative effect on militarized conflict since the economic cost would be catastrophic to the various players. In other words, individual states most likely prefer maintaining good relations with others rather than military conflict. Park (2018) also supports Saez's argument by emphasizing the role of economic interdependence in reducing the likelihood of conflict initiation. He posits that as nations become more economically intertwined through trade and investment, the costs associated with conflicts rise, thereby acting as a deterrent to aggression. This perspective aligns with the liberal argument that trade fosters international peace by creating mutual dependencies that make conflict less attractive and cooperation more beneficial. Park's analysis highlights empirical evidence showing that countries with strong economic ties are less likely to engage in military disputes, as the economic repercussions would be detrimental to both parties.

However, the relationship between interdependence and conflict is not straightforward. While economic ties can foster cooperation, as seen in the case of EU and Mercosur (Andreatta, Ardeni, & Pallotti, 2000), they can also create tensions and vulnerabilities, particularly when the costs of interdependence, such as economic vulnerabilities, outweigh the benefits (Sáez, 2008; Yamakage, 1982). For instance, asymmetric interdependence, where one nation is more dependent on another, can lead to power imbalances and exploitation (Baldwin, 1980). This complexity underscores the dual nature of interdependence, where increased connectivity can either mitigate or exacerbate tensions depending on the context.

This duality is further complicated by the operationalization of interdependence and conflict, where different measures can yield varying results, suggesting that both realist and liberal

interpretations may hold validity. Moreover, regional dynamics, such as power imbalances and strategic interests, play a crucial role in shaping the outcomes of interdependence (Pevehouse, 2004). For instance, dominant military states may initiate conflicts to preempt perceived declines in their power, as suggested by dynamic differentials theory. The institutional management of conflicts also influences outcomes, where ineffective political institutions can perpetuate conflict despite economic ties (Snyder, 2008). In addition, regionalization processes along with economic cooperation and backed up by regional powers and security commitments provide crucial linkages between economic integration and political and security cooperation (Gasiorowski, 1986). Therefore, economic interdependence being the key to reducing regional conflicts remains an ambiguous activity with a series of absolute conditions based on the type of interdependence, the efficiency of institutions, regional power, etc. (Alexiadis, 2017; Braddon, 2012).

However, interdependence theory has been criticized and yield quite a rose tinted view on economic interdependence as a peace promoting function. The critics have pointed out that the theory does not fully incorporate the use of power politics and strategies in the international relations (Waltz, 1979). However, it situated most of its concepts within the economic agendas, and these tended to exclude other forms of interdependence including cultural or even environmental ones which are also vital in defining the dynamics of the international systems. Interdependence theory offers a more appropriate mode of understanding international relations due to these intricate and complex interconnections between nations in the contemporary globalized world. In sum, pointing out the cooperative aspect of economic and political relations together with the conflict potential of these relations, the theory provides a broad analytical framework for understanding the current issues of global politics.

METHOD

The dataset used in this study contains daily Brent oil prices in USD, specifically focusing on the dates between March 7, 2023, and May 7, 2024. Brent crude oil barrel prices are utilized in this analysis because Brent crude serves as a globally recognized benchmark for oil pricing due to the global significance of Brent. Brent oil prices are used in two-thirds of crude oil trade globally (Daneshvar et al., 2022). This period was chosen to encompass seven months before and after the onset of the Palestine-Israel conflict on October 7, 2023, allowing for a comparative analysis of oil price dynamics before and after the conflict. Data processing and analyses will be conducted using R in RStudio. The first step in the data handling process involves filtering the dataset for the relevant dates. The conflict's start date will be prominently marked in our visualizations to delineate the pre-conflict (from March 7, 2023, to October 6, 2023) and post-conflict periods (from October 7, 2023, to May 7, 2024). To provide a clear visual representation of the data, we will plot the daily oil prices, highlighting the conflict's onset with a vertical line. This will help in visually assessing any immediate effects of the conflict on oil prices.

For the statistical analysis, the Augmented Dickey-Fuller (ADF) test will be employed to check for stationarity within the dataset. As the stability of data means is essential in time series

analysis, non-stationary data are designated to be differenced — subtraction of the previous day’s value from the current day’s value to stabilize the data’s mean. After data was manipulated, a t-test will be performed to assess whether the mean oil prices changed after this geopolitical event and if these changes were significant. We will also provide insight into the respective volatility of oil prices (using standard deviation) for pre-conflict and post-conflict periods.

Additionally, we will perform a volatility analysis by calculating the standard deviation of oil prices for both the pre-conflict and post-conflict periods. This will be useful in knowing the stability and reaction of the market to any geopolitical event, providing these can affect the movement of financial markets.

RESEARCH

The analysis we conducted taking the outlined methodology began with a look at daily crude oil prices for March 7, 2023 through May 7, 2024. Visualization of this dataset was done in RStudio which helped us to have an early overview about the trend of oil prices over time. A vertical line was introduced with the graph at October 7, 2023 to divide the pre- and post-conflict periods after the Palestine-Israel conflict.

The graphical representation (Fig. 1) clearly explained the trend and volatility of oil prices including its behavior over a specific period if any. Crucially, there was no clear sign of material disruption in the beginning stages of war so that may suggest we were right to be more sanguine about an immediate conflict impact on oil prices. This indication suggests that the inter-related universe of oil and energy markets may have either priced-in any outbreak of military hostility or been equipped with ample buffers to mitigate initial reverberations without in this stage inducing significant price instability. This could also suggest that there are other measures in place to combat the impact of a full-blown oil shock: strategic reserves, resilient technology deployment or even interventions by major oil-producing countries (like Saudi Arabia and Russian Federation).

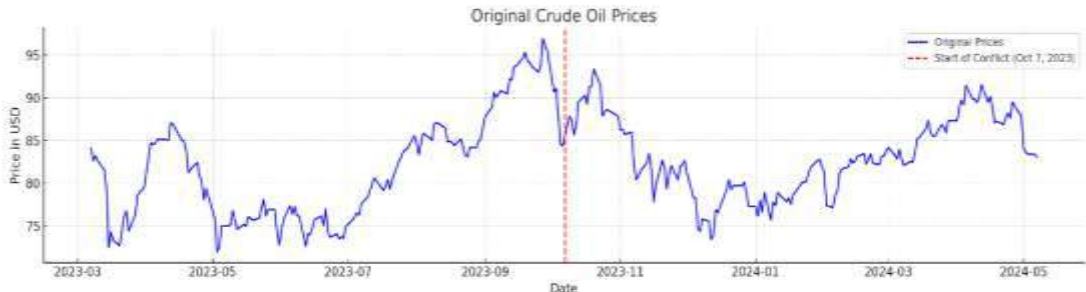


Figure 1. Crude Oil Prices from March 7, 2023, to May 7, 2024

A statistical check of the time series data for stationarity was then conducted after visualising. A Augmented Dickey-Fuller (ADF) test was performed in R and it showed that the series could be listed as non-stationary since its p-value is significantly greater than 0.05. This was supplemented

by the unit root test results which revealed that data had to be transformed in order for stationarity to take place. To render the time series stationary, a first difference was applied to the data, subtracting each day's price from the previous day's price. This transformation was visualised, highlighting the effect of differencing on stabilising the series' mean (Figure 2).

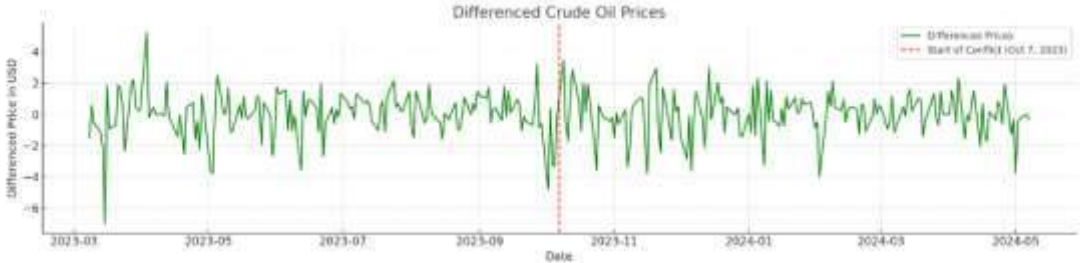


Figure 2. Differenced Crude Oil Prices from March 7, 2023, to May 7, 2024

Before proceeding with the t-test, the assumption of normality within each group was evaluated. Histograms of the differenced prices before and after the conflict were plotted to examine the distributions (Figure 3). Although the histograms did not show perfectly normal distributions, the large sample size allows us to rely on the Central Limit Theorem, which permits the assumption of normality for the purpose of conducting the t-test.

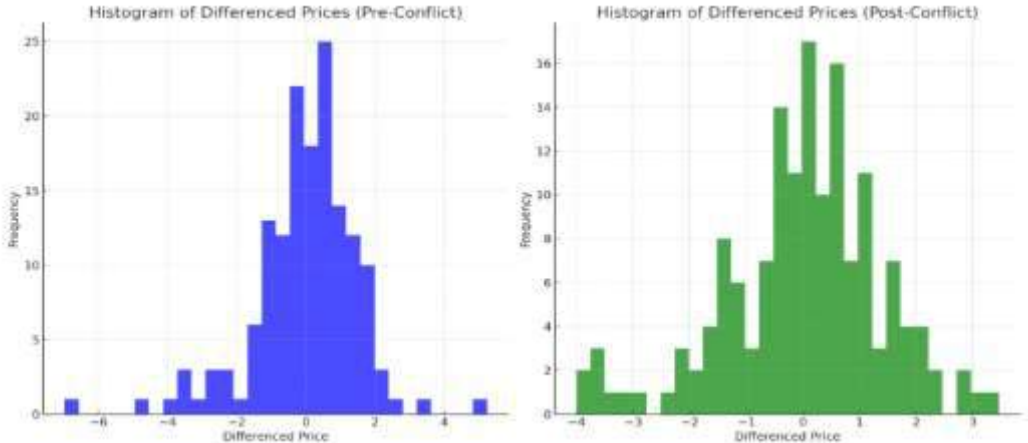


Figure 3. Histograms of Differenced Prices

A re-application of the ADF test on the differenced data yielded a p-value close to zero, firmly establishing the stationarity of the transformed dataset. The statistical outputs, formatted akin to RStudio output, are presented in Table 1, clearly indicating the before and after results of the ADF tests.

Table 1. Augmented Dickey-Fuller Test Results

Condition	Test Statistic	p-value	Critical Values (1%, 5%, 10%)
Original Data	-2.31	0.166	-3.45, -2.87, -2.57
Differenced Data	-17.24	$6.07e^{-30}$ (essentially 0)	-3.45, -2.87, -2.57

Following the confirmation of stationarity and addressing the normality assumption, the t-test was conducted to compare the mean differences between prices before and after the conflict. The statistical test revealed no significant difference in means, as the p-value was considerably high (0.950; the T-statistic for this test was 0.062), suggesting that the conflict had no substantial impact on the mean price of oil.

Finally, a volatility analysis was performed by calculating the standard deviations of the pre-conflict ($s = 1.509$) and post-conflict ($s = 1.405$) differences in prices. The results indicate that the volatility of oil prices decreased slightly after the conflict began. However, the difference in volatility is not substantial, suggesting that the overall market reactions to the conflict were relatively muted in terms of oil price fluctuations.

DISCUSSION

According to test result which is mentioned in the previous part of the article, A volatility analysis was conducted by calculating the standard deviations of the differences in oil prices before the conflict ($s = 1.509$) and after the conflict ($s = 1.405$). The findings reveal a slight decrease in the volatility of oil prices following the onset of the conflict. However, the change in volatility is not significant, indicating that the overall market reactions to the conflict were relatively subdued in terms of oil price fluctuations. Volatility analysis was done in two parts: first without the conflict era ($s = 1.509$) and second with the war era as well for further clarity $s = 1.405$. Results indicate that the oil price volatility has indeed experienced a minor depression in its aftermath. However, the move in volatility ranks low on the list of historical responses to global conflict when it comes to oil price moves.

This includes the examination of daily price levels in Brent oil trading from a Platts database both before and after this period - these data allow for statistical assessment of how has changed its reaction by world global oil market concerning the Israel-Palestine conflict. Additionally, the relatively restrained response from markets suggests that oil supply chains were not radically affected by the conflict nor did market sentiment change drastically. While the market once displayed dramatic price moves in response to geopolitical events, most significantly during 1973 when prices tumbled following an oil embargo by several Middle Eastern states led by Saudi Arabia, this analysis shows a distinct variance from historical precedent. The realization here is that market dynamics may have diverged from the past, hinting toward

stronger structural resistance in future markets or a retesting of historical global supply shocks 20th century style. This research attempts to investigate the key factors causing oil price stability during geopolitical conflict in contemporary times by looking at these trends and providing an analysis that could be useful for a better understanding of global energy markets. Contrary to the gloom-and-doom price shocks often invoked by memories of the 1973 oil crisis-characterized as they were by substantial reductions in supply coupled with severe economic downturns-the market's reaction this time around has been notably subdued. The conclusions obtained in the framework of this study demonstrate the shift in market specifications and variations of the global oil industry, as well as the transformations of the geopolitical and economic factors which initiated several decades before. This unwanted and, therefore, actually can mean that the absence of severe oscillation in Brent oil prices implies today's global oil markets are or have the adequate countermeasures to an armed regional conflict. Taking these results in mind, it is crucial to keep in mind that historical context is not the only key factor, there is always a gradual process of continuous transformation of the global economy and energy networks to estimate the impact of geopolitical shocks on the commodity markets. This article does help to reveal a diverse complex picture of how particular conflicts affect market patterns and economic security in the contemporary world in detail with relevant statistical data. Particularly, OPEC countries as major players in the world economy ensure that there is stability in Brent price in the global market as supported the structure of the global economy. Thus, the lack of a record-breaking increase in Brent prices after the conflict can be explained by the fact that OPEC consciously decided not to disrupt the world economy's oil supply.

According to a report published by the International Energy Agency in December 2023, there was no sharp production difference between October and November. OPEC, which provides 40% of the world's oil supply annually, did not take a decision similar to the one taken in 1973. In the 1970s, individual countries had no strong ties with each other in an economic sense (International Energy Agency, 2024). Countries experienced lower levels of interdependence, allowing them to prioritize political or strategic considerations over economic interests, as exemplified by the actions taken during the 1973 oil crisis. In contrast, the current globalized environment, characterized by a complex network of economic interdependencies, makes such a stance increasingly impractical. The financial stability of nations is closely linked, creating a situation where breaking connections or neglecting economic interests would have serious consequences. As a result, individual countries' choices regarding trade and the initiation of conflicts are shaped by their expectations of how adversaries will react, thereby broadening the scope of trade-peace analysis.

Table 2 shows the comparative production of OPEC and OPEC+ (including Sudan, Oman, and Bahrain) countries in October 2023 and March 2024. This table includes oil production data for Azerbaijan, which directs nearly 25% of its annual oil exports to Israel (Statista, Oil export volume from Azerbaijan in 1st half of 2023, by country 2023). During the onset of the Israel-Palestine conflict from October 2023 to March 2024, a comparison over two months may not reveal immediate production changes. This is due to the typical inability of OPEC and major

oil-producing nations like Azerbaijan to promptly react to such geopolitical events under normal circumstances. Nevertheless, this six-month comparison holds significance as it indicates that OPEC members are unlikely to adjust oil production levels amidst the ongoing conflict.

Table 2. OPEC+ crude oil production (*million barrels per day*)

Country	OPEC+ crude oil production ¹						
	Date	Oct. 23	Nov. 23	Dec. 23	Jan. 24	Feb. 24	Mar.24
OPEC-9		23,18	22,97	21,79	21,89	21.69	21.78
Iran		3,1	3,19	3,21	3,15	3,23	45717
Libya		1,14	1,14	1,17	1,18	1,16	1,16
Venezuela		0,78	0,78	0,8	0,8	0,86	0,86
Total- OPEC		28,2	28,08	26,97	27,02	26.94	27,05
Azerbaijan		0,49	0,49	0,49	0,48	0.,48	0,48

Table 2 below synthesizes analysis from an overview of oil market integration globally and various conditions that have impacted differently the various oil-exporting countries. Each nations mainly depend on the crude oil sales as an essential component of the economic growth plan, underlining the crutch role of petroleum income for maintaining the steady economic performance. This dependency explains the measures taken by these countries to avoid making decisions that are likely to cause instability in the oil markets and subsequently worsen the world's economy as it has been witnessed in other historical periods of fluctuation. Table 2 shows that one can understand how these oil-exporting nations manage their economic and political policies to defend their economic gains during uncertain oil prices or geopolitical conflicts. Table 2 determines the strategic significance of the stable oil price conditions by analyzing key indicators such as oil production volumes. Additionally, it underlines the interconnectedness of global economies and the vital impact on oil supply and demand disruptions. This interconnectedness caused several repercussions globally due to oil production changing policies in Azerbaijan. Therefore, even a decision taken solely by Azerbaijan could impact the world. In this circumstance, the crucial effect of multinational oil companies should not be ignored. Especially, main oil producer companies have a trade relationship with these companies. Additionally, multinational companies have no nation. These are only for-profit companies.

Moreover, the existence of multinational oil companies like Shell and Total Energies, which are main actors in the global oil trade, underlines interconnectedness of the international oil market. The case of Azerbaijani oil arriving in Israel and subsequently being transported to various points in Europe, particularly Turkey, via the port of Haifa, shows this interconnectedness. As mentioned in the previous part of the article, such logistical operations not only highlight the supply chains that span multiple countries but also emphasize the reliance of nations on these multinational corporations for energy resources. In a globalized world trade order, this interdependence among states continues to strengthen that is based on energy security, economic stability within the individual states. As a result, the strategies of multinational oil companies have a strong impact on international relations, policy responses to the geopolitical conflict, economic policies, and the stability of global energy markets. As Keohane and Nye mentioned (1977), the meaning of this interdependence is the influence of multinational companies on the international maneuvering capabilities of individual states. As a result, non-state actors have emerged as significant players in the global economic landscape.

CONCLUSION

This article has focused on the impact of the Israel-Palestine conflict on global oil prices from scope of an interdependence theory. The theoretical framework of an interdependence theory contributes a detailed analysis of how the interaction of global systems responds to regional geopolitical tensions. According to Robert Keohane and Joseph Nye's interdependence theory, strong economic and political relationships between the states allow mutual dependencies among them. Additionally, these dependencies shape international actors' market behavior such as multinational companies and individual states.

This article has pointed out how the Israeli-Palestinian conflict as a regional tension affects the global oil market by focusing on Brent oil prices. This analysis examines market reactions and policy responses of actors in the global economic order. This is a good angle for covering the global oil market and highlighting its strengths, weaknesses, and impacts of globalization as well as the detriment of globalization when it comes to the conflict in certain regions. Therefore, the broad implication of this finding is felt on the analysis of economic interdependence and the stability of the global markets which should be beneficial to policymakers, economists and any stakeholders who might be interested in the performance of the energy sector all over the world.

The result of the analysis shows that the response of the global oil market to the conflict was subdued which does not allow any significant fluctuation in Brent oil prices during the analysis period. These circumstances suggest that despite the geopolitical tension and potential risks for global disorder, the market maintained a high level of stability. In contrast to 1973 oil crisis, similar geopolitical tension in the same region caused high level of volatility in oil prices that had resulted with a global economic crisis. The observed resilience was contributed by several factors: enhanced diversification of oil supply sources, strategic reserves, and improved crisis management mechanisms within global oil market. In addition to these factors, the

improvement of regulatory and integration mechanisms allow buffer against fluctuated Brent oil price.

These factors offer insights into why markets have remained stable and how the global oil market can absorb and respond to geopolitical conflict. The comparatively less pronounced volatility of Brent oil prices clearly demonstrates that conflicts in the regions contribute to the constant fluctuations in the global economic system and that forecasting and analyzing them requires constant attention and diverse approaches for maintaining financial stability in today's interconnected world. The stability in the oil market depends on integration among oil suppliers and strategic decisions to maintain this stability. In contrast to the 1973 oil crisis, it is the challenge of individual states to prioritize political considerations over economic interests due to high levels of economic interdependence. The world economy is closely connected especially in the oil industry which meets the necessities of many oil users while stability remains a core aspect of these relations. The integration of the oil industry is fundamental for many economies and indispensable for global economic order.

While stable economic connections help manage these risks by reducing trade disruption and providing investors with confidence, the complicated relations among supply chains of oil, and trade agreements argue that sudden change in one state can have widespread results for others. In case of regional conflicts, stability in economic relations between the partners ensures that cooperative conflict resolution might be held rather than market downturn against to conflict.

This article confirms the importance of strong and sustainable economic relationships in supporting an interconnected economy globally, especially in the oil industry. Moreover, the issue of multinational business and their purpose deepen the nature of the economic interdependence and intending at the increase of the impact of non-state actors in the world of international economics. Consequently, while economic interdependence can reduce conflicts by creating mutual dependencies, it can also escalate tensions under certain conditions. This is the reason for the stability of Brent oil prices during pre- and post-conflict periods.

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Appendix

Appendix 1: Brent Oil Daily Price : 7 March 2023- 7 May 2024

DATE	AVERAGE	DATE	AVERAGE	DATE	AVERAGE
7.03.2023	84,12	2.06.2023	75,82	29.08.2023	84,89
8.03.2023	82,64	5.06.2023	77,38	30.08.2023	85,17
9.03.2023	83,22	6.06.2023	76,34	31.08.2023	86,67
10.03.2023	82,66	7.06.2023	77,28	1.09.2023	87,84
13.03.2023	81,55	8.06.2023	76,21	4.09.2023	88,88
14.03.2023	79,45	9.06.2023	76,15	5.09.2023	90,62
15.03.2023	72,46	12.06.2023	72,61	6.09.2023	90,06
16.03.2023	74,29	13.06.2023	74,09	7.09.2023	90,43
17.03.2023	73,36	14.06.2023	73,97	8.09.2023	90,83
20.03.2023	72,68	15.06.2023	74,84	11.09.2023	90,46
21.03.2023	74,56	16.06.2023	75,77	12.09.2023	92,23
22.03.2023	76,16	19.06.2023	76,17	13.09.2023	92,09
23.03.2023	76,75	20.06.2023	75,02	14.09.2023	93,6
24.03.2023	74,39	21.06.2023	76,97	15.09.2023	93,72
27.03.2023	76,33	22.06.2023	74,27	18.09.2023	94,67

28.03.2023	78,54	23.06.2023	73,68	19.09.2023	95,34
29.03.2023	78,98	26.06.2023	74,08	20.09.2023	94,29
30.03.2023	79,2	27.06.2023	73,48	21.09.2023	94,14
31.03.2023	79,5	28.06.2023	73,76	22.09.2023	93,68
3.04.2023	84,75	29.06.2023	73,59	25.09.2023	92,98
4.04.2023	84,53	30.06.2023	74,92	26.09.2023	93,71
5.04.2023	84,68	3.07.2023	75,69	27.09.2023	96,93
6.04.2023	85,12	4.07.2023	76,06	28.09.2023	96,09
7.04.2023	85,12	5.07.2023	76,56	29.09.2023	95,49
10.04.2023	85,12	6.07.2023	76,26	2.10.2023	90,68
11.04.2023	85,01	7.07.2023	77,57	3.10.2023	91,07
12.04.2023	87,1	10.07.2023	78,43	4.10.2023	87,87
13.04.2023	86,9	11.07.2023	79,15	5.10.2023	84,54
14.04.2023	86,47	12.07.2023	80,01	6.10.2023	84,39
17.04.2023	85,02	13.07.2023	80,64	9.10.2023	87,85
18.04.2023	85	14.07.2023	80,22	10.10.2023	87,39
19.04.2023	83,78	17.07.2023	79,18	11.10.2023	85,67
20.04.2023	81,22	18.07.2023	79,62	12.10.2023	86,63
21.04.2023	81,67	19.07.2023	80,45	13.10.2023	89,5
24.04.2023	82,42	20.07.2023	79,33	16.10.2023	90,31
25.04.2023	80,8	21.07.2023	80,41	17.10.2023	89,25
26.04.2023	80,33	24.07.2023	82,58	18.10.2023	91,26
27.04.2023	78,08	25.07.2023	83,01	19.10.2023	91,41

28.04.2023	79,39	26.07.2023	83,71	20.10.2023	93,35
2.05.2023	75,77	27.07.2023	83,92	23.10.2023	91,43
3.05.2023	71,97	28.07.2023	84,12	24.10.2023	87,85
4.05.2023	72,51	31.07.2023	85,57	25.10.2023	88,43
5.05.2023	75,01	1.08.2023	84,79	26.10.2023	88,63
8.05.2023	75,01	2.08.2023	83,3	27.10.2023	88,46
9.05.2023	75,13	3.08.2023	84,79	30.10.2023	87,99
10.05.2023	76,82	4.08.2023	85,85	31.10.2023	87,78
11.05.2023	75,66	7.08.2023	85,28	1.11.2023	86,27
12.05.2023	74,61	8.08.2023	85	2.11.2023	86,32
15.05.2023	75,2	9.08.2023	86,94	3.11.2023	85,71
16.05.2023	74,93	10.08.2023	87,09	6.11.2023	86
17.05.2023	76,09	11.08.2023	86,97	7.11.2023	82,64
18.05.2023	75,96	14.08.2023	86,45	8.11.2023	80,45
19.05.2023	75,67	15.08.2023	84,83	9.11.2023	80,73
22.05.2023	75,93	16.08.2023	84,92	10.11.2023	81,38
23.05.2023	77,11	17.08.2023	84,75	13.11.2023	82,44
24.05.2023	78,12	18.08.2023	84,42	14.11.2023	83,45
25.05.2023	76,18	21.08.2023	85,16	15.11.2023	81,61
26.05.2023	76,92	22.08.2023	84,2	16.11.2023	77,83
29.05.2023	76,92	23.08.2023	83,26	17.11.2023	79,75
30.05.2023	74,25	24.08.2023	83,11	20.11.2023	82,69
31.05.2023	72,76	25.08.2023	84,19	21.11.2023	81,78

1.06.2023	74,5	28.08.2023	84,19	22.11.2023	79,35
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DATE	AVERAGE	DATE	AVERAGE
23.11.2023	81,03	20.02.2024	82,24
24.11.2023	82,06	21.02.2024	82,82
27.11.2023	80,39	22.02.2024	83,44
28.11.2023	81,98	23.02.2024	82,35
29.11.2023	82,14	26.02.2024	82,19
30.11.2023	82,65	27.02.2024	83,18
1.12.2023	81,23	28.02.2024	83,20
4.12.2023	78,35	29.02.2024	83,78
5.12.2023	78,26	1.03.2024	84,18
6.12.2023	74,64	4.03.2024	83,24
7.12.2023	74,39	5.03.2024	82,83
8.12.2023	75,81	6.03.2024	83,98
11.12.2023	75,56	7.03.2024	82,82
12.12.2023	73,42	8.03.2024	82,09
13.12.2023	73,91	11.03.2024	82,57
14.12.2023	76,9	12.03.2024	82,47
15.12.2023	76,57	13.03.2024	83,56
18.12.2023	78,6	14.03.2024	85,17
19.12.2023	79,28	15.03.2024	85,37
20.12.2023	80,42	18.03.2024	86,41

21.12.2023	79,25	19.03.2024	87,35
22.12.2023	79,73	20.03.2024	85,95
25.12.2023	79,73	21.03.2024	85,5
26.12.2023	79,73	22.03.2024	85,51
27.12.2023	80,13	25.03.2024	86,85
28.12.2023	78,7	26.03.2024	86,59
29.12.2023	77,3	27.03.2024	85,88
2.01.2024	76,15	28.03.2024	87,32
3.01.2024	77,99	29.03.2024	87,32
4.01.2024	76,62	1.04.2024	87,32
5.01.2024	78,94	2.04.2024	88,86
8.01.2024	75,69	3.04.2024	89,72
9.01.2024	77,82	4.04.2024	89,17
10.01.2024	77,4	5.04.2024	91,46
11.01.2024	78,95	8.04.2024	89,87
12.01.2024	78,63	9.04.2024	89,83
15.01.2024	77,86	10.04.2024	89,43
16.01.2024	78,26	11.04.2024	90
17.01.2024	77,52	12.04.2024	91,53
18.01.2024	78,66	15.04.2024	89,47
19.01.2024	78,99	16.04.2024	90,17
22.01.2024	80,06	17.04.2024	88,8
23.01.2024	80,15	18.04.2024	87,08

24.01.2024	80,25	19.04.2024	87,24
25.01.2024	81,26	22.04.2024	86,89
26.01.2024	81,88	23.04.2024	87,71
29.01.2024	82,65	24.04.2024	88,22
30.01.2024	82,79	25.04.2024	87,59
31.01.2024	81,91	26.04.2024	89,51
1.02.2024	81,42	29.04.2024	88,23
2.02.2024	77,41	30.04.2024	87,9
5.02.2024	77,15	1.05.2024	84,15
6.02.2024	78,62	2.05.2024	83,65
7.02.2024	79,12	3.05.2024	83,4
8.02.2024	81,23	6.05.2024	83,4
9.02.2024	81,66	7.05.2024	83,08
12.02.2024	81,92	8.05.2024	83,44
13.02.2024	82,86	9.05.2024	83,64
14.02.2024	82,36		
15.02.2024	82,64		
16.02.2024	83,12		
19.02.2024	83,47		

ENHANCING AGRITOURISM EFFICIENCY IN SHKODRA REGION THROUGH GIS AND ROUTE OPTIMIZATION: A QGIS AND ORS TOOLS APPROACH

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ABSTRACT

Agritourism is a good opportunity for economic development in rural areas and to help sustainable tourism. Our study aims to support this sector using Geographic Information Systems (GIS) and some routing algorithms. Using the QGIS application we mapped some agrotourism points in the region of Shkodra. In this application, we have loaded all the possible roads of the area in the .shp format supported by QGIS, which enables us to highlight all the possible road connections between the points. Then QGIS ORS (OpenRouteService) Tools were used to calculate the shortest and fastest routes between the agritourism points providing us with accurate distances and estimates of the time needed to reach the destination. From the results obtained, we presented in tabular form the access times and distances of all other points starting from each point. The map shows the points of agrotourism and the trajectories that must be traveled to reach them. This study is a good way to highlight on the map the agrotourism points, drawing the trajectory traveled to reach them and other informative data using GIS technology and QGIS application. These maps help tourists in finding the shortest routes, and in planning trips, and help agritourism points to be identified and accessed more easily even though they are located in rural areas. Our study presents practical examples and methods that can be followed by policymakers and stakeholders in the agritourism industry. By integrating the digital map and presenting the travel times, we aim to provide an easy and pleasant travel experience for tourists, thus helping to increase and sustain agritourism in the Shkodra region.

Keywords: QGIS, geographical analysis, agrotourism, OpenRouteService (ORS), shortest path, rural zone.

INTRODUCTION

Agrotourism during the last few years is being watched with interest since such attractions are increasing every year. They help as an additional option to the tourist offer of our country, but also greatly help the economy of the area (Ammirato and Felicetti,2013). They are developed mainly in rural areas where we have a commitment of farmers who produce food products and entrepreneurs who provide service and accommodation. The region of Shkodra has several such

agrotourism points scattered in different geographical locations and sometimes difficult to access from difficult rural roads. To help this problem, in this study, we used Geographic Information Systems (GIS) and routing algorithms to increase the efficiency and accessibility of agro-tourism destinations in Shkodër. Using QGIS we mapped a network of agritourism points along with the road connections between them and the city center of Shkodra where the bus station is located. This was achieved after loading all possible routes of our country and using the OpenRouteService (ORS) extension by which we calculated the shortest and fastest routes between these points thus presenting accurate measurements of distances and times of travel (Zielstra and Hochmair, 2012; Zhou and Tian, 2018).

The main goal is to provide a detailed geospatial analysis that can help design routes to agritourism spots, thus optimizing travel plans and improving the tourist experience. We aim for the agritourism sites to be easily accessible and well-connected with possible routes.

In this paper, we present some results of journeys between agrotourism points near the Shkodra region as well as some results and recommendations at the end that we think are of interest to agrotourism points, the surrounding community, and other interested parties. We have also done other previous research regarding Agrotourism and the impact of GIS (Deda and Zaka, 2024).

LITERATURE REVIEW

Agrotourism is a very good option for the economic recovery of rural areas and offers a diversified option in the tourist market (Barbieri, 2013). Various information technologies are used by agritourism businesses (Deda and Zaka, 2024). GIS technology helps us to place geospatial data as well as other data on maps (Deda and Zaka, 2024). This data make it easy to find information about routes and waypoint locations, as well as to find additional information about them. The locations of destinations as well as the connections between roads and these points can be located and studied very well with the help of GIS maps. OSM (open street maps) is a map that shows us the surface where we want to add information (Neis et al. 2011). All points are connected to each other by roads. These roads are of different qualities (Satheeshkumar et al. 2022). Some roads are interurban and are of better quality and the walking speed is higher, some others are urban, rural or even paths where the speed is also lower. QGIS uses the Dijkstra algorithm (Cormen et al. 2001) to find the shortest path. (Liu and Zhu. 2004) has done a study of the road network of Guwahati city in India using GIS technology. It has addressed the importance of measuring the accessibility of different points and the importance this has for transport planning. He suggests the use of GIS for road and accessibility measurements. Other researchers have analyzed how GIS comes in handy for creating road maps for various purposes. We have also referred to other articles that study GIS, routing algorithms, road categories, etc. (Das et al. 2019; Omar et al. 2022; Jiang et al. 2021; OSM, 2023; Ferster et al. 2020; Hochmair et al. 2015; Ford et al. 2015).

METHODOLOGY

To create the QGIS map and collect the data we analyzed we followed these steps. First, we installed the QGIS application from its website <https://qgis.org/>. We integrated OSM (open street maps) which serves us to present the base map according to the geographical positioning of the region of Shkodra. We imported the shapefile which contains all the roads of different categories and the possible paths in the ".shp" format. Through Vector path => Data management tools => Split Vector layer, we divided the roads according to categories (interurban, urban, paths, etc.) and imported them as a separate layer to distinguish and differentiate them on the map using colors and symbols. With the help of geographical coordinates imported from (Deda and Zaka, 2024), we marked the points of agrotourism in the region of Shkodra and the bus station in the center of the city. Then we installed the ORS tool plugin which will help us calculate the shortest routes and the duration of the trip. We get an API key from <https://openrouteservice.org/dev/#/signup> through which we can use the free options offered by ORS. This tool, using the Dijkstra graph algorithm, allows us to calculate the distances from point to layer or point to point, as well as the duration of the trip according to the type of roads and the allowed speed. We have downloaded the data to Excel to make calculations and comparisons.

RESULTS

To build the maps, we must first install the QGIS application, which is free and can be downloaded from the link <https://qgis.org/>. The version of this application that we have used is 3.38.0-Grenoble which is the last in this version. To start work, we need a basic map on which we will place all the following details, which are: The points of agritourism according to the coordinates of their location, the names of the villages, and the city center where the bus station is. Another element that we will add is the roads that we will categorize and put in different colors to distinguish them. For this reason, from the XYZ Tiles menu, we have selected the OpenStreetMaps option. After choosing this option, the basic map will appear on the work page and we will see OpenStreetMaps as a layer located in the Layers window. Next, we need all the possible roads and paths that are located around the Shkodra area. These data will be downloaded as shapefiles from the official sites that provide them for all countries. The downloaded file that we need to import as a layer in our application has the suffix .shp. This file has the graphs of all the roads which also have some attributes that we need such as category (main road, secondary road, etc.). They have the walking speed which we will need later for distance and time calculations as well as other data. We will divide this shapefile into other shapefiles so that we have separate road categories. We will divide according to the category column and all other attributes will be attached to the corresponding values. To do this, go to Vector => Data management tools => Split Vector layer and then select the division by category. We save the obtained data in a folder in the .shp format. Then we import them all into our application and color them to highlight them. Coloring and other visual characteristics, as desired, are done by clicking with the right mouse button on the layer we want to modify and

selecting properties. In orange we have shown the national roads that connect the cities, in blue we have shown the interurban roads and city rings, while in purple we have shown the unpaved paths. Other roads are left with thin lines and are more numerous (see Figure 1).

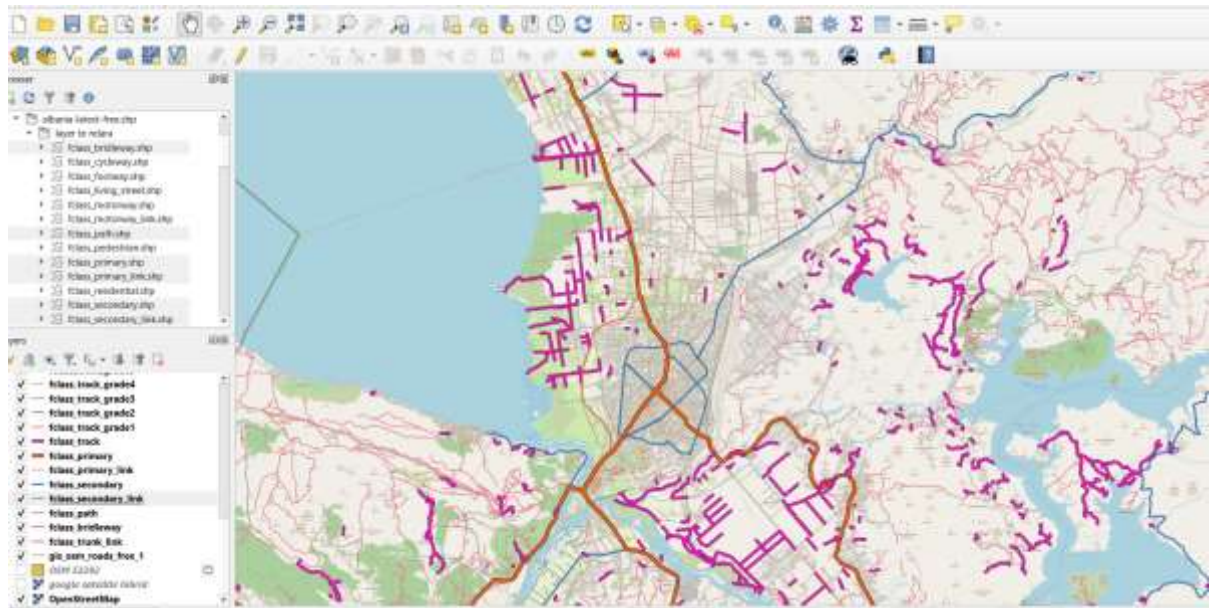


Figure 1. Map of Shkodra. Routes are divided by categories.

After we have built the basic map with the roads, we will continue with the identification of some points of agrotourism as well as the center of the city of Shkodra, which is also used as a public transport station to go to these destinations. We get the geographic coordinates of the agro-tourist points that we will add (Deda and Zaka, 2024) and save them in an Excel table in .csv format. Coordinates consist of latitude and longitude. In the columns, we will place the id column which has the id number that we assigned to the point, the designations column which has the designation of the agrotourism point, and the geographic coordinates which will be two columns with latitude and longitude. Then from Open Data Source Manager => Delimited Text, we import the file we created in .csv. We will be shown the points marked on the map, and we then make visual modifications of shapes, points, and colors as desired (see Figure 2).

There are several ways to go from one point to another, especially those within the city. These roads are connected directly or through other roads. These roads also have their characteristics according to the category, which we colored with different colors to distinguish them. Being different categories, the time of their passage is also different. Graph Theory helps us find the most optimal route to get from one destination to another. QGIS automatically calculates the shortest path from the road network we uploaded.

From all the possible routes that are available to access these agrotourism points, which we have marked in green, in Figure 3, using the Dijkstra algorithm (Cormen et al. 2001), through the program, we have calculated the shortest distances concerning the length of the road and duration starting from any point to go to any other point.

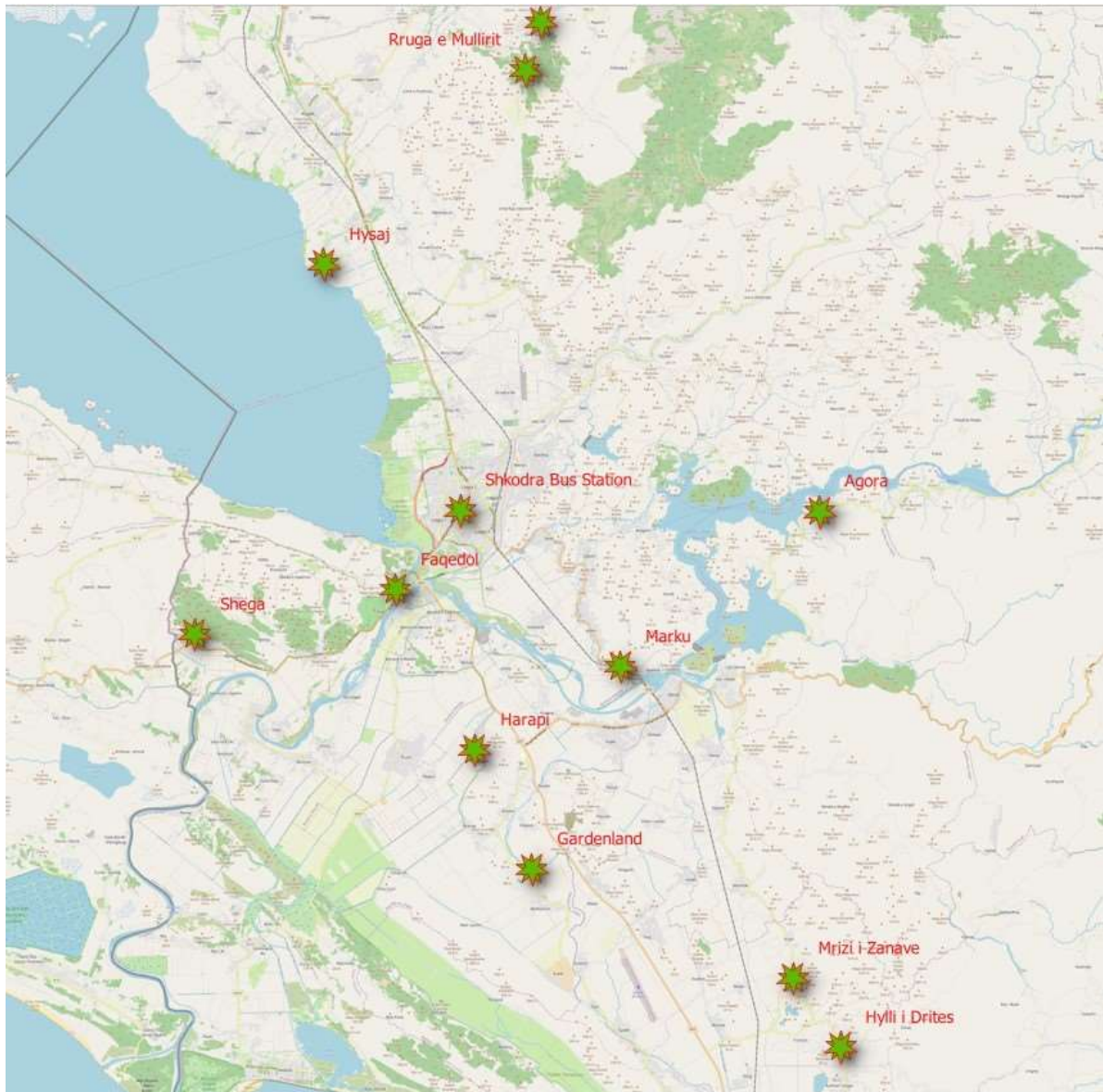


Figure 2. The locations of the agrotourism points and the station in the center of Shkodra.

The Dijkstra algorithm used by QGIS to solve the graph has the following form:

DIJKSTRA (G, ω, s)

```

1 INITIALIZE-SINGLE-SOURCE ( $G, s$ )
2  $S = \emptyset$ 
3  $Q = G.V$ 
4 while  $Q \neq \emptyset$ 
5      $u = \text{EXTRACT-MIN}(Q)$ 
6      $S = S \cup \{u\}$ 
7     for each vertex  $v \in G.\text{Adj}\{u\}$ 
8         RELAX( $u, v, \omega$ )

```

Following this algorithm, our application will begin testing the graph from the starting node to all other nodes until it finds the shortest path. To call this procedure in QGIS we do this.

We install plugins or tools which after being installed, ask us to create an account at <https://openrouteservice.org/dev/#/signup>. This account is free and can be created in a few steps. It gives us a user code (API key) to use this function in QGIS and more precisely from ORS tools. In search, we search for the shortest path and the variants point to point, point to layer, and layer to point are displayed. Point in our case represents a special agritourism site that we have placed on the map, while the "Agritourism Points" layer in our case, represents all the agritourism points that we have memorized there. New layers are created from these calculations and are added to the application in the layer section. In Figure 3, the entire road network is shown in blue.

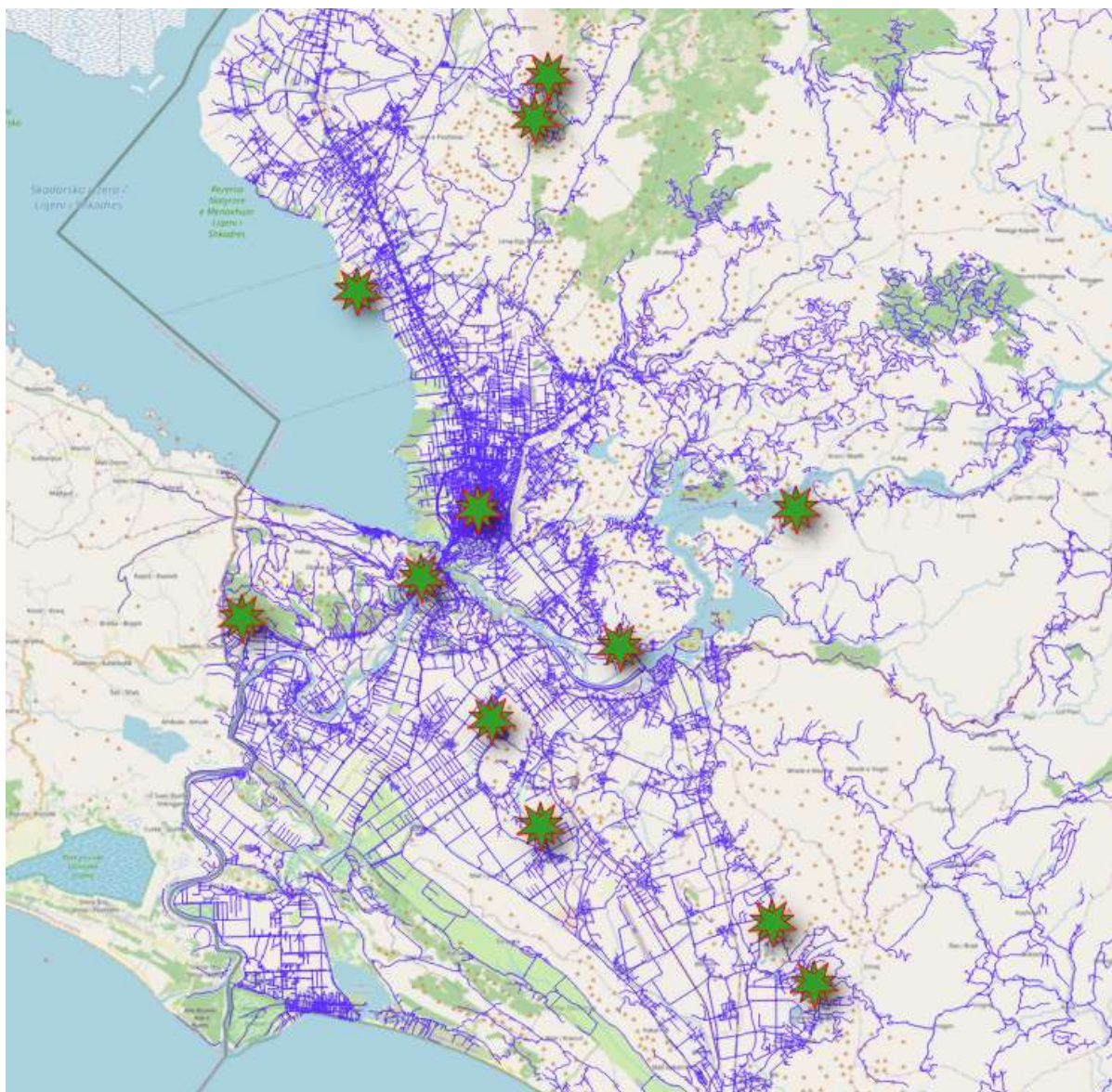


Figure 3. All the possible road networks for the connection between the agro-tourist points that we have chosen.

In Figure 4 shows with thick brown lines and more distinct, the shortest connecting routes of the agritourism points taken in the study, extracted after the execution of the Dijkstra algorithm by the application on the shortest routes.

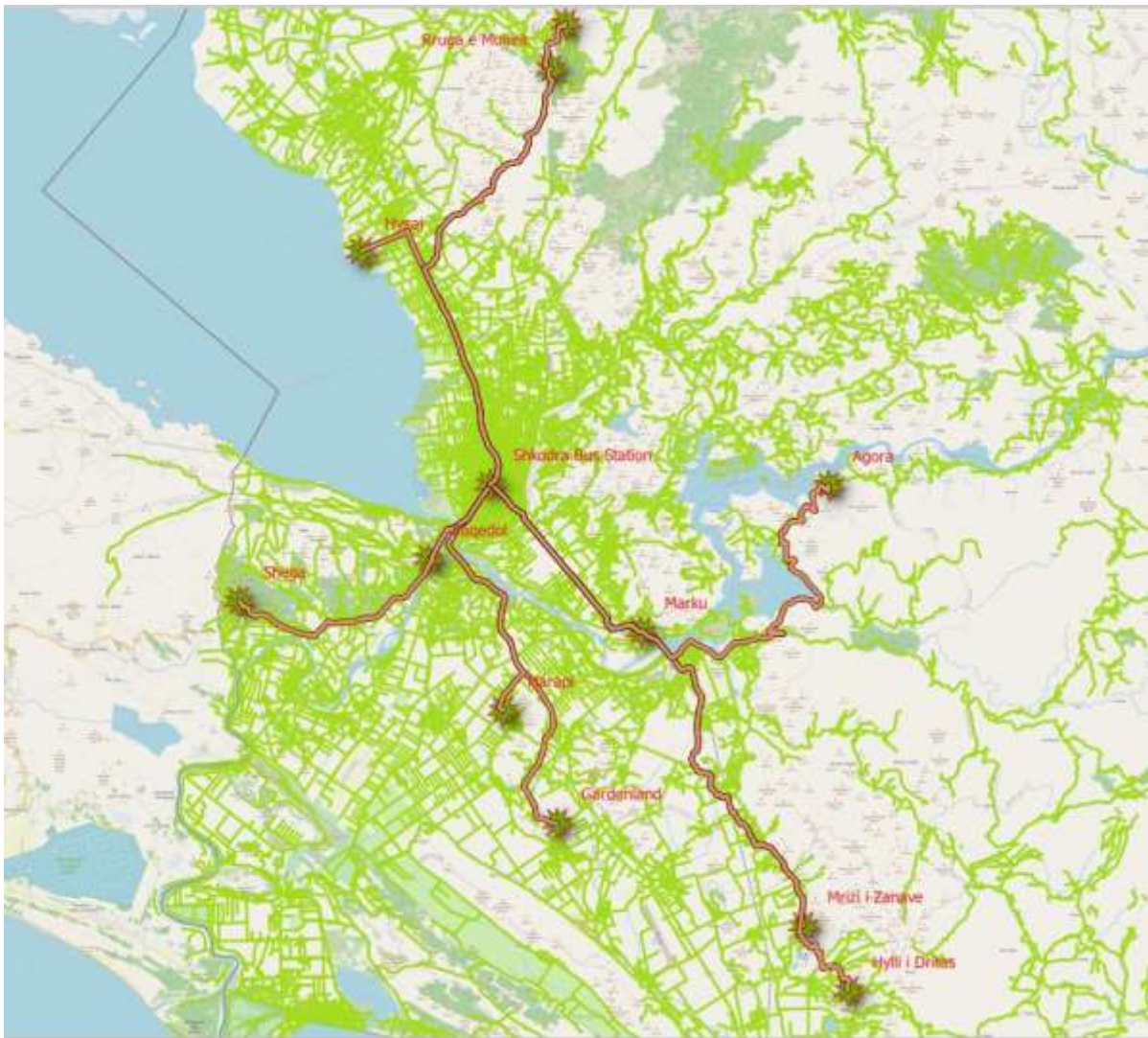


Figure 4. Representation of the shortest connecting routes between agritourism points: all possible routes are shown in green and the shortest routes between points are colored in brown.

From the already created layers of distances, we can export to Excel in tabular form any of the extracted results. We right-click on the layer of each of the selected paths and then click on Export. After that select the type of file we want to save, which we have selected in Excel with the suffix .csv. The parameters we receive in tabular form are the names of the departure point and the arrival point as we have assigned them at the beginning of the application during the data transfer and the mutual distances together with the duration of the trip.

In Table 1, the data on the distances from the center of Shkoder, where the bus station is, and all other points that we have considered are presented. The duration of the journey from one point to another is presented in hours and in the last column we have displayed the distances in kilometers.

Table 1. Distances and time from the bus station with all points.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Shkodra Bus Station	Mrizi i Zanave	0.789413889	28.00028
Shkodra Bus Station	Hylli i Drites	0.889863889	33.7752
Shkodra Bus Station	Gardenland	0.513886111	18.15852
Shkodra Bus Station	Harapi	0.377633333	12.243
Shkodra Bus Station	Marku	0.302855556	9.99908
Shkodra Bus Station	Faqedol	0.168194444	4.70734
Shkodra Bus Station	Shega	0.453408333	15.21236
Shkodra Bus Station	Agora	1.018644444	31.23792
Shkodra Bus Station	Shkodra Bus Station	0	0
Shkodra Bus Station	Hysaj	0.422094444	14.01431
Shkodra Bus Station	Baresha	0.810469444	29.17172
Shkodra Bus Station	Rruga e Mullirit	0.672913889	22.49184

Table 2 shows the route from Agora to any other agrotourism point, as well as the center of Shkodra, where the buses depart. If we notice the distance from Shkodra Bus Station to Agora in Table 1, it was 31.24km, while returning to Table 2, we have 31.49km. The duration also changes from 1.01 hours to 1.03. This happens because of the longest or shortest line traveled during a journey because of a major turn, roundabout, etc., even though we are traveling the same road.

Table 2: Distances and travel time from Agora to any point

FROM_ID	TO_ID	DURATION_H	DIST_KM
Agora	Mrizi i Zanave	0.990666667	29.67271
Agora	Hylli i Drites	1.1303	34.27155
Agora	Gardenland	0.967480556	31.17547
Agora	Harapi	0.916683333	28.89551
Agora	Marku	0.717938889	21.27108
Agora	Faqedol	1.063525	35.25051
Agora	Shega	1.348741667	45.75554
Agora	Agora	0	0
Agora	Shkodra Bus Station	1.027663889	31.4894
Agora	Hysaj	1.4184	44.9861
Agora	Baresha	1.806775	60.1435
Agora	Rruga e Mullirit	1.669219444	53.46363

In Tables 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, the distances and duration of the trip are presented, taking an agrotourism point as the starting point and any of the other points as the destination. Using graph theory and the Dijkstra algorithm our application built in QGIS gives us the shortest path length as well as its duration. The small differences that are seen in time and distance from the way to the return come because of any small deviation that is made on the road due to a turn, roundabout, etc. The distances are shown in km and are the sum of the lengths of all the selected routes and joined in the graph to give the shortest route. Duration is the time

we need to drive from one point to another, calculating the speed allowed on these roads as well as the quality of the terrain. This time is shown in hours.

Table 3: Distance and time from Baresha to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Baresha	Mrizi i Zanave	1.577513889	56.91514
Baresha	Hylli i Drites	1.6624	63.12424
Baresha	Gardenland	1.286419444	47.50756
Baresha	Harapi	1.150169444	41.59205
Baresha	Marku	1.090955556	38.91394
Baresha	Faqedol	0.940727778	34.05638
Baresha	Shega	1.225944444	44.5614
Baresha	Agora	1.806744444	60.15278
Baresha	Shkodra Bus Station	0.813727778	29.29748
Baresha	Hysaj	0.641847222	19.50063
Baresha	Baresha	0	0
Baresha	Rruga e Mullirit	0.184280556	2.96497

Table 4: Distance and time from Faqedoli to any other Point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Faqedol	Mrizi i Zanave	0.767675	28.73617
Faqedol	Hylli i Drites	0.835372222	32.03452
Faqedol	Gardenland	0.459391667	16.41784
Faqedol	Harapi	0.323141667	10.50233
Faqedol	Marku	0.437536111	14.05701
Faqedol	Faqedol	0	0
Faqedol	Shega	0.323694444	11.08222
Faqedol	Agora	1.060033333	35.21777
Faqedol	Shkodra Bus Station	0.204636111	6.13808
Faqedol	Hysaj	0.551783333	19.00915
Faqedol	Baresha	0.940161111	34.16655
Faqedol	Rruga e Mullirit	0.802605556	27.48668

Table 5: Distance and time from Gardenland to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Gardenland	Mrizi i Zanave	0.461505556	15.97011
Gardenland	Hylli i Drites	0.529202778	19.26847
Gardenland	Gardenland	0	0
Gardenland	Harapi	0.227880556	7.35271
Gardenland	Marku	0.413955556	15.02863
Gardenland	Faqedol	0.465530556	16.47032
Gardenland	Shega	0.750747222	26.97535
Gardenland	Agora	0.969286111	31.18256
Gardenland	Shkodra Bus Station	0.548083333	19.56083
Gardenland	Hysaj	0.895233333	32.4319
Gardenland	Baresha	1.283608333	47.5893
Gardenland	Rruga e Mullirit	1.146055556	40.90943

Table 6: Distance and time from Harap to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Harapi	Mrizi i Zanave	0.601538889	20.61243
Harapi	Hylli i Drites	0.669236111	23.91079
Harapi	Gardenland	0.227880556	7.35271
Harapi	Harapi	0	0
Harapi	Marku	0.361838889	12.74887
Harapi	Faqedol	0.327119444	10.54237
Harapi	Shega	0.612333333	21.0474
Harapi	Agora	0.917169444	28.90281
Harapi	Shkodra Bus Station	0.409672222	13.63288
Harapi	Hysaj	0.756822222	26.50395
Harapi	Baresha	1.145197222	41.66135
Harapi	Rruga e Mullirit	1.007644444	34.98148

Table 7: Distance and time from Hylli i Drita to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Hylli i Drites	Mrizi i Zanave	0.156530556	4.93682
Hylli i Drites	Hylli i Drites	0	0
Hylli i Drites	Gardenland	0.529513889	19.27943
Hylli i Drites	Harapi	0.669547222	23.92175
Hylli i Drites	Marku	0.628341667	22.63229
Hylli i Drites	Faqedol	0.839775	32.05928
Hylli i Drites	Shega	1.124991667	42.5643
Hylli i Drites	Agora	1.1303	34.27155
Hylli i Drites	Shkodra Bus Station	0.922330556	35.14979
Hylli i Drites	Hysaj	1.269477778	48.02085
Hylli i Drites	Baresha	1.657855556	63.17826
Hylli i Drites	Rruga e Mullirit	1.5203	56.49838

Table 8: Distance and time from Hysaj to any other point

FROM_ID	TO_ID	DURATION_H	DIST_KM
Hysaj	Mrizi i Zanave	1.187966667	41.75241
Hysaj	Hylli i Drites	1.272852778	47.96151
Hysaj	Gardenland	0.896875	32.34483
Hysaj	Harapi	0.760625	26.42931
Hysaj	Marku	0.701408333	23.75121
Hysaj	Faqedol	0.551183333	18.89365
Hysaj	Shega	0.8364	29.39867
Hysaj	Agora	1.417197222	44.99005
Hysaj	Shkodra Bus Station	0.424180556	14.13475
Hysaj	Hysaj	0	0
Hysaj	Baresha	0.641463889	19.50711
Hysaj	Rruga e Mullirit	0.556236111	15.07263

Table 9: Distance and time from Marku to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Marku	Mrizi i Zanave	0.488708333	18.03344
Marku	Hylli i Drites	0.628341667	22.63229
Marku	Gardenland	0.41215	15.02153
Marku	Harapi	0.361352778	12.74157
Marku	Marku	0	0
Marku	Faqedol	0.441369444	14.14817
Marku	Shega	0.726586111	24.6532
Marku	Agora	0.717938889	21.27108
Marku	Shkodra Bus Station	0.311875	10.25056
Marku	Hysaj	0.702611111	23.74726
Marku	Baresha	1.090986111	38.90466
Marku	Rruga e Mullirit	0.953430556	32.22478

Table 10: Distance and time from Mrizi i Nave to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Mrizi i Zanave	Mrizi i Zanave	0	0
Mrizi i Zanave	Hylli i Drites	0.156530556	4.93682
Mrizi i Zanave	Gardenland	0.461505556	15.97011
Mrizi i Zanave	Harapi	0.601538889	20.61243
Mrizi i Zanave	Marku	0.488708333	18.03344
Mrizi i Zanave	Faqedol	0.771766667	28.74996
Mrizi i Zanave	Shega	1.056983333	39.25499
Mrizi i Zanave	Agora	0.990666667	29.67271
Mrizi i Zanave	Shkodra Bus Station	0.798433333	28.25176
Mrizi i Zanave	Hysaj	1.189166667	41.74845
Mrizi i Zanave	Baresha	1.577544444	56.90586
Mrizi i Zanave	Rruga e Mullirit	1.439988889	50.22598

Table 11: Distance and time from Rruga e Mullir to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Rruga e Mullirit	Mrizi i Zanave	1.440430556	50.24188
Rruga e Mullirit	Hylli i Drites	1.525316667	56.45098
Rruga e Mullirit	Gardenland	1.149338889	40.8343
Rruga e Mullirit	Harapi	1.013086111	34.91879
Rruga e Mullirit	Marku	0.953872222	32.24068
Rruga e Mullirit	Faqedol	0.803644444	27.38312
Rruga e Mullirit	Shega	1.088861111	37.88814
Rruga e Mullirit	Agora	1.669661111	53.47952
Rruga e Mullirit	Shkodra Bus Station	0.676644444	22.62422
Rruga e Mullirit	Hysaj	0.555372222	15.07204
Rruga e Mullirit	Baresha	0.184280556	2.96497
Rruga e Mullirit	Rruga e Mullirit	0	0

Table 12: Distance and time from Shega to any other point.

FROM_ID	TO_ID	DURATION_H	DIST_KM
Shega	Mrizi i Zanave	1.052891667	39.2412
Shega	Hylli i Drites	1.120586111	42.53955
Shega	Gardenland	0.744608333	26.92287
Shega	Harapi	0.608358333	21.00735
Shega	Marku	0.722752778	24.56204
Shega	Faqedol	0.323694444	11.08222
Shega	Shega	0	0
Shega	Agora	1.34525	45.72279
Shega	Shkodra Bus Station	0.48985	16.64311
Shega	Hysaj	0.837	29.51417
Shega	Baresha	1.225375	44.67158
Shega	Rruga e Mullirit	1.087822222	37.9917

CONCLUSIONS AND RECOMMENDATIONS

This study presents the use and implementation of the QGIS application in finding and displaying on the map the shortest routes to agrotourism points around the city of Shkodra. Using the spatial data analysis and advanced routing techniques that QGIS offers we have achieved some key findings. Finding the shortest route that takes us from destination to destination using QGIS and ORS Tools. With their help, we found and marked the distances on the map and calculated the durations of the roads that connect the city of Shkodra with agrotourism points around it. We have also presented the types of roads separated by color starting from interurban, and urban roads, paths, and alleys. Through graph theory and the Dijkstra algorithm, the application gives us the shortest routes that increase accessibility and minimize travel time. This is valuable for transport logistics and helps in planning itineraries for visitors. Through maps, users know the quality of the road they will travel. We recommend that the studies of the routes be further deepened and other variants of the routes for a certain destination are also presented which can come in handy in cases of evacuation of the area for various reasons such as fires or even the intervention of ambulances and firefighters and other necessary tools. We aim to continue the study of these agro-tourist points and the interconnection of their routes using graph theory. We will also study specific points of agritourism and use the techniques offered by GIS for the identification of farms around the point, different attractions that belong to that agritourism, the relevant paths to pass, etc. We will also look at the integration of height above sea level. This is important for those agrotourism points that are located on a hill or other area with broken relief, and it is of interest to know the difficulties of the roads and paths.

DISCUSSIONS

The agritourism points around the region of Shkodra are mainly located in rural areas. Being like that, the road to get there sometimes became even more difficult due to the use of village roads. Sometimes these parts of the road are unpaved and narrow to pass. QGIS is a free application that helps us create comprehensive maps in the service of accessing agro-tourist points. Thanks to the plugins that this application offers us, we can differentiate the road

categories. A representation of the quality of the route to the destination, duration, and distance can help the tourist to make the most optimal choice for him. Sometimes we look at a point on Google Maps that doesn't seem far away, but when we often go to rural areas, we can be delayed a lot due to the quality of the road or even turn around and choose another route due to road damage or works. In rural areas, the quality of the Internet is poorer and navigation on the Internet becomes more difficult, so preliminary offline maps can be of great help to users. We think that stimulating the use of GIS and different trainings can bring benefits in improving access and increasing the number of visitors to agrotourism sites.

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COMPARISON OF EXTRACTION METHODS FOR CAROB SWEET JUICE: TRADITIONAL APPROACHES AND TECHNOLOGICAL INNOVATIONS

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ABSTRACT

Carob, the fruit of the carob tree (*Ceratonia siliqua*), is a valuable natural resource widely used for its nutritional properties and sweetening potential. The extraction of sweet juice from carob is of particular importance in the food and pharmaceutical industries. This presentation aims to review the various methods of extracting sweet carob juice, highlighting both traditional techniques and modern innovative approaches. We will discuss conventional methods such as maceration and pressing, as well as advanced technologies like ultrasound-assisted extraction and enzymatic extraction. Special attention will be given to extraction yields, the quality of the juice obtained, and the energy efficiency of each method. Additionally, the economic and environmental implications will be examined to provide a comprehensive overview. This comparison seeks to identify the most promising methods for sustainable and efficient production of carob sweet juice, tailored to current market demands.

Keywords: Carob, Sweet Juice, Extraction Methods, Sustainable Production, Juice Quality, Energy Efficiency.

INTRODUCTION

With the growing societal focus on consuming nutritious and value-added foods, the production of functional foods and dietary supplements has become increasingly important, now representing a rapidly expanding global industrial market. Simultaneously, there is a rising interest in replacing synthetic additives and colorants with natural alternatives. While the extraction of natural products was once considered environmentally friendly compared to heavy chemical industries, experts now recognize that its environmental impact is significantly greater than initially perceived.

Less-known fruit species, such as carob, have recently gained popularity. These fruits are rich in non-nutritive, nutritional, and bioactive compounds, including flavonoids, phenolics,

anthocyanins, phenolic acids, sugars, essential oils, carotenoids, vitamins, and minerals. These lesser-known fruits also offer unique flavors, significant medicinal value, and health benefits (Engin & Mert, 2020 ; Eydurán et al., 2015 ; Gundogdu et al., 2014 ; Kaskoniene et al., 2020).

The extraction of carob sugar is a key process in enhancing the value of this natural resource, which is widely appreciated for its nutritional and bioactive properties. Traditionally, conventional extraction methods, such as solvent extraction or pressure extraction, have been used to isolate sugars from carob pods. Although these techniques are well-established and effective, they have drawbacks, including high consumption of solvents and energy, as well as significant environmental impacts.

In response to these challenges, non-conventional extraction methods have emerged as promising alternatives. These techniques, including ultrasound-assisted extraction, supercritical fluid extraction, and microwave extraction, aim to improve the efficiency of the process while reducing environmental impact and operational costs. These methods also offer the potential to better preserve bioactive compounds and optimize the extraction of carob sugars.

This study will present a complete picture of current knowledge on sustainable techniques for carob sugar extraction as success stories for research and education and also at the industrial scale , highlighting recent developments and prospects for a more sustainable and efficient use of this resource.

MATERIALS AND METHOD

The methods of carob juice production involve initiating various techniques for extracting sugars found in carob, primarily concentrated in the pulp. Generally, solid-liquid extraction is carried out either in an aqueous or ethanol medium. Currently, extraction processes have undergone significant advancements by using more advanced methods.

To apply solid-liquid extraction, different techniques can be used, such as leaching, percolation, decoction, infusion, maceration, digestion, and elution (Ben Amor, 2008). To explore the various studies on carob sugar extraction processes, here are some approaches with different methods.

Solvent Extraction: Maceration

Maceration is a commonly used solid-extraction technique that allows the extraction of high-value compounds by selecting the solvent's polarity and applying heat and/or agitation to increase the solubility of the compounds of interest from the sample (Luque de Castro and Priego-Capote., 2010).

The method was in accordance with (Bahry ., 2017). The preparation of the syrup involves, after mechanically separating the seeds and grinding the pods, a double maceration at room temperature in water. After each maceration, the juice recovered by

filtration serves as the raw material for molasses, while the dry matter from the filtration retentate or "cake" from the second maceration constitutes the bulk of the waste.

- Accurately weigh 300g of carob pods (stored at 4°C).
- Perform mechanical grinding to obtain pieces of pods with seeds.
- Manually remove the seeds.
- Place the weighed amount in a container and add 1 liter of distilled water (this time, do not heat).
- Control the temperature, ensuring it does not exceed between 20 and 25°C.
- Let macerate for 3 hours without agitation.
- Separate the maceration juice (MAC) from the solid matter (CAKE) by filtration (cloth/strainer).
- Repeat the operation twice.
- Place the maceration juices MAC1 and MAC2 in an oven at 70°C to evaporate the remaining water until syrup is obtained.
- Perform analyses to complete the mass balance: total sugars (TS), ash, lipids, polyphenols, and proteins.

Hot Aqueous Extraction

Hot water extraction is classified as a hydrothermal process and is readily used in the cellulosic industry (Ruiz et al., 2021). This method application on carob pods was in accordance with (Khlifa et al., 2013).

- After cleaning the carob and separating the seeds, sugar extraction from the pulp is carried out with distilled water.
- Accurately weigh 5g of the pulp.
- Take a 100 ml flask and introduce the weighed pulp using a funnel.
- Add 37.5 ml of distilled water.
- The flask will be heated for one hour at a temperature not exceeding 80°C (L/S ratio = 7.5), followed by filtration of the contents using filter paper to measure the quantity of sugars in the extract in each case.

Ultrasound-Assisted Extraction and heat-assisted method

Ultrasound-assisted extraction (UAE) is recognized as an eco-friendly method for extracting biologically active compounds. This technology has significantly influenced the extraction processes in the chemical and food industries for obtaining bioactive substances (Ahmad et al., 2019; Awad et al., 2012). This extraction non conventional method on carob pods was in accordance with (Antoniou et al., 2020).

The carob pods were washed, rinsed, then dried before being coarsely ground and deseeded. The pulp was reduced to medium granules (9-13 mm) and powder (1-4 mm), then immersed in distilled water with a granules/water mass ratio of 0.6. Extraction was performed either by

a conventional heat-assisted method (HAE) at different temperatures and durations in a water bath or by an ultrasound-assisted method (UA) at 40°C for 30 or 60 minutes. The resulting suspensions were filtered and centrifuged, and the clear supernatants were used to analyze non-structural carbohydrates and total phenolics. The experiments were repeated three times.

RESULTS AND DISCUSSION

- 1) Method 1. Extraction of sugars from carob waste Carob waste (2.5 cm size) issued from molasses preparation was used in this work. Residual sugar extraction was obtained by maceration at room temperature for a liquid/solid ratio (L/S=3), without stirring for 90 minutes (Bahry et al., 2017). The concentration of total sugars in the juice was 65 g/L (54±2% saccharose, and 46±2% hexose, among which glucose and fructose are the most abundant).
- 2) Method 2 : In the carob kibbles, the average values for sucrose, glucose, and fructose were (44 ± 0.74, 2.16 ± 0.09, 7.04 ± 0.17), respectively. Additionally, carob pods are free from theobromine and caffeine, which makes them an ideal food for certain diets. Conversely, carob kibbles are notably rich in total and non-reducing sugars (sucrose) as well as gross energy, positioning them as a high-energy food source for animal nutrition.
- 3) By comparing the two extraction methods under the same temperature and time conditions using t-Test analysis, it was found that the heat-assisted Extraction (HAE) at 50°C for 80 minutes (14.4 g/100 mL; 1150.3 mg/L GAE) produced significantly higher yields of total sugars and phenolics (P-sugars < 0.001, P-phenolics < 0.01) than the Ultrasound-Assisted Extraction (UAE) at 40°C for 60 minutes (12.1 g/100 mL; 943.2 mg/L GAE). Thus, the lower concentration of phenolics achieved with UAE was overshadowed by its lower sugar yield.

Results should take into account not only the yields and quality of the extracts but also practical factors such as time, cost, and energy efficiency. This allows for determining which method is the most appropriate based on specific needs and constraints of the extraction process.

CONCLUSION

The development of extraction procedures currently faces several challenges, as these methods need to be faster and more efficient than earlier protocols, while also minimizing the use of organic solvents (Herrero and Ibañez, 2018; Herrero and Ibañez, 2015; Tiwari, 2015). Despite this, conventional technologies are still widely used today and, in some cases, remain the preferred choice for various applications. Nonetheless, all methodologies can be applied potentially for industrial production of carob juice depending on the targeted functional and sensory properties of the extracted juice.

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İNSAN SPERMİNDE KRİYOPREZERVASYONUNUN SPERM VİTALİTESİNE ETKİSİ

EFFECT OF CRYOPRESERVATION OF HUMAN SPERM ON SPERM VITALITY

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ÖZET

Kriyoprezervasyon, biyolojik materyallerin (hücreler, dokular, embriyolar, sperm, yumurta hücreleri vb.) çok düşük sıcaklıklarda (genellikle -196°C 'de sıvı azot kullanılarak) saklanması işlemidir. Bu sıcaklıklarda, biyolojik aktiviteler durma noktasına gelir ve böylece hücreler veya dokular uzun süreli saklanabilir. Erkek infertilite tedavisinde kullanılan sperm kriyoprezervasyonundaki amaç ise spermin kriyoprezervasyon sonrası döllenme kapasitesini sürdürebilmesidir. Biz de bu çalışma ile sperm kriyoprezervasyonunun, sperm parametrelerinden vitaliteye etkisini araştırmayı amaçladık. Çalışmamızda, Dicle Üniversitesi

Tıp Fakültesi Üroloji Kliniğine infertilite nedeniyle başvuran, 25-40 yaş aralığındaki erkek hastalardan 40 gönüllü hastanın onayı ile semen örneği alındı. Çalışmada, hastalardan 3-4 günlük ideal cinsel perhiz sonrası masturbasyon yöntemi ile elde edilen semen örneklerinden, üroloji kliniğinin infertilite değerlendirmesi sonrası geriye kalan semen örnekleri kullanıldı. Hastaların demografik özellikleri (sigara, alkol, vitamin tüketimi, yakın zamanda alınan hormonal veya kemoterapötik tedavi ve varikosel) devre dışı bırakıldı. Çalışmaya sperm volümü 1,5 ml'den fazla olan, sayısı 15 milyonun üzerinde, hareketliliğin %40'tan fazla ve Morfoloji>%4 olan normozoospermialı semen örnekleri dahil edildi. 20 normozoospermialı hastadan alınan semen örneği Gradient tekniği kullanılarak yıkanıp, Eosin Nigrosin solüsyonları damlatılarak ışık mikroskobu altında incelendi ve vitalite değerlendirmesi yapıldı. Vitrifikasyon (dondurma) işlemi için; 20 normozoospermialı hastadan alınan semen örneği gradient yöntemi ile yıkanıp, hazır vitrifikasyon mediumu ile dondurularak kriyotüplere aktarıldı ve nitrojene daldırılarak saklandı. Çözülme işlemi için ise; nitrojenden çıkarılan kriyotüpler 37°C suya daldırılıp sıvı hale dönüncüye kadar beklenildi. Sıvı hale dönen örnekler klasik gradient yöntemi ile yıkanıp, Eosin Y solüsyonu damlatılarak ışık mikroskobu altında incelendi ve vitalite değerlendirmesi yapıldı. Sadece gradient uygulanan normozoospermik semen örnekleri ile kriyoprezervasyon sonrası normozoospermik semen örnekleri karşılaştırıldığında istatistiksel olarak ($p < 0,05$) anlamlı düzeyde bir azalış olduğu görüldü. Sonuç olarak; yaptığımız vitalite değerlendirmesi ile, dondurup çözme işleminin vitaliteye olumsuz bir etkisi olduğu kanısına vardık.

Anahtar kelimeler: İnfertilite, Kriyoprezervasyon, Normozoospermia, Vitalite.

ABSTRACT

Cryopreservation is the process of storing biological materials (cells, tissues, embryos, sperm, egg cells, etc.) at very low temperatures (usually using liquid nitrogen at -196°C). At these temperatures, biological activities come to a halt and thus cells or tissues can be stored for long periods. The purpose of sperm cryopreservation used in the treatment of male infertility is to ensure that the sperm maintains its fertilization capacity after cryopreservation. With this study, we aimed to investigate the effect of sperm cryopreservation on vitality, one of the sperm parameters. In our study, semen samples were taken from male patients between the ages of 25-40 who applied to Dicle University Faculty of Medicine Urology Clinic due to infertility, with the consent of 40 volunteer patients. In the study, the semen samples obtained from the patients by masturbation after 3-4 days of ideal sexual abstinence and the remaining semen samples after the infertility evaluation of the urology clinic were used. Patients' demographic characteristics (smoking, alcohol, vitamin consumption, recent hormonal or chemotherapeutic treatment, and varicocele) were excluded. Semen samples with normozoospermia with sperm volume more than 1.5 ml, number of more than 15 million, motility of more than 40% and morphology $>4\%$ were included in the study. Semen samples obtained from 20 normozoospermia patients were washed using Gradient technique, Eosin Nigrosin solutions

were dripped and examined under light microscope and vitality assessment was performed. For the vitrification (freezing) process; Semen samples taken from 20 normozoospermia patients were washed with the gradient method, frozen with ready-made vitrification medium, transferred to cryotubes and stored by immersion in nitrogen. For the dissolution process; The cryotubes removed from nitrogen were immersed in 37°C water and waited until they turned into liquid form. The samples that turned to liquid state were washed with the classical gradient method, Eosin Y solution was added and examined under a light microscope, and vitality evaluation was made. A statistically significant decrease ($p < 0.05$) was observed when the normozoospermic semen samples that were applied only to the gradient were compared with the normozoospermic semen samples after cryopreservation. In conclusion; Based on our vitality assessment, we concluded that freezing and thawing has a negative effect on vitality.

Keywords: Infertility, Cryopreservation, Normozoospermia, Vitality.

GİRİŞ

İnfertilite, düzenli cinsel ilişkiye rağmen bir yıl boyunca gebelik elde edilememesi durumu olarak tanımlanır ve dünya genelinde evli çiftlerin yaklaşık %15'ini etkileyen global bir sorun haline almıştır. Erkek infertilitesinin, bölgesel farklılıklara bağlı olarak, tüm infertilite vakalarının yaklaşık %20-70 kadarını oluşturduğu düşünülmektedir (Agarwal vd. 2015). İnfertilite tedavilerinde, sperm hücrelerinin kriyoprezervasyonu (dondurup çözme) sık kullanılan bir yöntemdir. Bu yöntem ile; kemoterapi ve radyoterapi öncesi üreme hücrelerinin korunması amacıyla veya testiküler hasara yol açabilecek hastalıklarda, ejakülasyon düzensizliklerinde, sperm bankası-donasyon uygulamalarında, oligospermi (düşük sperm sayısı) ve azospermi (ejakülatta hücre bulunmaması) hastalarında planlanan Üremeye Yardımcı Tedavi (ÜYTE) uygulamalarında kullanılmak üzere sperm hücreleri dondurularak saklanabilmektedir (Hamada vd. 2014, Costa vd. 2019). Sperm dondurma işlemi ilk kez 1949 yılında Polge ve arkadaşları tarafından gliserol kullanılarak gerçekleştirilmiştir (Mazur, 1984). Bu teknik, düşük sıcaklıkta canlı hücre veya dokuların fonksiyon kaybı olmadan minimum hasar ile uzun süreli saklanması mümkün kılınmıştır (Wetzels A.M.M., 1996). Kriyoprezervasyonun genel prensibi; materyalin kriyoprotektanlarla dengelendikten sonra, sıvı nitrojen içinde -196°C'de depolanması ve çözülme sonrasında kriyoprotektanları uzaklaştırarak, spermlerin canlılıklarını koruyabildikleri fizyolojik ortamlara aktarılmasıdır (Gardner, 2007).

Günümüzde sperm kriyoprezervasyonu; yavaş dondurma, azot buharında dondurma ve vitrifikasyon gibi çeşitli teknikler kullanılarak uygulanmakta ve başarılı sonuçlar elde edilmektedir. Yavaş dondurma işlemi, sperm hücrelerinin manuel veya otomatik olarak, 2-4 saatlik süreler içinde sıcaklığın kademeli olarak düşürülmesi suretiyle aşamalı olarak dondurulmasıdır. Öte yandan sperm süspansiyonu, soğuk kriyoprotektan madde içeren medium ile eşit hacimde karıştırılarak 4 °C'de dengelendikten sonra, sıvı azot buharında bekletilip dondurulmak sureti ile de sperm hücreleri saklanabilmektedir (Di Santo 2012, Justice ve

Christensen 2013). Vitrifikasyon yönteminde ise çok hızlı bir şekilde sıvı fazdan katı faza geçiş amaçlanır. Sperm hücrelerinde kristalleşme ve buz oluşumunu önlemek için sperm hücreleri özel taşıyıcılara yüklenir ve hemen ardından sıvı azot içine alınır. Kriyoprezervasyon işlemi sırasında kriyoprotektan maddeler kullanılmadan da hızlı dondurma tekniği kullanılarak başarılı sonuçlar alındığı bildirilmiştir (Isachenko vd. 2004b).

Sperm dondurma işlemi kadar önemli olan bir diğer aşama ise çözündürme prosedürüdür. Çözülme işlemi genellikle oda sıcaklığında 15 dakika veya 37°C'lik su banyosunda 10 dakika süreyle gerçekleştirilir. Çözme sonrası kriyoprotektan maddelerin sperm hücrelerinden uzaklaştırılması gerekmektedir (Di Santo, 2012). Bu süreç, hücrelerin ısı ve ozmotik şoka uğramadan biyolojik aktivitelerinin geri kazandırılmasını hedeflemekte, ancak hücre membran bütünlüğünün bozulması riski her zaman mevcut olmaktadır. Canlı ve cansız (ölü) sperm, boyanmama veya hipotonik şişme testiyle sağlam membran ayrımına göre belirlenirler. Ölü hücrelerde plazma membranlarının hasarlı olmasından dolayı boyalar hücre içine girer ve hücrelerin boyanması ölü olduğunun tespit edilmesini sağlar. Canlı hücrelerde ise membranların sağlamlığı sayesinde hipotonik sıvılarda şişme gözlemlenir ve bu da Hipoozmotik Şişme Testi (HOST) 'nin temel prensibini oluşturur (WHO, 2010). Vitaliteyi belirlemek özellikle hareketsiz spermelerde klinik açıdan oldukça önemlidir. Bu yöntemle, az sayıda spermatozoonun elde edildiği (testiküler biyopsi veya oligospermi) durumlarda, hareketsiz ancak canlı spermelerin ayırt edilebilmesi de sağlamaktadır.

Çalışmamızda, üroloji kliniğine başvuran infertil erkek hastalardan alınan semen örnekleri ile çalışılacak ve kriyoprezervasyon işleminin sperm canlılığı ve plazma membran bütünlüğü üzerine olan etkileri ortaya konacaktır.

YÖNTEM

Semenin Elde Edilmesi ve Sperm Hazırlama Tekniği

Çalışmamızda, Dicle Üniversitesi Tıp Fakültesi Üroloji Kliniğine infertilite nedeniyle başvuran, 25-40 yaş aralığındaki erkek hastalardan 40 gönüllü hastanın onayı ile semen örneği alındı. Üroloji kliniğinin infertilite değerlendirmesi sonrası geriye kalan semen örnekleri kullanıldı. Hastaların demografik özellikleri (sigara, alkol, vitamin tüketimi, yakın zamanda alınan hormonal veya kemoterapötik tedavi ve varikosel) devre dışı bırakıldı. Çalışmaya sperm volümü 1,5 ml'den fazla olan, sayısı 15 milyonun üzerinde, hareketliliğin %40'tan fazla ve Morfoloji>%4 olan normozoospermialı semen örnekleri dahil edildi.

Bu çalışma, doktora bitirme tezi kapsamında gerçekleştirildi. Çalışmaya başlamadan önce Dicle Üniversitesi Tıp Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan 187 sayılı ve 14.06.2023 tarihli etik kurul onayı alındı. Tüm hastalar, hasta veri gizliliği ve veri paylaşımı hakkında bilgilendirildi ve hastalardan semen temini için onam formu onayı alındı. Semen örnekleri, hastalardan 3-4 günlük ideal cinsel perhiz sonrası mastürbasyon yöntemi ile elde edildi. Mastürbasyonla elde edilen ejakülat steril ve geniş ağızlı bir kaptan toplanarak semenin likefaksiyonu için oda sıcaklığında 30 dakika bekletildi. Örneklerin makroskobik

değerlendirmeleri (renk, likefaksiyon, viskozite, hacim, ph) yapıldıktan sonra kriyoprezervasyon işlemi ve vitalite değerlendirmesi için Dansite Gradient Yöntemi (yoğunluk farkıyla ayırma) uygulanarak spermeler hazır hale getirildi. Bunun için 45/90 Dansite Gradient Medyum (Vitrolife) olmak üzere iki tabakalı yoğunluk gradient solüsyonları kullanıldı. 15 ml'lik falkon deney tüplerine pipetle aşağıdan yukarıya doğru 1'er ml sırasıyla %90 ve %45'lik gradient solüsyonları olacak şekilde konuldu. En üste likefiye olmuş ejakulattan pipet yardımıyla 2 ml alınıp sarsmadan konuldu. Gradient tabakaları 20 dk 300–400 g'de santrifüjlendi. En alt tabakada 1 ml fraksiyon kalacak şekilde üst sıvı transfer pipeti kullanılarak aspire edildi. Alt tabakada kalan 1 ml sperm fraksiyonu üzerine 5 ml yıkama solüsyonu eklenip pipetaj yapılarak yıkandı ve 200g'de 5 dk santrifüjlendi. Santrifüj sonrasında üst sıvı atılarak sperm örneği çalışmaya hazır hale getirildi.

Sperm Vitrifikasyonu ve Çözme Prosedürü

Vitrifikasyon (dondurma) işlemi için; 20 normozoospermialı hastadan alınan semen örneği gradient yöntemi ile yıkanıp, 1/1 oranda kriyoprotektan solüsyon (Sperm Freeze Solution, Vitrolife) ile muamele edilerek kriyotüplerde oda sıcaklığında 5 dk bekletildi, ardından sıvı azot buharı üzerinde 20 dk tutuldu. Dondurulmuş olan numuneler -196°C'lik sıvı azot tanklarında, çözme sonrası inceleme aşamasına kadar saklandı. Dondurulmuş spermelerin çözülmesi sırasında azot tanklarından çıkarılan kriyotüpler 37°C'lik sıcak su banyosunda 10 dk hafif hareketlerle çalkalandı. Santrifüj tüpüne alınan numunelerden kriyoprotektanın uzaklaştırılması için ise 2 ml sperm yıkama medyumunu eklenerek 300g de 5 dk süreyle santrifüjlendikten sonra üstte kalan kısım aspire edildi.

Eozin-Nigrosin Uygulaması ile Vitalite Değerlendirmesi

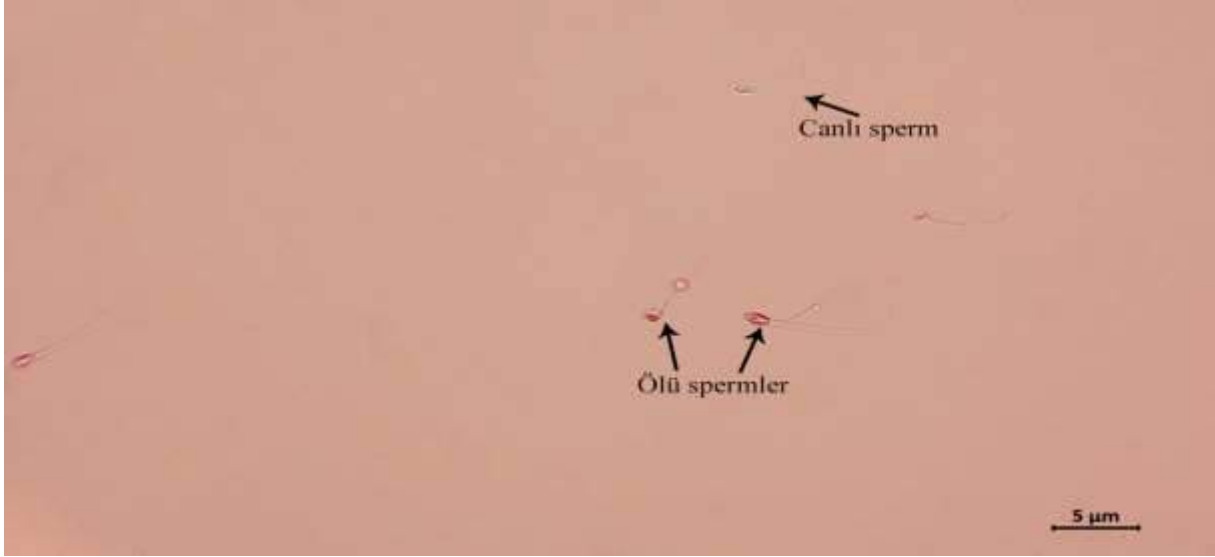
Vitalite değerlendirmesi için Eozin Y ile birlikte, kontrastı arttırıp sperm başlarının daha belirgin hale gelmelerini sağlayan Nigrosin kullanıldı (Vital Screen Kit, GBL). Bu yöntem ile hazırlanan preparatlar, yeniden değerlendirebilmek ve kontrol amacıyla uzun süre saklanabilmektedir. Semen örneği steril bir pipet yardımıyla hafifçe karıştırılıp homojen hale gelmesi sağlandı. Bir tüp içerisinde, 1 damla (1µl) semen 2 damla (2µl) Eozin-Y ile karıştırıldı. 30 saniye sonra 3 damla Nigrosin eklenip hafifçe karıştırıldı. Karışımdan 1 damla alınarak lam üzerinde yayma yapıldı ve havada kurumaya bırakıldı. Kuruduktan hemen sonra ışık mikroskobu altında x40 büyütmede incelendi. Bu yöntem ile ölü hücreler kırmızıya boyanırken, canlı hücrelerin boyanmadığı görüldü. 100 sperm sayılarak vitalite değerlendirme yapıldı.

İstatiksel Analiz

Değişkenlere ilişkin tanımlayıcı istatistikler verildi. İki değişken incelendi. İstatistik yöntemi olarak bağımsız iki grubu karşılaştıran Student's t testi kullanıldı. Verilerin normallik kontrolü Kolmogorov Smirnov Testi ile test edildi. Veriler normal dağıldığı için, Students 't testi kullanıldı. Anlamlılık düzeyi olarak p=0,05 sınır kabul edildi. Veriler %95 güvenle analiz edildi.

ARAŞTIRMA BULGULARI VE TARTIŞMA

Eozin-Nigrosin yöntemi ile boyanan spermler vitalite açısından değerlendirildi, canlı ve ölü sperm x100 immersiyon objektifi ışık mikroskopunda görüntülendi, ölü hücreler kırmızıya boyanırken, canlı hücrelerin boyanmadığı görüldü (Resim 1).



Resim 1. Normozoospermik olgularda, Eozin-Nigrosin ile boyanan preparatlarda vitalite gösterimi. (x100 immersiyon objektifi ışık mikroskopu görüntüsü)

Örnekler vitalite açısından değerlendirilip istatistiksel analiz sonuçları karşılaştırıldığında; sadece gradient işlemi uygulanan normozoospermik semen örneklerinde %84,56±7,15 oranında vitalite gözlenirken, bu oran dondurup çözme sonrası %32,16±6,80'e kadar düşmektedir. Sadece gradient işlemi uygulanmış kontrol grubu ile gradient sonrası kriyoprezervasyon işlemi uygulanmış grup karşılaştırıldığında, plazma membran bütünlüğünde istatistiksel olarak anlamlı ($p<0,05$) bir azalma görülmüştür. Bu sonuçlar, kriyoprezervasyon işleminin sperm hücrelerinin yapısal ve fonksiyonel bütünlüğü üzerindeki olumsuz etkilerini açıkça ortaya koymaktadır.

Sperm hücreleri, dondurma ve çözme prosedürleri sırasında çeşitli stres faktörlerine maruz kalmaktadır. Isı değişimleri, buz kristali oluşumu, ozmotik şok, reaktif oksijen türleri (ROT) oluşumu ve kriyoprotektan toksisitesi gibi etkiler, sperm hücrelerinde kriyohasara yol açabilmektedir. Bu süreçlerde sperm hücre membranlarının yüksek oranda çoklu doymamış yağ asidi içermesi, onları bu tür etkilere karşı daha hassas hale getirmektedir. Membran yapılarında meydana gelen hasarlar, sperm hücrelerinin mitokondrilerinde azalmaya ve fonksiyonel kayıplara neden olabilmektedir. Mitokondrilerin, enerji metabolizması ve hücre canlılığı için hayati öneme sahip organeller olmaları sebebiyle, kriyohasara uğramaları durumunda sperm hücrelerinin canlılık ve hareketlilik oranı, dolayısıyla fertilizasyon kapasitesi olumsuz etkilenmektedir (Keel vd., 1987; Hammadeh vd., 1999).

Öte yandan kriyoprezervasyon işlemi, hücre membranındaki fosfolipid yapının yanısıra karbonhidrat içeriğini de etkileyerek çeşitli biyokimyasal değişimlere neden olmaktadır. Olgun spermatozoon membranı, epididimden geçerken glikolize edilmiş lipid ve proteinden oluşan bir tabaka olan glikokaliks ile kaplanır. Glikokaliks, yaklaşık 300 farklı glikoprotein ve glikolipidten oluşur ve spermatozoonun dış çevre ile etkileşimde bulunduğu yüzeyini oluşturur. Bu tabaka, spermiyogenez, kapasitasyon ve akrozom reaksiyonu gibi önemli fizyolojik olaylar sırasında yeniden düzenlenir. Glikokaliksin spermatozoonun korunmasında, oositi tanıma ve kaynaşma süreçlerinde kritik bir rol oynadığı bilinmektedir. Bu nedenle, glikokaliksin bütünlüğü, başarılı bir fertilizasyon için hayati öneme sahiptir (Cross ve Overstreet, 1987; Schroter vd., 1999; Purohit vd., 2008).

Yapılan birçok sperm kriyoprezervasyon çalışmasında, kullanılan farklı kriyoprotektan maddeler ve geliştirilen çeşitli kriyoprezervasyon yöntemlerine rağmen, çözme sonrasında sperm hareketliliğinde %30-75 oranında bir azalma bildirilmiştir (Esteves vd., 2000; Nijs vd., 2009). Biz de çalışmamızda kriyoprezervasyonun; fertilizasyon başarısında kritik öneme sahip parametrelerden motiliteyi de etkileyen vitalite oranının olumsuz etkilendiğini ve sağkalım oranlarının ciddi düşüş gösterdiğini gözlemledik.

Günümüzde de gelişimini sürdüren yardımcı üreme teknikleri ile erkek infertilitesi konusunda önemli başarılar elde edilmiştir. Testiküler biyopsi sonrası veya çok az sayıda sperm hücresi elde edilen vakalarda, sperm hücrelerinin dondurularak saklanması infertilite tedavilerinde başarı oranını artırmaktadır. Ancak kriyoprezervasyon sonrasında ortaya çıkan sperm parametrelerindeki bu bozulma, fertilizasyon başarısında azalmaya sebep olabilmektedir.

SONUÇ

Vitalite değerlendirmesi yaptığımızda kriyoprezervasyon işleminin sperm hücre membran bütünlüğünü ve sperm canlılığını olumsuz bir şekilde etkilediği gözlemlenmiştir.

Bu bulgular ışığında kriyoprezervasyon prosedürlerinin, spermatozoonun yüzey yapılarının ve dolayısıyla sperm hücre fonksiyonlarının korunmasına yönelik olarak optimize edilmesi gerekmektedir.

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PREDICTIVE MODELING OF LD₅₀ VALUES FOR NITRO-AROMATIC COMPOUNDS WITH MULTIPLE LINEAR REGRESSION

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ABSTRACT

This research aimed to accurately predict the acute oral median lethal dose (LD₅₀) values of nitro-aromatic compounds (NACs) in rats. This was achieved by analyzing the contribution of various descriptors using a multiple linear regression (MLR) model based on the quantitative structure-toxicity relationship (QSTR) approach. The dataset used in this study comprised 180 NACs, each paired with corresponding LD₅₀ values. For the modeling phase, an MLR approach was adopted to construct a mathematical model for estimating LD₅₀ values based on 18 selected descriptor values. The low mean squared error indicates that the MLR model performed extremely well in accurately predicting LD₅₀ values. This low error suggests that the model's predictions closely match the actual LD₅₀ values, demonstrating high precision and reliability in the estimation process. The MLR model provides a framework for estimating LD₅₀ values based on critical molecular descriptors. Our model can enhance the safety usage of NACs, widely used in the pharmaceutical/chemical industry and recognized as structural alerts for predictive toxicology. This approach saves time and costs, while also being ethically acceptable as it reduces reliance on animal testing. This method optimizes the usage of NACs, guides conventional advanced toxicity tests, and reduces late-stage failures in chemical development.

Keywords: Computational Toxicology, Acute Toxicity, Nitro-Aromatic Drugs, Multiple Linear Regression, Mathematical Model.

INTRODUCTION

Nitro-aromatic compounds (NACs) are widely used in the chemical industry for synthesizing various substances, such as pharmaceuticals, cosmetics, insecticides, explosives, and paints. These chemical structures, mainly from anthropogenic activities, are classified as widespread pollutants due to their potential risks to human safety and environmental health (Liu et al. 2024). Considering their adverse reactions, including tumorigenic, carcinogenic, genotoxic,

and reproductive-toxic properties (Cyganowski et al. 2023), evaluating the toxicological effects of NACs is crucial for comprehensive risk assessment (Hao et al. 2022).

In recent years, *in silico* studies examining quantitative structure-toxicity relationships (QSTR) of compounds have become quite popular. Specifically, mathematical-based models designed to calculate the median lethal dose (LD₅₀) value, a criterion for acute toxicity, have garnered attention in computational toxicology. This value signifies the quantity that results in mortality in 50% of the tested animal population. Utilized in toxicological risk assessments, the LD₅₀ value assists in prioritizing substances, enabling standardized safety evaluations (Karaduman and Kelleci Çelik, 2024). Due to limited experimental resources, evidence on acute oral toxicity for the majority of NACs in mammals is insufficient, prompting the development of reliable *in silico* approaches to evaluate this endpoint. However, limited studies have focused on calculating the acute oral LD₅₀ value of NACs without using animal models in the literature (Kuz'min et al. 2008; Gooch et al. 2017). They demonstrated moderate predictive capability and the restricted scale of the available datasets constrained the chemical spectrum within QSTR models, thus limiting accurate predictions of NAC toxicity. In this context, models with more comprehensive datasets and high predictive power are required.

In this study, we constructed a multiple linear regression (MLR) based QSTR model encompassing 180 NAC derivatives. We aimed to predict the acute oral LD₅₀ values of NACs in rats with high predictive accuracy. We explored which combinations of descriptors, besides nitro-aromatic structures, could be associated with suspected toxic effects in these compounds. This methodology facilitates the identification of correlations between the physicochemical properties of NACs and their acute oral toxicity endpoint, enabling quick and effective analysis and mechanistic interpretation of complex data. By focusing on the critical molecular descriptors identified by our model, safer NACs can be developed. Our study focused on limiting experimental animals' use by determining the LD₅₀ value of NACs, particularly in the early stages. Computational models such as ours constitute only a part of the risk assessment of chemicals. The final LD₅₀ value should be determined through animal trials in the final stage, ensuring a comprehensive evaluation and validation of pharmaceutical/chemical safety. Our study can be used to select an appropriate initial dose for advanced *in vivo* research. The findings of this study contribute to developing the safety profile of compounds with structural alert or toxicophores, such as NACs.

MATERIALS AND METHOD

In this study, we used a mathematical approach to estimate acute oral LD₅₀ values for a set of NACs. Unlike traditional methods based on machine learning techniques or interpolating molecular descriptors, our approach aimed to predict a range of LD₅₀ values using MLR models (Rangel-Peña, et al. 2023; Karaduman and Kelleci Celik, 2024). The model incorporated chemical descriptors of NACs to establish a relationship with their acute oral toxic effect.

Materials

We collected a dataset comprising 180 NACs, each accompanied by the available acute oral LD₅₀ values obtained from the PubChem database. To characterize the compound's chemical structure and physical attributes, two-dimensional structural data files (2D SDF) were obtained from PubChem (Kim, et al. 2021). Chemical descriptors were then calculated using the open-source program PaDEL (Yap, 2011).

To ensure the dataset's quality, cleansing and preprocessing steps were performed. The dataset was then subjected to the "ReplaceMissingValues" tool, an unsupervised attribute filter in the WEKA 3.9.5 software, to impute missing descriptive values (Frank et al. 2016). Additionally, any duplicated data entries were systematically removed to maintain data integrity.

Methods

Multiple linear regression (MLR) model

We used an MLR approach to create a mathematical model for estimating LD₅₀ values based on descriptor values. MLR is a statistical method that models the relationship between multiple independent variables and a dependent variable (Jobson, 1991). In this case, we had 18 descriptor values for each of the 30 data points, along with the corresponding LD₅₀ values. The independent variables are the various molecular descriptors MW, AMR, apol, WTPT-1, nAtom, bpol, ETA_Beta, nHeavyAtom, ALogP2, topoDiameter, ETA_Alpha, AMW, AlogP, nRing, nHeteroRing, IC0, topoShape, ETA_Epsilon_1. These are respectively the values of X_1 through X_{18} , and the dependent variable is the LD₅₀ values.

Let X_1, X_2, \dots, X_{18} be the descriptor values, and Y be the LD₅₀ values for each of the 30 data. The general form of a MLR model can be expressed as,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{18} X_{18} + \epsilon, \quad [\text{Eq.2}]$$

where $\beta_0, \beta_1, \dots, \beta_{18}$ are the coefficients to be estimated and ϵ is the error term.

Suppose we are given LD₅₀ values Y_i and descriptor values $X_{i,1}, X_{i,2}, \dots, X_{i,18}$ for each i -th data. Since we used 30 data points to determine the best-fit line, aiming to get as close as possible to all the data points, we obtained the following system of equations.

$$\begin{aligned} Y_1 &= \beta_0 + \beta_1 X_{1,1} + \beta_2 X_{1,2} + \dots + \beta_{18} X_{1,18} \\ Y_2 &= \beta_0 + \beta_1 X_{2,1} + \beta_2 X_{2,2} + \dots + \beta_{18} X_{2,18} \\ &\vdots \\ Y_{30} &= \beta_0 + \beta_1 X_{30,1} + \beta_2 X_{30,2} + \dots + \beta_{18} X_{30,18}. \end{aligned} \quad [\text{Eq.3}]$$

We can write the above system of 30 equations in the single unknown vector $\beta \in \mathbb{R}^{19}$ and the coefficient matrix $X \in \mathbb{R}^{30 \times 19}$.

$$X\beta = \begin{bmatrix} 1 & X_{1,1} & X_{1,2} & \dots & X_{1,18} \\ 1 & X_{2,1} & X_{2,2} & \dots & X_{2,18} \\ 1 & X_{3,1} & X_{3,2} & \dots & X_{3,18} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & X_{28,1} & X_{28,2} & \dots & X_{28,18} \\ 1 & X_{29,1} & X_{29,2} & \dots & X_{29,18} \\ 1 & X_{30,1} & X_{30,2} & \dots & X_{30,18} \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_{18} \end{bmatrix} = \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \vdots \\ Y_{28} \\ Y_{29} \\ Y_{30} \end{bmatrix} = Y. \quad [\text{Eq.4}]$$

The system of Eq. 4 is overdetermined and it has a solution if the following theorem holds.

Theorem 1: Let $X \in \mathbb{R}^{m \times n}$ with $m > n$. The least squares solution of the overdetermined system. $X\beta = Y$ is a solution of the normal equations

$$X^T X \beta = X^T Y, \quad [\text{Eq.5}]$$

where $\beta \in \mathbb{R}^n$ and $Y \in \mathbb{R}^m$. If X has rank n , then $X^T X$ is nonsingular and the unique solution of Eq.5 is given by

$$\beta = (X^T X)^{-1} X^T Y. \quad [\text{Eq.6}]$$

Proof 1: (Cullen, 1993).

Notation: $\mathbb{R}^{m \times n}$ is the set of all $m \times n$ real matrices, $\mathbb{R}^m = \mathbb{R}^{m \times 1}$, and $\mathbb{R} = \mathbb{R}^1$. The superscript “ T ” takes the transpose of a matrix or vector. The rank of a matrix defines the number of independent column vectors within a matrix.

Error term

The coefficients were estimated by minimizing the sum of squared differences between the observed LD₅₀ values Y , and the values predicted by the model. Mathematically, this involves finding the values of $\beta_0, \beta_1, \dots, \beta_{18}$ that minimize the sum of squared errors (SSE),

$$SSE = \sum_{i=1}^{180} (Y_i - (\beta_0 + \beta_1 X_{i,1} + \beta_2 X_{i,2} + \dots + \beta_{18} X_{i,18}))^2. \quad [\text{Eq.7}]$$

The linear regression cost function is determined by the mean squared error (MSE). Essentially, MSE quantifies the average squared disparity between the actual and predicted values of observations. The outcome signifies the cost or score associated with the current set of weights, usually represented as a single numerical value. MSE can be calculated using the following formula.

$$MSE = \frac{1}{k} SSE, \quad [\text{Eq.8}]$$

where k is the total number of data points.

Solving the coefficients

The solution to the linear regression problem involves finding the values of β that minimize the SSE. First, we substituted the descriptive values $X_{i,j}$ which represent the descriptors of the 30 data points we used in modeling, and their corresponding LD_{50} values Y_i to obtain the general form of a MLR model. Subsequently, we derived the following matrix equations.

$$X\beta = \begin{bmatrix} 1 & 275.0558 & 8.5954 & \cdots & 20.5 \\ 1 & 291.0330 & 9.0947 & \cdots & 20.5 \\ 1 & 277.0173 & 9.5523 & \cdots & 20.0 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & 274.9706 & 11.7485 & \cdots & 18.25 \\ 1 & 630.9385 & 12.3713 & \cdots & 52.75 \\ 1 & 275.0542 & 9.48462 & \cdots & 27.75 \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_{18} \end{bmatrix} = \begin{bmatrix} 1.8 \\ 2 \\ 2.85 \\ \vdots \\ 7470 \\ 9120 \\ 15610 \end{bmatrix} = Y, \quad [\text{Eq.9}]$$

where X is the coefficient matrix with dimensions 30×19 , β is the coefficient vector with dimensions 19×1 , and Y is the response vector with dimensions 30×1 . To solve for β , we employed the least squares method, which seeks to minimize the sum of the squares of the residuals (RSS). Since the coefficient matrix in Eq.9 has full column rank (i.e. $\text{Rank}(X) = 19$), the solution for β was obtained using Theorem 1,

$$\beta = \begin{bmatrix} 2.573 \\ 3.39 \\ \vdots \\ 3.0274 \end{bmatrix}. \quad [\text{Eq.10}]$$

Once β is determined, it represents the coefficients that minimize the difference between the predicted values $X\beta$ and the actual values Y .

Prediction for new data

The statistical significance of the coefficients and overall model fit was assessed. The aim was to develop a model that efficiently predicts a range of LD_{50} values for NACs based on their chemical descriptors. Once we plugged in the β value in Eq.2 we obtained the general form of a MLR model to predict the LD_{50} for new data,

$$\begin{aligned} \text{Predicted } LD_{50} \cong & 2.573 + 3.39 * X_{new,1} - 3.5142 * X_{new,2} + 7.3881 \\ & * X_{new,3} - 1.8573 * X_{new,4} + 6.3151 * X_{new,5} + 1.0095 \\ & * X_{new,6} - 1.8939 * X_{new,7} + 9.74 * X_{new,8} + 1.3596 \\ & * X_{new,9} + 7.7391 * X_{new,10} - 4.67 * X_{new,11} + 2.2597 \\ & * X_{new,12} + 3.7061 * X_{new,13} - 2.31 * X_{new,14} + 3.2819 \\ & * X_{new,15} + 7.2571 * X_{new,16} + 4.0738 * X_{new,17} + 3.0274 \\ & * X_{new,18} + \epsilon, \end{aligned} \quad [\text{Eq.11}]$$

where $X_{new,1}, X_{new,2}, \dots, X_{new,18}$ are the descriptor values of a new data and ϵ is the error term.

RESULTS AND DISCUSSION

Results

The selected descriptors of the best model

The present mathematical model for predicting the acute oral LD₅₀ value of NACs comprised the descriptors of the classes Weight, AlogP, APol, Weighted Path, Atom Count, BPol, Extended Topochemical Atom, Topological, Ring Count, and Information Content (Table 1).

Table 1. The molecular descriptors of the high-performance model

Descriptor	Description	Descriptor Class	*std
MW	Molecular weight	Weight	90.342
AMR	Molar refractivity	AlogP	21.554
apol	Sum of the atomic polarizabilities (including implicit hydrogens)	APol	11.998
WTPT-1	Molecular ID	Weighted Path	11.842
nAtom	Number of atoms	Atom Count	10.516
bpol	Sum of the absolute value of the difference between atomic polarizabilities of all bonded atoms in the molecule (including implicit hydrogens)	BPol	9.04
ETA_Beta	A measure of electronic features of the molecule	Extended Topochemical Atom	6.744
nHeavyAtom	Number of heavy atoms (i.e. not hydrogen)	Atom Count	5.863
ALogP2	Square of AlogP	AlogP	3.8
topoDiameter	Topological diameter (maximum atom eccentricity)	Topological	2.812
ETA_Alpha	Sum of alpha values of all non-hydrogen vertices of a molecule	Extended Topochemical Atom	2.745
AMW	Average molecular weight (Molecular weight / Total number of atoms)	Weight	2.309
AlogP	Ghose-Crippen LogKow	AlogP	1.137
nRing	Number of rings	Ring Count	0.646
nHeteroRing	Number of rings containing heteroatoms (N, O, P, S, or halogens)		0.433
IC0	Information content index (neighborhood symmetry of 0-order)	Information Content	0.195
topoShape	Petitjean topological shape index	Topological	0.164
ETA_Epsilon_1	A measure of electronegative atom count	Extended Topochemical Atom	0.098

*std: standard deviation

Numerical results

We used a mathematical approach to estimate acute oral LD₅₀ values for a set of NACs. This model allows for the prediction of LD₅₀ values for new NACs based on their molecular descriptors. According to the model the calculated and experimented LD₅₀ values were reported in Figure 1.

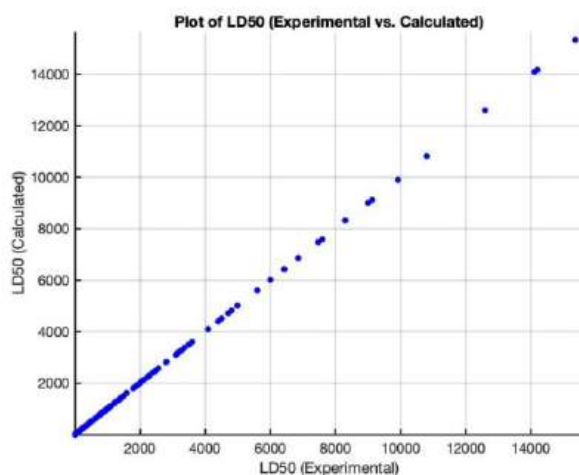


Figure 1. Experimental vs. Calculated LD₅₀ values

MSE was utilized as a measure of the model's performance, providing insights into the accuracy of the predictions. We calculated the error values using our model while estimating the LD₅₀ values for each of the 180 data points. Considering 180 data points, we determined the MSE using.

$$\begin{aligned}
 MSE &= \frac{1}{180} 5624.64 \\
 &= 31.248.
 \end{aligned}
 \tag{Eq.1}$$

Since the target variable has a wide range, an MSE of 31.248 can be considered exceptionally low. A low MSE value suggests that the MLR model performed exceptionally well in accurately predicting LD₅₀ values for the given 180 data points. The small error implies that the model's predictions closely align with the actual LD₅₀ values, indicating high precision and reliability in the estimation process. The robust performance of the model with such a low error level enhances its credibility and underscores its effectiveness in capturing the underlying relationship between the molecular descriptors and toxicity levels.

In conclusion, the MLR model provides a framework for estimating LD₅₀ values based on a set of molecular descriptors. The significance of the coefficients and overall model fit was assessed, and the developed model can be applied to predict LD₅₀ values for new NAC derivatives based on their specific chemical descriptors.

Discussion

Analyzing selected descriptors

The attribute selection procedure is a critical step in machine learning modeling since it includes determining the significant chemical descriptors to achieve optimal performance. In this model, we tested several combinations of attributes and created our most robust model by selecting eighteen descriptors with the highest predictive power (Table 1). For LD₅₀ approximation, we focused on the descriptors relevant to the acute oral toxicity endpoint of

the NACs. Considering these descriptors is crucial when designing pharmaceuticals/chemicals of NACs structure, as they can influence toxicological response.

The advantages and disadvantages of the model

In traditional acute toxicity research, different dosages of a novel molecule are administered to laboratory animals before determining the LD₅₀ value of the chemical. Due to the limited information about the adverse effects of the newly synthesized chemical at this stage, a wide dose range can be used. During this procedure, laboratory animals are employed for each dose until an optimal dosage is identified (OECD, 2002). Today, the Organisation for Economic Co-operation and Development (OECD) has published guidelines to reduce the application of traditional *in vivo* trials in toxicity tests (OECD, 2014). Embracing the views of health authorities on reducing animal experiments, we suggest applying mathematical trials before moving on to animal experiments to determine the acute oral LD₅₀ value of NACs. Thus, the use of animal models can be significantly decreased while determining the safety profile of NACs.

One significant advantage of using MLR techniques to predict NACs' LD₅₀ values is the ability to perform calculations with high accuracy. This allows for a precise evaluation of NACs' acute toxicity potential, facilitating early-stage chemical synthesis or later-stage regulatory chemical approval processes. Our computational model simplifies the modeling process, reduces the need for costly and extensive *in vivo* experiments, conserves resources, and accelerates chemical assessment processes. A mathematical-based approach can minimize ethical concerns regarding research on animals and promote more humane study methods.

In our model, the rat oral LD₅₀ values of NACs were utilized, thus, valuable insights can be provided regarding the acute oral toxicity profile of NACs in different mammalian species, including domestic mammals, wild mammals, and humans. In this context, our research aims to support the development of eco-friendly NACs, aiming to reduce the ecological impact of these compounds.

The acute toxic effects of a chemical have complicated mechanisms affecting from a variety of biokinetic, cellular, and molecular processes. Compressing the complex physiological events associated with toxic response into just one metric may lead to the erosion of useful information. Furthermore, toxicological testing varies significantly due to changes in experimental methodologies, laboratories, animal species, and breeds. Consequently, these challenges complicate the modeling process (Lapenna et al. 2010). This situation can be encountered not only in computational modeling research but also *in vivo* trials where LD₅₀ values are conventionally determined. This issue can be addressed through the integration of non-animal prediction models and various animal models, as well as the inclusion of various exposure scenarios.

CONCLUSION

In conclusion, the LD₅₀ value, which represents the dose at which death occurs in 50% of the animal population, is crucial for evaluating acute toxicity in the chemical development process. The LD₅₀ test evaluates the chemical's acute toxic effect on living organisms and the ecosystem, ensuring safe usage. Due to ethical considerations, conventional animal models in toxicological research are being replaced by mathematically based alternatives. Our model predicts LD₅₀ values for NACs in rats, serving as the basis for toxicological categorization and use for regulatory regimes. This implies the synthesis of new chemicals more cost-effectively, timely, and safely. Validated and reliable *in silico* methods can be used as the initial phase in the process of calculating the LD₅₀ value of NACs and serve as a useful tool in preliminary toxicity assessment. By focusing on the critical molecular descriptors identified by our model, secure NACs can be developed. This study provides a reliable method for predicting LD₅₀ values of NACs in rats. The presented mathematical model provides advantages in decreasing NAC risks, preserving the ecological system, and establishing chemical risk management strategies.

Data Availability Statement

The data that support the findings of this study are available from the authors upon reasonable request.

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RELATIONSHIP BETWEEN BLOOD UREA NITROGEN (BUN) ALBUMIN RATIO WITH ACUTE KIDNEY INJURY AND MORTALITY IN PATIENTS WITH CIRRHOSIS

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ABSTRACT

Liver cirrhosis remains a major health problem, causing morbidity and mortality. Elevated blood urea nitrogen (BUN) to serum albumin (BAR) ratio has been identified as a risk factor associated with mortality in pneumonia, sepsis, COVID-19 disease. In this study, we aimed to investigate whether this clinical index can predict clinical outcomes such as acute kidney injury and mortality in cirrhotic patients. In this retrospective study, patients over the age of 18 years who were admitted to the internal medicine intensive care unit and/or gastroenterology clinic of Necmettin Erbakan University with a diagnosis of liver cirrhosis were included. The study included 246 cirrhotic patients. When the etiologies of cirrhosis of the patients included in the study were analyzed, HBV, cryptogenic and HCV-associated cirrhosis were the most common etiologies. The most common reasons for hospitalization were refractory ascites, hepatic encephalopathy and GI bleeding, respectively. Acute kidney injury (AKI) developed in 75 of these patients. 56.5% of the patients were male and the mean age was 61.8 ± 13.2 years. The median BUN/albumin ratio was significantly higher in patients with acute kidney injury (15.2) compared to patients without AKI (5.45)($p < 0.001$). Similarly, the median BUN/albumin ratio of patients who ended in mortality (16.3) was significantly higher than that of living patients (6.2) ($p < 0.001$). Spearman correlation analysis showed that BUN/albumin ratio correlated with Child score ($r:0.498$, $p < 0.001$) and MELD score ($r:0.484$, $p < 0.001$). Factors associated with mortality were determined by univariate analysis. Bilirubin, INR, albumin, sodium, encephalopathy, ascites and BUN/albumin ratio were included in the analysis. In multivariate logistic regression analysis, BUN/albumin ratio (OR 1.069; 95% CI 1.020-1.121; $P = 0.006$), bilirubin (OR 1.097; 95% CI 1.028-1.172; $P = 0.005$), encephalopathy (OR 8.640; 95% CI 3.261-22.888; $P < 0.001$) and ascites (OR 10.794; 95% CI 1.362-85.555; $P < 0.024$) were independent predictors of mortality.

Keywords: Cirrhosis, Acute kidney injury, BUN/albumin ratio, Mortality.

GİRİŞ

Sirozlu hastalar, hastane içi morbidite ve mortalitede belirgin artışla ilişkili bir komplikasyon olan akut böbrek hasarı (ABH) geliştirmeye eğilimlidir. Akut dekompanseasyon nedeniyle hastaneye yatırılan sirotik hastalarda ABH insidansı %20-50 arasında değişir. Hastaneye yatırılan sirotik hastaların hem yatarak hem de taburcu olduktan sonra yüksek bir mortalite oranı vardır. Sirozun kendisi, önemli hacim kaymaları ve artmış vazodilatasyon nedeniyle önemli morbiditeye neden olan karmaşık bir hastalık sürecidir (Gupta et al. 2021).

BUN albümin oranı (BAO) son zamanlarda ortaya atılmış, BUN değerinin albümine bölünmesi ile elde edilen yeni bir belirteçtir. Çeşitli hastalıklarda mortalite ile ilişkisi bildirilmiştir. Kardiyak cerrahi geçiren hastalarda (Ye et al. 2022), akut gastrointestinal kanaması olan hastalarda (Bae et al. 2021) ve ST elevasyonlu miyokard enfarktüsü geçiren hastalarda mortaliteyi predikte ettiği bildirilmiştir (Balcik et al. 2023).

Albümin, karaciğerin sentez fonksiyonunu yansıtır ve hipoalbumineminin sirozlu hastalarda kötü prognozla ilişkili olduğu bilinmektedir (Cai et al. 2021). BUN hastaların volüm durumunu yansıtır.

BAO'nun sirotik hastalarda prognostik performansını değerlendiren çok az çalışma vardır (Shen J, Shan Z (2023)). Biz de bu çalışmada, bu klinik indeksin sirotik hastaların akut böbrek hasarı ve mortalite gibi klinik sonuçlarını tahmin edip edemeyeceğini araştırmayı amaçladık.

MATERYAL VE METOD

Necmettin Erbakan Üniversitesi Tıp Fakültesinde yapılan bu retrospektif çalışmaya, karaciğer sirozu tanısı ile gastroenteroloji kliniği veya iç hastalıkları yoğun bakım ünitesine yatırılan erişkin hastalar alındı. Çalışma dışında tutulma kriterleri ise hastanın kabulde bakılan kreatinin değerlerinin ≥ 4 mg/dl olması, eksik verilerinin olması ve yatış süresinin 2 günden az olması olarak belirlendi.

Çalışmaya alınan hastaların yaş, cinsiyet, yatış süreleri, yatış nedenleri, siroz etyolojileri, komorbid hastalıkları, hemodiyaliz ve mekanik ventilatör ihtiyacı, mortalite durumu, yatış esnasında bakılan hemogram, glukoz, üre, kreatinin, sodyum, potasyum, alanin aminotransferaz, aspartat aminotransferaz, total ve direkt bilirubin, albumin ve INR değerleri hastane veri tabanından kaydedildi. BAO değeri (mg/g), BUN düzeyinin (mg/l) albümin düzeyine (g/l) bölünmesiyle elde edildi. Hastalar, hastane içi mortalite olup olmamasına göre sağ kalan veya sağ kalmayan grubuna atandı.

Hastaların MELD (Model For End-Stage Liver Disease) ve Child Pugh skorları hesaplandı. Child skoru hesaplanırken serum total bilirubin, albumin, INR değerleri ile asit, hepatik ensefalopati durumu dikkate alındı. MELD skoru ise hastaların INR, total bilirubin ve kreatinin değerleri ile hesaplandı.

Hastaların tüm yatış süresince kreatinin değerleri kaydedilerek, KDIGO (Kidney Disease Improving Global Outcomes) kriterlerine göre akut böbrek hasarı tanı ve evrelemesi yapıldı.

Kaydedilen verilerin istatistiksel analizi SPSS 22.0 paket programı (SPSS Inc., Chicago, IL) kullanılarak yapıldı. Verilerin normallik analizleri histogram ve Kolmogorov-Smirnov testi kullanılarak yapıldı. İstatistiksel sürekli değişkenler ortalama±standart sapma, normal dağılmayan sürekli değişkenler ortanca (minimum-maksimum) ve kategorik veriler de yüzde olarak gösterildi. Grupların karşılaştırıldığı analizlerde kategorik değişkenler için ki-kare, sürekli değişkenler için t-testi ve normal dağılmayan verilerde Mann Whitney U-testi yapıldı.

Mortalite gelişimi için bağımsız etkili faktörleri göstermek için Backward Multivariate Regresyon analizi yapıldı. p değeri 0.05'in altı anlamlı olarak kabul edildi..

BULGULAR VE TARTIŞMA

Bu çalışmaya 246 hasta dahil edildi. Hastaların % 43,9'u kadındı ve ortalama yaş 61,7±13,3'di. ABH gelişen ve gelişmeyen hastalara bakıldığında yaş, cinsiyet ve siroz etyolojisi açısından anlamlı fark yoktu. Yatış etyolojisi açısından bakıldığında ABH gelişen hastalarda hepatik ensefalopati ve refrakter asit ile yatış oranlarının fazla olduğu görüldü (Tablo 1).

ABH gelişen hastalarda Child Pugh skoru ve MELD skoru anlamlı olarak yüksekti. ABH gelişmeyen hastalarla kıyaslandığında ABH gelişen hastalarda sodyum ve albümin değerleri anlamlı olarak düşükken INR, bilirübin, WBC, trombosit ve AST değerleri anlamlı olarak yüksek bulundu. Median BAO ise ABH gelişenlerde (15,2) ABH gelişmeyenlere (5,45) göre anlamlı olarak yüksekti (p<0,001) (Tablo 2).

Mortalite ile sonuçlanan hastaların median BAO (16,3) yaşayanlara (6,2)göre anlamlı olarak yüksek bulundu (p<0,001). Ayrıca mortal seyreden hastaların Child pugh skoru, MELD skoru, BUN, kreatinin, INR, bilirübin, WBC, AST değerleri yaşayan hastalara göre anlamlı olarak yüksek, sodyum ve albümin değerleri ise anlamlı olarak düşüktü (Tablo 3).

Spearman korelasyon analizinde BUN/albumin oranının Child skoru (r:0,498, p<0,001) ve MELD skoru (r:0,484, p<0,001) ile korele olduğu görüldü.

Univariate analiz yapılarak mortalite ile ilişkili faktörler belirlendi. Anlamlı bulunan bilirübin, INR, albumin, sodyum, ensefalopati varlığı, asit varlığı ve BUN/albumin oranı analize dahil edildi. Yapılan multivariate lojistik regresyon analizinde BUN/albumin oranı (OR 1.069; 95% CI 1.020-1.121; P= 0.006) bilirübin (OR 1.097; 95% CI 1.028-1.172; P= 0.005), ensefalopati (OR 8.640; 95% CI 3.261-22.888; P < 0.001) ve asit varlığı (OR 10.794; 95% CI 1.362-85.555; P < 0.024) mortalitenin bağımsız prediktörleri idi (Tablo 4).

Sonuç olarak, bu çalışmadaki BAO düzeyleri mortalite ile seyreden grupta hayatta kalan gruptan anlamlı olarak daha yüksekti. Ayrıca sirotik hasta grubunda BAO Child ve MELD skoru ile korele ve mortalite için bağımsız prediktör idi.

Zhang ve arkadaşları hepatit B virüsüyle ilişkili dekompanse sirozu olan 161 hastayı dahil ettikleri çalışmalarında BAO'nun 30 günlük mortalite ile ilişkisini araştırmışlardır. Mortal seyreden hastalarda BAO 2.95 ve yaşayan hastalarda 1.71 olarak bulunmuş ve aradaki farkın istatistiksel olarak anlamlı olduğu bildirilmiştir (p<0.001). BAO değerlerinin bizim

çalışmamızdaki değerlerle farklı olmasının nedeni bu çalışmada BUN değerini mmol/L birimiyle kullanmaları bizim ise mg/dL olarak kullanmamıza bağlı olduğunu düşündük. Bu çalışmada dekompanse sirozlu hastalarda 30 günlük mortaliteyi predikte etmede BAO kesme değeri 2.32 ve AUC değeri 0.752 olarak bulunmuştur. (Zhang et al. 2022).

Tablo 1: Hastaların demografik, klinik özellikleri ve bunların akut böbrek hasarı ile ilişkisi

	ABH (+)	ABH (-)	P değeri
N	75	171	
Yaş (yıl) ort±SD	61,5±12,5	61,9±13,5	0,857
Cinsiyet, n(%)			
Kadın	30 (40)	77 (45)	0,464
Erkek	45 (60)	94 (55)	
Siroz etyolojisi, n (%)			
HBV	29 (38,7)	47 (27,5)	0,104
HCV	16 (21,3)	34 (19,9)	
Alkol	1 (1,3)	7 (4,1)	
Otoimmün	1 (1,3)	10 (5,8)	
Kriptojenik	19 (25,3)	53 (31)	
Diğer	9 (12)	20 (11,7)	
Yatış nedeni, n (%)			
Hepatik ensefalopati	21 (28)	35 (20,5)	0.048
Refrakter asit	22 (29,3)	42 (24,6)	
GİS kanaması	9 (12)	38 (22,2)	
SBP	5 (6,7)	10 (5,8)	
SBP dışı enfeksiyon	7 (9,3)	5 (2,9)	
Diğer	11 (14,7)	41 (24)	

Shen ve arkadaşlarının HBV ile ilişkili dekompanse sirozda BAO'nun öngörücü rolünü araştırdıkları çalışmalarında BAO seviyeleri sağ kalanlar ve sağ kalmayanlar arasında belirgin şekilde farklı bulunmuştur. Ayrıca BAO multivariate analizle mortalitenin bağımsız prognostik göstergesi olduğu bildirilmiştir. Çalışmamızın bulguları bu iki çalışma ile uyumludur.

Çalışmamızın bazı kısıtlılıkları vardır. Çalışmamıza tek merkezden hastalar retrospektif olarak taranarak alındı. Hastaların yatış BAO değerleri değerlendirmeye alındı. Yatış süresi boyunca bu değerlerde değişiklikleri olabilir, bunu değerlendirmedik. Albumin değerlerinin beslenme ve enfeksiyon durumundan da etkilendiği bilinmektedir. Yatış öncesi albümin değerlerini ve beslenme durumunu değerlendiremedik.

Tablo 2: Hastaların laboratuvar, klinik özellikleri ve bunların akut böbrek hasarı ile ilişkisi

	ABH (+) n:75	ABH (-) n:171	P değeri
Hastaneye kabulde			
Child Pugh Skor	10,7±2,2	8,3±2,2	<0,001
MELD	22,3±6,7	13,6±3,2	<0,001
Hemoglobin (g/l)	10,6±2,2	10,5±2,01	0,834
Serum kreatinin (mg/dl)	1,6±1,2	0,9±0,3	<0,001
Sodyum (mEq/L)	132,8±5,4	136,5±2,8	<0,001
BUN (mg/dL)	40,2 (20,8-130,8)	16,8 (3,3-33,2)	<0,001
Albumin (g/dl)	2,6±0,54	2,9±0,52	<0,001
INR	1,84±0,68	1,51±0,35	<0,001
T. bilirübin (mg/dl)	6,4±4,8	2,3±2,1	<0,001
WBC (IU/mm ³)	9,2±5,4	5,8±2,9	<0,001
PLT (10 ³ /mm ³)	132,2±85	111,5±61,2	0,032
AST (U/L)	70 (10-940)	53 (14-781)	0,034
ALT (U/L)	34 (5-1743)	30 (6-545)	0,310
BUN albümin ratio	15.2 (2,04-61,6)	5.45 (1,2-28,6)	<0,001
MV gereksinimi, n(%)	15 (20)	1 (0,6)	<0,001
YB kalış süresi (gün)	5,1±7,7	1,5±2,20	<0,001
Hospitalizasyon süresi (gün)	12,2±8,1	10,2±5,2	<0,001
Hastane mortalitesi, n(%)	37 (49,3)	5 (2,9)	<0,001

Tablo 3: Hastaların laboratuvar, klinik özellikleri ve bunların hastane mortalitesi ile ilişkisi

	Ölen	Yaşayan	P değeri
n, (%)	42 (17)	204 (83)	
Yaş (yıl), ortalama±SD	61,4±12,3	61,9±13,2	0,959
Cinsiyet, n(%)			
Kadın	14 (33,3)	93 (45,6)	0,145
Erkek	28 (66,7)	111 (54,4)	
Hastaneye kabulde			
Child Pugh Skor	12,0±2,2	8,5±2,2	<0,001
MELD	24,1±7,4	14,6±5,4	<0,001
Hemoglobin (g/l)	10,5±2,5	10,7±1,9	0,819
Kreatinin (mg/dl)	1,76±1,3	1,0±0,5	<0,001
Sodyum (mEq/L)	132,0±5,3	135,8±4,3	<0,001
BUN (mg/dL)	107±45	50,1±34	<0,001
Albumin (g/dl)	2,5±0,4	2,9±0,5	<0,001
INR	2,0±0,7	1,5±0,4	<0,001
T. bilirubin (mg/dl)	8,0±5,6	2,6±3,2	<0,001
WBC (IU/mm ³)	10,4±6,0	6,1±3,3	<0,001
PLT (10 ³ /mm ³)	117,1±63	117,9±71	0,943
AST (U/L)	82,5 (24-918)	53 (10-940)	0,001
ALT (U/L)	40 (10-1743)	29,5 (5-545)	0,055
BUN albümin ratio	16,3 (2-61,6)	6,2 (1,2-34,4)	<0,001
MV gereksinimi, n(%)	16 (38,1)	0	<0,001
YB kalış süresi (gün)	8,4±8,4	1,4±3,1	<0,001
Hospitalizasyon süresi (gün)	9,5±6,3	12±5,8	<0,001

Tablo 4 Karaciğer sirozu olan hastalarda mortalite gelişimini predikte eden faktörler için multivariate regresyon analizi

Değişken	OR	Güven aralığı	p
Bilirubin	1.097	1.028-1.172	0.005
Ensefalopati varlığı	8.640	3.261-22.888	<0.001
Asit varlığı	10.794	1.362-85.555	0.024
BAR	1.069	1.020-1.121	0.006

SONUÇ

BAO sirotik hastalarda ucuz, kolay ulaşılabilir ve pratik bir belirteçtir. Bu hasta grubunda mortalitenin bağımsız bir belirteçidir. Prognozla ilgili skorlama sistemlerine entegre edilebilir. Bunun için prospektif kontrollü çalışmalara ihtiyaç vardır.

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ŞEV ÜZERİNDE YER ALAN KOMŞU YÜZEYSEL TEMELLERİN DAVRANIŞI THE BEHAVIOR OF ADJACENT SHALLOW FOUNDATIONS LOCATED ON SLOPES

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ÖZET

Büyük şehirlerde yüksek kapasitede istihdam sağlamak amacı ile mevcut sınırlı iskan alanlarında yatay mimariden ziyade dikey mimariye yönelmeye başlanılmış veya bitişik nizam inşa süreci uygulanarak alan kazanımı mantığı arttırılmıştır. Yakın mesafede inşa edilen bu binalar özellikle eğimli yüzeyler üzerinde yer almakta iseler temel elemanları yatayda etkileşimde bulunan temel elemanlarından daha farklı bir mekanizma ile deformasyon gösterebilirler ve taşıma güçleri yapının özelliklerine bağlı olarak farklılıklar içerebilmektedir. Bu çalışmada, uyulama açısından sıklıkla karşımıza çıkan söz konusu problemin detaylı bir şekilde analiz edilmesi için iki boyutlu ve sonlu elemanlar yöntemi ile çalışan Plaxis 2D.2023 programından faydalanılmıştır. Çalışma kapsamında saf kum temel zeminlerinden oluşan şevler değerlendirilmiş, kumun göreceli sıklık değerinden faydalanılarak rijitlik ve kayma mukavemeti parametreleri elde edilmiştir. Toplamda yirmi farklı temel zemini kullanarak yapılan birincil analizlerde göçmeden belirli bir güvenlik seviyesinde stabilitesini koruyabilecek olan şev kesitleri belirlenmiş ve olası en kritik göçme mekanizmaları belirlenmiştir. Çalışmanın ardışık aşamalarında ise şev üzerinde yer alan iki komşu yüzeysel temeden oluşan vakalar irdelenmiştir. Bu vakaların analiz edilmesi yolu ile şev üzerine farklı şekillerde nihai taşıma kapasitesi oranında yüklenerek şevi sınır göçme durumuna getiren limit durumlar incelenmiştir. Şevin başlangıçta belirli bir güvenlik seviyesinde sergilediği davranıştan çoğul temeller inşası ile deformasyon ve güvenlik durumunun gelişimi takip edilmiş ve aynı zamanda farklı inşa koşulları söz konusu olması durumunda olası kritik göçme düzlemlerinin takibi yapılabilmektedir. Parametrik analizlerde temel zemini olan kumun geoteknik özelliklerinin değişiminin yanı sıra, temel boyutlarının, şevin yüksekliğinin, şev-temel etkileşim mesafesindeki farklılaşmanın ve temeller arasındaki mesafenin değişmesinin belirli vakalarda deformasyon durumu değişimine ve güvenlik sayısı ile mobilize olan kayma düzlemlerine etkisine odaklanılmıştır. Çalışmanın sonuçları, kum şevlerin üzerine inşa edilecek çoklu temellerin deformasyon ve kayma mekanizmaları gözetilerek etkileşim mesafesinin

belirlenmesinde, stabilite durumunu etkileyen koşulların değişiminin algılanmasında ve olası göçme mekanizmalarının tahmininde yol göstericidir.

Anahtar kelimeler: Şev, Yüzeysel temel, Kum, Güvenlik.

ABSTRACT

In order to provide high-capacity employment in large cities, the existing limited housing areas have started to be oriented towards vertical architecture rather than horizontal architecture, or the logic of space gain has been increased by applying the adjacent order construction process. If these buildings are constructed in close proximity, especially if they are located on sloping surfaces, their foundation elements may deform with a different mechanism than the foundation elements interacting horizontally, and their bearing strength may vary depending on the characteristics of the structure. In this study, Plaxis 2D.2023 program, which works with two-dimensional and finite element method, was used to analyze this problem in detail. Within the scope of the study, slopes consisting of pure sand foundation soils were evaluated and stiffness and shear strength parameters were obtained by utilizing the relative stiffness value of the sand. In the primary analyses using a total of twenty different foundation soils, the slope sections that can maintain their stability at a certain safety level without collapse were identified and the most critical possible collapse mechanisms were determined. In the successive stages of the study, cases consisting of two neighboring superficial foundations on the slope were examined. By analyzing these cases, the limit states that bring the slope to the limit collapse state by loading the slope at its ultimate bearing capacity in different ways were investigated. From the initial behavior of the slope at a certain level of safety, the deformation and the evolution of the safety state with the construction of multiple foundations were followed, and at the same time, the possible critical failure planes could be monitored in case of different construction conditions. The parametric analyses focused on the effect of the variation of the geotechnical properties of the foundation soil, sand, as well as the effect of the variation of the foundation dimensions, slope height, slope-foundation interaction distance and the distance between the foundations on the change of the deformation state and the number of safety and mobilized shear planes in specific cases. The results of the study are instructive in determining the interaction distance of multiple foundations to be built on sand slopes considering deformation and slip mechanisms, perceiving the change of conditions affecting the stability state and predicting possible collapse mechanisms.

Keywords: Slope, Shallow foundation, Sand, Safety.

GİRİŞ

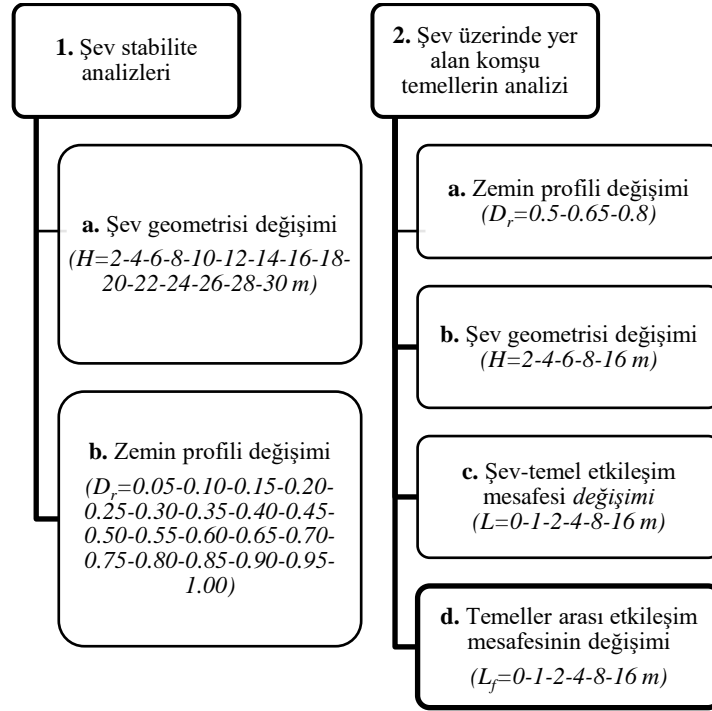
Şev, düz bir zemine kıyasla yükseklik farkı olan eğimli yüzeylere verilen isimdir. Şev, arazinin doğal eğimi nedeniyle doğal olarak veya inşaat veya mühendislik çalışmaları sonucunda yapay bir şekilde de oluşabilir. Şev stabilite analizi, eğimli yüzeylerin stabilitesini değerlendirmek ve

potansiyel tehlikeleri belirlemek için yürütülen mühendislik çalışmalarını içerir. Bu analizlerde şev stabilite sorunlarına karşı direnci değerlendirir. Şev stabilite analizleri tipik olarak; zemin özelliklerinin belirlenmesi, geometri ve şev parametrelerinin ölçülmesi, yüklerin belirlenmesi, stabilite analiz yöntemlerinin uygulanması ve güvenlik faktörünün hesaplanması adımlarını içerir. Ancak, otoyollar, köprüler ve yeraltı yapılarında olduğu gibi, bazı turistik nedenlerin yanı sıra arazi engelleri nedeniyle şevlerin üzerine veya yakınına inşaat yapmak kaçınılmazdır. Bu nedenle, şev üzerine inşa edilen bir temel, temelin taşıma kapasitesinde bir azalmaya neden olur ve şevin stabilitesini tehdit eder. Bu durumda iki göçme durumu söz konusudur; bunlardan ilki kayma yüzeyi şevlerle kesişmediğinde taşıma kapasitesi göçmesidir ve yatay zemin yüzeyi için taşıma kapasitesi teorileri bu tür göçme durumlarına uygulanabilir. İkinci göçme şekli ise kritik kayma yüzeyinin kretin ötesine uzandığı ve dolayısıyla şevin bir kısmını içerdiği şev göçme şeklidir. İlaveten, analizlerde yapı-zemin etkileşimini göz önünde bulundurmamak ve davranışı etkileyebilecek tüm parametreleri değerlendirmek gerekir. Literatür çalışmaları kapsamında bu konular sınırlı bir şekilde ele alınmış olup (Leshchinsky, 2015; Yang ve diğ., 2019; Qarmout ve diğ., 2020), davranışı potansiyel olarak etkileyebilecek tüm parametreleri tek bir kaynaktan değerlendirip konsolide ederek yol gösterici olabilecek araştırmalara ihtiyaç duyulmaktadır. Bu bağlamda, bu bildirinin kapsamı, bitişik düzende inşa edilen sınırlı sayıda temelin stabilite davranışı üzerindeki etkilerini araştırmaktır. Literatürde bu konuda yol gösterici çalışmalar da mevcut olup (Raj ve diğ., 2018; Acharyya ve Day, 2017; Xiao ve diğ., 2020; Acharyya ve Day, 2020; Haghgouei ve diğ., 2021; Xiao ve Chen, 2022) bu çalışma kapsamında önerilen farklılık, şev analizlerinde ele alınan çözümleme stratejisi ve değişken sayı ve niteliğinin farklılaştırılmasıdır.

Bu amaçla, bu bildiri kapsamında öncelikle şevlerin belirli yüksekliklerde stabilitesini korumak için uygulanması gereken geometrik kriterler parametrik analizlerle belirlenmiştir. Sayısal analizler sonlu elemanlar yöntemi ile çalışan ticari bir yazılım kullanılarak (Plaxis 2D, 2023) gerçekleştirilmiştir. Çalışmanın ikinci aşaması, şev üzerine inşa edilecek temellerin farklı yükleme, temel ve zemin özellikleri kullanılarak stabil koşullar altında analiz edilmesidir. Üçüncü aşamada, şev üzerindeki komşu temellerin etkileşim mekanizmaları ve şev ile etkileşim mekanizmaları değişken parametreler kullanılarak incelenmiştir.

YÖNTEM

Bu çalışma kapsamında, şev stabilite analizlerinden başlayarak şev üzerindeki komşu sığ temellerin modellenmesi için parametrik çalışmalar yapılmıştır. Bu modelleme çalışmalarının amacı, şev üzerinde yer alan yapıların göçme ve deformasyon davranışlarındaki farklılıkları incelemek ve bu davranışların komşu (bitişik) binalar üzerindeki etkilerini araştırmaktır. Bu amaçla, geoteknik mühendislik yapılarının tasarımında ticari olarak tercih edilen bir yazılım olan “Plaxis 2D Ultimate (Version 2023)” yazılımı kullanılarak sonlu elemanlar yöntemine dayalı bir altyapı ile parametrik analizler gerçekleştirilmiştir (Badawi, 2023). Parametrik analizlerde iki aşamalı bir süreç izlenmiştir. Aşağıda, bu adımların her biri açıklanmış ve sürecin ayrıntıları Şekil 1'de gösterilmiştir.



Şekil 1. Analiz prosesi

İki adımdan oluşan tüm analiz süreci boyunca temel zemini olarak saf kumlu zeminler seçilmiş ve kumlu zeminlerin özellikleri Brinkgreve ve diğ.(2010) tarafından yapılan çalışma kullanılarak göreceli sıkılıklarına (D_r) göre hesaplanmıştır. Brinkgreve ve diğ.(2010) Sertleşen Zemin modeli için zemin modeli parametrelerinin, özellikle de küçük şekil değiştirme rijitliği (HSsmall) ile ilgili parametrelerin seçiminde geoteknik mühendislerini desteklemek için ampirik formüller geliştirmiştir. Bu formüller karakteristik bir özelliğe (kumlar için göreceli sıkılık ve killer için plastisite indeksi) dayalı olarak türetilmiştir. Ampirik formüllerin temel amacı, geniş bir kum yelpazesini kapsayan sonlu eleman modeli hesaplamalarında zemin davranışının makul bir birinci dereceden yaklaşımını sağlamaktır. Yazarlar, önerilen ilişkilerin, seçilen bir vaka çalışmasında gerçek bir proje için deformasyonların ve gerilme gelişiminin ilk tahminini elde etmede makul derecede iyi çalıştığını göstermiştir. Bu nedenle, bu çalışma kapsamında malzeme modeli parametreleri Brinkgreve ve diğ. (2010) tarafından kumlu zeminler için önerilen ilişkiler kullanılarak elde edilmiştir. Bu çalışma kapsamında kullanılacak parametreler 0 ile 100 arasında 5'erlik artışlarla değişen göreceli sıkılık değerleri için incelenmiş ve ilgili tüm parametreler hesaplanmıştır. Brinkgreve ve diğ. (2010) tarafından önerilen ampirik denklemler ile göreceli sıkılık değerlerine bağlı olarak elde edilen analiz parametreleri Tablo 1'de sunulmuştur.

Tablo 1. Göreceli sıklık değerlerine ve ampirik denklemlere dayanan parametreler

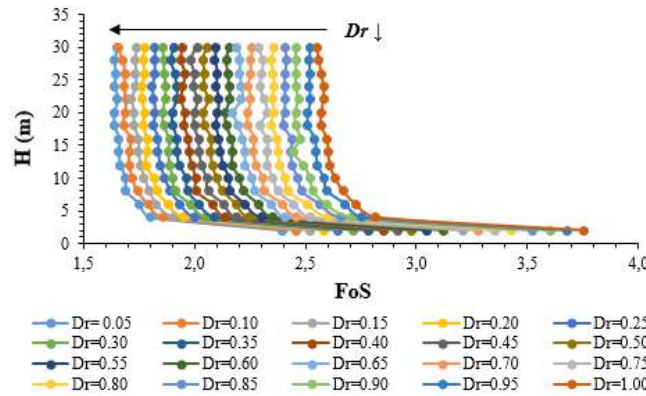
Density definition	D_r	γ_{unsat}	γ_{sat}	$E_{50\text{ref}}$	m	$\gamma_{0.7}$	ϕ'	R_f	v_{ur}	$k_x=k_y$
Unit	%	kN/m^3	kN/m^3	kN/m^2	-	-	$^\circ$	-	-	m/sec
Very loose	0	15.0	19.0	0	0.70	0.00020	28.0	1.00	0.2	0.000001
	5	15.2	19.1	3000	0.68	0.00020	28.6	0.99	0.2	0.000001
	10	15.4	19.2	6000	0.67	0.00019	29.3	0.99	0.2	0.000001
Loose	15	15.6	19.2	9000	0.65	0.00019	29.9	0.98	0.2	0.000001
	20	15.8	19.3	12000	0.64	0.00018	30.5	0.98	0.2	0.000001
	25	16.0	19.4	15000	0.62	0.00018	31.1	0.97	0.2	0.000001
	30	16.2	19.5	18000	0.61	0.00017	31.8	0.96	0.2	0.000001
Medium	35	16.4	19.6	21000	0.59	0.00017	32.4	0.96	0.2	0.000001
	40	16.6	19.6	24000	0.58	0.00016	33.0	0.95	0.2	0.000001
	45	16.8	19.7	27000	0.56	0.00016	33.6	0.94	0.2	0.000001
	50	17.0	19.8	30000	0.54	0.00015	34.3	0.94	0.2	0.000001
	55	17.2	19.9	33000	0.53	0.00015	34.9	0.93	0.2	0.000001
	60	17.4	20.0	36000	0.51	0.00014	35.5	0.93	0.2	0.000001
Dense	65	17.6	20.0	39000	0.50	0.00014	36.1	0.92	0.2	0.000001
	70	17.8	20.1	42000	0.48	0.00013	36.8	0.91	0.2	0.000001
	75	18.0	20.2	45000	0.47	0.00013	37.4	0.91	0.2	0.000001
Very dense	85	18.4	20.4	51000	0.43	0.00012	38.6	0.89	0.2	0.000001
	90	18.6	20.4	54000	0.42	0.00011	39.3	0.89	0.2	0.000001
	95	18.8	20.5	57000	0.40	0.00011	39.9	0.88	0.2	0.000001
	100	19.0	20.6	60000	0.39	0.00010	40.5	0.88	0.2	0.000001

Şev stabilite analizleri ön analizlerdir ve şev üzerindeki temeller de dahil olmak üzere tüm sistemi kontrol etmek için bir araç görevi görür. Bu nedenle, bu ön analizlerde, analiz için elastik-mükemmel plastik malzeme modeli seçilmiştir. Yapılan tüm ilk aşama şev stabilite analizlerinde, şev geometrisi şev yüksekliğine göre değiştirilirken, şev eğimi sabit tutulmuştur. Tüm analizlerde kullanılan şev eğim oranı $dikey/yatay = 1/2$ 'dir. Ayrıca çalışmanın ilk aşamasında farklı şev yüksekliklerine sahip durumlar da modellenmiştir. Bu aşamanın amacı, şevlerin belirli bir güvenlik seviyesinde stabilitelelerini koruyabildiklerini göstermektir. Analizlerde şev yüksekliği H parametresi ile gösterilmiş, sayısal değerlerin sırayla 2-4-6-8-10-12-14-16-18-20-22-24-26-28-30 metre olduğu varsayılmıştır. Şev stabilite koşullarını değerlendirmek için düzlem şekil değiştirme koşulları ve 15 düğümlü elemanlarla sonlu eleman analizi tercih edilmiştir. Sistemin sınırları, gerilme ve şekil değiştirme dağılımlarının ve/veya yayılımının kısıtlanmasına izin verecek şekilde her analiz için yeterince geniş seçilmiştir. Şevler “structures” menüsünde modellenmiş ve Mohr Coulomb malzeme modelinde farklı parametreler ile toplam 20 farklı zemin profili için analizler tekrarlanmıştır. Analizlerde ince mesh tercih edilmiştir. Çalışma kapsamında oluşturulan modellerin hiçbiri yeraltı suyu içermemektedir ve analizler statik koşullar altında gerçekleştirilmiştir. Şev stabilitesinin değerlendirildiği bu analizlerde üç aşama kullanılmıştır. Stabilite koşullarını incelemek için ilk aşama yerçekimi yükleme koşulları kullanılmıştır. İkinci aşama, plastik yükleme etkileri altında şev davranışının gözlemlenmesini içerir ve üçüncü aşama güvenlik aşaması olarak kabul edilir. Çalışmanın ikinci adımında, komşu temeller konusu incelenerek şev üzerinde yer alan bitişik temellerin analizi gerçekleştirilmiştir. Bu analiz, komşu temel sistemleri arasındaki etkileşimi ve potansiyel etkiyi araştırmayı amaçlamıştır. Birden fazla zemin profili göz önünde bulundurularak tüm analizler üç farklı zemin profili için tekrarlanmıştır. Bu analizlerde, temel zemininin göreceli sıklık değerlerinin sırasıyla %50, %65 ve %80 olduğu varsayılmıştır. Her iki temelin boyutu 1 metredir. Temelin birim ağırlığı 12,5 kN/m/m olarak hesaplanmış ve Poisson oranının 0,15 olduğu varsayılmıştır. Şev yüksekliği 2, 4, 6, 8 ve 16 metre olarak seçilmiştir. Ayrıca, temellerin şeve göre konumları da değerlendirilen parametreler olarak dikkate alınmıştır. Şev tepesine yakın ilk temelin mesafesi 0, 1, 2, 4, 8 ve 16 metre olarak kabul edilmiştir. Bitişik temellerin analizini özel kılan şey, iki temel arasında tanımlanmış bir mesafenin dikkate alınmasıdır. İki temel arasındaki mesafenin (L_f) 0, 1, 2, 4, 8 ve 16 metre olduğu durumlarda analizler tekrarlanmış ve sonuçlar buna göre değerlendirilmiştir. İnşaat aşamalarının modellenmesi için başlangıç aşaması K_0 prosedürüne göre modellenmiştir. Bu durumda, ortamda herhangi bir eğim olmadığı ve ortamın yatay katmanlı bir durumda olduğu varsayılmaktadır. Ancak ikinci aşamada deplasmanlar sifira ayarlanarak şev kazısı yapıldığı varsayılır ve bu nedenle kazı alanı olarak tanımlanan bölge devre dışı bırakılır. Sonraki aşamalarda, temel sisteminin nihai yük taşıma kapasitesinden daha fazla yüklendiği durum modellenmektedir. Bu şekilde temelin maksimum yük taşıma kapasitesi belirlenir ve taşıyabileceği maksimum yük ile yüklenir. Amaç, şev ve temel çiftinden oluşan ortamı bir limit denge durumuna getirmek ve böylece limit güvenlik koşulundaki mekanizmaları kontrol etmektir. Bu nedenle şev kazısı ve temel yükünün yüklenmesi gibi her aşamanın sonuna ek

güvenlik analizleri eklenerek hem güvenlik faktörleri hem de artımsal yer değiştirmeler menüsünden elde edilen mekanizmalar incelenmiştir.

ARAŞTIRMA BULGULARI VE TARTIŞMA

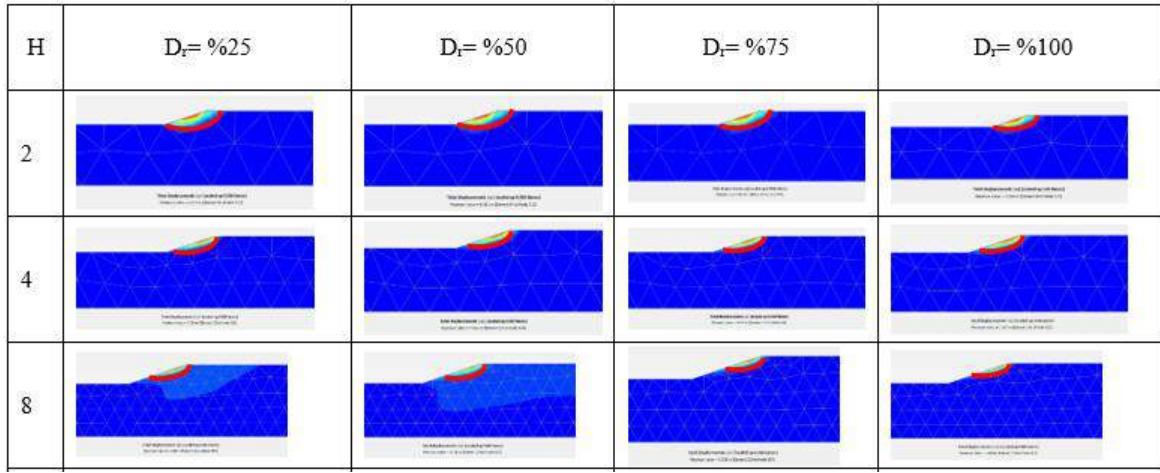
Çalışmanın ilk aşamasında, sabit eğimli bir şev için farklı yüksekliklerde ayarlanan geometrilerin stabilite analizleri yerçekimi yüklemesi seçeneği kullanılarak yapılmıştır. Analizlerden elde edilen güvenlik faktörleri ve en kritik kayma düzlemlerinin değerlendirilmesi dikkate alınmıştır. Analizlerden elde edilen güvenlik faktörü değerleri (FoS veya FSslope) farklı göreceli sıklık koşullarına göre değerlendirilmiş ve güvenlik faktörünün şev yüksekliğine göre değişimi Şekil 2'de gösterilmiştir. Şekil, artan göreceli sıklık değerleriyle birlikte beklendiği gibi şev yüksekliği arttıkça güvenlik faktörünün de arttığını göstermektedir. Güvenlik faktöründeki artış oranı, göreceli sıklıktaki artış oranına orantılı olarak karşılık gelmektedir. Şekildeki önemli bir gözlem, şev yüksekliği 2 metreden 4 metreye çıktığında güvenlik faktöründeki önemli değişimdir. Dikkat çeken bir diğer gözlem ise şev yüksekliği 8 metreyi aştığında güvenlik faktöründe önemli bir değişiklik olmamasıdır.



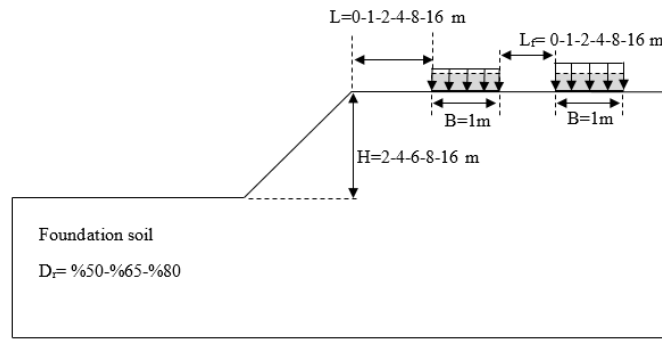
Şekil 2. Farklı göreceli sıklık koşullarına ve şev yüksekliğinin değişimine bağlı olarak güvenlik faktörü

Ayrıca, her bir farklı göreceli sıklık değeri ve şev yüksekliği için olası kritik göçme mekanizmaları elde edilmiştir. Şekil 3, seçilen referans göreceli sıklık ve şev yüksekliği değerleri için elde edilen kritik göçme mekanizmaları örneklerini göstermektedir. Elde edilen mekanizmalar program çıktısında aynı ölçekte sunulmuş ve mekanizmanın sınırları netlik açısından kalın kırmızı bir çizgi ile vurgulanmıştır. Şev yüksekliği düşük olduğunda, kritik yer değiştirme davranışı tüm şevi tarayacak şekilde gerçekleşir. Şev yüksekliği arttıkça kritik göçme düzlemi şevin üst noktasına doğru kayar. Ortaya çıkan deformasyonun yoğunluğu değerlendirildiğinde, etkinleşen mekanizmaların şev yüksekliği ile orantılı olarak sığlaştığı gözlemlenebilir. Göreceli sıklıktaki artış, her durumda, kırılma yüzeyinin daralmasına yol açmış ve yükseklik arttıkça yoğunluk ile ters bir ilişki göstermiştir. Yapılan bu analizler ile çalışmanın ilk aşamasında geometri açısından belirli bir güvenlik seviyesine sahip şevler elde edilmiştir. Çalışmanın sonraki aşamalarında bu şevler, üzerlerine inşa edilen sığ temeller dahil

edilerek yeniden modellenmiş ve güvenlik seviyesi kontrolleri buna göre güncellenmiştir. Çalışmanın ikinci adım analizlerinde kullanılan profil Şekil 4'te sunulmuştur.

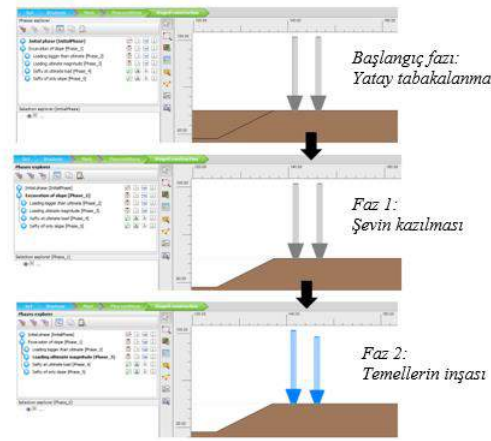


Şekil 3. Seçilen referans göreceli sıkılık ve şev yüksekliği değerleri için elde edilen kritik göçme mekanizmaları.



Şekil 4. Modellenen bitişik temellerin şev üzerindeki durumları.

Analizler bir önceki bölümde tanımlanan şekilde kurgulanmıştır ancak, temeller arasındaki mesafe değişiminin etkisini araştırmak için ek analizler de yapılmıştır. Şev üzerinde iki temel olması durumunda, temel yüklemeleri, yükleme değerlerinin şev güvenliğini kritik bir duruma getirecek şekilde ayarlandığı bir ara aşama ile analiz edilmiştir. Daha sonra, bu değerler analizin yükleme aşamasında uygulanmıştır. Şekil 5'te analiz uygulama aşamalarını temsil edecek ardışık faz görüntüleri sunulmuştur. Sağlanan bilgilere dayanarak parametrik analizler gerçekleştirilmiş ve bunun sonucunda odaklanmış analiz çıktıları, güvenlik faktörleri ve kritik göçme düzlemleri belirlenmiştir.



Şekil 5. Çoklu temellerin analizinde kullanılan aşamalar.

Sonuçlar $D_r=50\%$ için Tablo 2’de, $D_r=65\%$ için Tablo 3’de ve $D_r=80\%$ için Tablo 4’de sunulmuştur. İlgili tablolarda spesifik şev-temel yaklaşım mesafeleri ($L= 0, 4, 16$ m) için derlenen sonuçlar verilmiştir. Tablolarda F1 şev zirvesine yakın olan temeli F2 ise F1’e bitişik temeli nitelendirmektedir.

Tablo 2. $D_r=50\%$ için şev üzerinde bulunan bitişik temellerin analiz sonuçları

Dr = 50%															
Constants	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
$L=0$ m	FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)	
		F1	F2		F1	F2		F1	F2		F1	F2		F1	F2
Lf = 0 m	1.5	142	119	1.4	143	111	1.4	124	100	1.4	119	100	1.3	115	98
Lf = 1 m	1.5	65	61	1.4	63	58	1.4	63	56	1.4	61	56	1.3	60	55
Lf = 2 m	1.5	62	59	1.4	62	55	1.4	63	54	1.4	60	53	1.3	59	51
Lf = 4 m	1.5	58	53	1.4	60	52	1.4	61	53	1.4	58	51	1.3	57	49
Lf = 8 m	1.5	56	51	1.4	56	51	1.4	59	50	1.4	56	50	1.3	56	47
Lf = 16 m	1.5	52	48	1.4	56	48	1.4	57	47	1.4	55	50	1.3	54	46

Constants	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
$L=4$ m	FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)	
		F1	F2		F1	F2		F1	F2		F1	F2		F1	F2
Lf = 0 m	1.5	374	341	1.4	362	334	1.4	354	325	1.4	348	317	1.3	336	305
Lf = 1 m	1.5	313	331	1.4	338	320	1.4	329	312	1.4	314	282	1.3	312	275
Lf = 2 m	1.5	307	316	1.4	331	309	1.4	324	303	1.4	312	275	1.3	298	264
Lf = 4 m	1.5	292	282	1.4	326	299	1.4	322	297	1.4	309	272	1.3	284	255
Lf = 8 m	1.5	281	269	1.4	322	293	1.4	319	288	1.4	298	264	1.3	277	243
Lf = 16 m	1.5	275	256	1.4	320	288	1.4	314	283	1.4	284	253	1.3	273	237

<i>Constants</i>	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
<i>L=16 m</i>	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	
Lf= 0 m	1.5	526	449	1.4	493	421	1.4	470	404	1.4	443	381	1.3	429	367
Lf= 1 m	1.5	317	227	1.4	353	268	1.4	368	281	1.4	346	253	1.3	322	236
Lf= 2 m	1.5	314	221	1.4	339	245	1.4	342	251	1.4	325	239	1.3	312	217
Lf= 4 m	1.5	296	203	1.4	318	219	1.4	300	240	1.4	317	224	1.3	304	200
Lf= 8 m	1.5	292	197	1.4	302	211	1.4	296	217	1.4	306	216	1.3	289	184
Lf= 16 m	1.5	280	174	1.4	294	207	1.4	293	202	1.4	295	186	1.4	283	175

Tablo 3. $D_r=65\%$ için şev üzerinde bulunan bitişik temellerin analiz sonuçları

Dr = 65%															
<i>Constants</i>	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
<i>L=0 m</i>	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	
Lf= 0 m	1.7	157	129	1.5	177	151	1.5	161	124	1.5	156	118	1.4	139	116
Lf= 1 m	1.7	98	91	1.5	100	89	1.5	99	83	1.5	96	85	1.4	93	88
Lf= 2 m	1.7	84	77	1.5	94	82	1.5	91	69	1.5	89	75	1.4	89	75
Lf= 4 m	1.7	93	83	1.5	98	86	1.5	101	68	1.5	94	73	1.4	91	81
Lf= 8 m	1.7	95	80	1.5	87	74	1.5	95	64	1.5	92	71	1.4	87	79
Lf= 16 m	1.7	95	74	1.5	109	85	1.5	93	90	1.5	93	95	1.4	89	91

<i>Constants</i>	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
<i>L=4 m</i>	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	
Lf= 0 m	1.7	421	389	1.5	412	371	1.5	407	362	1.5	399	358	1.4	386	341
Lf= 1 m	1.7	397	395	1.5	408	379	1.5	404	370	1.5	388	362	1.4	384	350
Lf= 2 m	1.7	329	373	1.5	399	393	1.5	398	379	1.5	382	369	1.4	373	362
Lf= 4 m	1.7	290	352	1.5	376	410	1.5	384	407	1.5	375	379	1.4	360	381
Lf= 8 m	1.7	269	331	1.5	362	434	1.5	379	435	1.5	361	386	1.4	344	398
Lf= 16 m	1.7	257	329	1.5	349	468	1.5	346	435	1.5	347	402	1.4	326	433

<i>Constants</i>	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
<i>L=16 m</i>	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)	FSslope		quilt (kPa)
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	
Lf= 0 m	1.7	713	617	1.5	634	582	1.5	599	546	1.5	551	519	1.4	521	457
Lf= 1 m	1.7	441	209	1.5	431	198	1.5	427	347	1.5	423	340	1.4	418	376
Lf= 2 m	1.7	437	200	1.5	422	181	1.5	419	333	1.5	415	329	1.4	403	362
Lf= 4 m	1.7	391	184	1.5	416	175	1.5	407	325	1.5	401	320	1.4	374	341
Lf= 8 m	1.7	369	171	1.5	400	163	1.5	395	319	1.5	388	309	1.4	336	322
Lf= 16 m	1.7	369	150	1.5	381	159	1.5	391	316	1.5	372	300	1.4	314	300

Tablo 4. $D_r = 80\%$ için şev üzerinde bulunan bitişik temellerin analiz sonuçları

Dr = 80%															
Constants	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
L=0 m	FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)	
		F1	F2		F1	F2		F1	F2		F1	F2		F1	F2
Lf=0 m	1.7	214	148	1.7	211	140	1.6	207	137	1.5	202	137	1.5	194	129
Lf=1 m	1.7	144	148	1.7	135	147	1.6	143	150	1.5	132	153	1.5	130	136
Lf=2 m	1.7	119	153	1.7	121	172	1.6	126	172	1.5	129	165	1.5	127	151
Lf=4 m	1.7	111	191	1.7	118	189	1.6	123	181	1.5	125	179	1.5	127	165
Lf=8 m	1.7	108	209	1.7	110	203	1.6	119	201	1.5	124	191	1.5	116	188
Lf=16 m	1.7	107	238	1.7	116	231	1.6	119	242	1.5	120	233	1.5	112	227

Constants	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
L=4 m	FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)	
		F1	F2		F1	F2		F1	F2		F1	F2		F1	F2
Lf=0 m	1.7	523	444	1.7	507	428	1.6	500	411	1.5	491	400	1.5	479	383
Lf=1 m	1.7	469	444	1.7	497	435	1.6	498	420	1.5	489	408	1.5	477	395
Lf=2 m	1.7	417	455	1.7	494	446	1.6	494	432	1.5	484	419	1.5	473	409
Lf=4 m	1.7	404	467	1.7	492	459	1.6	488	445	1.5	482	436	1.5	466	430
Lf=8 m	1.7	400	483	1.7	488	472	1.6	480	468	1.5	476	453	1.5	462	464
Lf=16 m	1.7	398	502	1.7	487	497	1.6	477	493	1.5	474	485	1.5	460	499

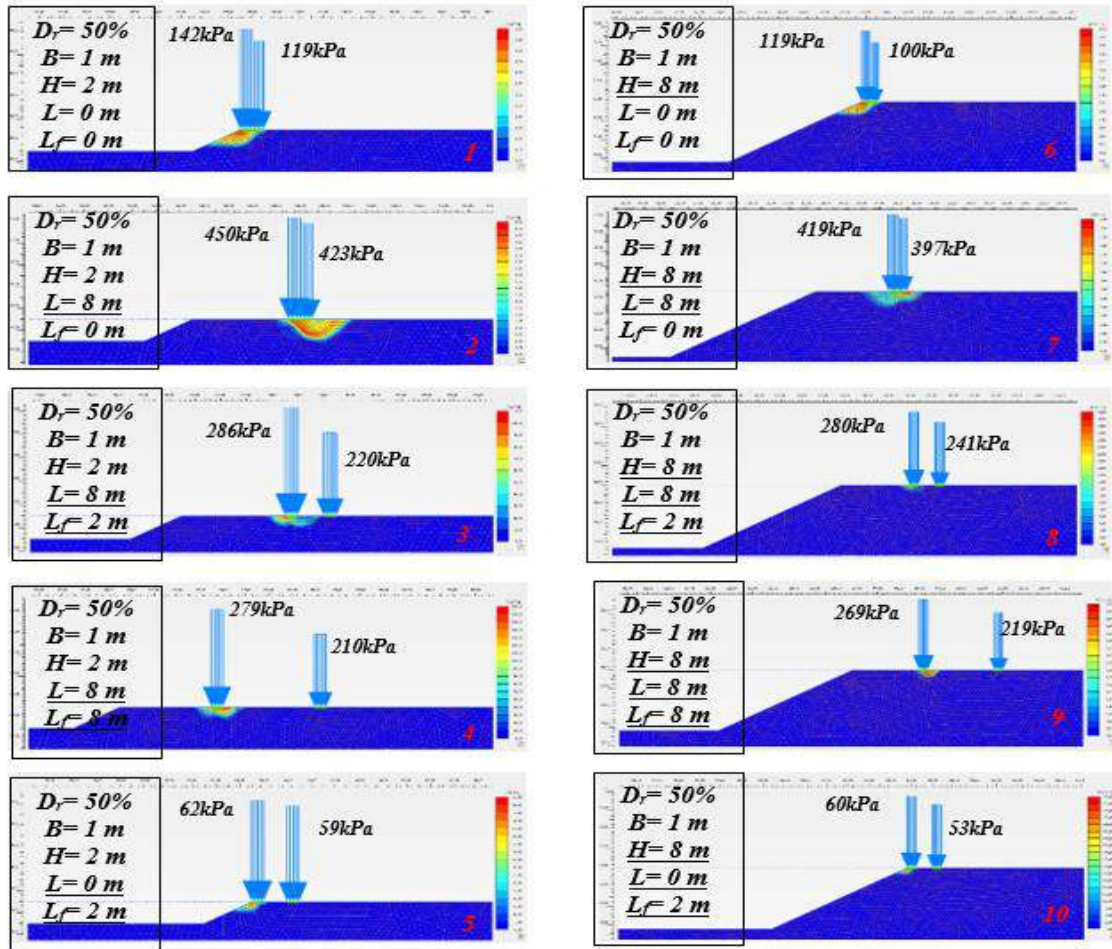
Constants	H=2 m			H=4 m			H=6 m			H=8 m			H=16 m		
L=16 m	FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)		FSslope	quilt (kPa)	
		F1	F2		F1	F2		F1	F2		F1	F2		F1	F2
Lf=0 m	1.7	761	637	1.7	436	351	1.6	653	569	1.5	632	537	1.5	616	499
Lf=1 m	1.7	518	401	1.7	507	386	1.6	504	379	1.5	489	354	1.5	477	345
Lf=2 m	1.7	514	379	1.7	504	377	1.6	487	376	1.5	472	351	1.5	461	342
Lf=4 m	1.7	507	363	1.7	498	363	1.6	472	368	1.5	463	345	1.5	453	336
Lf=8 m	1.7	499	357	1.7	495	349	1.6	465	353	1.5	457	332	1.5	449	328
Lf=16 m	1.7	490	356	1.7	494	332	1.6	463	340	1.5	455	319	1.5	448	318

Sunulan tablolarda, tüm durumlarda artan şev yüksekliği ile birlikte güvenlik faktöründe hafif bir düşüş olduğu gözlemlenebilir. Bu eğilim, daha fazla olan şev yüksekliklerinin şev stabilitesi üzerinde hafif bir olumsuz etkiye sahip olduğunu göstermektedir. Ayrıca, zeminin değişen göreceli sıklığının etkisi, göreceli sıklık arttıkça şevin güvenlik faktöründe bir artış yoluyla gözlemlenebilir. Bu bulgu, göreceli sıklığın şev stabilitesini etkilemedeki önemini vurgulamakta ve daha yüksek göreceli sıklığın daha iyi güvenliğe katkıda bulunduğunu göstermektedir. Temellerin analiz edilen kesitlere entegrasyonu sonrasında, mobilize edilen kayma düzlemlerini ve bu tür durumlarda nihai taşıma kapasitesi değerlerini yorumlamak için güvenlik faktörünü sınırına getiren yükleme değerleri tasarımda kullanılır. Göreceli yoğunluk dışında diğer tüm değişkenler sabit tutulduğunda, zemin taşıma kapasitesinin artmasının etkisi nihai yükte bir artış olarak gözlemlenebilir. Ayrıca, temelleri şev zirvesinden uzaklaştırmak, tüm durumlarda nihai yükte bir artışa neden olur. Bu etki, şevden uzaklaştıkça yükün şev stabilitesi üzerindeki etkisinin azalmasından kaynaklanır. Tersine, şev yüksekliğinin taşıma kapasitesi üzerindeki olumsuz etkisi, analiz vakalarına uygulanan nihai yükte bir azalma ile kendini gösterir. Daha fazla olan şev yükseklikleri, daha düşük nihai yük kapasitesine yol açan

azalmış taşıma kapasitesi ile ilişkilidir. Öte yandan, bitişik temeller arasındaki mesafe toplam nihai yük üzerinde önemli bir etkiye sahiptir. Temeller birbirine yakın yerleştirildiğinde, tek bir temel gibi davranarak birleşik bir etki ve gerilme alanı oluştururlar. Temeller arasındaki mesafenin artması, iki gerilme alanının üst üste binmesine, şev stabilitesinin azalmasına ve toplam nihai yükün düşmesine neden olur. Bu gerilme alanı örtüşmesinin etkisi, iki temel arasındaki mesafe arttıkça kademeli olarak azalır. Aslında, her yükseklikteki son durumda, ikinci temel F2'ye uygulanan yükün arttığı gözlemlenmiştir.

Ele alınan duruma farklı bir yorum getirmek amacıyla bazı özel senaryolar sınıflandırılmış ve güvenlik aşamasındaki analizde artımsal yer değiştirmeler bölümünden olası kritik göçme düzlemleri elde edilmiştir. Farklı göreceli sıklık değerleri için aynı geometrik ve zemin koşullarına sahip farklı kesitler modellenmiştir. Bu bağlamda Şekil 6, $D_r = \%50$ için elde edilmiştir, diğer göreceli sıklık değerleri için de analizler tekrarlanmış ancak genel bir yaklaşım sunması açısından bu bildiri kapsamında sadece bir adet göreceli sıklık için uygulanan parametrik analizler ve detayları paylaşılmıştır, Çalışmanın tüm detayları Badawi (2023) tarafından hazırlanan yüksek lisans tezinde mevcuttur. Bu şekiller on (10) numaraya kadar sıralı olarak numaralandırılmıştır. Her şekil için bir numaralı (1) durum referans durum olarak seçilmiş ve her analizde parametreler değiştirilerek olası kritik göçme düzlemleri elde edilmiştir. Şekillerde, referans kesitten farklı olarak kullanılan parametreler altı çizili olarak gösterilmiştir. Ayrıca, şevde bulunan ikili temel sistemi durumunda, temellerin göçmeye ulaşmasına neden olacak maksimum yük değerleri, yani temel taşıma kapasitesi değerleri, şekil üzerinde ayrı ayrı yazılmıştır. Bir (1) numara ile temsil edilen referans analizinin uygulanacağı kesitin özellikleri şu şekilde seçilmiştir: $B=1$ m, $H=2$ m, $L=0$ ve $L_f=0$. İkinci analizde (2) şev ve temel arasındaki etkileşim mesafesi, $L=8$ metreye çıkarılmıştır. Üçüncü analizde (3) $L=8$ m olarak ayarlanmış ve iki temel arasındaki mesafe, $L_f=2$ metreye artırılmıştır. Dördüncü analizde (4) $L=8$ m olarak ayarlanmış ve $L_f=8$ m'ye çıkarılmıştır; bu durumda iki temel arasındaki mesafe temel boyutunun 8 katıdır. Beşinci analizde (5) $L=0$ m ve $L_f=2$ m olarak ayarlanmıştır. Altıncı analizde (6) şev yüksekliği, $H=8$ metreye çıkarılmıştır. Yedinci analizde (7) $H=8$ m, $L=8$ m ve $L_f=0$ m olarak ayarlanmıştır. Sekizinci analizde (8) bir önceki analize kıyasla $L_f=2$ m olarak değiştirilmiştir. Dokuzuncu analizde (9) $L_f=8$ metreye çıkarılmıştır. Onuncu ve son analizde (10) $H=8$ m, $L=0$ m ve $L_f=2$ m olarak ayarlanmıştır. Referans durum incelendiğinde, şev zirvesine yerleştirilen bitişik temel nedeniyle yüklerden kaynaklanan mobilize bir mekanizma gözlemlenmiştir. Ancak, şev yüksekliğinin düşük olması nedeniyle kapsamlı bir mekanizma harekete geçirilmiş, bu da temel taşıma kapasitesi sorunuyla başlayıp, şev stabilitesinin de sorgulanmasıyla devam ederek şevi de kapsayan bir duruma dönüşmüştür. İkinci durumda, şev ve temel arasındaki etkileşim mesafesinin artması nedeniyle temellerin yük taşıma kapasitesi birinci duruma kıyasla yaklaşık üç kat artmıştır. Sistemin genel stabilitesindeki problem yalnızca temel taşıma kapasitesinden kaynaklanmıştır. Temeller, yatay zemin katmanlarında bulunan bitişik temel gibi davranmış ve şev stabilitesi, entegre sistem stabilitesini etkilememiştir. Üçüncü durumda, hem şev-temel etkileşim mesafesinin değişmesi hem de temellerin birbirinden ayrılması söz konusudur. Bu senaryoda, ikinci durumda rijit bir

plak gibi davranan çift temel, iki ayrı parçaya ayrılmış ve birbirinden uzaklaşmıştır. Temellerin taşıma kapasitesi azalmış ve aşırı yüklemeye altında temellerden birinde güvenlik faktörünü 1.0'a düşüren bir oturma mekanizması harekete geçmiştir. Bu durum yine de şev stabilitesi üzerinde bir etkiye sahip değildir. Sadece, yatay zemin katmanlarında birbiriyle etkileşimde bulunan iki farklı yapının analizi olarak yorumlanabilecek bir senaryo sunmaktadır. Analiz sonucunda, temel-şev etkileşim mesafesinin temel genişliğinin sekiz katı olduğu bu durumda, incelenen yapı-temel etkileşimi için istenen mesafenin etkili olmadığı görülmüştür. Ayrıca, dördüncü durumda iki temel arasındaki mesafe de 8 metredir. Bu durumda, temellerin nihai taşıma kapasitesi önemli ölçüde değişmese de, artık temeller arası bir etkileşim söz konusu değildir. Beşinci durumda, yalnızca referans duruma kıyasla temeller arasındaki etkileşim mesafesi değiştirilmiştir. Altıncı durumda ise, tekrar iki temel, 8 metre yüksekliğe sahip olarak şev zirvesine bitişik şekilde yerleştirilmiştir. Referans durumla karşılaştırıldığında değişken faktör, şev yüksekliğidir. Bu durumda, temellerin taşıma kapasitesi referans duruma kıyasla azalmıştır. Referans duruma benzer bir mekanizma gözlemlenmektedir. Başlangıçta temel taşıma kapasitesinden kaynaklanan oturma davranışı şeve doğru yayılmakta, ancak şev yüksekliği nedeniyle tüm alana yayılmamıştır.



Şekil 6. Aynı geometri ve zemin koşullarına sahip, $D_r=50\%$ sahip temel zemini için şev üzerindeki temellerin farklı kesitleri.

Yedinci durumda, şev yüksekliğine ek olarak temeller ve yşev arasındaki mesafeler de değiştirilmiştir. Bu durum incelendiğinde, ikinci duruma benzer şekilde, yük taşıma kapasitesinin arttığı ve şev stabilitesinin temel yüklerinden etkilenmediği sonucuna varılabilir. Sekizinci durumda, analiz, temellerin şev zirvesinden ve birbirinden ayrılmasına odaklanmıştır. Bu senaryoda, referans durumla karşılaştırıldığında yük taşıma kapasitesi değerlerinin arttığı gözlemlenmiştir. Ancak, aynı mantıkla tasarlanmış ancak daha düşük şev yüksekliğine sahip üçüncü durumla karşılaştırıldığında, yük taşıma kapasitelerinin biraz azaldığı söylenebilir. Dokuzuncu durumda, temeller 8 metre mesafe ile ayrılmıştır. Bu durumda, yük taşıma kapasiteleri önceki durum olan sekizinci durumla benzer kalmaktadır. Bu sonucun, temel boyutlarının 1 metre olması nedeniyle, birbirini etkileyen temeller arasındaki mesafenin temel genişliğinin iki katından az olmasıyla ilişkili olduğu söylenebilir. Onuncu durumda, şev zirvesine yerleştirilen ayrıık temeller problem odağıdır. Bu senaryoda, referans durumla karşılaştırıldığında yük taşıma kapasiteleri azalmıştır. Ancak bu azalma, şev yüksekliğinden nispeten bağımsız olarak gerçekleşmiştir. Bu gözlem, beşinci durumla karşılaştırıldığında sadece bu özel durum için yapılabilecek spesifik bir değerlendirmedir. Gerçekten de, beşinci ve onuncu durumlarda nihai yük kapasiteleri benzer büyüklüktedir ve şev stabilitesiyle tetiklenen bir oturma mekanizmasının mevcut olduğu söylenemez.

Çalışma kapsamında analiz edilen durumlar göz önüne alındığında, etkinleşen mekanizmaların öncelikle temel-şev etkileşim mesafesinin küçük olduğu durumlarda temel taşıma kapasitesinden kaynaklandığı, bunun ardından şevi etkilediği ve göçmeye yol açtığı gözlemlenebilir. Ancak, temel-şev etkileşim mesafesi temel genişliğinin iki katını aştığında, taşıma kapasitesinden kaynaklanan etkilerin zaten stabil olan bir şev üzerinde bir etkisi olmayacağı değerlendirilebilir. Bu yorumun soruda sağlanan bilgilere dayanarak yapıldığı ve teknik detaylar ile bağlamın değişebileceği unutulmamalıdır. Belirli durumların kapsamlı bir analiz ve değerlendirmesi için her zaman ilgili uzmanlara danışılması önerilir.

SONUÇ

Bu çalışmada, şev üzerinde bulunan tek ve bitişik temellerin taşıma kapasitesini etkileyen parametreleri araştırmak için sayısal bir model geliştirmek üzere sonlu elemanlar tekniği kullanılmıştır. Şev yüksekliği, temel genişliği, çift temeller arasındaki mesafe ve temelden şev kenarına olan mesafe gibi değişkenler dikkate alınarak kapsamlı parametrik analizler gerçekleştirilmiştir. Analiz bulgularına dayanarak çalışma kapsamında değerlendirilen analizler için geçerli olmak üzere bazı değerlendirmeler yapılabilmektedir. İlk olarak, şev yüksekliğindeki bir artışın temelin taşıma kapasitesinde bir azalmaya karşılık geldiği bulunmuştur. Tersine, taşıma kapasitesi eğimden artan mesafeler ve/veya daha yüksek göreceli sıklık ile artış göstermiştir. Ayrıca, temeller arasındaki mesafe taşıma kapasitesi üzerinde farklı etkiler göstermiştir. Özellikle, mesafe arttıkça, gerilme alanları arasında bir örtüşme etkisi meydana gelmiş ve bu da bir temelin taşıma kapasitesinde diğerine kıyasla bir düşüşe neden olmuştur. Ancak, mesafe daha da arttıkça, bu çakışmanın etkisinin ihmal edilebilir olduğu bir noktaya ulaşana kadar engelleyici etki kademeli olarak azalmıştır. Bu sonuçlar, mühendisler ve

tasarımcılar için değerli bilgiler sağlayarak, şev özellikleri ve zemin koşullarıyla ilişkili olarak temel yerleştirme konusunda bilinçli kararlar vermelerini ve sonuçta hem temelin hem de şev sisteminin stabilitesini sağlamalarını mümkün kılmaktadır.

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PREDICTING HUMAN WELL-BEING: ANALYZING JOB SATISFACTION, WORK-LIFE BALANCE, AND JOB-RELATED STRESS USING ENSEMBLE LEARNING MODELS

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ABSTRACT

Fast-paced working condition demands understanding of multiple factors, which may impact employees' feelings towards work satisfaction, balance, and social well-being, to have a better account of individualistic performance and health of the organization. Therefore, ensemble learning will be applied to major facets concerned about well-being in employees by making predictions from the complete dataset including age groups, personal habits, time management, and other measures of stress. The objectives will be to develop predictive models on Job Satisfaction, Work-Life Balance, and Daily Stress Levels using some advanced ensemble methods like Random Forests, Gradient Boosting Machines, and Extreme Gradient Boosting (XGBoost).

This is related to the diurnal stress in the category of the job, spending time at work every day, time spent on sports, usage of social media, family and friend time, hobbies, and other lifestyle habits. Such features are included in models largely to capture important complex nonlinear relationships that specify well-being relations across individuals. After rigorous training and validation of the models, we illustrate that the predictive accuracies of such ensemble learning models are superior to traditional machine learning methods. The results portrayed the most important predictors for Job Satisfaction, Balance Level, and Stress Levels that offer very good insights for the employers and HR professionals when designing relevant interventions.

In this paper, the potentials of machine learning for human resource management are opened in new ways for more adaptable and responsive strategies at the workplace. Further research will be needed on how models developed can be used in real-time to facilitate proactive efforts of management in improving the work environment to a more healthy and vital one.

Keywords: Ensemble Learning, Job Satisfaction, Work–Life Balance, Well-being of the Employee, Stress Prediction, Human Resource Management, Predictive Modeling

INTRODUCTION

It is relevant to several components of the workplace, such as professional expertise, employee satisfaction, balance between work and life, and overall organizational efficiency and health. These components are highly complex and often require predictive models that can capture non-linear relationships between variables. Ensembles are one major and sturdy learning algorithm within this context, as they combine several models to improve accuracy and reliability. In this study, we assume well-being as acting as a temporal outcome arising from a set of personal practices and time management techniques, apart from several variables related to stressors. With the use of Random Forests, Gradient Boosting, and XGBoost for building a full predictive model, hyperparameter tuning would be done for its efficiency and to discover the most important predictors of well-being.

RELATED WORK

A good deal of earlier studies has been dedicated to the factors of job satisfaction, work-life balance, and occupational stress. The job characteristics model postulated by **Hackman and Oldham** was a springboard for understanding how the job design affects employee motivation and satisfaction. Further, **Diener's** work on subjective well-being established a central framework for studying psychological factors that do affect overall employee well-being and productivity. Conventional regression models demonstrate efficacy under conditions of linearity; however, they frequently overlook significant nonlinear dynamics inherent in human behavioral data.

Probably the most useful way to overcome such limitations is by ensemble learning. This approach to dealing with large, high-dimensional datasets has given a popular ensemble framework—the Random Forest model by **Breiman**—which has seen extensive use in prediction tasks—and another very prominent development, Gradient Boosting Machines, for iteratively improving modeling techniques. It has recently been shown by **Chen and Guestrin** to be very scalable and resource efficient for large datasets. Another relatively recent and popular technique considers the use of PCA for dimensionality reduction in combination with ensembles that try to get more accurate models at less computational cost. The paper is related to and merges PCA with ensemble learning settings about the prediction of well-being, job satisfaction, and stress, keeping primary emphasis on hyperparameter optimization.

METHODOLOGY

In all, there were 28 different features with 327 observations in total. These variables entail facets about the welfare of the employee calculated in different age brackets, occupational categories, self-reported daily stress, time management strategies, social activities' involvement, and everyday lifestyle habits. The variables of interest happened to be Job Satisfaction, Work-Life Balance, and degree of Daily Stress. The overall methodology can then be summarized in these key steps:

1. Preprocessing: This dataset contains several features in the dataset of this study that are categorical in nature. For example, job type, duration spent on social media, and time spent in natural environments. All these categorical variables are to be converted into numerical form for easy analysis. Therefore, in this study, label encoding has been used. Further, dimensionality reduction techniques were used to avoid overfitting and improve accuracy in the results. For this purpose, PCA was utilized, which led to the identification of six key features.

2. Modeling: Keeping this trend in mind for this regression analysis, we have selected three relatively better models for ensemble learning that give better results compared to other ensemble methods like Bagging and AdaBoost. The models used for this research work include Random Forest, Gradient Boosting, and XGBoost. To tune the evaluation results, we integrated hyperparameter tuning through Grid Search. Using this approach, every model will have some setting that gives the best configuration. This study used Root Mean Squared Error as the main metric in evaluating each of the models.

3. Hyperparameters: The optimal hyperparameters for each model are displayed in Table 1 below:

Ensemble Model	Number of Trees	Max Depth	Learning Rate	Min Split	Samples	Max Features
Random Forest	200	10	N/A	sqrt		N/A
Gradient Boosting	150	8	0.1	auto		0.8
XGBoost	100	6	0.05	auto		0.7

Table 1.

The best performance in the out-of-sample data of our real-world dataset was achieved using the above ensemble models with optimally chosen parameters.

RESULTS

It involved the use of a statistical measure called the Root Mean Squared Error, commonly abbreviated as RMSE, to compare the overall performance of the three different ensemble models involved: Random Forest, Gradient Boosting and XGBoost. This is done in relation to three specific target variables of interest: Job Satisfaction, Work-Life Balance, and, lastly, Stress Levels at the end. For a better comprehension of these facts, refer to Table 2.

Model RMSE	Job Satisfaction (RMSE)	Work-Life Balance (RMSE)	Daily Stress Level
Random Forest	0.432	0.467	0.499
Gradient Boosting	0.415	0.453	0.480

XGBoost	0.398	0.439	0.468
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Table 2.

It means that among all of them, the RMSE values are found to be minimum for the XGBoost model with respect to all three prediction tasks. This makes it especially suitable for predicting indicators of human wellbeing because of the ability to handle linear and nonlinear relationships together and the robustness in handling a wide range of features. The Gradient Boosting model also performed well because of its marginally high error rates as compared to XGBoost, coupled with its strong predictive capabilities. On the other hand, the Random Forest model was efficient in some cases, but it returned the highest root mean square error in all cases, thus showing its comparative inadequacy to handle complex interactions between features.

Seven traits in these models brought to the fore strategies of better time management, pointers of social engagement, work-related stress, and others that turn up more and more in the robust predictors of well-being. The results indicated that whereas all three models—in ensemble—work very well in predicting well-being, their accuracy and interpretability come at a great disparity where the accuracy of the XGBoost model grossly outperforms the others.

Evidently, this flagged the need for further evaluation on the ability to generalize without overfitting. This is an important consideration in most real-world, large-scale applications since the generalization error needs to be stable and must reflect that observed on the training and validation datasets, which provide an estimate of how well a model will perform on new data. Such stability, together with low computational costs and high scalability, means that the model is indeed applicable to human resource management within extensive frameworks.

CONCLUSION

The current study has demonstrated ensemble learning methods to be effective in this respect on the estimation of a variety of factors of employee well-being, such as job satisfaction, work-life balance, and stress level, using the algorithm of XGBoost. In the present paper, Principal Component Analysis has been used for the purpose of dimensionality reduction, and high performance of the model has been enhanced to a significant extent with complex and high-dimensional datasets by using the optimized hyperparameters.

Results show that new machine learning techniques really have the potential to make human resource management practices much better. With paramount standing in exceptional predictive accuracy and outstanding performance when handling large volumes of data, this research work was able to give an important insight into the major drivers influencing employee well-being with the use of XGBoost. This will assist in the identification of variables—which are very instrumental in strategies toward the improvement of working conditions at the place of work—like time management, social interactions, and work-related stress.

These findings of the study open a number of other avenues for future research. For instance, in the future, studies can be done using data consisting of real-time behavioral data to make

models of prediction accurate. Moreover, if embedded inside a real-time framework of human resource management, these factors could include much more adaptable and responsive recommendations for employee well-being. It is such advancements that will finally result in a much healthier, more balanced, and productive workforce; hence, they become indicators of the quintessential role of predictive analytics in modern organizational management.

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ÇOCUKLUK ÇAĞI ACİL SORUNLARI VE HEMŞİRELİK BAKIMI

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ÖZET

Tüm dünyada hastanelerin en yoğun çalışan birimlerinden biri çocuk acil üniteleridir. Çocuk acil üniteleri 7 gün 24 saati sürekli sağlık hizmeti sunan ünitelerdir. Bu ünitelere başvuran hastalar, toplam acil servis başvurularının yaklaşık olarak %30'unu oluşturur ve yaşanan ölümlerin %80 gibi büyük bir bölümü acil durumlardan kaynaklanmaktadır. Çocuk acil birimine en sık başvuru nedenleri arasında vücut sıcaklığının artması (ateş), febril konvüzyon, suda boğulmalar, elektrik çarpmaları, zehirlenmeler, yanıklar, travmalar, besin ve cisim aspirasyonları, hipoglisemiler ve enfeksiyonlar yer alır. Ailelerin çocuk acil servise giriş yapması ile hemşirelik bakımının hızlı bir şekilde planlanması ve uygulanması hayati önem taşır. Hemşirelik bakımının amacı acil durumlara özgü tıbbi müdahaleleri etkin bir şekilde uygulamak, hastalara triyaj uygulayarak sınıflandırabilmek, ortamdaki hasta sirkülasyonunu hızlıca sağlayabilmek, hasta için gerekli acil girişimleri ve bakım gereksinimlerini karşılamak, hasta çocuğun durumunu en hızlı şekilde stabilize etmek ve hasta ve ailesinin gereksinim duyduğu bakımı sağlamaktır. Hemşirelik girişimlerinin karşılanmasında uygun bakım modellerinin kullanılarak etkili hemşirelik bakımının uygulanması hemşirelerin en önemli sorumluluklarından biridir. Bu doğrultuda hemşireler acil servislerde hasta ve ailesini bir bütün içerisinde değerlendirerek bakım girişimlerini gerçekleştirir ve sonucunu değerlendirir.

Anahtar Kelimeler: Çocuk, Acil, Hemşire

ABSTRACT

One of the busiest units in hospitals around the world is pediatric emergency units. Pediatric emergency units are units that provide continuous healthcare services 24 hours a day, 7 days a

week. Patients applying to these units constitute approximately 30% of the total emergency department admissions, and a large portion of the deaths, 80%, are due to emergencies. The most common reasons for admission to the pediatric emergency unit include increased body temperature (fever), febrile convulsion, drowning, electric shock, poisoning, burns, trauma, food and object aspiration, hypoglycemia and infections. Once families enter the pediatric emergency department, it is vital to plan and implement nursing care quickly. The aim of nursing care is to effectively apply medical interventions specific to emergencies, to classify patients by applying triage, to ensure rapid patient circulation in the environment, to meet the necessary emergency interventions and care requirements for the patient, to stabilize the condition of the sick child as quickly as possible, and to provide the care needed by the patient and his family. Implementing effective nursing care by using appropriate care models in meeting nursing interventions is one of the most important responsibilities of nurses. In this regard, nurses evaluate the patient and their family as a whole in emergency departments, carry out care interventions and evaluate the results.

Keywords: Child, Emergency, Nurse

1) Giriş

Tüm dünyada hastanelerin en yoğun çalışan birimlerinden biri çocuk acil üniteleridir. Bu üniteler çocukların ve ailelerin oldukça yoğun stres yaşadığı üniteler olmalarının yanında aynı zamanda çocuklara birçok ağırlı prosedürün uygulandığı ünitelerdir. Bu nedenle çocukların acil durumlarında bu alanda özel eğitim almış ve uzman sağlık çalışanları tarafından çocuklara uygun araç gereç ile gerekli girişimlerin uygulanması önem arz etmektedir (Palabıyık,2024).

Çocukluk çağı acil sorunları ve hemşirelik yaklaşımları acil servislere getirilen çocukların gereksinimlerine göre farklılık gösterir ve çok dikkat gerektirir. Çocuğun hastalığını veya yaralanmasını algılaması ve tepkileri, gelişimsel düzeyden ve önceki hastane deneyimlerinden etkilenir. Bu sebeple, çocuk acil servislerinde çalışan hemşireler, çocuk hastalara yönelik farklı bilgi ve becerilere sahip olmalıdır. Acil servislere çocuk hastalara hizmet veren hemşireler, büyüme ve gelişme, pediatrik triyaj, pediatrik tanılama ve girişimler, pediatrik travma ve hastalıklar ile önleme stratejileri konularında bilgi ve becerilere sahip olmalıdır (Yıldız 2021). Ayrıca, aile merkezli bakım yaklaşımı ile bakım verenlerin/ebeveynlerin tedavi alanında bulunmaları desteklenmelidir. Çocuk hastaya bakım verecek hemşireler, basit bir dille kendini tanıtmalı, çocuğun gelişimsel korkularını ve stresörlerini en aza indirmek amacıyla anne-baba ya da çocukla birlikte gelen erişkinin çocuğun yanında kalmasına izin vermelidir. İşlem öncesi açıklama yapmak, çocukla göz hizasında iletişim kurmak, güler yüzlü olmak, yavaş, sakin ve yumuşak bir ses tonu kullanmak çocuklarda acil bir durumla karşılaşıldığında, çocuğu rahatlatmak adına çok önemlidir.

2) Çocuklarda Acil Durum Olduğunu Düşündüren Durumlar

Çocuklarda acil bir durum olup olmadığını bazı durum ve davranışlardan anlayabiliriz bunlar;

- Her zamankinden farklı davranışlar,
- Anormal ve zor nefes alma,
- Etrafla ilgilenmeme ve cevap vermeme,
- Aşırı uyku eğilimi,
- Sürekli huzursuzluk,
- Bebeklerde emmeme, beslenme güçlüğü,
- Bilinç bulanıklığı,
- Dudakların ve cildin mavi-mor bir renk alması,
- Durdurulamayan kanama,
- Ateşle birlikte bilinç bulanıklığı,
- Sürekli ve şiddetli ağrılar,
- Sürekli ve aşırı kusma,
- Ellerde kollarda atma tarzı hareketlerdir (palabıyık,2024).

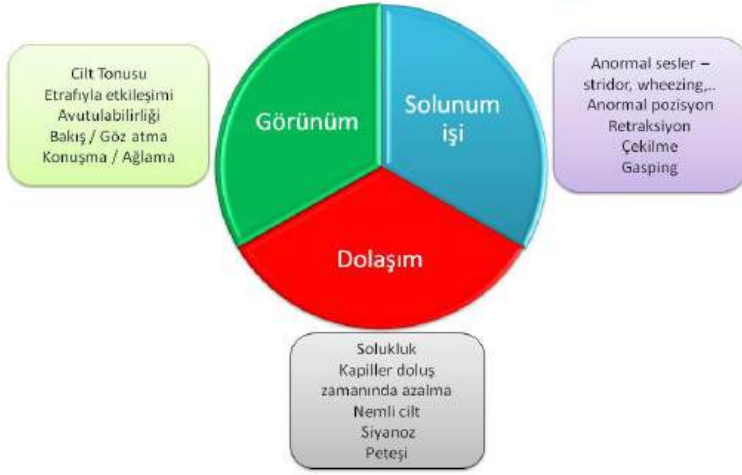
Acil durumlardan en önemli olanlarından bazıları şunlardır;

- Ateş,
- Febril konvüzyon,
- Trafik kazaları,
- Suda boğulmalar,
- Elektrik çarpmaları,
- Ateşli silah yaralanmaları,
- Yanıklar,
- Düşmeler,
- Zehirlenmeler,
- Besin ve yabancı cisim aspirasyonları,
- Hipoglisemidir.

3)Pediatrik Değerlendirme Nasıl Yapılır?

Çocuklarda acil bir durumla karşılaşıldığında pediatrik değerlendirme ölçeği kullanılır. Bu ölçekte Görünüm-Solunum-Dolaşım değerlendirilir ve bu değerlere göre hastaya yaklaşılr.

Pedriatrik Deęerlendirme Üçgeni



4)Ateş ve Hemşirelik Yaklaşımları

Ateş, çocukluk çağının en sık görülen semptomlarından birisidir. Çocuk acil başvurularının büyük çoğunluęunu (dünyada %30, ülkemizde ise %71'ini) ateşli çocuklar oluşturmaktadır. Ateşin nöbet geçirme, beyin hasarı ve kalıcı fiziksel hasara neden olabileceęi düşüncesi genellikle ailelerde kaygı ve panięe sebep olmaktadır. Kaygı ve panik, ailelerin erken, yanlış ve etkisiz tedaviye yönelmeleri ile birlikte, gereksiz antibiyotik kullanımına ve tekrarlayan acil başvurularına neden olmaktadır.

Ateşin en yaygın nedenlerinden biri **enfeksiyon** olup, en sık **krup**, **pnömoni**, kulak enfeksiyonlarında da görülmektedir, bunu grip, şiddetli soęuk algınlığı ve boęaz ağrısı gibi **üst solunum yolu hastalıkları** takip etmektedir.

Ebeveynlerin ateş ile ilgili yetersiz bilgisi ve ateşle dair yanlış algılarının olması, hatalı ve fazla dozlarda tedaviye neden olduęu, bu duruma baęlı hastanelere başvuruda da artış olduęu bildirilmektedir (Vélez-Rivera ve ark., 2021). Yüksek ateş ebeveynlerde kaygı düzeyinin artması sonucu agresif ve riskli davranışlara neden olabilmektedir. Literatürde ebeveynlerin ateş düşürücüleri gereksiz, önerilenden daha kısa aralıklarla, tamamlayıcı ateş düşürme yöntemlerini denemeden, farklı ateş düşürücüleri birleştirek ve yanlış dozda verebildikleri vurgulanmaktadır (Kerdar ve ark., 2021).

Ateş Yönetiminde Hemşirenin Sorumlulukları

Ebeveynler, saęlık sorunları ile mücadelede ilk olarak saęlık çalışanlarına danışmakta ve rol model olarak kabul etmektedir. Saęlık çalışanlarının uygulamaları, girişimler sırasında gösterdikleri davranış ve tepkileri ebeveynler için yol gösterici olmaktadır. Literatürde (Urbane ve ark., 2019; Fidancı ve ark., 2021; Gaffney, Bereznicki ve Bereznicki, 2021) ebeveynlerin hastanede karşılaştıkları hekim ve hemşirelerin, muayene ve müdahale sırasında verdikleri tepkilerinin kararsız ve gergin olması durumunda stres ve kaygı düzeylerinin arttıęı bildirilmektedir. Ateşin yönetiminde güçlük yaşıyan ve kaygı düzeyi artmış ebeveynler ile

iletişim normalden daha güç olabilmektedir, bu durum da sağlık çalışanları ile aileler arasında gerilime neden olabilmektedir. Ateşli çocuğa doğru, zamanında ve etkili müdahale edebilmek için hemşireler ebeveynleri de sürece dahil ederek, etkili ateş yönetimi gerçekleştirirken aynı zamanda ailelerin eğitimini de desteklemelidir. Hastanın yakın takibini gerektiren bu süreçte, ebeveyn ve hemşire teması önemlidir. Hemşire ebeveynleri eğiterek etkili baş etme teknikleri geliştirilmelidir (Sert,2021).

Hemşirelik bakımı;

- Güvenli çevre sağlanmalıdır,
- İleri yaşam desteği malzemeleri hasta başında bulundurulmalıdır,
- Hastanın vital bulguları değerlendirilir,
- Hava yolu açıklığı sağlanmalıdır,
- Gerekirse oksijenle desteklenir,
- Çocuğun başının altında yastık olmadan, başı yan pozisyonda yatırılmalıdır,
- Hasta monitörize edilir,
- İntravenöz katater açılır,
- Kan gazı alınır,
- Kan şekeri ölçümü yapılır,
- Hekim tarafından istemi yapılan ilaçlar uygulanır (basit konvülziyon da parasetamol, komplike konvülziyon da midazolam),
- Ortam ısı ayarlanır,
- Çocuğun fazla kıyafetleri çıkarılır, ılık uygulama yapılır,
- Yapılan tüm işlemler kayıt altına alınır,
- Aileye gerekli bilgiler verilir.

6)Febril Konvüzyon ve Hemşirelik Yaklaşımları

Febril konvülziyon (FK), beyinin serebral korteksindeki nöronların anormal, ani, aşırı veya senkron nöronal aktiviteden kaynaklanan belirti ve semptomların geçici olarak görülmesi, tonik veya klonik istemsiz kas kasılma nöbetidir. Çocukluk çağında en çok görülen konvülziyon tipi febril konvülziyondur (Ünver O, vd 2015). Çocukluk çağı nörolojik bozuklukları arasında en üst sırada, yaşa bağımlı, benign ve ateşle ortaya çıkan konvülziyondur.

FK Belirti- Bulguları FK nöbeti öncesi çocukların çoğunda yorgunluk, ağlama belirtileri ve huzursuzluk görülür (Aksay A, vd 2018). Genellikle bilinç kaybı, uzuvların seğirmesi veya sarsılması, nefes almada zorluk (ebeveynler çocuğun nefes almayı bıraktığını bildirebilir), ağızda köpüklenme, cildin soluk veya mavi renkte olması ve gözleri geri yuvarlama görülür.

Nöbetten sonra çocuk sinirli ve/veya uykulu olabilir, şaşkın görünebilir ve etrafındaki insanları tanıyamayabilir.

Tedavi ve Hemşirelik Yaklaşımı

Nöbetler, genellikle benign karakterde olup, tekrarlama özelliği nadir görülse de epileptik nöbete dönüşme riski taşıması sebebiyle önemlidir ve güncel bir konudur. Konvülsiyonlar ebeveynler ve sağlık çalışanları için zorluk verici deneyimlendendir. Ebeveynler çocuklarının sakat kalacağı, epilepsi hastası olacağı ve hatta öleceği endişesiyle paniklemekte ve gereksiz bir korkuyla yanlış davranışlara yönelebilmektedirler (Efe E, İşler 2013). Bu nedenle pediatri hemşiresi, acil müdahalede hızlı gözlem yapma, karar verme ve yapılacak müdahaleyi hızlı şekilde gerçekleştirebilme yeteneğine sahip olmalıdır. Konvülsiyon geçiren bir çocuğa müdahaleler genellikle, çocuk servisleri, çocuk nöroloji klinikleri ya da çocuk acil servislerinde gerçekleştirilmektedir.

7) Travmalar ve Hemşirelik Yaklaşımları

Çocuklarda karşımıza çıkan travma şekillerinin bazıları şunlardır;

- Araç içi, araç dışı trafik kazaları,
- Düşmeler,
- Bisiklet, paten kazaları,
- Hava yolu tıkanıklığı, yabancı cisim aspirasyonu,
- Ateşli silah yaralanmaları,

Çocuklarda sıklıkla karşımıza çıkan travmalar kafa ve omurga travmalarıdır ve hayati önem taşımaktadır. Kafa travmalarından sonra çocuklarda en sık görülen ikinci travma toraks bölgesindedir. Toraks yaralanmaları da çoğunlukla araç kazaları ve istismar nedeniyle görülmektedir. Bununla birlikte çocuklarda yetişkinden farklı olarak vücudun küçük olması nedeniyle toraks yaralanmalarına eşlik eden kafa ya da abdomen yaralanmaları da fazla görülmektedir (Uysal 2021).

Travmalarda hemşirelik bakımı

- Hasta travma tahtasında yatağına alınır,
- Omurga sabit konumda hareketsiz hale getirilmelidir,
- Vital bulgular değerlendirilir,
- Hasta monitörize edilir, hemşire parametreleri izler, değerlendirir, sonuçları kaydeder ve normalden sapmaları hekime bildirir.
- Boyun travmalarında çocukların hava yolu açıklığını koruyamama riski yüksektir, hava yolu açıklığı sağlanır gerekirse aspirasyon yapılır,
- Hava yolu açıklığından emin olunduktan sonra oksijen uygulanmalıdır,

- Solunum hızı , ritmi , sayısı takip edilmelidir,
- Dolaşım değerlendirilir,
- Nörolojik açıdan değerlendirilir,
- Kırıklar açısından hasta değerlendirilir,
- Ağrı değerlendirilmesi yapılır order edilen analjezikler yapılır,
- Çocuk ve ailesine psikolojik destek sağlanmalıdır (Uysal 2021).

8)Yanıklar ve Hemşirelik Yaklaşımları

Yanıklar; özellikli, yoğun ve uzun zamanlı tedavi gerektiren cerrahi travmalardır. Yanıkta akut dönem, yanığın olumsuz etkilerine karşın organizmayı, hazırlıklı hale getirmek amacıyla, oluşan, bir dizi reaksiyonlar bütünüdür. Yanık hastalarında, cilt bariyeri bozulduğundan ciddi sıvı, elektrolit, protein, mineral kayıpları olmakta; yoğun katabolik durum, infeksiyonlar ve yara iyileşmesi sonucunda artan gereksinimler nedeni ile protein, enerji ve mikro besin ögesi eksiklikleri gelişebilmektedir. Bu aşamada hemşirenin, akut dönemdeki gereksinimleri bilmesi ve buna yönelik acil bakım vermesi, hastanın yaşamını sürdürebilmesi açısından büyük önem taşımaktadır.

Yanıkta Akut Dönem: Yanıkta, ilk 24-48 saat erken ya da akut dönem, daha sonraki dönem ise hipermetabolik ya da geç dönem olarak adlandırılmaktadır. Akut dönem, yanık alanının tamamen cilt dokusuyla kaplanıp, yara iyileşme süreci başladığında sona erer. Bu süreç, haftalarca veya aylarca sürebilmektedir. Fiziopatoloji Yanık yarasında, cilt bariyerinin ortadan kalkması ile birlikte ısı ve sıvı kaybına yol açan fiziopatolojik değişimler oluşur. Büyük yanıklarda lokal ve sistemik mediyatörlerin salınımı gerçekleşmekte, kapiller geçirgenlikte artış ve ekstrasellüler sıvının hareketi sonucu hastada yaygın ödem oluşmaktadır. Akut dönemde gelişen bu ödem, hem tam kalınlıklı hem de kısmi kalınlıklı yanıklarda, acil döneme göre daha belirgin olmaktadır. Yine, bu dönemde hasta uyanık ve durumun farkında olabildiğinden hemşirenin, hastaya psikososyal destek vermesi büyük önem taşımaktadır. İyileşme sürecinde, yara çevresinde lökosit birikimi ve fagositoz görülmekte, nekrotik doku sertleşmeye başlamaktadır. Fibroblastlar yara iyileşme sürecinde yer alan bir sitokin olup, kollajen oluşumunda rol oynamaktadır. Bunun sonucunda da granülasyon dokusu oluşumu gerçekleşmektedir. Kısmi kalınlıktaki yanık yaraları, infeksiyondan korunur ve yeterli nem sağlanırsa, kenarlardan ve dermal tabakadan iyileşme başlar. Bununla birlikte, yanık yarasının büyük ve derin olduğu durumlarda, eksizyon ve greftlemeden yararlanılmaktadır. Literatürde, eksizyon ve greftlemenin erken dönemde yapılmasının yara iyileşmesi ve hastanede kalış süresini kısalttığı, greftin 6 hafta sonrasında sağlam ve elastik bir iyileşme sağladığı bildirilmektedir (Çınar, Yalnızoğlu Çaka ve Topal 2021).

Yara Bakımı

Yanlı hastada bakım sonuçları, günlük yara bakımı, izlemi, eksizyonu ve yaranın kapanması ile infeksiyonun tedavisi ve önlenmesine bağlıdır. Yara bakımının hedefleri; Mikrobiyal

kolonizasyon kontrolü ve yara infeksiyonunu önlemek, yaranın derinleşmesini önlemek, mümkün olan en kısa sürede yaranın kapanmasını sağlamak, iyileşen cildin fonksiyonunu arttırmaktır (Lemone vd).

Yaranın Debride Edilmesi: Yanık dokusu, fagositozu uyaran kimyasal mediatörlerin salınımını serbest bırakır. Nekrotik doku fagositik harekete karşı, iyileşmeyi geciktirir ve inflamasyon süresini uzatır. İnfeksiyonu önlemek ve iyileşmeyi hızlandırmak için yara her gün temizlenir ve debride edilir. Yara temizliği duş sedyesi, duş koltuğu ya da yatak başı bakım kullanılarak yapılır. Debridman ya da ölü dokunun çıkarılması, mekanik, kimyasal, cerrahi ya da bu üç yöntemin kullanılması ile gerçekleştirilir. Mekanik debridmanda ölü dokuyu gevşetmek için manuel olarak makas, forseps veya ıslak-nemli ince gözenekli gazlı bez sargıları kullanılabilir. Kimyasal debridman, nekrotik dokuyu uzaklaştıran bir proteolitik enzimatik debridman maddesinin kullanılmasıdır. Cerrahi debridman ise, tam veya kısmi kalınlıktaki yanıkların kesilerek çıkarılmasıdır. Bu yöntemden sonra bir cilt grefti uygulanır (Kanan vd 2012).

Yanıklarda Ağrı Yönetimi

Yanık hastasının ağrı kontrolünde en önemli nokta doğru zamanlamadır. Yanığı olan hastalarda ağrının giderilmesi, yaralanmadan hemen sonra başlayıp rehabilitasyon döneminin sonuna kadar mutlaka uygulanması gereken bir girişimdir. Yanık yarasının yanında, tedavi sırasında uygulanan pansuman, fizik tedavi ve mobilizasyon gibi işlemler de ağrı oluşturmaktadır (Çınar, Yalnızoğlu Çaka ve Topal 2021).

Beslenme: Yanıklı hastada beslenme, metabolik gereksinimleri karşılamak, yara iyileşmesini hızlandırmak, infeksiyona karşı direnci arttırmak, protein kaybını azaltmak için oldukça önemlidir. Yaralanmadan 6-12 saat sonra, hastanın duodenal ya da jejunal enteral beslenilmesi sonuçları iyileştirebilir. Karbonhidratlar yağlardan daha iyi enerji kaynağı olduğu için yanık sonrası beslenme içeriği %82 karbonhidrat, %15 protein, %3 oranında yağdan oluşmalıdır. Günlük protein gereksinimi en az 1.5-2 gr/kg'dır. Omega-6 yağ asitleri ile karşılaştırıldığında, omega-3 yağ asitleri, daha iyi bir inflamatuvar yanıtı neden olur. Multivitamin ve minarel desteği normal olmalıdır.

Akut Dönemde Görülen Olası Komplikasyonlar İnfeksiyon: Yanık sonucunda vücudun ilk savunma yeri olan cilt yok edilir. Patojenler, genellikle yeterli fagositoz sağlanamadan çoğalmaya başlar. Yanık yarasında bakteri kolonizasyonu gelişir. İnfeksiyon varlığında, lokal inflamasyon, hassasiyet ve yara yerinde iltihaplanma da görülebilir. İnvaziv yara infeksiyonlarında kültür sonucuna göre sistemik antibiyotik kullanımı gereklidir (Randal vd 2017). Yaraya geç ya da uygun olmayan girişimlerde bulunulması sebebiyle yanık yara sepsisi gelişebilmektedir. Sepsisin ilk belirtileri arasında hipotermi veya hipertermi, kalp atım ve solunum sayısında artış, kan basıncında ve idrar miktarında azalma yer almaktadır. Bu hastalar aynı zamanda septik şok için de risk altındadır. Literatüre göre yanık yarasında, hastanede kalınan dönem içerisinde MRSA (Metisiline dirençli Stafilokokus aureus) oluşumu da sık gözlemlenmektedir (shek, vd 2017).

İnsan vücudunun karşılaştığı en ağır travmalardan olan yanık; sıvı elektrolit, protein mineral kayıpları, ağır ve uzun seyreden katabolik durum, yara iyileşmesi için artan gereksinimler ve tedavi sürecinde eklenen ikincil enfeksiyonlar sebebiyle uzun süreli tedavi gerektirmektedir.

Yanıklarda Hemşirelik Bakımı

- Tüm sağlık çalışanları iş birliği içinde koordineli olarak çalışmalıdır.
- İlk yaklaşım yanan ve sıcak nesnelere teması devam ediyorsa cilt temasını durdurulmalıdır.
- Hava yolu solunum ve dolaşım değerlendirilir.
- İntavenöz mayi başlanmalıdır.
- Yanan bölge distile su altında tutulur.
- Yanan bölgedeki kıyafetler çıkarılmalıdır.
- 1-2 cm den büyük büllerin içinin boşaltılması kalan ölü dokuların temizlenmesi yapılır.
- Sıcak sıvılar ile yanık oluşmuşsa tüm ıslak kıyafetler çıkarılmalıdır.
- Hasta sıvı elektrolit açısından değerlendirilir.
- Aldığı çıkardığı takibi yapılır.
- Vital parametreleri solunum kalp atım hızı saturasyon değerlendirilir.
- Yanık düzeyi belirlenir buna göre order edilen pomadlar kullanılır.
- Yara bakımının takibi yapılır.
- Ağrıyı en aza indirmek için order edilen analjezikler verilir.
- Enfeksiyon açısından takip edilir.
- Enerji gereksiniminden dolayı yeterli beslenmesi sağlanmalıdır.
- Her yanık vakası adli vaka olarak değerlendirilir.
- Yapılan bütün işlemler kayıt altına alınmalıdır.
- Hasta ve ailesinin tedaviyi anlama durumu değerlendirilir.

9)Zehirlenmeler ve Hemşirelik Yaklaşımları

Zehirlenme, bir maddenin vücuda zarar verecek miktarda, kaza veya istemli olarak alınması sonucu gelişen bir klinik tablodur. Tüm dünyada önlenemez çocuk ölüm nedenleri içinde ilk sıralarda yer alır. Zehirlenmeler acil müdahale gerektiren önemli bir sağlık sorunudur. Zehirlenmeler her yaş grubunda görülse de çocukluk çağında özellikle 5 yaş altı ve adölesan yaş grubu olmak üzere iki dönemi ilgilendirmektedir. Amerikan Zehir Kontrol Merkezinin kayıtlarına göre 2003 yılında iki milyondan fazla olgunun %65,8'ini 0-19 yaş arasındaki çocuklar ve adölesanlar oluşturmaktadır (Keskin, 2019). Zehirlenme nedenleri ülkelere, coğrafik şartlara, toplumların yaşam tarzı ve sosyokültürel düzeylerine, çağın zaman içinde getirdiği yaşam alışkanlıklarında ki değişime paralel olarak farklılıklar gösterebilir.

Türkiye’de en sık görülen akut zehirlenme etkenleri sırasıyla, ilaçlar (analjezik, antidepresan, antihistaminik, antihipertansif, antiepileptik vb.), tarım ilaçları ve böcek öldürücüler (organofosfatlı, piretrin grubu vb.), ev içi kimyasallar (çamaşır suyu, lavabo açıcı, kireç çözücüler, deterjanlar, naftalin vb.), zehirli gazlar (karbonmonoksit, boğucu gazlar), diğer kimyasallar, bitki ve besinler (mantarlar, salon bitkileri, balık, delibal, kayısı çekirdeği, vb.) ve zehirli hayvan ısırma ve sokmaları (akrep, yılan, örümcek, arı vb.)’dır. Bilinç değişikliği, bilinen bir kalp hastalığı olmaksızın ani ritim bozukluğu, birdenbire gelişen ve hiçbir hastalığa uymayan ya da aynı anda birçok kişide görülen benzer belirti ve bulgular, öyküde zehirlenme, psikolojik bozukluk ya da özkıyım varsa zehirlenmeden kuşkulandırılmalıdır. Zehirlenen ya da zehirlendiğinden kuşkulanan hastanın önce yaşamsal bulguları ve bilinç durumu değerlendirilmeli, gerekliyse temel ve ileri yaşam desteği verilmelidir.

İlaçların en sık zehirlenme nedeni olduğunu, kaza ile zehirlenmelerin 6 yaşından küçük ve erkek çocuklarında, öz kıyım amaçlı zehirlenmelerin ergenlik döneminde ve kız çocuklarında daha fazla olduğu bilinmektedir. Çok hassas bir süreç olan ergenlik döneminde gençlerin yaşadığı psikolojik streslerle baş edebilmesi hususunda aileler ve hekimler tarafından uygun ve etkin sosyal ve psikolojik desteğin verilmesi gençlerimizde öz kıyım amaçlı zehirlenmelerin önüne geçebilir. İlaç etiketlerinin üzerine açıklayıcı uyarı bilgilerinin yapıştırılması, ilaçların ve toksik maddelerin uygun yerde saklanması, ilaçlara güvenli kapak sisteminin getirilmesi, yazılı veya görsel medya da kamu bilgilendirme programları aracılığıyla toplum eğitimi kaza sonucu olan zehirlenmelerinin büyük ölçüde azaltılabilir. Ülkemize özgü çocukluk çağı zehirlenmelerin epidemiyolojik verileri ve bu husus da yapılacak sağlık önemlerini belirlemek için, farklı bölgelerden merkezlerin katılımı ile oluşturulacak, prospektif çok merkezli yapılacak çalışmalara ihtiyaç vardır (Arapoğlu, 2005).

Zehirlenme nedeniyle acil servise başvuran çocukların zehirlenmeye neden olan maddeyi kazara aldığı görülmektedir. Çocukların demografik özelliklerine bakıldığında kazara olan zehirlenmeler sıklıkla okul öncesi dönem çocuklarında görülmektedir. Ahmed ve arkadaşlarının yaptıkları çalışmada zehirlenme nedeni ile acil servise başvuran çocukların %88,9’unun 1-5 yaş aralığında olduğu saptanmıştır (Sümer, 2011). Diğer ilgili çalışmalarda da benzer sonuçlar bulunmuştur (Yang, vd 2011). Bu yaş grubunda zehirlenen çocukların cinsiyetleri değerlendirildiğinde erkek çocukların oranının daha yüksek olduğu görülmüştür (Ahmed, 2015). Bu yaş grubu çocuklar meraklıdır, bu duyguları nedeniyle karşılaştıkları sıvı ya da katı maddelerin ne olduğunu anlamak için yiyip içebilirler. Okul öncesi dönem çocukların bu tip kazaları yaşamamaları için ebeveynlerin daha fazla dikkat ve özen göstermeleri gerekmektedir.

Sonuç olarak, çocuklarda görülen akut zehirlenmeleri azaltmak ve görülebilecek olumsuz sonuçları hafifletmek için ebeveynlerin farkındalığı artırılmalıdır. Özellikle birinci basamakta görev yapan sağlık çalışanları erken çocukluk döneminde ebeveyn ve çocuklarla sık olarak bir araya geldikleri için akut zehirlenme konusunda eğitim ve danışmanlık vermelidir. Ayrıca acil servislerde görev yapan sağlık çalışanları, akut zehirlenmeler konusunda acil servise gelen ebeveynlerin farkındalığını artırmak için çalışmalar yapabilir.

- Kişinin neden zehirlendiği tespit edilmelidir.
- İyi bir anamnez alınmalıdır.
- Zehrin adı, içeriği, kutusu, rengi, kokusu, miktarı, ne kadar önce alınmış ya da karşılaşılmış olduğu, başka bir hastalığı olup olmadığı ve sürekli bir ilaç kullanıp kullanmadığı, o anda yakınması olup olmadığı, aynı yakınmaları olan başka kişiler olup olmadığı, gelmeden önce herhangi bir tedavi girişimi yapıp yapılmadığı, zehrin kazayla mı yoksa bilerek mi alındığı, zehirlendiğinde hastanın yanında kimsenin olup olmadığı sorulmalıdır.
- Toplu ilaç içimi var ise yakınlarından hangi ilacı aldığı öğrenilir ve kişinin mide lavajı yapılır.
- İlaç alımından dolayı zehirlendiği kesin biliniyor ise kusturulabilir.
- Zehrin gücünü azaltmak adına bol hidrasyon sağlanmalıdır.
- Kişi yakıcı bir besin almış ise kesinlikle kusturulmaz.
- Doktor istemine göre aktif kömür tedavisi başlatılır.
- Bronş kasılmalarını önlemek için bronş genişleticiler kullanılır

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EPİLEPSİLİ ÇOCUĞUN HEMŞİRELİK BAKIMI

NURSING CARE OF CHILDREN WITH EPILEPSY

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ÖZET

Epilepsinin kelime anlamı yunanca iki sözcükten oluşur. Epi: üzerinde, üzerinden, Lepsis: tutunmak, tutunup sarsmak anlamındadır. Epilepsin sözcük anlamı olarak: yakalamak, aniden tutulma anlamındadır. Yunanca'da nöbet anlamında kullanılmıştır. Epilepsi; beyindeki nöronlarda normal olmayan ve yüksek elektriksel deşarjlar sonucu görülen, ani, yineleyici, tanımlanabilen bir olay ile oluşmamış nöbetler ile açıklanan bir durumdur. Epilepsi hastalığı, çocukluk döneminde en çok görülen beyin yapısal nörolojik bozukluğudur ve çocukların tüm hayatını etkileyerek günlük yaşamını bozabilmektedir. Bebeklerin yaşamlarının ilk yılı içinde epilepsi geçirme 1000'de 1 dir. İndsidans yaş arttıkça azalır. Çocuklarda epilepsi, santral sinir sistemi hastalığı, enfeksiyonlar, metabolizma hastalığı, asfiksi, elektrolit bozuklukları ya da altta yatan diğer hastalıklara bağlı olarak gelişir. Epilepside bulgular epilepsinin türüne ve süresine göre değişiklik göstermektedir. Çocuklarda semptom sırasında EEG de epileptik boşalımın gösterilmesi ile tanı konulur. Tedavinin amacı epilepsinin nedeninin belirlenmesi, konvülsiyonların tedavisi ve konvülsiyonların önlenmesidir. Epilepsili çocuğun hemşirelik bakımı oldukça önemlidir. Bakım uygulamalarında amaç, havayolu açıklığını sağlamak, güvenlik önlemlerini almak, ilaç uygulamak, duygusal destek sağlamak ve aileye uzun süreli bakımda destek olmaktır. Hemşirelik girişimleri olarak; nöbet sırasında oluşabilecek travmalardan korunmak için önlemler alınır. Antikonvülsan ilaçların önerildiği şekilde kullanımı sağlanır ve olası yan etkileri açısından takip edilir. Nöbeti başlatan faktörler belirlenir ve bu faktörler en aza indirgenir (parlak ışıklar, uykusuzluk, aşırı aktivite, egzersiz). Nöbet sırasında çocuğun hareketleri kısıtlanmaz, çocuk yan çevrilir ve hava yolu açıklığı sağlanır. Aileye, çocuğun nöbeti sırasında gözlememesi gereken bulguların bir listesi verilir. Aileye ve çocuğa hastalık ve tedavisi hakkında bilgi verilir.

Anahtar Kelimeler: Epilepsi, çocuk, hemşirelik bakımı

ABSTRACT

The word meaning of epilepsy consists of two Greek words. Epi: means on, over, Lepsis: means to hold on, to hold on and shake. The literal meaning of epilepsy is to catch, to be caught suddenly. It was used in Greek to mean seizure. Epilepsy; It is a condition that is explained by seizures that occur as a result of abnormal and high electrical discharges in the neurons in the brain, and are sudden, repetitive, and not caused by an identifiable event. Epilepsy is the most common structural neurological disorder of the brain in childhood and can disrupt children's daily life by affecting their entire lives. The incidence of epilepsy in babies' first year of life is 1 in 1000. The incidence decreases with increasing age. Epilepsy in children develops due to central nervous system disease, infections, metabolic disease, asphyxia, electrolyte disorders or other underlying diseases. Findings in epilepsy vary depending on the type and duration of epilepsy. In children, diagnosis is made by showing epileptic discharge on EEG during symptoms. The aim of treatment is to determine the cause of epilepsy, treat convulsions and prevent convulsions. Nursing care of a child with epilepsy is very important. The aim of care practices is to ensure airway patency, take safety precautions, administer medication, provide emotional support and support the family in long-term care. As nursing interventions; Precautions are taken to protect against trauma that may occur during a seizure. Anticonvulsant drugs are used as recommended and monitored for possible side effects. Seizure-initiating factors are identified and these factors are minimized (bright lights, insomnia, excessive activity, exercise). During the seizure, the child's movements are not restricted, the child is turned on his side and airway patency is ensured. The family is given a list of signs to observe during the child's seizure. The family and the child are informed about the disease and its treatment.

Keywords: Epilepsy, child, nursing care

GİRİŞ

Epilepsi hastalığı, doğuştan ve sonradan oluşan bozukluklar sebebiyle gerçekleşen merkezi sinir sistemi işlevsizliğinin sebep olduğu, tekrarlayıcı nöbetlerle seyreden, çocuk ve ergenlik döneminde en fazla görülen kronik bir nörolojik hastalıktır. Epilepsi hastalığının çocukluk çağındaki görülme sıklığı %0,5-1'dir. Hafiften ağıra doğru ilerleyen geniş yelpazede değişik klinik şekilde ortaya çıkabilen, heterojen bir hastalık türü olarak bilinmektedir. (Kurul, 2016). Çocuklarda görülen nöbet sebepleri çok çeşitlidir. Epilepsi hastalığı olan çocukların %60 - 80'inde bu hastalık için bir etiyolojik neden belirlenmemiştir.(Narlı, vd., 2007). Her ne kadar birçok pediatrik epilepsi hastalığı antiepileptikler kullanılarak çok iyi bir şekilde yönetilse de, epilepsi tanılı çocukların % 25'inden daha fazlası, kontrolü olmayan nöbetler geçirir. (Zamani, vd.,2016). Günümüzde ise epilepsi hastalığı olan çocuklarda hastalığa eşlik eden başka sistem bozukluklarına artan bir ilgi söz konusudur. Bu yaklaşımla epilepsi hastalığının sadece bir nöbet bozukluğu olmadığı, aynı zamanda da çok çeşitli nörobiyoloji, bilişsel, psikolojik ve sosyallik yönleri olan bozukluklar olarak tanımlanmasına sebep olmuştur. (Aaberg, vd., 2017). Epilepsi

hastalığına sahip çocukların yaklaşık %30'u okul hayatlarında başarısızlık ve hafıza güçlüğü gibi davranışsal, bilişsel bozukluklar göstermektedir ve bu çocuklar için uzun süreli bilişsel ve sosyoekonomik değerler olumsuz olarak uzun yıllar sürebilmektedir. (Loiselle, vd., 2016). Epilepsi hastalığı dünyada nörolog uzmanlar tarafından baş ağrısından sonra ikinci sıklıkta görülebilen, hem çocuğu hem de aileleri etkileyen, hastalık yönetimi ilaç tedavileri dışında diğer eğitimsel, psikoterapötik, davranışsal girişimleri de içine alacak şekilde multidisipliner bir yaklaşımı gerektiren kronik olan nörolojik bir hastalıktır. (Loiselle, vd., 2016). Lisansüstü çalışmalarda kullanılan yöntemlere göre dağılım incelendiğinde %78,2'nin tarama modeli olduğu, %16,35'inin deneysel çalışma olduğu ve %5,45'inin boylamsal çalışma olduğu belirlenmiştir. Yüksek lisans tezleri ve tıpta uzmanlık tezlerinde sırası ile en sık kullanılan araştırma yöntemlerinin tarama modeli olduğu, doktora tezlerindeyse deneysel çalışmaların gerçekleştirildiği belirlenmiştir.

Epilepsi

Epilepsinin kelime anlamı Yunanca iki sözcükten oluşur. Epi: üzerinde, üzerinden, Lepsis: tutunmak, tutunup sarsmak anlamındadır. Epilepsin sözcük anlamı olarak: yakalamak, aniden tutulma anlamındadır. Yunanca'da nöbet anlamında kullanılmıştır (Soyuer vd., 2011). Epilepsinin anlamı "sebebi açıklanamayan kasılmaların oluşması" şeklindedir. Epilepsi; beyindeki nöronlarda normal olmayan ve yüksek elektriksel deşarjlar sonucu görülen, ani, yineleyici, tanımlanabilen bir olay ile oluşmamış nöbetler ile açıklanan bir durumdur (Bora vd., 2008).

Türkiye'de son yıllardaki farklı gruplarda yapılan çalışmalar epilepsi hastalığının görülme sıklığı çocukda ve adölesanlarda 20/100.000 ile 124/100.000 arasında olduğunu açıklamıştır. (Çalık vd., 2020).

Epilepsi çocukluk çağı dönemindeki en sık görülen nörolojik hastalıktır. (Prasad et al., 2011; Sivri & Özpulat, 2013). Epilepsi hastalığı dünyada 65 milyon insanı etkilemektedir, bunlardan 10.5 milyonu 15 yaşın altındaki çocuklar oluşturmaktadır. Her sene 3.5 milyon insana epilepsi hastalığı tanısı konulmaktadır ve bunlardan %40.0'ı 15 yaş altındaki çocuklardır, bu çocukların %80.0'ı de gelişmekte olan ülkelerde yaşayan çocuklardır. (Güven& İşler, 2015).

Çocuklarda epilepsi nöbetlerinin çok çeşitli nedenleri vardır. Altta yatan farklı hastalık mekanizmaları epilepsi nöbetlerine yol açabilse de dünyada görülen vakaların yaklaşık %50'sinde epilepsinin sebebi hala bilinmemektedir (WHO, 2023). Çocukluk döneminde epilepsinin en yaygın sebepleri merkezi sinir sistemi (MSS) enfeksiyonları, hipoksi ve kafa travmalarıdır. Bazı epilepsi nöbetlerinin bilinen bir uyararı yoktur. Genellikle genetik kökenlidirler. (Törüner vd., 2023).

Epilepsi hastalığını ve altında yatan sistemleri anlamak, nöbeti önleyebilmek ve tedavi planını oluşturabilmek için ILAE, güncel rehberler geliştirmektedir (Scheffer vd., 2017; Falco-Walter vd., 2018). ILAE; 2017 yılında etiyolojik nöbet sınıflandırmasını güncellemiştir. ILAE 2017

sınıflandırmasında epilepsi hastalığının genetik, yapısal, metabolik veya bilinmeyen faktörler olmak üzere altı kategoride belirlemiştir. (FalcoWalter vd., 2018).

Epilepsinin Patofizyolojisi

Beyin korteksindeki gri maddede anormal elektriksel deşarjların olması sonucuyla beynin normal aktivitesinin bozulması ve klinikte belirli bir süreyle sınırlı bilinç bozukluğu, davranış bozukluğu, duyu sorunları, hareket ve algılamada bozukluklar gözlemlenir (Efe ve İşler, 2021). Nöbetlerin duygusal stres, anksiyete, yorgunluk, enfeksiyon, elektrolit bozuklukları, bazı sesler, fotik uyarı gibi durumlar, reçete edilmiş ilaçları kullanmama durumları veya metabolik bozukluklar gibi tetikleyici faktörleri vardır. (Törüner ve Büyükgönenç, 2023; Efe ve İşler, 2021).

Epilepsi Nöbetlerinin Sınıflandırılması

Nöbetlerin tipinin doğru sınıflandırılması çok önemlidir. Nöbet geçiren çocukları değerlendirirken ilk başta nöbetin tipini belirlemek önemlidir. Nöbet tipi nöbetin sebebi konusunda ipucu verir ve en uygun tedavilerin uygulanmasını da sağlar. Epilepsi nöbetlerinin sınıflandırılması konusunda 1981 yılında Uluslararası Epilepsi ile Savaş Derneği (ILAE) tarafından oluşturulan sınıflandırma kullanılmaktadır. (Türkiye Çocuk Nörolojisi Derneği, Çocuk Nörolojisi,2010) (tablo 1)

Tablo 1. Epileptik Nöbetlerin Uluslararası Sınıflandırılması (ILAE):

1. Fokal (Parsiyel) Nöbetler
2. Jeneralize Nöbetler
a. Absans nöbetleri (Dalma nöbetleri)
-Tipik Absans (sadece bilinç kaybı, hafif kloniler, tonus kaybı, tonik kasılma, otomatizma ve otonomik semptomlar ve bulgularla olabilir)
-Atipik Absans
b. Myoklonik nöbet
c. Klonik nöbet
d. Tonik nöbet
e. Tonik-klonik nöbet
f. Atonik nöbet
3. Sınıflandırılmayan Epileptik Nöbetler

Epilepside Tanı Yöntemleri

Nöbetlerin sıklıkla görülen pediatrik durumlara (baş ağrısı, tikler, senkop veya dikkat eksikliği hiperaktivite bozukluğu vb.) benzer durumlara sahip olabileceği düşünüldüğünde, pediatrik

epilepsi tanısını doğru bir şekilde belirlemek için kapsamlı bir tanısal değerlendirme gereklidir (Smith ve diğerleri,2020). Çocuğun gerçek nöbeti olup olmadığını anlamak için, nöbet tipini sınıflandırmak için ve nöbetin sebebini belirlemek için tanılama çok önemlidir (Geçkil ve Köse, 2022).

Tablo 2: Epilepside Tanı Yöntemleri

EEG	Beyin dalgaları test edilir. İşlem 1-1,5 saat sürer. Beynin belirli Bölgelerin de anormal epileptik aktivitenin olup olmadığını inceler.
Video-EEG (Video EEG Telemetri Monitörizasyonu)	EEG'nin uzun bir sürede yapılmasıdır. Video kamera ile birkaç gün ve gece devam edebilen eş zamanlı kamera ve EEG kaydıdır. Epilepsinin nereden orjin aldığını ve nasıl dağılım gösterdiğini belirlemek için yapılmaktadır.
Magnetik Rezonans Imaging (MRI)	Beynin detaylı bir şekilde görüntülenmesi için manyetik sinyallerden yararlanır. Epilepsiye neden olan yapısal bir durum (kanama, tümör vb.) olup olmadığını belirlemek amacıyla yapılır. Aynı zamanda beyinde belli bölgelerde kimyasal yapılar konusunda da bilgi sağlar.
Bilgisayarlı Beyin Tomografisi (BBT)	Beyinde kan akımı konusunda fotoğraflama sağlar. Beynin görüntüleme tekniğidir.
Pozitron Emission Tomography (PET)	MRI ve BT'den farklı olarak, beyin glukoz mekanizmasını gösterir. Epileptik odaklarda hipometabolizma tipik bulgudur. Eğer nöbet sırasında olursa odakta hipermetabolizma görülür.
Intrakarotid Amobarbütal Test (WADA)	Epilepsinin dil ya da hafıza problemlerine yol açıp açmayacağını belirlemek için yapılır.

Nöropsikoloji	Çocukta belli öğrenme problemleri olup olmadığını test etmek için yapılır. Toplam sekiz saatlik bir testtir. Konvülsiyonun ne gibi sorunlar oluşturduğunu belirlemek için yapılır.
Nöropsikiyatri	Değerlendirme yapmak için psikiyatrist çocuk ve ebeveynler ile görüşür.

(Efe ve İşler, 2021; İnci, 2022).

Epilepside Tedavi

Epilepsi hastalığının tedavi amacı nöbetin etiyolojisini doğru olarak tanımlamak, çocuğun gelişen ve büyüyen vücuduna zarar vermeden daha sonradan oluşabilecek nöbetleri kontrol altına almak, önlemek, nöbetlerin olma sıklığını ve şiddetini azaltmak, yaşam kalitesini koruma altına almak ve iyileştirmektir (Çavuşoğlu, 2022; Kılıçarslan ve Büyükgönenç, 2023). Tedavi yöntemleri olarak antiepileptik ilaç tedavileri, cerrahi tedavisi, vagus sinir uyarımı veya ketojenik diyet tedavi yöntemi uygulanabilmektedir. (Çavuşoğlu, 2022).

Antiepileptik İlaç (AEİ) Tedavisi

Epilepsi nöbetlerinin kontrolünde kullanılan en etkili yöntemler antiepileptik ilaç tedavileridir. Antiepileptik ilaç; sinapslardaki iletme engel olarak, yüksek frekanslı düzensiz deşarjların primer odaklarından yayılımını durdurur böylece nöbet oluşumunu engeller (Geçkil ve Köse, 2022; Rodgers, 2015; Yeni ve diğerleri, 2020).

Nöbetlerin tıbbi tedavilerinde nöbeti kontrol altında tutmak için doğru ilaçların uygun dozda verilmesi gerekmektedir. İlaç tedavileri, çocuğun nöbet türüne, yaşına, kilosuna göre uzman doktor tarafından düzenlenir. Tedavinin başında, belirlenen nöbet türüne en uygun olan ilaç ile başlangıç yapılır ve nöbetlerin tekrarladığı durumlarda maksimum doza kadar çıkılabilir. İlacın etkinliğini değerlendirme ve gerektiğinde ilaç dozunu değiştirme için ilacın kandaki düzeyi ölçümü düzenli olarak yapılmalıdır.

Antiepileptik tedavilere olumlu cevap alınmazsa eğer veya istenmeyen yan etkiler görülürse tedavide kullanılan ilaçların değiştirilmesi gerekli durumlarda ise ilaç dozu yavaş yavaş azaltılarak kesilmelidir. Çünkü ilacın aniden kesilmesi nöbet sayısını ve şiddetini arttırabilir. (Çavuşoğlu, 2022; Geçkil ve Köse, 2022).

Nöbetler kesildikten sonra iki yıl içinde çocukların nöbet geçirmemesi ve EEG kontrollerinde epileptik bozuklukların görülmediği durumlarda ilaçların dozu yavaş yavaş azaltılarak kesilir.

Epilepsi nöbet tiplerine göre en çok kullanılan antiepileptik ilaç ajanları ve toksik etkileri tabloda belirtilmiştir.

Tablo 3. Antiepileptik İlaçlar, Etkili Olduğu Nöbet Tipleri ve Toksik Semptomları

NÖBET TİPLERİ	TOKSİK SEMPTOMLAR
Abans Nöbetler Valproik Asit (Depakin) Zarontin	Bulantı, Hıçkırık, Sedasyon
Jeneralize Nöbetler Depakin Felbatol Topiramate (Topamax)	Sedasyon Kilo Kaybı Konuşma Bozukluğu Uykusuzluk
İnfanıl Nöbet Valproik Asit (Depakin) Vigabatrin (sabrill)	Uyuşukluk Hareket Bozuklukları İştah Artışı
Myoklonik Nöbetler Klonezapam (rivotril)	Uyuşukluk Ataksi
Yenidoğan Nöbetleri Fenobarbital (Luminalettan)	Derin uyku durumu(letarji)
Parsiyel Nöbetler Karbamazepin (tegetol) Oxcarbazepine (Trileptal) Primidone (Mysoline)	Ataksi, Baş Ağrısı GIS sorunları Uyku Hali Uyuşukluk

Yeni İlaçlar	Baş Dönmesi,Sedasyon
Lamictal	Uyku Hali
Gabapentin (Neurontin)	Konuşma Bozuklukları
Topiramet	Hareket Bozuklukları
Levetirasetam (Epilem)	

Kaynak: Potts, N.L., Mandleco, B.L. (2019).

Epilepsi Tanılı Çocuğun Hemşirelik Bakımı

Epilepsi tanılı çocuğun hemşirelik bakımında amaç; nöbet geçiren çocuklarda hava yolu açıklığı sağlamak, gerekli önlemleri almak, gereken ilaçları düzenli olarak uygulamak, uygulanan ilaçların yan etkileri açısından izlemek, duygusal destek olmak ve çocukların bakımında aileye destek olmaktır (Törüner vd., 2023). Nöbet tipi ve sıklığının yanısıra çocuğun yaşı ve gelişim durumları da değerlendirilir. Epilepsi hastalığına sahip çocuklar için güvenli çevre alanı oluşturulmalı, düşme riskine karşı önlem alınmalı, yatak kenarları kaldırılmalıdır, fiziksel darbe almasına karşı yatak kenarları koruyucuyla desteklenmelidir (Çavuşoğlu, 2022). Epilepsi hastalığına sahip çocuklar tipik olarak tedaviler, muayene ve testler için uzun bir zamana ihtiyaç duyarlar. Epilepsili çocukların toplumun epilepsiyle ilgili yetersiz bilgisi, yanlış inanç ve tutumlar nedeniyle psikososyal yaşamlarını ve yaşam kalitelerini olumsuz etkileyebilmektedir. Hemşirelerin epilepsiyle ilgili bilgisi ve tutumunu hastaya verilen bakımda etkili bir şekilde görülmektedir. Bu bilgi hastanın ruh hali ve hastane deneyimi üzerinde etkilidir. (Yeni vd., 2021). Epilepsi tanılı çocuk ve ailenin bilgi alması, bakımı, hastalığa uyum sağlaması ve bu uyumu sürdürmesi açısından hemşirelerin hasta ve ailelerinin taleplerine uygun, yeterli ve doğru bilgiye sahip olması gerekir (Yu vd., 2022). Hemşireler, hasta ve aile bireylerine hastalık ile ilgili bilgilendirme yapma, bireyin özyönetim becerilerini geliştirerek yaşam kalitesi artırılmasına destek olma, disiplinler arası iletişim ve toplumun epilepsi hakkında bilgili olmasını sağlama gibi rolleri bulunmaktadır. Epilepsi sürecinde başarılı olmak için, öncelikle çocuk ve ailenin eğitim ihtiyaçları belirlenmeli ve hastalık özyönetim ve uyumu artırılmalıdır (Yel vd., 2021). Hasta ve ailesine; epilepsi hastalığı, tedavisi, ilaç kullanımı, ilaç kullanımının önemi, ilacın yan etkileri, periyodik kontrollerin önemi, nöbeti tetikleyen durumlar ile ilgili bilgilendirme yapılmalıdır. Nöbet kontrolü ve nöbet esnasında alınacak tedbirler gibi uyumu arttıracak konularda eğitim verilmelidir (Yel vd., 2021). Epilepsi hastalığı ve nöbetlerle ilişkili önemli riskler mevcut olup yaralanmalar, yumuşak doku yaralanmaları, kırıklar ve çıkıklarda dahil olmak üzere nöbet ile ilişkili travmalar meydana gelebilmektedir (Tomson, 2021). Bu riskler nöbet geçiren kişiyi görenlerin, nasıl yardım edecekleri konusunda, bilgi sahibi olmalarını sağlayarak azaltılabilir. (Fitzsimmons, 2023). Epilepsili çocuklar değersizlik, korku, damgalanma, öfke ve umutsuzluk duygularını yaşayabilir, pasif davranışlar sergileyebilir, sosyal izolasyon ve sosyal kısıtlamalar yaşayabilirler. Bu sebepler psikososyal

işlevleri, öz yeterliliği ve yaşam kalitesini olumsuz yönde etkileyebilir. (Chen vd., 2010). Bu nedenlerle hemşireler bunlara yönelik önlem almalıdır, çocuk ve aileyi güçlendirmelidir. Epilepsi tanımlı bir çocuğun etkili tedavi ve bakımını sağlamada ve sağlığı geliştiren davranışları göstermede çocukların öz yeterlik düzeyinin ve özyeterlik düzeylerini etkileyen durumları bilinmesini ve çocukların öz yeterlik algısını yükseltilmesi önemlidir. (İnci, 2022). Bütüncül yaklaşımla çocukların tedavi ve bakımında yer alan pediatri hemşiresi, çocuğun nöbet öz yeterliliğinin belirlenmesinde, öz yeterlilik geliştirmek için gerekli öneriler ve destekler verilerek geliştirilmesini ve güçlendirilmesini sağlanmasında, nöbet yönetim ve nöbetle başa çıkmada yardımcı olarak aile ve çocuklara özgüven arttırmak, stres azaltmak, tedavi uyumunu arttırmak, yaşam kalitesi arttırmak için gerekli eğitim vermelidir (Balkan vd 2015; Chen vd, 2010; İnci, 2022). Eğitim hedeflenen sağlık davranışları kazanılmasında en önemli unsurlardan birisidir. Eğitim ve danışmanlık programının amacı, nöbet sıklığı, bakım ve tedavi maliyetleri azaltmak ve bununla birlikte tüm aile bilgisini, tedavi uyumunu ve yaşam kalitelerini arttırmaktır. İyi bir eğitim ile nöbet özyeterliliğinin yanında yaşam kalitesinde iyileşmesi sağlanabilmektedir. (Chen vd, 2010; Ma vd, 2021)

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Bilgilerinizi ve gereğini arz/rica ederim.

Prof. Dr. Mustafa YILDIZ
İlahiyat Fakültesi Dekanı V.

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X-INTERNATIONAL EUROPEAN CONFERENCE ON INTERDISCIPLINARY SCIENTIFIC
RESEARCH held on August 27-29, 2024 / Zurich, Switzerland

20.09.2024

REF: Akademik Teşvik

İlgili makama;

"X-INTERNATIONAL EUROPEAN CONFERENCE ON INTERDISCIPLINARY SCIENTIFIC RESEARCH 27-29 Ağustos 2024 tarihlerinde Zürih/İsviçre'de Türkiye-232, Diğer Ülkelerden-240 -(Azerbaycan (23), Nigeria (14), Albania (33), Moldova (1), USA (1), Pakistan (18), Lithuania (1), Ethiopia (4), Iran (1), Algeria (6), Nepal (1), India (32), Israel (2), Cameroon (2), Morocco (25), Iraq (6), Romaia (8), Saudi Arabia (1), Brazil (1), Bangladesh (3), Uzbekistan (3), Kenya (1), Ukraine (3), Afganistan (1), Kazakistan (4), Turkish Republic of Northern Cyprus (2), Greece (3), Indonesia (1), Serbia (4), Poland (3), Georgia (6), United Kingdom (1), Hungary (4), Italy (2), Vietnam (2), Uganda (1), South Africa (1), Slovakia (1), Libya (1), Taiwan (1), China (1), Lebanon (2), Bosnia Herzegovia (1), Bulgarian (1), Republic of Croatia (1), Jordan (1), Irlanda (1), Kosovo (3), Canada (1)-akademisyen/araştırmacılarının katılımıyla gerçekleşmiştir. Kongre 16 Ocak 2020 Akademik Teşvik Ödeneği Yönetmeliğine getirilen "Tebliğlerin sunulduğu yurt içinde veya yurt dışındaki etkinliğin uluslararası olarak nitelendirilebilmesi için Türkiye dışında en az beş farklı ülkeden sözlü tebliğ sunan konuşmacının katılım sağlaması ve tebliğlerin yarıdan fazlasının Türkiye dışından katılımcılar tarafından sunulması esastır." değişikliğine uygun düzenlenmiştir.

Bilgilerinize arz edilir,
Saygılarımızla



Prof. Dr. Jose R. Hernandez-Carrion
Member of Organizing Committee

