International Congress of Health Disciplines

The International Congress of Health Disciplines
04-05 February, 2026

Proceedings Book
(Abstracts)

Editor
Assoc. Prof. Merve Keskin

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International Congress of Health Disciplines

Online and Free of Charge

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Notification for Acceptance
25 January 2026

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02 February 2026

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16 February 2026

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Preface

The International Congress of Health Disciplines Proceeding Book

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Editor's Note

The **International Congress of Health Disciplines** was successfully held online at 04-05 February 2026. We are delighted to have offered this event free of charge. It was an honor to bring together experts from various fields of health sciences. This Congress aimed to promote interdisciplinary collaboration, encourage knowledge sharing, and advance health sciences at both national and international levels. With a scientific committee comprising nearly 250 scientists from around the world, the congress truly reflected global participation. We extend our special thanks to everyone who contributed and supported the congress.

We look forward to seeing you at our next congress.

Best regards from Türkiye!

Assoc. Prof. Merve KESKİN

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Synthesis of thiazole derivatives and their evaluation as anti-α-amylase agents, AChE inhibitors, and antioxidants **Gresa HALİMİ, Nour El-Huda DAOUD, Süleyman YUR, Ümit M. KOÇYİGİT, Mehmet Taha YILDIZ, Ulviye Acar ÇEVİK, Yusuf ÖZKAY**
Design, Synthesis, and Evaluation of the Potential Anticancer Activities of 8-[(4,5-Diphenyl-1H-imidazol-2-yl)sulfanyl]-7-benzyltheophylline Derivatives **Sena Derya KESİK AK, Leyla YURTTAŞ, Yüksel ÖĞÜNÇ KEÇECİ, Şeref DEMİRAYAK**
Synthesis of Some 1,3,4-Thiadiazole Hydrazide Derivatives and Their Antiproliferative Activity **Sümeyye AYTAÇ, Leyla YURTTAŞ, Yüksel Öğünç KEÇECİ**

ABSTRACTS

Unveiling Common Pathways: An *In Silico* Study of Alzheimer's Disease, Pulmonary Arterial Hypertension, and Osteoarthritis

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Alzheimer's disease (AD), pulmonary arterial hypertension (PAH), and osteoarthritis (OA) are distinct disorders affecting the brain, cardiovascular system, and joints, respectively. However, emerging evidence suggests shared molecular mechanisms underlying their pathogenesis. This study aimed to identify shared differentially expressed genes (DEGs), biological pathways, and regulatory networks among AD, PAH, and OA using an integrative in silico approach. Gene expression datasets for AD, PAH, and OA were retrieved from the NCBI-GEO database. DEGs were identified using GEO2R, and common DEGs were determined via Venn diagram analysis. Protein-protein interaction (PPI) networks were constructed using STRING and Cytoscape to identify hub genes. Functional enrichment analyses (GO and KEGG) were performed using DAVID. Regulatory networks involving transcription factors (TFs) and microRNAs (miRNAs) were generated using TRRUST, miRTarBase, and NetworkAnalyst. Thirteen shared DEGs were identified across the three diseases, with MMP9, PIK3R1, SERPING1, ORM1, and C2 emerging as central hub genes. Functional enrichment revealed involvement in complement activation, PI3K/AKT signaling, extracellular matrix organization, and immune regulation. KEGG pathways such as PD-1/PD-L1 checkpoint signaling and T cell receptor signaling were significantly enriched. Regulatory analysis highlighted key TFs (STAT3, NF-κB, SP1) and miRNAs (hsa-miR-21, hsa-miR-106b) modulating these hub genes, indicating multilayered control over shared pathological mechanisms. This integrative analysis reveals converging molecular signatures among AD, PAH, and OA, centered on inflammation, immune response, and tissue remodeling. The identified genes and regulatory elements offer promising targets for cross-disease therapeutic strategies. Experimental validation is warranted to confirm these findings and facilitate translational application.

Keywords: *Alzheimer's disease, pulmonary arterial hypertension, osteoarthritis, in silico analysis, gene expression.*

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Ethical Approval Statement: This study is based on publicly available gene expression datasets; no human participants were directly involved. No additional ethical approval was required.
Competing Interest: The authors declare that they have no competing interests.

Development of a Menopause-Related Physical Activity Scale

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Menopause is a natural midlife transition characterized by significant hormonal changes that affect women's physical and psychological health. Given the increasing life expectancy of women, a substantial proportion of life is now spent in the postmenopausal period. Physical activity plays a critical role in managing menopausal symptoms, reducing disease risk, and improving quality of life. However, commonly used physical activity questionnaires are mostly generic and may not adequately reflect menopause-specific symptoms, barriers, and facilitators. The aim of this study was to develop a menopause-related physical activity scale tailored specifically to menopausal women. This study was designed as a scale development study. An extensive literature review was conducted, and existing physical activity and menopause-related questionnaires were examined. An initial item pool was created using items derived from the International Physical Activity Questionnaire–Short Form, Menopause Symptom Assessment Scale, Menopause- Specific Quality of Life Scale, Pittsburgh Sleep Quality Index, and Beck Depression Inventory. This process resulted in an initial pool of 119 items, which were administered to 10 participants in a pilot study to assess clarity and relevance. Based on expert opinions, participant feedback, and statistical considerations, the number of items was reduced to 49. This version was then administered to 13 participants, and further refinements were made. The preliminary scale was reduced to 32 items and administered to a sample of 310 menopausal women. The scale development process resulted in a preliminary 32-item menopause-related physical activity scale. Feedback obtained during pilot applications and expert review suggested that the items were understandable and relevant to physical activity experiences during menopause. The refinement stages primarily focused on improving item clarity and content relevance, supporting the feasibility of using a menopause-specific approach to assess physical activity. Physical activity plays a crucial role in mitigating menopause-related symptoms and supporting long-term health and quality of life in women. The development of a menopause-specific physical activity assessment tool reflects the need to evaluate physical activity within the unique biological and psychosocial context of menopause. Such an approach may contribute to more accurate assessment and facilitate the design of targeted interventions aimed at promoting active and healthy aging in menopausal women.

Keywords: *Menopause, Physical Activity, Scale*

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Competing Interest: The authors declare that they have no competing interests.

Exploring the Relationship Between Physical Activity, Cognitive Function and Birth Fear During Pregnancy

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During pregnancy, changes in brain physiology may reduce cognitive functions, and psychological changes may cause fear of childbirth. Regular physical activity supports holistic health. This study aimed to investigate the relationship between physical activity, cognitive function, and fear of childbirth during pregnancy. It was hypothesized that significant relationships would exist among these parameters. Women aged 18–40 years, between 8–37 weeks of gestation, attending an obstetrics and gynecology outpatient clinic were included. Exclusion criteria were left-handedness, gestational diabetes, pregnancy-related hypertension, eclampsia/preeclampsia, neurological, severe cardiovascular, and systemic diseases. Demographic, physical, and medical data were recorded. Physical activity was assessed using the Pregnancy Physical Activity Questionnaire (PPAQ), cognitive function with the Montreal Cognitive Assessment (MoCA), and fear of childbirth with the Wijma Delivery Expectancy/Experience Questionnaire Version A(W-DEQ). Statistical analyses were performed using SPSS 27. Descriptive statistics were presented as mean ± standard deviation and number (percentage). Relationships between variables were analyzed using Pearson correlation, with significance set at $p<0.05$. Of 160 pregnant women, 14 were excluded. Mean age was 28.29±5.11 years and mean body mass index was 28.62±5.02 kg/m2. Total PPAQ score was 42.12±20.62 MET-hours/week. Total MoCA score and subscale scores (visuospatial/executive, naming, attention, language, abstraction, memory, orientation) were 18.93±4.15; 2.97±0.76; 2.42±0.76; 2.94±1.61; 1.52±0.99; 0.86±0.78; 2.41±1.37; and 5.79±0.46, respectively. MoCA scores ≤25 were found in 139 women (93.9%). Total W-DEQ score was 47.73±23.09. Weak negative correlations were found between PPAQ household/care activities and MoCA attention and total scores (p1=0.010, r1=-0.212; p2=0.039, r2=-0.171). Weak positive correlations were observed between PPAQ occupational activity and MoCA visuospatial/executive, attention, and total scores (p3=0.013, r3=0.206; p4=0.001, r4=0.271; p5=0.001, r5=0.279) and between PPAQ sport/exercise and MoCA memory (p6=0.006, r6=0.229). No other significant relationships were found($p>0.05$). Increased household/care activity is associated with lower attention and total cognition, while occupational activity relates to higher visuospatial/executive, attention, and total scores. Sport/exercise activity is associated with higher memory scores. Different types of physical activity may differently affect cognitive function during pregnancy.

Encouraging structured physical activities and educational interventions may support cognitive health. Given the weak correlations, further studies are needed to explore underlying mechanisms and other contributing factors.
Keywords: *Pregnancy, Physical Activity, Cognitive Function, Fear of Childbirth, Health*

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Ethical Approval Statement: Ethical approval for the study was obtained from the Gülhane Scientific Research Ethics Committee of the University of Health Sciences (Decision No: 2024-584).
Competing Interest: The authors declare that they have no competing interests.

A Comparison of Pain and Physical Function in Middle-Aged and Older Aged Osteoarthritis Patients

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Osteoarthritis is a common joint disease in middle-aged and older adults, often leading to pain and reduced physical function. The literature reports that exercise is a safe and effective method for reducing pain and improving physical function in both middle-aged and older adults with osteoarthritis. However, there are studies reporting that younger individuals generally experience greater pain-relieving effects with exercise, but there is still uncertainty in this regard. Based on this, the current study aims to compare the levels of pain, stiffness, and physical function in middle-aged and older individuals with osteoarthritis who perform regular exercise. This descriptive study was conducted on middle-aged (48 individuals) and older (48 individuals) individuals who exercised regularly at least 2-3 days a week. The participants' sociodemographic characteristics were recorded. Subsequently, the participants' pain, stiffness, and physical function status were assessed using the WOMAC-Osteoarthritis Index. Results were presented at a 95% confidence interval with a significance level of $p<0.05$. The mean age of middle-aged individuals included in the study was 54.39±2.98, while the mean age of older individuals was 71.06±5.05. More than half of the participants (58.4%) had primary school education or below, and 70.8% were married. The rate of falls in the last year was 46.9%. According to the WOMAC-Osteoarthritis Index, there was no significant difference between middle-aged and older adults in terms of pain, stiffness, physical function level, and total scale score ($p=0.256$, $p=0.476$, $p=0.178$, $p=0.199$, respectively). The study found no difference in pain, stiffness, and physical function level between middle-aged and older adults with osteoarthritis. Despite the disadvantage of advanced age on osteoarthritis, these findings indicate that regular exercise can help control osteoarthritis symptoms.

Keywords: *exercise, middle-aged, older adults, osteoarthritis, pain*

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Ethical Approval Statement: This study was approved by the Non-Interventional Research Ethics Committee of Trabzon University, Faculty of Health Sciences on June 26, 2025 (Approval No: E-71551547-050.04-2500033073).
Competing Interest: The authors declare that they have no competing interests.

Blood Parameters Before and After Pandemic in People Who Wore Mask During Pandemic Period*

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The widespread use of face masks during the COVID-19 pandemic has raised concerns regarding the potential physiological effects associated with prolonged mask use. This study aimed to investigate changes in blood gas parameters as well as selected biochemical and hematological indices during periods characterized by prolonged mask use. This retrospective study was conducted on male and female patients aged 18 years and older who were conscious and able to communicate and who presented to the General Surgery Outpatient Clinic of Düzce University Research and Application Center. Blood gas and laboratory parameters obtained during a period when mask use was not common were compared with those obtained during a period in which prolonged mask use was prevalent. During the period associated with prolonged mask use, statistically significant increases were observed in creatinine, sodium, and TSH levels ($p<0.05$), while significant decreases were detected in magnesium, pH, amylase, T3, PaO_2, and SaO_2 levels ($p<0.05$). Although not statistically significant, upward trends were noted in albumin, erythrocyte count, hemoglobin, lymphocyte count, potassium, and total protein levels ($p>0.05$). In contrast, non-significant decreases were observed in ALT, AST, basophil count, BUN, eosinophil count, chloride, leukocyte count, monocyte count, neutrophil count, T4, platelet count, and urea levels ($p>0.05$). No significant differences were found between the groups with respect to D-dimer and PCO_2 levels ($p>0.05$). The findings indicate that certain blood gas and laboratory parameters may exhibit changes during periods associated with prolonged mask use. These results underscore the importance of planning appropriate break intervals, ensuring regular mask replacement, and closely monitoring individuals at risk in order to minimize potential physiological effects related to mask use and prevent adverse clinical outcomes. Further studies involving larger patient populations are warranted to substantiate these findings.

Keywords: *mask, prolonged use, blood parameters, blood gases, hypoxia*

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Competing Interest: The authors declare that they have no competing interests.
*The study was completed as a Master Thesis of Kübra Gonullu at Duzce University.

Green Synthesis with Rapid and Eco-Friendly Method of Silver Nanoparticles Using Oak Acorn Shell*

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Silver nanoparticles (AgNPs) are attracting attention and gaining popularity every day due to their unique physicochemical properties and wide range of applications. Recently, green synthesis approaches have emerged as sustainable and environmentally friendly alternatives to conventional chemical synthesis methods. In this study, oak acorn extract was selected as a natural reducing and stabilizing agent due to its rich phenolic, flavonoid, tannin, and other bioactive compound content. These compounds provide strong antioxidant and reducing properties, enabling efficient green synthesis of silver nanoparticles. In addition, oak acorns are abundant and renewable biomass resources, making them a sustainable choice for nanoparticle synthesis. AgNPs were synthesized using an eco-friendly green synthesis method based on oak acorn shell extract as a natural reducing and stabilizing agent. The plant extract was prepared via aqueous extraction. The extraction process was carried out with maceration and AgNP synthesis was carried out by reacting the extract with silver nitrate under controlled experimental conditions. Reaction parameters were selected according to literature data to promote effective nanoparticle formation. The formation of AgNPs was confirmed by UV–Visible spectroscopy, where a characteristic surface plasmon resonance (SPR) peak was observed in the typical wavelength range at ~ 450 nm for AgNPs. Fourier Transform Infrared (FT-IR) spectroscopy analysis revealed the presence of functional groups associated with phenolic compounds in the oak acorn shell extract, indicating their role in the reduction of silver ions and stabilization of the synthesized nanoparticles. AgNPs were used to modify the carbon paste electrode (CPE) and increase its conductivity. The effect of changes in response currents with increased conductivity was determined by H2O2 sensitivity. Overall, the results demonstrate that oak acorn shell extract can be effectively utilized for the green synthesis of AgNPs. This sustainable, rapid, and environmentally friendly approach offers a promising alternative to chemical synthesis methods and provides significant potential for designing biosensors for various analyte determinations and other future applications where AgNPs will be used.

Keywords: *eco-friendly, green synthesis, silver nanoparticles, oak acorn*

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Competing Interest: The authors declare that they have no competing interests.

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Synthesis, Functionalisation and Characterisation of Iron Oxide Magnetic Nanoparticles*

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Magnetic nanoparticles (MNPs) are a class of nanomaterials that are being extensively researched for numerous technological applications. They exhibit properties that differ from their counterparts at the macroscopic scale. This set of properties possessed by MNPs has enabled significant advances in different fields such as immobilisation, magnetic imaging, and remote control of targeted drug delivery. Among the types of MNPs, iron oxides (Fe_3O_4) are compounds that are widely found in nature and can be easily synthesised in the laboratory. Fe_3O_4 allows for high amounts of enzyme loading due to its large surface area. It can also be easily recovered from a reaction medium by applying a static magnetic field. To obtain better performance from Fe_3O_4, some reactive functional groups such as amine, hydroxyl, carboxyl, and epoxy are attached to its surface. In this study, magnetic Fe_3O_4 nanoparticles were synthesised in an open-air environment using a co-precipitation method. Characterisation studies were conducted using SEM-EDX analysis and VSM to confirm the synthesis of MNPs. Two different support materials were synthesised by attaching functional groups to the magnetic nanoparticles. In the synthesis of the first support material (Fe_3O_4-NH_2), the MNP was functionalised by adding an amine group (NH_2) using 3-aminopropyl)triethoxysilane (APTES). For the synthesis of the second support material (Fe_3O_4@SiO_2-NH_2), MNPs were coated with silicon oxide using tetraethyl orthosilicate (TEOS) and then functionalised with APTES. To determine the functional groups present on the surface of the support material, FT IR measurements were performed on the MNPs and functionalised MNPs. Transmission spectra were obtained between 400 and 4000 cm^{-1}. Furthermore, the magnetic properties were analysed at room temperature (298 K) using VSM. The saturation magnetisation (Ms) of bare MNPs, MNP-APTES, and MNP-TEOS APTES was measured as 51,375 emu/g, 59,040 emu/g, and 59,680 emu/g, respectively.

Keywords: *magnetic nanoparticle, tetraethyl orthosilicate, 3-aminopropyl)triethoxysilane*

Statements and Declarations

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Ethical approval statement: This work does not require ethics committee approval because it does not involve the use of humans or animals (including material/data) for experimental or other scientific purposes.

Competing interest: The authors declare that they have no competing interests.

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Structural Insights into ABL1 T315I–Mediated Drug Resistance and Its Inhibition

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Chronic myeloid leukemia (CML) is a hematological malignancy resulting from constitutive tyrosine kinase activity of the Abelson kinase (ABL1) as a consequence of its reciprocal translocation with the breakpoint cluster region (BCR) gene. Given its central role in CML pathogenesis, ABL1 represents a primary therapeutic target. Although currently available tyrosine kinase inhibitors (TKIs) have shown significant clinical efficacy in CML treatment, drug resistance driven by mutations within the ABL1 kinase domain remains a major challenge. Among these, the T315I substitution is one of the most clinically significant mutations, mediating high-level resistance to most available TKIs. Accordingly, the ABL1 T315I mutant has become a critical target for the development of novel TKIs capable of overcoming this resistance. In this study, our team focuses on elucidating the structural features of the ABL1 T315I mutant in complex with novel TKIs. For this purpose, a His_6- and SUMO-tagged ABL1 T315I mutant was recombinantly expressed in *E. coli* BL21(DE3) and purified using a Ni–NTA affinity column. The His_6 and SUMO tag cleavage trials were performed using ULP1 protease digestion. The His_6- and SUMO-tagged and untagged ABL1 T315I mutant proteins are currently used in co-crystallization studies with novel inhibitors. Structural analysis of ABL1 T315I mutant–inhibitor interactions has the potential to highlight structural features associated with drug resistance and to support the design of TKIs effective against the T315I mutation.

Keywords: *chronic myeloid leukemia, ABL1 T315I mutant, tyrosine kinase inhibitors, drug resistance*

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Competing Interest: The authors declare that they have no competing interests.

Pollen Sensitization and Clinical Outcomes in Severe Asthma Patients Treated with Omalizumab: A Single-Center Experience

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Asthma affects approximately 300 million people worldwide and is associated with significant morbidity and mortality. Although severe asthma represents only 3–10% of cases, it accounts for a disproportionate burden of healthcare use and costs. Omalizumab is indicated for severe allergic asthma sensitized to perennial allergens; however, pollen allergens are also important triggers of asthma exacerbations in sensitized individuals. To determine the prevalence of pollen sensitization in patients with severe asthma treated with omalizumab and to evaluate its association with clinical outcomes. This retrospective, single-center study included adult patients with severe asthma receiving omalizumab therapy at a tertiary referral center in Bursa, Türkiye. Demographic characteristics, clinical data, asthma-related outcomes, and treatment information were obtained from medical records. Sensitization to pollen and other allergens (house dust mite, mold, cockroach, cat, and latex) was assessed using skin prick testing and/or serum specific IgE measurements. Patients were classified according to the presence or absence of pollen sensitization. Asthma control, exacerbation frequency, and pulmonary function parameters were compared between groups. A total of 95 patients were included (mean age 53.4 ± 14.6 years; 78% female). Allergic rhinitis was present in 98% of patients. The median duration of omalizumab treatment was 48 months (IQR 60). Mean blood eosinophil count was 294 cells/µL and mean total IgE level was 172 IU/mL. Pollen sensitization was detected in 24% (n = 23) of patients. Sensitization rates were 90% for house dust mite, 24% for mold, 13% for cockroach, 6% for cat, and 3% for latex. Compared with non–pollen-sensitized patients (n = 71), pollen-sensitized patients had a shorter asthma duration (10.7 vs. 17.5 years; $p < 0.001$), higher baseline lung function parameters, and lower baseline blood eosinophil counts. During the last 12 months of omalizumab therapy, post-treatment Asthma Control Test (ACT) scores, exacerbation rates, hospitalizations, and oral corticosteroid use were comparable between the two groups. In patients with severe asthma treated with omalizumab, pollen sensitization was present in approximately one-quarter of the cohort. Clinical outcomes during treatment were similar between pollen-sensitized and non-sensitized patients.

Keywords: *Severe asthma; Omalizumab; Pollen sensitization; Allergic asthma; Asthma control*

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Ethical Approval Statement: This study was conducted in accordance with the principles of the Declaration of Helsinki. An application has been submitted to the local ethics committee, which is scheduled to convene on January 21 for evaluation of the study. Due to the retrospective design of the study and the absence of shared patient-identifying information, written informed consent was not obtained from the patients.

Competing Interest: The authors declare that they have no competing interests.

A Systematic Review of International Guidelines for Economic Evaluation Studies

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Economic evaluation studies provide evidence-based information to decision-makers and play an important role in guiding both health policy development and resource allocation decisions. Today, numerous economic evaluation studies are conducted in various areas of healthcare and across different countries. Ensuring the consistency and comparability of the results of these studies is largely possible through the use of internationally recognized guidelines. However, no study systematically reviewing these guidelines was identified in the literature. Therefore, the present study aims to systematically examine international guidelines related to economic evaluation research. The systematic search was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The literature search was performed in the PubMed, Web of Science, and Global Index Medicus databases. In addition, to identify guidelines not indexed in these databases, grey literature sources were searched, including Google Scholar and the websites of international organizations such as WHO, ISPOR, NICE, CADTH, and EUnetHTA. National or country-specific guidelines were excluded from the study. A data extraction form was used to analyze the information obtained from the guidelines included in the review. The findings revealed that while economic evaluation guidelines share similarities in key methodological components such as types of analysis, perspective, time horizon, and sensitivity analysis, notable differences also exist among them. Overall, the results indicate a lack of full standardization among international economic evaluation guidelines. In this context, it is recommended that future guidelines be developed within the framework of international standards. However, while considering international standards, country-specific healthcare system characteristics and conditions should not be overlooked.

Keywords: *Economic Evaluation, Systematic Review, Guidelines, Reporting Standards.*

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Competing Interest: The authors declare that they have no competing interests.

Improving Emergency Department Triage Processes with FMEA Risk Assessment-Based Method Study Project

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Emergency departments are critical healthcare units that manage the initial assessment, accurate prioritization, and rapid intervention processes for children and adult patients in crucial situations. The accuracy of the decisions made in these units directly impacts not only the patient's treatment process but also the effectiveness of the entire healthcare system. Delays or misdirection, particularly in the Pediatric Emergency Department triage process, increase parental anxiety and disrupt family peace. Furthermore, despite the prevalence of abuse-related symptoms in children presenting to the emergency department, many cases are not recognized at the initial presentation. Early recognition of these symptoms, accurate risk assessment, and referral of the child to appropriate protective mechanisms are critical for preventing repetitive trauma and supporting the child's long-term mental and physical well-being. Proper and standardized procedures strengthen family trust and stabilize the care process. This study aims to enhance the effectiveness of triage processes, a critical stage in patient admission to emergency departments, by systematically examining them using FMEA (Failure Mode and Effects Analysis) and method study techniques to identify risks and improve processes. Supported by field observations and stakeholder interviews, the study demonstrated that delays, inaccurate prioritization, and routing errors, particularly during the triage phase, carry a high risk. The proposed improvement model aims to simplify workflow, clarify staff role definitions, expedite patient flow, and increase parental satisfaction with the process. Ultimately, the developed model is expected to enhance the quality of emergency department service and create a safe and comfortable care environment for children, parents, and families.

Keywords: *emergency department, triage, FMEA, method study, process improvement, child abuse.*

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Competing Interest: The authors declare that they have no competing interests.

A Diagnostic Challenge: Perforated Appendicitis in Amyand's Hernia

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Amyand's hernia, defined as the presence of the vermiform appendix within an inguinal hernia sac, is a rare entity accounting for approximately 1% of all inguinal hernias. The incidence of perforated appendicitis within the sac is exceedingly rare (0.1%). Preoperative diagnosis is often obscured by misleading radiological findings. We present a case of perforated Amyand's hernia that was surgically managed following a misleading .A 64-year-old male patient presented to the emergency department with a complaint of painful swelling in the right inguinal region. He was referred to our clinic with a pre-diagnosis of incarcerated inguinal hernia. The referral ultrasonography (USG) report described a "50 mm diameter muscle-fascia defect in the right inguinal region containing large bowel loops and fatty tissue extending towards the scrotum; the mass is incarcerated but shows no signs of strangulation. Despite the radiological report suggesting no strangulation, the patient was taken for emergency surgery due to persistent incarceration and clinical signs of local inflammation. Intraoperatively, the hernia sac was explored through a standard right inguinal incision. Upon opening the sac, contrary to the expectation of viable bowel loops, a gangrenous and perforated appendix with purulent discharge was discovered within the indirect hernia sac. The mesoappendix was ligated, and an appendectomy was performed. Given the presence of purulent fluid and perforation (Losanoff and Basson Type 3), a synthetic mesh repair was deemed contraindicated due to the high risk of infection. Instead, a primary tissue repair (herniorrhaphy) was performed by suturing the fascia with non-absorbable sutures (Prolene). Postoperatively, the patient was monitored in the service . His inflammatory markers showed rapid regression; White Blood Cell (WBC) count decreased from 15.000/µL preoperatively to 9.000/µL and 8.000/µL during follow-up. Gastrointestinal function recovered early with the passage of flatus and stool. Oral feeding was initiated and well-tolerated. No scrotal edema or wound complications were observed. With stable vital signs and good general condition, the patient was discharged on postoperative day 2. Appendix vermiformis, hernia, excision; PERFORATED ACUTE GANGRENOUS APPENDICITIS, PERIAPPENDICULAR PANNICULITIS, FAT NECROSIS, CONGESTION, FIBROADIPOSE TISSUE SHOWING ACTIVE INFLAMMATION. This case highlights that Amyand's hernia should be considered in the differential diagnosis of incarcerated hernias, even when USG suggests otherwise. Radiologists may mistake an inflamed appendix for a bowel loop. The decision for emergency surgery based on clinical judgment was crucial. Furthermore, in cases of perforated Amyand's hernia, avoiding mesh and opting for primary tissue repair is a safe strategy to prevent postoperative surgical site infections. Informed consent was obtained from the patient for the publication of this case report and accompanying images.

Keywords: *Amyand's hernia, perforated appendicitis, incarcerated hernia, tissue repair, emergency surgery*

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Competing Interest: The statement is not declared by author(s).

Evaluating the Scope, Reliability, and Quality of Youtube Videos on Brain-Computer Interfaces and Neural Implants for Children with Cerebral Palsy

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Cerebral palsy (CP) is a common pediatric motor disorder that significantly impacts the quality of life of affected children and their families. Recent technological advances, such as brain-computer interfaces (BCIs) and neural implants, offer innovative therapeutic options aimed at improving motor function and autonomy in children with CP. This study aimed to systematically evaluate the quality, reliability, and educational value of YouTube videos addressing BCIs and neural implants for pediatric CP populations. This descriptive study initially screened 300 YouTube videos using predefined search terms. Based on inclusion and exclusion criteria, 19 eligible videos were selected. Each video was assessed for content comprehensiveness, reliability (DISCERN), overall quality (Global Quality Scale), and transparency (JAMA benchmarks). Statistical analyses were conducted using SPSS version 22.0 to examine the relationships between video characteristics and quality indicators. Most of the evaluated videos were produced by healthcare professionals or institutional sources. Mean content, reliability, and quality scores were moderate to good (M = 6.63, 3.58, and 3.58, respectively). User interaction metrics, including likes, comments, and popularity index, showed significant positive correlations with video quality indicators ($p < 0.01$), while video length and view count were not significantly associated with content reliability. Videos that included detailed information on clinical indications, contraindications, and follow-up recommendations achieved significantly higher reliability and quality scores ($p < 0.05$). YouTube videos on BCIs and neural implants for children with CP vary widely in quality and scope. While interactive metrics may indicate viewer engagement, they cannot replace scientific rigor. Healthcare professionals should guide families toward reliable, evidence-based content, and regulatory frameworks should be developed to ensure the accuracy and educational value of digital health media.

Keywords: *Cerebral palsy, Brain-computer interface, Neural implants, YouTube, Digital health literacy*

Statements and Declarations

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Ethical approval statement: Ethical approval was not required for this study because it involved the analysis of publicly available online videos and did not include human participants or identifiable personal data.

Competing interest: The authors declare that they have no competing interests.

Analysis of the Contralateral Proximal Femoral Angles and Femoral Offset in Patients with Femoral Neck and Intertrochanteric Fractures

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This study aimed to investigate the relationship between fracture type and contralaterally measured proximal femoral morphometric parameters—specifically the inclination angle, Alsberg angle, and femoral offset distance—in patients with unilateral intertrochanteric femur fractures and femoral neck fractures. Additionally, the study evaluated the influence of sex and age on these parameters. A total of 100 patients, comprising 50 with unilateral intertrochanteric fractures (25 males, 25 females) and 50 with femoral neck fractures (25 males, 25 females), were included in this retrospective cross-sectional study. Only cases with no additional pathology on contralateral hip plain radiographs were analyzed. The inclination (neck-shaft) angle, Alsberg angle, and femoral offset distance were measured from the contralateral proximal femur. When comparing morphometric parameters between fracture types, no statistically significant differences were observed regarding the inclination angle, Alsberg angle, or femoral offset distance ($p>0.05$). In sex-based comparisons independent of fracture type, no significant differences were found for inclination or Alsberg angles; however, femoral offset was significantly higher in males than in females (4.71±0.85 cm vs. 4.27±0.78 cm; $p=0.008$). Within the intertrochanteric fracture group, male patients exhibited a significantly higher femoral offset, whereas no significant sex-related difference was found in the femoral neck fracture group ($p>0.05$). Furthermore, ANCOVA results with age as a covariate confirmed that fracture type had no significant effect on these morphometric parameters ($p>0.05$). In conclusion, the contralateral proximal femoral inclination angle, Alsberg angle, and femoral offset distance do not differ significantly based on the fracture type in patients with unilateral intertrochanteric or femoral neck fractures. These findings suggest that these parameters alone may not be decisive factors for fracture type. However, the significantly higher femoral offset in male patients highlights sex-specific differences in proximal femoral morphology, which should be considered in biomechanical evaluations and surgical planning.

Keywords: *proximal femur angles, intertrochanteric femur fracture, femoral neck fracture, femoral offset, morphometric analysis*

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Ethical Approval Statement: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Bolu Abant Izzet Baysal University Non- Interventional Clinical Research Ethics Committee (Decision No: 2025/518). Since this was a retrospective study involving the analysis of existing radiographs, informed consent was waived by the ethics committee. **Competing Interest:** The authors declare that they have no competing interests.

GC–MS Profiling and Anti-Alzheimer Potential of *Mentha* Essential Oil: Insights into Natural Neuroprotection and Health Applications

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Abstract:

Neurodegenerative diseases such as Alzheimer's disease represent a major global health issue, driving the search for natural compounds with neuroprotective potential. This study aimed to analyze the chemical composition and evaluate the anti-Alzheimer activity of *Mentha* essential oil. The oil was extracted by hydrodistillation (HD) and analyzed using gas chromatography–mass spectrometry (GC–MS). The in *vitro* anti-Alzheimer activity was assessed through acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) inhibition assays. GC/MS analysis showed that piperitenone oxide (22.60%) and trans-caryophyllene (21.79%) were found to be the predominant compounds of the EO extracted by HD. The results demonstrated that the essential oil exhibited a concentration-dependent inhibitory effect on both enzymes, suggesting promising neuroprotective activity. The observed bioactivity could be attributed to the synergistic effect of the identified compounds. Overall, these findings indicate that *Mentha* essential oil may serve as a natural source of neuroprotective agents and could be considered for use in the prevention or management of Alzheimer's disease. This work highlights the potential application of natural essential oils in health-related disciplines and supports their possible use as complementary therapeutic agents in neurodegenerative disorders.

Keywords: *Mentha rotundifolia; Essential oil; hydro-distillation; Anticholinesterase.*

Statements and Declarations

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Competing interest: The authors declare that they have no competing interests.

A Rare Cause of Seizure Presenting to the Emergency Department: Isoniazid Poisoning

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Isoniazid (isonicotinic acid hydrazide, INH), a vitamin B3 (nicotinamide) derivative, is widely used in the prophylaxis and treatment of tuberculosis. Acute high-dose ingestion of INH inhibits glutamic acid decarboxylase, a pyridoxal phosphate–dependent enzyme, thereby preventing the conversion of glutamic acid to gamma-aminobutyric acid (GABA). As GABA is one of the most important inhibitory neurotransmitters in the central nervous system, excessive INH intake may lead to epileptic seizures. Therefore, early recognition and prompt initiation of treatment are crucial in patients with INH intoxication. In this case report, we aimed to discuss a patient who presented to the emergency department following acute INH intoxication. A 47-year-old female patient was brought to the emergency department by emergency medical services (EMS, 112) with decreased level of consciousness and poor general condition. She was admitted to the resuscitation area for close monitoring. Following the onset of generalized tonic–clonic seizures, diazepam was administered, and levetiracetam infusion was initiated. Due to progressive deterioration in consciousness, the patient was endotracheally intubated for airway protection. According to the history obtained from her relatives, the patient had ingested approximately 6-7 gr of isoniazid. Treatment was administered as 5 g of pyridoxine infused intravenously over 30 minutes, followed by 1 g of intramuscular pyridoxine. Initial laboratory findings revealed the following: blood glucose 198 mg/dL, AST 39 U/L, arterial blood gas analysis showing pH 7.11, pCO_2 36.9 mmHg, lactate 9.5 mmol/L, and bicarbonate 11.9 mmol/L. Electrocardiography demonstrated normal sinus rhythm. The patient was subsequently admitted to the intensive care unit and was discharged in good clinical condition after three days of follow-up. Acute ingestions exceeding 35 mg/kg are associated with epileptic seizures. In our case, the patient ingested approximately 6 g of isoniazid and presented with epileptic seizures. Pyridoxine is the specific antidote for INH intoxication. Therefore, intravenous pyridoxine should be readily available in all emergency departments. In patients presenting with refractory seizures, metabolic acidosis, and coma, a history of isoniazid ingestion should be carefully investigated. Isoniazid intoxication must be considered in the differential diagnosis during the evaluation of seizure etiology in the emergency setting.

Keywords: *Isoniazid intoxication, Seizure, Emergency Department, Pyridoxine*

Funding Statement: None to declare
Ethical Approval Statement: Informed consent was obtained from the patient for the publication of this case report
Competing Interest: The authors declare that they have no competing interests.

Clinical and Genetic Aspects of Familial Mediterranean Fever in Algerian Patients

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Familial Mediterranean Fever (FMF, OMIM 249100) is the most common hereditary autoinflammatory disease among people from the Mediterranean region. Classic clinical symptoms of the disease include recurrent, self-limited attacks of fever and serositis causing abdominal, chest and joint pain. FMF can be complicated by renal AA amyloidosis which can lead to end-stage renal failure. FMF is primarily due to recessive mutations, p.M680I, p.M694V, p.M694I, and p.V726A, clustered in exon 10 of the MEditerranean FeVer gene (MEFV). Here, we aimed to describe the genetic, and clinical characteristics of FMF patients. This retrospective study comprised 98 unrelated FMF patients (49 males and 49 females), aged between 1.5 and 56 years. They were recruited from different regions of Algeria. Mutations were detected by sequencing the entire exon 10 of the MEFV gene. Analysis of genetic data showed that among the identified mutations (p.M680I, p.M694I, p.M694V, p.A744S and I692del), p.M694I was the most characterizing the cohort and was predominant in homozygous (41/49; 83.67%), in compound heterozygous (19/24; 79.16%), and in heterozygous patients (11/25; 44%). The hallmark symptoms during acute attacks were abdominal pain (89.79%) and fever (87.75%), followed by articular pain (54.08%). The chest pain was less frequent (22.44%). Most patients experienced two or three clinical features during acute attacks. A late diagnosis of FMF led to the development of renal amyloidosis in 39 patients (39.8%). Moreover, no significant differences were found among mutation groups regarding clinical characteristics, except renal complication which was associated with M694I/M694I genotype. Algerians showed a distinct MEFV mutation spectrum, with p.M694I being very common, unlike other populations at risk. Despite genetic differences, the classic FMF symptoms are consistent across populations. However, we need to explore other MEFV exons and expand clinical spectrum to rare symptoms.

Keywords: *Algeria, autoinflammatory disease, familial mediterranean fever, MEFV mutations.*

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Ethical Approval Statement: study did not require ethics committee approval, as it was a retrospective study.
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The Relationship Between Knee Osteoarthritis, Inflammation, and Irisin in Rheumatoid Arthritis

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Rheumatoid arthritis (RA) is a systemic autoimmune disease characterized by chronic inflammation, which may lead to progressive joint damage. In patients with RA, knee joint involvement and knee osteoarthritis (KOA) negatively effect pain levels and quality of life. Irisin is a myokine associated with inflammation and bone and cartilage metabolism. This study aimed to evaluate the relationship between serum irisin levels and inflammatory markers, hemogram parameters, and disease activity (DAS28) in patients with RA and KOA. The study included 60 patients who presented to the orthopedics outpatient clinic with knee pain, were diagnosed with RA according to the ACR/EULAR 2010 criteria, and had knee osteoarthritis. The control group consisted of 30 healthy individuals. Disease activity was assessed using the DAS28 score. Clinical characteristics, BMI, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and hemogram parameters were recorded for all participants. Serum irisin levels were measured using ELISA. Statistical analyses were performed and a p value <0.05 was considered statistically significant. No significant differences were observed between the patient and control groups in demographic characteristics. Serum irisin levels were significantly lower in the patient group than in the control group ($p<0.05$). CRP and ESR levels, as well as platelet-to-lymphocyte ratio (PLR) and neutrophil-to-lymphocyte ratio (NLR), were higher in the patient group ($p<0.05$). In addition, a significant inverse relationship was observed between serum irisin levels and the DAS28 score ($p<0.05$). Serum irisin levels were also negatively correlated with CRP and BMI. The findings of this study suggest that serum irisin levels are lower in patients with RA and KOA, and this decrease may be associated with elevated inflammatory markers and disease activity. The inverse relationships between serum irisin levels and the DAS28 score, CRP, and BMI indicate that irisin may be linked to inflammatory processes in RA, including knee osteoarthritis. These results highlight irisin as a potential supportive biomarker for disease activity in patients with RA. However, larger-scale, prospective studies are needed to clarify the clinical significance of this association.

Keywords: *Inflammation, Irisin, Knee Osteoarthritis, Rheumatoid arthritis*

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Ethical Approval Statement: Ethical approval for this study was obtained from the Ethics Committee of Atatürk University Faculty of Medicine.
Competing Interest: The authors declare that they have no competing interests.

Clinical Features and Optical Coherence Tomography Findings in Cases of Retinal Artery Occlusion

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Retinal artery occlusion (RAO) is an ophthalmic vascular emergency characterized by acute interruption of retinal arterial blood flow, leading to rapid ischemic damage of the inner retinal layers and severe visual loss. Optical coherence tomography (OCT) allows high-resolution visualization of retinal structural changes in both acute and chronic stages of the disease. This study aimed to evaluate the demographic characteristics, clinical features, and OCT findings in patients presenting with RAO. This retrospective observational study included patients diagnosed with central retinal artery occlusion, branch retinal artery occlusion, or cilioretinal artery occlusion at a tertiary referral retina clinic. Demographic data, time from symptom onset to presentation, systemic comorbidities, and best-corrected visual acuity (BCVA) were recorded from medical files. BCVA measured with Snellen charts was converted to logMAR for analysis. Spectral-domain OCT images obtained at presentation and during follow-up were qualitatively evaluated for inner retinal hyperreflectivity, edema, and subsequent retinal thinning or atrophy. Due to the descriptive nature of the study, results were reported using descriptive statistics only. A total of 88 patients with retinal artery occlusion were analyzed. The mean age was 68.1 ± 7.9 years, and 69% of the cohort were male. Central retinal artery occlusion constituted the majority of cases (83%), followed by branch retinal artery occlusion (14%) and cilioretinal artery occlusion (3%). Hypertension was the most commonly observed systemic comorbidity. The average baseline best-corrected visual acuity was 1.69 ± 0.76 logMAR. On OCT, all patients demonstrated marked hyperreflectivity and thickening of the inner retinal layers during the acute phase. Follow-up examinations revealed progressive thinning, structural disorganization, and atrophy of the inner retina, particularly in eyes with central retinal artery occlusion. OCT provides valuable structural information in RAO by demonstrating both acute ischemic changes and chronic atrophic alterations of the retina. When combined with clinical findings, OCT contributes significantly to the assessment of disease severity and structural prognosis in patients with retinal artery occlusion.

Keywords: *Retinal artery occlusion, optical coherence tomography, retinal ischemia, inner retinal layers, visual acuity*

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Ethical Approval Statement: This study was conducted in accordance with the principles of the Declaration of Helsinki. Due to the retrospective design of the study and the use of anonymized patient data obtained from routine clinical records, formal informed consent was waived and ethics committee approval was not required according to institutional regulations.

Competing Interest: The authors declare that they have no competing interests.

Perfluorodecanoic Acid (PFDA), A Plasticizing Agent in Food Containers, Induces Adipogenesis: A 3T3-L1 Cell Culture Study

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Obesity is a complex health problem that develops due to many different factors and causes serious health problems on a global scale. Exposure to environmental chemicals can cause changes in human metabolism, making individuals more prone to weight gain and leading to the development of metabolic disorders associated with obesity. PFDA is a synthetic chemical that induces the process of adipogenesis and is an endocrine disruptor to which living organisms are exposed due to its use in food packaging and cookware. The 3T3-L1 preadipocyte cell line has long been widely preferred as an in vitro model for evaluating the adipogenesis process. We aimed to investigate the adipogenesis process in widely used 3T3-L1 preadipocytes differentiated into adipocytes with PFDA. Cells were treated with PFDA under culture conditions. Cell viability was assessed using the WST-1 assay. Adipogenic differentiation and intracellular lipid deposition were examined by Oil Red-O staining. Lipid content was quantified through spectrophotometric analysis. The expression levels of adipogenesis-related genes, including PPARγ, C/EBPα, SREBF1, and FASN, were evaluated by RT-qPCR. Based on the WST-1 assay findings, elevated concentrations of PFDA were found to induce cytotoxic effects. Oil Red-O staining revealed that PFDA at doses of 50, 75, and 100 µM resulted in increased lipid accumulation. According to the gene expression analysis, 50 µM PFDA was chosen as the dose associated with lipid elevation. Additionally, treatment with 75 µM PFDA resulted in a greater increase in lipid levels compared to 50 µM. The relationship between PFDA exposure and obesity was investigated by determining the expression levels of adipogenesis-related genes, including PPARγ, C/EBPα, SREBF1, and FASN. Our RT-qPCR findings indicated that PFDA alone has the capacity to promote adipogenic differentiation. Based on the overall results of this study, we suggest that certain concentrations of PFDA stimulate adipogenesis and lipid accumulation in 3T3-L1 cells. Understanding the obesogenic effects of chemicals that come into contact with our food and can threaten our health is crucial for developing new strategies to safely treat and prevent obesity and related diseases.
Keywords: *adipogenesis, perfluorodecanoic acid, 3T3-L1 cellular model, obesity*

Statements and Declarations

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Development and Validation of a Water Footprint Knowledge Scale for Teachers in Türkiye: A Validity and Reliability Study

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The aim of this study is to develop the Water Footprint Knowledge Scale to assess Turkish teachers understanding of water footprint knowledge. This study employed a methodological design for scale development and was conducted between November 2023 and April 2024. The universe of the study comprised high- school teachers employed in the central district of Kütahya province. The planned scale consists of 15 items; therefore, the sample size was determined to range between 150 and 300 participants. All statistical analyses were conducted with the aid of SPSS 25.0 for general data processing and AMOS for structural equation modeling. Validity of the scale was assessed by applying the Content Validity Ratio (CVR) for content validation, and by conducting Exploratory Factor Analysis (EFA) alongside Confirmatory Factor Analysis (CFA) to examine construct validity. In terms of reliability, internal consistency was measured via Cronbach's alpha coefficient, alongside test-retest procedures and item discrimination analyses comparing upper and lower scoring groups. The final sample included 299 participants, of whom 118 (39.5%) were male and 181 (60.5%) female, with a mean age of 41.2±7.9 years (min=21, max=65). The Kaiser-Meyer- Olkin (KMO) scale was found to be 0.87, and the Bartlett test yielded statistically significant results ($\chi 2 = 1380.1$, $p < 0.001$). Item 5, Item 7 and Item 9, whose item loadings were below 0.30 in the common variance table, were removed and the analysis was repeated. It was seen that the scale consisted of two factors in the obtained structure. In the two-factor structure, Item 2 was removed because the difference between its factor loadings across the two factors was less than 0.10. In the scale consisting of 2 factors and 11 items, the total variance explained was 50.35%. The confirmatory factor analysis values were found to be; X2/sd=1.640, GFI=0.961, AGFI=0.938, CFI=0.973, RMSEA=0.046. The Cronbach alpha value was found to be 0.84 within the scope of reliability analyses. The research shows that the Water Footprint Knowledge Scale functions as an effective assessment tool which measures water footprint knowledge among Turkish teachers with both accuracy and dependability.

Keywords: *environmental health, scale development, water footprint*

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Ethical Approval Statement: Informed consent was obtained from all subjects involved in the study. The study was conducted in accordance with the Declaration of Helsinki and necessary approvals were obtained. (Kütahya Health Sciences University Non-Interventional Clinical Research Ethics Committee, ethics committee board decision dated 11.10.2023 and numbered 2023/11-03) (Kütahya Governorship Approval dated 31.10.2023 and numbered 88510005).

Competing Interest: The authors declare that they have no competing interests.

The Importance of Multifactorial Analysis in Molecular Obesity Studies: A Methodological Example on the Effects of Boron Compounds on SIRT1

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This study examines the effects of boron compounds (boric acid (BA) and calcium fructoborate (CaFB)) on the SIRT1 pathway in adipogenesis at the mRNA, protein, and enzymatic levels, with the aim of highlighting the critical importance of methodological diversity and multifactorial analyses in molecular obesity research. Focusing solely on gene expression levels when defining the effects of anti-obesity candidate compounds can lead to an incomplete explanation of the mechanism. Therefore, considering methodological differences and molecular-level variations in results is fundamental to achieving a complete understanding of the mechanisms of action. In our study, we used the differentiated 3T3-L1 preadipocyte cell line model. The SIRT1 mRNA level in cells treated with CaFB and BA was measured by quantitative PCR (qPCR), and the protein level was measured by enzyme-linked immunosorbent assay (ELISA). Additionally, the effect of boron compounds on the level of SIRT1 enzyme activity was determined using a cell-free method and fluorescence measurement. Our investigations revealed a significant increase in SIRT1 mRNA levels following the application of boron compounds. Specifically, we observed a threefold increase in mRNA levels for 5 mM CaFB ($p < 0.001$). However, this increase was not completely correlated with protein expression levels. Furthermore, SIRT1 activity measurements indicate that boron compounds inhibit SIRT1 enzyme activity in a dose-dependent manner. Significant inhibition of 42% was detected at a concentration of 20 mM CaFB ($p < 0.001$). These findings suggest that higher mRNA levels may be the result of a cellular feedback mechanism designed to compensate for low enzyme activity. Therefore, classifying a compound as an 'activator' based solely on mRNA data can be misleading. Post-translational changes and direct enzyme interactions can alter the outcome significantly. This study demonstrates that focusing solely on mRNA expression in obesity research may lead to inaccurate conclusions. To accurately elucidate molecular mechanisms, it is essential to evaluate findings through multifactorial methodological perspectives by integrating different experimental layers such as gene expression, protein levels, or biochemical activity assays.

Keywords: sirt1, obesity, boron compounds, gene-protein correlation, sirt1 enzyme activity

Statements and Declarations

Funding statement: This study was financially supported by the Scientific and Technological Research Institution of Turkey Projects (Project No: 222S104 and 124S255) **Ethical approval statement:** This study was approved by the Local Ethics Committee. Approval was obtained from the Non-Interventional Research Ethics Committee of Dokuz Eylül University Decision no: 2021/02-71 Date: 18.01.2021 **Competing interest:** The authors declare that they have no competing interests

Synthesis of Thiazole Derivatives Containing Allylhydrazine Moiety and Investigation of Their Cytotoxic Activity

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The Agency for Research on Cancer (IARC) states that cancer is the second leading cause of death after cardiovascular disease in individuals under the age of 85; 20 million new cases and approximately 10 million cancer deaths are expected in 2022. The risk of cancer is increasing globally, and this increase is expected to peak this century. The World Health Organization estimates that there will be more than 35 million new cancer cases by 2050. In 2022, there were 2.3 million new cases and 670,000 deaths from breast cancer in women. Therefore, it is necessary to research effective molecules for cancer, which is a significant cause of death worldwide and for which there is still no radical cure. The thiazole ring is a special five-membered heterocyclic compound containing nitrogen and sulfur atoms. The thiazole ring is found in the structure of many important pharmaceutical drugs, including cancer drugs. Many anticancer drugs and some natural compounds contain a thiazole ring. In light of all this information, 4-phenyl-2-(2-(-3- phenylallylidene)hydrazinyl)thiazole derivatives were synthesized in two steps, starting from sinnamaldehyde in this study. The structures of the synthesized final compounds were confirmed by ^{1}H NMR and ^{13}C NMR methods. The anticancer activity of the synthesized compounds against A549, C6, and MCF7 cell lines was investigated. Additionally, studies were conducted on the healthy cell line NIH/3T3. One of the synthesized compounds was found to exhibit moderate cytotoxic activity against the MCF7 cell line.

Keywords: *thiazole, breast cancer, cytotoxicity*

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Competing Interest: The authors declare that they have no competing interests

Effects of Mocetinostat-Resveratrol Combination on JAK, STAT-3, and BCL-2 Proteins in a Lung Cancer Cell Line

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Currently, single-agent therapies in cancer treatment yield shorter- lived responses and cause toxic effects in normal tissues. Therefore, these agents are used in combination or multi-component regimens with various chemotherapy drugs to both enhance efficacy and reduce toxicity. Mocetinostat, a histone deacetylase inhibitor, exerts anticancer effects primarily through induction of cell cycle arrest, apoptosis, and suppression of angiogenesis. Recognized as a key therapeutic agent in oncology, it holds substantial promise in cancer management. Resveratrol, a polyphenolic antioxidant derived from dietary sources such as grapes, peanuts, and select mulberry species, has demonstrated notable chemopreventive and chemotherapeutic properties. The present study aimed to evaluate the effects of the mocetinostat-resveratrol combination on cell proliferation in the A549 lung cancer cell line and to elucidate the alterations it induced in the expression levels of JAK, STAT-3, and BCL-2 proteins, which play pivotal roles in cancer development. The combined effects of mocetinostat and resveratrol on A549 lung cancer cells were evaluated using cell viability assays, reactive oxygen species detection, and immunoblot analysis. The half-maximal inhibitory concentrations (IC50) for the mocetinostat-resveratrol combination were determined as 2/30 µM following 48 hours of treatment. This regimen led to reduced cell proliferation, elevated reactive oxygen species levels, and altered expression of BCL-2, STAT-3, and JAK proteins. The combined treatment of mocetinostat and resveratrol induces cell death in lung cancer cells in a time-dependent manner.

Keywords: *Mocetinostat, Resveratrol, Combine treatment, Lung cancer*

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Competing Interest: The authors declare that they have no competing interests.

The Relationship Between Food Inflation–Related Consumer Behaviors and Perceived Stress: A Cross-Sectional Study

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Food inflation has become an important socioeconomic stressor affecting individuals' daily lives and health-related behaviors. The aim of this study was to examine the relationship between food inflation–related consumer behaviors and perceived stress levels in adults. This cross-sectional study was conducted with 320 adults aged 18–64 years. Participants' sociodemographic characteristics and anthropometric measurements were recorded. Food inflation–related behaviors were assessed using the Food Inflation Consumer Behavior Scale, which consists of the subdimensions of food consumption status, food shopping behaviors, and purchasing motivations, while perceived stress was measured using the 14-item Perceived Stress Scale (PSS-14). The mean perceived stress score of participants was 30.83 ± 6.02, indicating a moderate to high stress level. Among food inflation–related behaviors, the most pronounced effect was observed in the food shopping behaviors subdimension. Perceived stress was positively and significantly associated with food consumption status ($r = 0.115$, $p = 0.039$), food shopping behaviors ($r = 0.211$, $p < 0.001$), and total food inflation score ($r = 0.223$, $p < 0.001$), whereas no significant relationship was found with purchasing motivations ($p > 0.05$). In multiple linear regression analysis, the total food inflation score was identified as an independent and significant predictor of perceived stress ($B = 2.73$, $p < 0.001$), and gender was also found to have a significant effect on stress levels ($p = 0.024$). The model explained 6.6% of the variance in perceived stress. In conclusion, food inflation–related consumer behaviors, particularly changes in food shopping behaviors, are associated with higher perceived stress levels among adults, suggesting that rising food prices may influence psychological stress through everyday food-related decision-making; these findings indicate that access to affordable food is important not only for nutritional health but also for mental well-being.
Keywords: *food inflation, perceived stress, consumer behavior, food shopping, adults*

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Ethical Approval Statement: This study was approved by the Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee (Decision No: 291, Date: 06.03.2025). All participants were informed about the study, and written informed consent was obtained prior to participation.
Competing Interest: The authors declare that they have no competing interests.

Antibacterial Potential of Propolis Extracts Against Carbapenem-Resistant Bacteria Isolated from Clinical Samples

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The growing ineffectiveness of conventional antibiotics against multidrug-resistant microorganisms represents a serious global health challenge. This study evaluated the antibacterial efficacy of propolis extracts exhibiting distinct phenolic profiles against carbapenem-resistant clinical isolates. The antimicrobial activity of the propolis extracts was assessed against *Acinetobacter baumannii* (K17, K16, K21), *Klebsiella pneumoniae* (K22, K19), and *Stenotrophomonas maltophilia* (E5, E7, E4) strains obtained from tracheal aspirates and blood cultures. Total phenolic content and detailed phenolic composition of the extracts were determined. Antibacterial activity was evaluated using the disk diffusion assay, and minimum inhibitory concentration (MIC) as well as minimum bactericidal concentration (MBC) values were calculated. The findings demonstrated that all propolis extracts exhibited variable inhibitory effects against the tested bacterial strains. Overall, the pronounced antibacterial activity of propolis extracts against resistant pathogens such as *A. baumannii*, *K. pneumoniae*, and *S. maltophilia* highlights their potential as alternative or complementary agents in the management of resistant infections. Nevertheless, these findings should be substantiated by further randomized and well-designed clinical studies.
Keywords: *Antimicrobial, carbapenem-resistant bacteria, propolis, alternative medicine*

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Competing Interest: The authors declare that they have no competing interests.

Molecular Prediction and Modeling of Bee Venom Effectiveness on Metastatic Breast Cancer Tissue Using Fuzzy Logic and Artificial Intelligence

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Metastatic breast cancer remains a major clinical challenge due to its high mortality and limited therapeutic options. This study aims to predict the molecular effectiveness of bee venom on metastatic breast cancer tissue using computational approaches based on fuzzy logic and artificial intelligence. A multidimensional dataset was generated from hypothetical biochemical parameters and cellular response indicators. Fuzzy logic algorithms were applied to handle uncertainty and biological variability, followed by artificial neural networks to classify the potential impact of bee venom on apoptotic pathways and inhibition of metastatic cell proliferation. The developed model achieved an overall prediction accuracy of 91.4%, with sensitivity and specificity values of 92.1% and 94.8%, respectively. The simulation indicated a 88% probability of significant apoptotic activation and a 68% reduction in metastatic proliferation under modeled conditions. These findings suggest that bee venom may exert notable molecular effects that can be reliably predicted through computational modeling. This approach offers a cost-effective and time-saving strategy for optimizing therapeutic interventions prior to experimental validation. Further studies will integrate real-world omics data and expand the model to include drug synergy predictions, enabling more comprehensive therapeutic planning. By accurately modeling complex molecular interactions, it opens a pathway toward personalized cancer therapies and innovative treatment strategies.

Keywords: *fuzzy logic, artificial intelligence, bee venom, breast cancer, computational modeling*

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Ethical Approval Statement: No ethical approval was required as the study was based solely on computational modeling.
Competing Interest: The author declares that he has no competing interests.

Antioxidant and Antibacterial Effects of Hydroetahnolic Extract Obtained from *Moringa oleifera* Plant

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Throughout the ages, human beings have depended on the plant kingdom to meet their needs, including therapy. The therapeutic use of plants to treat certain human pathologies goes back a very long way, and has evolved with the history of mankind. The current work aims to extract bioactive compounds from *Moringa oleifera* and evaluate their antioxidant and antibacterial effects. Comprehensive chemical screening of *M. oleifera* revealed a rich profile of bioactive compounds, including flavonoids, alkaloids, and saponins. The extract contains a high quantity of total phenolic and total flavonoids contents. Antioxidant activity assay demonstrated significant free radical scavenging capability. The antibacterial effect results disclosed the inhibition zones ranged from 7.5mm against *S. typhitirium* and 11.1mm against *E. coli*, while it exhibited no antifungal apt except *Penicillium* sp. This research highlights the importance of *M. oleifera* leaves as a source of antioxidants and using them in food and pharmaceutical domains.

Keywords: *M. oleifera leaves, phytochemical screening, DPPH assay, antibacterial.*

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Quantification of Phenolic Compounds and Evaluation of Antioxidant and Anti-inflammatory Activities of *Silybum marianum* Extract *in vitro*

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The present work contributes to the quantification of phenolic compounds from a medicinal plant (*Silybum marianum*), and the evaluation of their antioxidant and in vitro anti-inflammatory activity. Quantitative phytochemical analyses revealed the content of secondary metabolites in the methanolic extract as 181.92 ± 63.92 mg GAE/g of extract for polyphenols, 151.76 ± 3.5 mg QE/g of extract for flavonoids, and 92.8 ± 8 mg GAE E/g of extract for tannins. The antioxidant activity of S. marianum extract was evaluated by three in vitro tests: free radical scavenging assay (DPPH), ferric reducing antioxidant power assay (FRAP), and β-carotene bleaching test (BCB). The antioxidant activity expressed as percentage inhibition of DPPH free radical at 1 mg/mL is 49.999 ± 2.145%. The inhibitory power of β-carotene bleaching is 33.33 ± 0.12%, and the ferric reducing power of the extract showed a value of 582.68 ± 1.63 mM Fe(II) equivalents. The extract of *S. marianum* showed a membrane lysis inhibitory power of 69.15 ± 0.15% for red blood cells. *S. marianum* may constitute a potential source of antioxidants used for therapeutic purposes.

Keywords: *Silybum marianum, polyphenols, antioxidant, antiiflammatory*

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Ethical Approval Statement: Our study did not require ethics committee approval.
Competing Interest: The authors declare that they have no competing interests.

Determination of the Antioxidant Capacity of Some Thiazole Derivatives Using the CUPRAC and DPPH Method

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The chemical versatility of the thiazole ring enables its participation in a broad range of pharmacological activities, including antioxidant, antimicrobial, anti-inflammatory, and anticancer effects [1,2]. The incorporation of the thiazole ring into antioxidant molecular architectures has emerged as a promising strategy for developing new therapeutic agents targeting the interlinked pathways of oxidative stress and inflammation, attracting the attention of researchers in recent years [3-6]. In this study, the antioxidant properties of some thiazole compounds were investigated using DPPH and CUPRAC methods. Amide, urea, and benzyl-substituted thiazole compounds were obtained from the reactions of the 4-phenyl-2-aminothiazole derivative with acetyl chloride, phenyl isocyanate and benzyl chloride, respectively. Compound 5 was obtained from the formylation reactions of these compounds, and compound 7 was obtained from 4-bromoacetophenone. In addition, the synthesis pathways of thiazole compounds are given, and the product formations in the formylation reactions of thiazole compounds are discussed. Evaluation of antioxidant capacity is of great importance in the development of bioactive heterocyclic compounds with potential therapeutic applications. Compound 7 (13.7% RSC) showed the best DPPH activity (Reference trolox 8.4%). When the CUPRAC test was applied to compound 7, the TEAC value (Trolox equivalent antioxidant capacity) was found to be 1.75.These results show that compound 7 is weak in radical scavenging but strong in reducing power.
Keywords: *thiazole; CUPRAC; DPPH; antioxidant.*

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Competing Interest: The authors declare that they have no competing interests.

In-vitro α-Amylase and α-Glucosidase Enzymes Inhibitors and Free Radical Scavenging Ability of Fenugreek Methanol Eextract

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Many traditional foods, especially plant foods, are reported to possess biological properties that can be of benefit to human health. An example of this is the leguminous plant fenugreek (*Trigonella foenum-graecum*). Fenugreek is a widely used herbal medicine as a complementary therapy for diabetes mellitus. Lots of clinical trials have proved its beneficial effect on glycemic control parameters and lipid profiles. This study aims to investigate the antioxidant potential and, in vitro, antidiabetic effect of fenugreek methanolic extract. The antioxidant capacity was assessed by measuring DPPH reduction and FRAP method. The antidiabetic activity was determined by the inhibition of α-amylase and α-glucosidase. The findings showed that the examined extract possess high antioxidant effect. The antiradical activity (DPPH inhibition) was of 78,23% while, the antioxidant activity (FRAP assay) was 343,7 Fe 2+ /kg. In the case of intestinal α-glucosidase activity, the fenugreek methanol extract had a high inhibitory effect on intestinal α-glucosidase activity with 78.26 ± 1.42%, comparable to the effect of acarbose (83.90 ± 1.12%). For the pancreatic α-amylase enzymatic inhibitory assay, the studied extract showed an inhibitory capacity of 68,21± 2,38%. Our finding indicates that fenugreek showed strong antioxidant effect, sugesting its use as a potential source of natural antioxidant against free radical associated diseases and could constitute promising nutraceuticals for the prevention and treatment of type 2 diabetes mellitus.

Keywords: *fenugreek ; antioxidant ; diabetes ; α- amylase ; α glucosidase.*

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Ethical Approval Statement: Not applicable.
Competing Interest: The authors declare that they have no competing interests.

Pharmacological Evaluation of the Photoprotective, Neuromodulatory and Antidiabetic Capacities of *Paronychia capitata* L. with Biochemical Interaction Investigation

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Plants play a crucial role in global pharmacology. Indeed, modern research uses plants as a starting material point to identify molecules of therapeutic interest, known as active ingredients. In addition, bioinformatics and specifically help during drug formulation process by allowing to visualize the possible interaction of these phyto-compounds with receptor active sites. Let's not forget that Paronychia species have pharmacological importance, due to their traditional uses and their potential as a source of bioactive compounds. In this context, this study aimed to reveal for the first time the capacity of *Paronychia capitata* fractions to regulate the activity of key enzymes named alpha-amylase and butyrylcholinesterase (BuChE), due to their implication in both diabetes and neuroprotection. Moreover this study tested the photoprotective effect of our herb based on European standard protocol and evaluate the possible interaction of a major identified compound with binding sites of BuChE. Our investigation revealed that among the 3 tested fractions, the n-butanol fraction exerted the most noticeable effect against α-amylase (48.17 ± 2.38 %) and this herb possess a high photoprotective factor (43.40 ± 0.32), when referred to the European commission recommendation on sun products categories. However, the ethyl acetate fraction was the most active against buterylcholinestarase (58.79 ± 2.98 %), with a respective IC_{50} = 94.08 ± 2.39 µg/mL. The molecular docking results showed that our compound could possibly interact with BuChE, but in antagonistic way (-6.4 kcal/mol) and various interactions such us hydrophobic contact, cation pi interactions and hydrogen bounds could be generated, involving various amino acids such as phenylalanine [F329], tyrosine [Y332], aspartic acid [D70], proline [P285]. In conclusion, the biological in vitro data observed in this study may be insufficient and must be reproduced within a whole living organism to confirm the pertinence of these data.

Keywords: *α-amylase, BuChE, Paronychia capitata, pharmacology, photoprotective.*

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Ethical Approval Statement: Not needed for this work.
Competing Interest: The authors declare that they have no competing interests.

Evaluation of Traditional Methods Used for Episiotomy Healing in Women Who Have Had Vaginal Birth

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This study aimed to examine traditional methods used for episiotomy healing in women who have had vaginal deliveries. This study is a descriptive, cross-sectional, retrospective research. The study population consisted of women in Silifke district who had vaginal births and used traditional methods for episiotomy healing. The sample group consisted of 400 women who met the inclusion criteria, used social media, and could be individually contacted between April 1, 2005, and July 1, 2025. In line with the study's objective, a questionnaire (16 questions) prepared through a literature review was sent to women using social media channels. In this study, frequency and percentage distributions (n, %) were used as descriptive statistics for categorical variables in the analysis of the data. It was found that 56.0% of the women had a bachelor's degree, 68.0% had experienced 2-4 pregnancies, and 83.5% had given birth more than 6 months prior. İt was determined that all women (100.0%) were knowledgeable about them, and 42.3% used a traditional method for healing postpartum stitches. It was determined that women learned traditional methods largely from their elders (73%). Traditional methods were most frequently preferred for reasons such as wound healing (61.3%), pain relief (58%), burn treatment (36.2%), massage (35.2%) and accelerating healing (35.2%). Furthermore, women used traditional methods for reasons such as positive experiences of those around them (51.4%), low side effects (47.8%), high positive effects (35.9%), previous use and satisfaction (30.6%), being something continuously practiced in their culture (27.6%), ease of access (27.3%), low cost (25.3%), and being more effective and safer (14.4%). The methods used by women, in order of frequency, were found to be: St. John's wort oil, hot and cold sitz baths, olive oil, massage, cold application, lavender, aloe vera, music therapy, yoga, and egg cream. Women also continue to use these methods to speed up healing, reduce pain, and prevent scarring. In light of these findings, it is important for health professionals to question women's use of traditional methods, provide counseling on potential benefits and risks, and evaluate cultural practices holistically using evidence-based approaches.

Keywords: *vaginal birth, traditional methods, recovery*

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Ethical Approval Statement: Ethical approval statement: The necessary permissions for the study were obtained from the Mersin University Clinical Research Ethics Committee (dated 19/03/2025 and numbered 2025/315).
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Evaluation of Posttraumatic Stress Syndrome, Postpartum Depression and Maternal Attachment in Puerperium Who Experience the Earthquake

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Women in the postpartum period constitute a particularly vulnerable group in the face of traumatic events, as such experiences can exacerbate psychological distress and compromise maternal mental health. The study aimed to investigate the impact of the February 6, 2023 earthquake in Turkey on posttraumatic stress, maternal attachment, and postpartum depression among puerperal women. The present descriptive study comprised 128 puerperal women. A sociodemographic survey was administered to participants in combination with three validated tools: the EPDS for postpartum depression, the MAI for maternal attachment, and the IES-R for posttraumatic stress symptoms. The participants exhibited relatively high mean maternal attachment scores. Mean scores on the Edinburgh Postpartum Depression Scale exceeded the established cut-off, with 56% of women identified as being at risk for postpartum depression. The results indicated the presence of posttraumatic stress symptoms, as measured by the Impact of Event Scale-Revised, in 95.3% of the participants. A weak yet statistically significant negative correlation was identified between maternal attachment (MAI) scores and postpartum depression (PPD) scores. A moderately significant positive correlation was identified between the EPDS and IES-R scores. There was no statistically significant relationship found between posttraumatic stress symptoms and maternal attachment. This study revealed that maternal attachment of puerperants was not affected after the earthquake, postpartum depression rates were seen in more than half of the participants, and almost all of them developed posttraumatic stress syndrome.

Keywords: *maternal attachment, postpartum depression, posttraumatic stress syndrome, earthquake.*

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Ethical Approval Statement: Written permission for the conduct of the study was obtained from Hatay Dörtyol Hospital, and ethical approval was granted by the Gazi University Ethics Commission (E-77082166-604.01.02-779238) to evaluate the ethical suitability of the study. All of the participants signed a written informed consent form before participating in the study.
Competing Interest: The authors declare that they have no competing interests.

Health-Seeking Behaviors and the Impact of Menstrual Attitudes in Women Experiencing Dysmenorrhea

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Dysmenorrhea is a common problem affecting women's health and requiring treatment. Women's attitudes towards their menstrual cycle can directly influence their health-seeking behavior. This study is descriptive-correlational in nature. The sample group consisted of 550 women aged 18 and over who experienced their menstrual cycle. The Health-Seeking Behavior Scale, the Menstrual Attitude Scale, and the Numerical Rating Scale were used for data collection. Study data were collected using an online questionnaire. The mean age of the women was 28.03 ± 8.97, and 82.2% (n:452) experienced dysmenorrhea. The mean score on the Health Seeking Behavior Scale was 3.39 ± 0.54, and the mean score on the Menstrual Attitude Scale was 89.47 ± 6.16. The most frequently preferred coping mechanisms for women dealing with dysmenorrhea were rest/sleep (74.1%), painkiller use (73.0%), and heat application (65.7%). The most common reasons for not seeking health care were believing they could cope on their own (57.5%), perceiving painful menstruation as normal (55.5%), and using traditional methods (24.7%). A statistically significant difference was found between women's income level and their mean scores on the Health Seeking Behavior Scale ($p<0.05$). A weak, negative correlation was found between the scores obtained from the Health Seeking Behavior Scale and the Menstrual Attitude Scale ($p=0.020$; r:-0.110). The study revealed that a significant majority of women experience dysmenorrhea and that positive attitudes towards menstruation reduce health-seeking behavior. This finding emphasizes the importance of awareness and education programs aimed at increasing women's health-seeking behavior and the necessity of interventions such as educational programs on dysmenorrhea management.

Keywords: *Dysmenorrhea, Health-Seeking Behavior, Menstrual Attitude, Women.*

Funding Statement: This research was supported under the TÜBİTAK 2209-A University Students Research Projects Support Program (Project No: 1919B012402214).
Ethical Approval Statement: This research was conducted in accordance with Ethical approval for the study was obtained from Kütahya Health Sciences University Non-Interventional Research Ethics Committee (E-41997688-050.99-176716).
Competing Interest: The authors declare that they have no competing interests.

Large Appendiceal Neuroendocrine Tumor Incidentally Detected After Acute Appendicitis: A Case Report

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Appendiceal neuroendocrine tumors (NETs) are most commonly detected incidentally after appendectomy performed for acute appendicitis. Although most are small and low-grade, tumor size, depth of invasion, and surgical margin status are critical factors that determine further management. Case Presentation Patient Information: A 20-year-old female patient. On October 8, 2025, the patient underwent appendectomy in an outside center with a diagnosis of acute appendicitis. Pathological Findings After Appendectomy: - Well-differentiated neuroendocrine tumor, WHO Grade I - Tumor size: 4 cm - pT3 - Mitotic index: <1 mitosis / 2 mm² - Tumor invaded beyond muscularis propria into subserosa and mesoappendix - Tumor continuity at the proximal surgical margin (cecal junction) - Mesenteric radial margins intact - No tumor necrosis - No lymphovascular invasion - Perineural invasion present The patient was staged as T2N0M0, Stage II. Due to positive surgical margin and high-risk tumor features, the patient underwent right hemicolectomy + ileotransversostomy. Pathology After Right Hemicolectomy: - No residual tumor was identified - Morphology code: 0000/0 – No neoplasm detected - No lymph node metastasis - Surgical margins were negative The postoperative course was uneventful and the patient was discharged in good condition. Tumors larger than 2 cm, invasion beyond muscularis propria, positive surgical margins, and perineural invasion are indications for additional surgery. In this case, tumor size and positive margin justified completion right hemicolectomy with ileotransversostomy, which proved curative. Histopathological evaluation after appendectomy is essential. Tumor size, depth of invasion, and margin status guide further surgical management.

Keywords:

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Ethical Approval Statement: The statement is not declared by author(s).
Competing Interest: The statement is not declared by author(s).

A Patient with COPD: Adaptation to the Disease and Nursing Interventions: A Case Presentation

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Chronic illnesses can cause problems with adapting to the illness and treatment, particularly due to lifestyle changes, multifaceted losses and dependence on others. Adaptation is fundamental to the treatment of chronic diseases. When assessing individuals with COPD, factors affecting adherence to the disease must be considered. Effective nursing education is an approach that contributes positively to disease adaptation by ensuring symptom control, increasing compliance with disease and treatment, and reducing exacerbations. Non-adherence to treatment in COPD is a significant problem that increases the burden of disease and healthcare costs. In this case presentation, a patient diagnosed with COPD was assessed in terms of disease and treatment adherence from psychosocial perspectives, and the impact of nursing interventions on the adherence process was discussed. A 43-year-old male patient diagnosed with COPD three years ago has been hospitalised in the chest diseases clinic for seven days. It has been determined that the patient is unable to adapt to the disease and treatment. An assessment using the Psychosocial Adjustment–Self-Report Scale revealed psychosocial problems such as anger, hopelessness, helplessness, role loss, fear of dependence, depressive appearance, and social isolation. The patient's level of adaptation to the illness was observed, and individualised nursing interventions were planned and implemented based on information and data questioning their adaptation. Positive changes were observed in the patient's adaptation to the illness and treatment after nursing education and psychosocial support. The assessment of psychosocial adjustment in patients with COPD and targeted

Keywords: *patient compliance; nursing care; COPD*

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Ethical Approval Statement: For the case presentation, the patient was given verbal and written explanations, and the procedure was carried out in accordance with the 1964 Helsinki Declaration and ethical standards. Informed consent was obtained from the patient.
Competing Interest: The authors declare that they have no competing interests.

Determination of Communication Needs of Pediatric Nursing Course Students with Adolescents Diagnosed with Cancer: Q Methodology

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Adolescence is a period during which individuals prepare for adulthood in terms of their physical, cognitive, sexual, social, psychological and emotional development. The rapid change experienced by adolescents during their treatment for cancer can lead to communication problems. The perception of cancer by adolescents, their experiences during the disease process, their coping methods, the prognosis of the disease, facing a life-threatening disease, adhering to strict treatment regimes, changes in physical appearance and separation from peers and school are all affected by care and communication. It is important for student nurses undertaking clinical practice to bear this in mind when communicating with adolescents diagnosed with cancer. This study aimed to determine the needs and priorities of student nurses when communicating with adolescents diagnosed with cancer, using Q methodology. Q methodology was employed in the study design. Q methodology is based on the activity of ranking statements about a particular subject. Fifty undergraduate nursing students from a state university in Turkey participated in the study. The students ranked the 18 statements from most to least important, taking their own needs into account. The Q-rankings were analysed using factor analysis. Three factors revealing the communication needs of the students when interacting with adolescents diagnosed with cancer were extracted. These were 'emotion management', 'information requirements about characteristics of the age group' and 'information requirements about the cancer diagnosis, treatment and care'. Identifying and prioritising the communication needs of student nurses can help to overcome barriers. This may lead to an increase in healthcare quality, patient satisfaction, and positive health outcomes.

Keywords: *adolescent, cancer, communication, Q methodology, nursing student*

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Competing Interest: The authors declare that they have no competing interests.

Gamifying Health Literacy Among Adolescents: A Systematic Review

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Gamification refers to the application of game elements and mechanics to non-game contexts, enhancing motivation, engagement, and learning. In recent years, gamification has emerged as an effective strategy for enhancing health literacy among children and adolescents, leading to increased knowledge acquisition, positive changes in health behaviors, and improved long-term health outcomes. Interest in gamified health interventions has grown substantially over the past decade, particularly within digital health education. This study is a systematic review conducted in accordance with the PRISMA guidelines. The search strategy was developed using the PICOS framework (Population, Intervention, Comparator, Outcomes, Study design). The population consisted of adolescents; interventions included gamification-based approaches designed to improve health literacy. Comparators involved traditional educational methods or non-gamified interventions. Outcomes focused on adolescents' health literacy levels. Relevant articles published between 2020 and 2025 were identified through searches of the Web of Science, Scopus, PubMed, and CINAHL databases. Studies were included if they involved adolescents, implemented gamification-based interventions, and assessed health literacy outcomes. A total of 12 studies met the inclusion criteria and were included in the review. Data were systematically analyzed using a researcher-developed data extraction form.The findings indicate that gamification significantly enhances learning engagement and motivation, particularly in the domains of mental health literacy, nutrition education, promotion of physical activity, chronic disease management, and sexual health literacy. Despite consistent evidence supporting the effectiveness of gamified interventions, several systemic challenges were identified, including limited technological infrastructure, cultural stigma, variability in governmental and educational policy support, and unequal accessibility across different socioeconomic contexts. In conclusion, this review highlights the critical role of game design in adolescent health education and underscores the need for robust infrastructure investments, policy reforms, and professional development for educators. Future research should prioritize longitudinal studies to assess sustainability, conduct cross-cultural comparative analyses, and evaluate economic feasibility. Strategically implemented, gamification-based health education interventions— supported by strong multisectoral collaboration—hold substantial potential for improving adolescent health literacy and reducing global health literacy gaps.

Keywords: *adolescent, gamification, health literacy, nursing*

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Confronting Tracheostomy as a Caregiver in the Palliative Unit: A Case Report

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Stroke is a neurological disorder that causes chronic dependence in individuals in physical, psychological, and social dimensions. Approximately 50% of stroke survivors continue their lives with permanent disabilities, and half of these require rehabilitation due to their existing disabilities. While patients and their relatives experience shock at how their lives will be affected, they also try to adapt to this acutely developing situation. Caregivers of patients diagnosed with stroke face a significant care burden arising from the patient's post-stroke needs. This case report examines a caregiver who undertook the care of a 73-year-old patient diagnosed with Hypoxic-Ischemic Brain Injury and undergoing tracheostomy, expressing concerns about the care process and seeking support in their caregiving roles. The patient's Zarit Caregiver Burden Scale score was 68. The caregiver stated that "aspiration procedure," "monitoring," "difficulty communicating with the patient," and "discharge anxiety" were the main challenges in caregiving. Nursing interventions were applied within the scope of the identified caregiver burden in this case. Nursing care, education, and support provided to the caregiver of a patient undergoing tracheostomy are essential factors in patient care. In palliative care for patients followed with tracheostomy, nursing support has been observed to significantly contribute to improving the caregiving roles of caregivers. Ethical consent was obtained from the patient's family.

Keywords: *Caregiver, Ischaemic Stroke, Tracheostomy*

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Ethical Approval Statement: Since this was a case report, the purpose of the study was explained and written informed consent was obtained from the caregiver.
Competing Interest: There is no conflict of interest related to this article.

The Effect of Nursing Students' Level of Cyberchondria on Their Health Perception

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This study aimed to examine the effect of nursing students' levels of cyberchondria on their perceptions of health. This cross-sectional study was conducted with nursing students enrolled in a faculty of nursing during the 2025–2026 academic year. The study population consisted of all students in the faculty (n = 781). Using the sample size formula for a known population, the sample was determined to include 202 students. Data were collected using a "Descriptive Information Form," the "Cyberchondria Severity Scale," and the "Health Perception Scale." The mean age of the nursing students was 20.7 ± 2.4 years, and the majority were female (94.1%) and third-year students (56.9%). More than half of the participants (57.4%) lived at home, 10.4% reported having a chronic illness, and 36.1% used medication regularly. Most students (79.2%) stated that they were satisfied with the nursing program, and 63.4% indicated that they primarily used official websites when searching for health-related information online. The mean score on the Cyberchondria Severity Scale was 84.5 ± 17.2, indicating a level above moderate, while the mean score on the Health Perception Scale was 47.5 ± 6.0, indicating a moderate level. Correlation analysis revealed a weak and statistically non-significant negative relationship between students' cyberchondria levels and their health perception (r = –0.076, p = 0.283). The study revealed that nursing students frequently search for health-related information online; however, this behavior did not negatively affect their perception of health. This finding suggests that digital health information seeking increases awareness among students without leading to a negative shift in health perception. Accordingly, it is recommended to develop educational programs aimed at enhancing nursing students' digital health literacy. Training students to identify reliable health information sources, access accurate and up-to-date information in online health research, and manage anxiety in digital environments may help reduce cyberchondria tendencies and strengthen their health perceptions.

Keywords: *cyberchondria; health perception; nursing; student*

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Ethical Approval Statement: The study was approved by the Gülhane Scientific Research Ethics Committee (Date:25.11.2025; Decision No: 2025-539), and institutional permission was obtained from the faculty where the research was conducted. In addition, the students who agreed to participate in the study were provided with detailed information about the research by the investigators, and both written and verbal informed consent were obtained.

Competing Interest: The author declares that there are no competing interests.

The Mediating Role of Job Stress in the Relationship Between Clinical Nurses' Psychological Well-Being and Psychosocial Caregiving Competence*

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Nurses' psychological well-being, job stress levels, and psychosocial care competencies constitute critical determinants of professional sustainability and the overall quality of patient care. Although each variable has been examined independently in previous research, studies that evaluate their interrelationships within an integrative framework remain scarce. The aim of this study is to examine the relationships among psychological well-being, psychosocial care competencies, and job stress in clinical nurses.This cross-sectional and descriptive study was conducted with 188 nurses employed for at least six months in the internal medicine and surgical clinics of a public hospital in Kocaeli. Data were collected face-to-face between March 8 and October 25, 2024, through a Personal Information Form, the Psychological Well-Being Scale (PWS), the Psychosocial Care Competence Self-Assessment Scale (PCSSAS), and the Nurse Stress Scale (NSS). The relationships among psychological well-being, psychosocial care competence, and job stress were analysed using Structural Equation Modeling (SEM).In the study, the mean PWS score of the nurses was found to be 44.1 ± 6.3; the mean PCSSAS score was 64.8 ± 9.1; and the mean NSS score was 76.8 ± 12.2. In the SEM analysis, psychological well-being demonstrated a significant positive effect on psychosocial care competence ($\beta = 0.226$, $p = 0.001$). On the other hand, the effect of job stress on psychosocial care competence was not found to be significant, and the effect of psychological well-being on job stress was also not statistically significant ($\beta = –0.054$, $\beta = –0.099$, respectively; $p > 0.05$).The findings indicate that nurses in this study exhibited relatively high levels of psychological well-being, moderate levels of psychosocial care competence, and below-moderate levels of job stress. Psychological well-being emerged as a key predictor of psychosocial care competence, whereas job stress did not serve as an intervening mechanism in these associations. These results underscore the necessity of designing and implementing organizational and psychosocial interventions that enhance nurses' psychological well-being asa strategic approach to strengthening the quality of psychosocial care.

Keywords: *Psychological well-being, psychosocial care, job stress, nursing, structural equity model.*

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Ethical Approval Statement: Ethical approval from Kocaeli City Hospital Scientific Research Ethics Committee (Date: 28.12.2023, Number: 2023-29).
Competing Interest: The authors declare that they have no competing interests.

* The Effects of Nurses' Psychological Well-Being and Perceived Work Stress on Their Psychosocial Care Competencies, Gamze Aygün, Kocaeli University Institute of Health Sciences, Master's Thesis in Mental Health and Psychiatric Nursing

Synthesis of Triazole Compounds as Aromatase Inhibitors and Investigation of Their Cytotoxic Effects on the MCF-7 and L929 Cell Lines*

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Breast cancer is a pathological disorder resulting from the uncontrolled growth of cells in breast tissue due to a loss of ability to divide. Globally, it is the most common cancer in women. According to a 2020 study, approximately 2.3 million women worldwide were affected by breast cancer, and approximately 685,000 deaths occurred due to breast cancer. By the end of 2020, 7.8 million women had been diagnosed with breast cancer in the previous five years, making it the most common type of cancer in women worldwide. When breast cancer patients are examined, approximately 70% of cases are ER (+) patients. Hormone-dependent breast cancer management relies on targeting estrogen signaling. Two main approaches have been adopted for this purpose: direct suppression of the estrogen receptor (ER) through antagonists or degraders, or inhibition of ligand (estrogen) biosynthesis using aromatase inhibitors. In this study, we aimed to develop triazole-structured inhibitors that inhibit the aromatase enzyme, which plays a crucial role in the aromatization step of estrogen biosynthesis, enabling the synthesis of estrogen from androgens. Cytotoxicity measured by the MTT method showed that compounds **3i, 3g, 3n,** and **3m** were the most effective. They inhibited MCF-7 at **19.96 µM, 15.75 µM, 52.29 µM,** and **43.49 µM**, respectively. Compounds **3i,3g,3n** and **3m** also inhibited L929 at **17.47 µM, 14.55 µM, 130.2 µM,** and **111.6 µM**, respectively. According to aromatase inhibition studies, compounds **3i, 3g, 3n,** and **3m** inhibited aromatase enzymes at concentrations of **8.59 µM, 11.98 µM, 11.41 µM,** and **7.69 µM**, respectively. Furthermore, molecular docking results showed that all four compounds exhibited similar binding energies to the aromatase enzyme. Considering ADME studies, compounds **3n** and **3i** can be said to be the most promising compounds due to their high GI absorption, optimal lipophilicity, good water solubility, and medicochemical safety profile. Based on the ADME studies and other research results, compound **3n** was found to be the most promising compound.

Keywords: *Breast cancer, aromatase, MCF-7, L929, Molecular docking*

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Ethical Approval Statement: Because our study does not work with biological samples such as humans or animals, it does not require ethical committee approval.

* DESIGN, SYNTHESIS AND MOLECULAR MODELLING STUDIES OF NEW TRIAZOL DERIVATIVES AS AROMATASE INHIBITORS Emine Rana BAĞCI Department of Pharmaceutical Chemistry Anadolu University, Institute of Graduate Education, June 2025

Competing Interest: The authors declare that they have no competing interests.

Psychometric Testing of the Gastrointestinal Quality of Life Index (GIQLI) in the Turkish Population

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To translate and culturally adapt the GIQLI (T-GIQLI) into Turkish and to evaluate its psychometric properties. Methodological study. A total of 210 patients diagnosed with gallstone disease participated. T-GIQLI and the Short Form Health Survey (SF-36) was used. Language validity, content, convergent, and construct validity (confirmatory factor analysis) were assessed. Item statistics, internal consistency, test-retest reliability, and responsiveness were also evaluated. The content validity index was high at 0.93. Factor analysis revealed a good-excellent overall model fit ($\chi 2/df=2.35$, RMSEA=0.03, CFI=0.94, IFI=0.94, SRMR=0.05; GFI=0.82). Convergent validity was supported by significant correlations with SF-36 Physical and Social Functioning domains (r=0.70-0.73, $p<0.001$, respectively). Internal consistency was strong, with overall Cronbach's alpha of 0.93 and subscale' alphas between 0.72 and 0.83. Item-total correlations (0.51–0.78) and an intraclass correlation coefficient of 0.86, confirmed the reliability of the tool. The scale successfully measured change of post-surgical improvement in quality of life (Standardized Response Mean=0.885) ($p<0.001$), showing a robust responsiveness ability. T-GIQLI as a reliable, valid, and responsive measure to determine health related QoL in patients with gastrointestinal diseases.

Keywords: *Cross-Cultural Comparison; Gastrointestinal Diseases; Quality of Life; Psychometrics; Reliability and Validity.*

Funding Statement: the study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Ethical Approval Statement: This study was approved by the Izmir Bozyaka Training and Research Hospital Non-Invasive Research Ethics Board (approval number: 2022/09, date: 12/01/2022). All patients received detailed information regarding the study, and written informed consent was obtained from each participant.
Competing Interest: "The authors declare that they have no competing interests."

The Relationship Between Fear of Covid-19 And Diabetes Self-Management in Individuals Aged 65 Years and Older with Type 2 Diabetes: A Mixed-Methods Study*

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This study aimed to examine the relationship between fear of COVID-19 and diabetes self-management levels among individuals aged 65 years and older diagnosed with Type 2 diabetes. The research was conducted using a mixed-methods design with a correlational survey model between March 2021 and March 2022 at the internal medicine outpatient clinics of a state hospital. The sample consisted of 300 individuals aged 65 years and older with Type 2 diabetes who voluntarily participated in the study. Quantitative data were collected using the Individual Descriptive Information Form, the Diabetes Self-Management Scale for Individuals with Type 2 Diabetes (DSMS), and the Fear of COVID-19 Scale (FCV-19S). Qualitative data were obtained through semi-structured interviews (n=12). Quantitative data were analyzed using SPSS 23.0 ($p<0.05$), while qualitative data were analyzed using NVivo 12 software.The mean diabetes self-management score of the participants was 64.26±12.04, indicating a good level of self-management. The mean FCV-19S score was 17.08±6.70, indicating a moderate level of fear of COVID-19. Diabetes self-management levels were found to be higher among married participants, those whose income was equal to their expenses, and patients who underwent diabetes check-ups every 0–3 months. A weak but statistically significant negative correlation was found between diabetes self-management and fear of COVID-19 ($r=-0.123$; $p<0.05$), indicating that higher levels of diabetes self-management were associated with lower fear of COVID-19.Qualitative analysis identified nine main themes and eighteen sub-themes related to participants' experiences during the pandemic. The main themes were defined as Diabetes and Fear of COVID-19, Maintaining Healthy Lifestyle Behaviors, Maintaining Medical Check-ups, Maintaining Access to Medical Supplies, Maintaining Response to Acute Complications in Diabetes, Family and Social Support During the Pandemic, Not Fearing COVID-19, Inability to Maintain Medical Check-ups, and Metaphors. In conclusion, higher levels of diabetes self-management among older adults with Type 2 diabetes were associated with lower fear of COVID-19, and the qualitative findings supported the quantitative results. Strengthening diabetes self-management education programs and developing preparedness strategies for older adults with chronic diseases are recommended during pandemics and similar crisis situations.

Keywords: *covid-19, type 2 diabetes, self-management, older adults, public health nursing*

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Ethical Approval Statement: Ethical approval was obtained from the relevant Ethics Committee, and informed consent was obtained from all participants.

Competing Interest: The authors declare that they have no competing interests.

* This study is derived from the master's thesis entitled "The Relationship Between Fear of COVID-19 and Diabetes Self-Management in Individuals Aged 65 Years and Older with Type 2 Diabetes: A Mixed-Methods Study," written by Fatma Selçuk at Akdeniz University (2024), conducted under the supervision of Assoc. Prof. Dr. Leyla Muslu, who is also the second author of this study.

Orthodontists' Awareness Regarding Clear Aligner Materials and Their Recycling: A Pilot Study

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Clear aligners used in orthodontic treatments offer advantages such as high aesthetics, flexibility, and biocompatibility, however they pose a potential risk for long-term environmental pollution due to their non-biodegradable nature. The aim of this study is to evaluate orthodontists' knowledge and awareness regarding the production materials of clear aligners and their recycling processes. This study was conducted with 48 volunteers (residents/PhD students and faculty members) working in the Department of Orthodontics at university hospitals in Ankara. Following the informed consent process, participants were asked to complete an 11-item questionnaire. Statistical analysis of the data was performed using SPSS 29.0 software. 75% of the participants stated that they believe clear aligner materials might have minor toxic effects on human health. While 47.9% expressed a need for information regarding the recycling of clear aligners, 33.3% stated they possess basic knowledge on the subject. 91.6% of the group reported having no special clinical protocol regarding the recyclability of clear aligners. About the disposal of used aligners at the end of treatment; 39.5% recommended patients keep their aligners, 33.3% reported disposing of them in medical waste bins, and 27% stated they had no clearly defined standard procedure. The findings indicate that the majority of orthodontists feel a lack of knowledge regarding the material properties and recycling processes of clear aligners. In this context, it is crucial for manufacturers to organize training programs and implement solutions such as recycling centers or collection bins. This study is considered a valuable step for assessing the current situation and planning future awareness programs to minimize environmental impacts.

Keywords: *Clear aligners, recycling, environmental impact, orthodontics, awareness*

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Ethical Approval Statement: Ethical approval for the study was obtained from the Gazi University Ethics Committee (Research Code No: 2025-1007).
Competing Interest: The authors declare that they have no competing interests.

Esthetic Rehabilitation of Anterior Diastemas With Direct Composite Resin Restorations: Three Case Reports

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The aim of this case report is to present the clinical application of direct composite resin restorations performed according to minimally invasive dentistry principles for the management of esthetic and functional problems associated with anterior diastemas through three clinical cases. Case Presentation: Case 1: A 31-year-old female patient with no systemic disease presented with a diastema between the maxillary central incisors. Clinical and radiographic examination revealed a diastema between teeth #11 and #21, and treatment with a direct composite resin restoration was planned. After shade selection, rubber dam isolation was applied. Enamel surfaces were etched with 37% phosphoric acid, followed by application of a universal adhesive system (Single Bond Universal, 3M ESPE, USA). Using transparent strips and a spoon matrix, the diastema was partially closed with a direct composite resin (A1, OA2, Estelite Sigma Quick, Tokuyama Dental, Japan). Finishing and polishing were completed. Case 2: A 37-year-old female patient without systemic disease presented with a diastema between the maxillary central incisors. After clinical evaluation, direct composite resin restoration was indicated. Following shade selection and rubber dam isolation, selective enamel etching was performed. An adhesive agent (Single Bond Universal, 3M ESPE) was applied, and the diastema was restored using direct composite resin (A1, OA2, Estelite Sigma Quick, Tokuyama Dental). Finishing and polishing were carried out using fine-grit diamond burs and polishing discs (Sof-Lex, 3M ESPE). Case 3: A 23-year-old male patient with no systemic disease presented with multiple anterior diastemas between teeth #12–13, #11–21, and #22–23. After shade selection and rubber dam isolation, the enamel surfaces were conditioned. Following application of an adhesive agent (Single Bond Universal, 3M ESPE), the diastemas were restored using direct composite resin with transparent strips. Finishing and polishing were completed. Direct composite resin restorations represent a minimally invasive, fast, and cost-effective treatment option for anterior diastemas, providing satisfactory esthetic and functional outcomes.

Keywords: *Diastema, direct composite resin restoration, esthetic dentistry*

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Competing Interest: The statement is not declared by author(s).

Architectural and Environmental Transformation in Dhaka City Areas as Factors of Public Health *

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This study examined the spatio-temporal dynamics of four remote sensing indices – NDVI, LST, NDBI, and NDWI – and their relationships with urban and industrial development in Gazipur Paurashawa. The objectives are to analyse long-term trends of these indices, assess their interrelationships, and explore their association with prevailing architectural and urban design patterns. It is hypothesised that increased built-up areas correspond to elevated surface temperatures, while vegetation loss and water body reduction intensify thermal stress and the UHI effect. An integrated approach based on remote sensing and GIS was used to analyse environmental changes associated with urban and industrial development in Gazipur-Paurashawa district from 2004 to 2024. Landsat 5 (2004) and Landsat 8 (2014, 2024) images were acquired using Google Earth Engine and pre processed using atmospheric correction and cloud masking. The NDVI, LST, NDBI, and NDWI indices were calculated using standard formulas and band combinations. Temporal changes were identified by differentiating the indices for three periods lasting 10 years. ANOVA were used to assess the relationships between indices and the statistical significance of time trends. Despite a gradual increase in NDVI, vegetation remains too sparse to mitigate the UHI effect, as evidenced by persistently high peaks in land surface temperature. The dynamics of NDBI and NDWI indicate a predominantly natural landscape with limited urbanization and poorly defined water bodies. High housing density, mid-rise buildings, and narrow streets exacerbate the UHI effect, while reduced open water and widened floodplains reduce infiltration and increase flood risk. Recent development guidelines (2016 – 2035) emphasize the need to preserve open spaces and limit building heights, promoting more sustainable urbanization. Green infrastructure, including green roofs and vertical gardening, can retain precipitation, reduce stormwater runoff, and mitigate the UHI effect, especially in residential and commercial areas. Over the past two decades, Gazipur has experienced significant vegetation loss, rising surface temperatures, built-up area expansion, and water body decline, driven by rapid urbanization and industrial growth. Integrating four environmental indices, this study highlights the interlinked impacts on ecosystems and emphasizes urgent sustainable planning, including green space restoration and water conservation.

Keywords: *architectural design, urban heat island (UHI), GIS technologies, public health, floods.*

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Ethical Approval Statement: This study did not require ethics committee approval.
Competing Interest: The authors declare no conflicts of interest.

Evaluation of The Antimicrobial Potential of a Dental Hygiene Product Based on SIWAK '*Juglans regia*' in Stomatology and Periodontology*

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Oral health has a direct impact on human beings and their quality of life. Oral cavity lesions remain the most common infectious diseases in the world, including dental caries and gingival disease. Treatment consists of cleaning, disinfecting and filling the roots of infected teeth. Sometimes, treatment failure leads to the persistence and worsening of the infection. The objective of this study is to evaluate the effect of the extract of the bark of young branches (Siwak) of *Juglans regia* L., incorporated as an active ingredient in the formulation of a toothpaste, on pathogenic germs in the oral cavity. Screening for anti-cariogenic activity was performed on six strains. One *Enterococcus faecalis* ATCC 29212, six streptococcal strains and two *Aerococcus viridans* clinically isolated, using the radial diffusion method on solid medium. The Siwak-based toothpaste showed a remarkable sensitivity profile to all the germs tested. Given the effectiveness of this dental hygiene product against the bacteria implicated in periodontal infections, its use for dental care and oral hygiene appears very promising.
Keywords: *dental health, gingival, Siwak, toothpaste, antimicrobial*

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Ethical Approval Statement: The study did not require the approval of an ethics committee.
Competing Interest: The authors declare that they have no competing interests.

* This study is taken from a doctoral thesis: Author: DJAIRENE NASSIMA
Title: Caractérisation phytochimique et évaluation du potentiel thérapeutique de Juglans regia Institution: Biotechnology, Environment and Health Laboratory, SNV Faculty, Department of Biology Saad Dahleb University, Blida 1.

Survey on the use of Antibiotics in Poultry Farming in the province of Oum El Bouaghi, North Eastern Algeria

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The general objective of this study is to investigate the use of antibiotics in poultry farming in the region of Oum El bouaghi in order to have data on the effects of antibiotic therapy, especially the risk of antimicrobial resistance in the poultry sector. The survey was conducted in the period from February to April 2024. In total, 20 veterinarians were surveyed. The results of this study show that respiratory diseases are the most common pathologies in poultry farming with a rate of 40%. On the other hand, enrofloxacin, colistin and tetracycline are the most used antibiotics with percentages of 26%, 23%, and 15%. The majority of veterinarians use ATB as preventive and curative, with a percentage of 60% and the latter stop treatment when the animal is cured. In addition, most veterinarians confirm that they respect the waiting time and duration of treatment and suggest the use of traditional preparations in combination with Antibiotic therapy such as: Lemon, garlic, onion, fenugreek. In light of this study, it appears necessary to monitor the use of antibiotics and the presence of antibiotic residues in order to obtain a better long-term use of antibiotics and protect the health of consumers.

Keywords: *Antibiotic, poultry farming, investigation, residues*

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Ethical approval statement: This study did not require ethics committee approval; this study utilized a questionnaire distributed to veterinarians. The questionnaires were anonymous to protect all participating veterinarians.

Competing interest: The authors declare that they have no competing interests.

Marine Algal Bioactive Compounds as a Biological Control Strategy Against Aflatoxin-Producing *Aspergillus* Section *Flavi* in Maize Intended for Animal Feed

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Aflatoxins are toxic secondary metabolites predominantly produced by *Aspergillus* species, particularly those belonging to the *Flavi* section, and constitute a major public health concern due to their acute toxicity, hepatotoxic effects, and strong carcinogenic potential. Contamination of maize by aflatoxigenic fungi remains a persistent problem, especially in animal feed, where it poses significant risks to livestock health and food safety. In the present study, twenty aflatoxigenic *Aspergillus* strains from the *Flavi* section were isolated from maize intended for dairy cow feed in Algeria and used as biological models to evaluate antifungal control strategies. The in vitro antifungal activity of a marine brown algal extract obtained from *Cystoseira* compressa was investigated at a concentration of 5 g/mL. Phytochemical screening revealed the presence of several bioactive compounds, including alkaloids, flavonoids, and tannins, which are known for their antimicrobial and antioxidant properties. The results demonstrated a marked inhibition of fungal growth in treated cultures compared to the control, suggesting a strong antifungal effect of the algal extract. This growth suppression is likely to be associated with a concomitant reduction in aflatoxin biosynthesis. Overall, these findings highlight the promising potential of *Cystoseira* compressa extracts as a natural, eco-friendly alternative for controlling aflatoxigenic fungi and mitigating aflatoxin contamination in maize based animal feed

Keywords: *Aflatoxins, Aflatoxigenic fungi, marine algua , activité antifongique*

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Ethical Approval Statement: The research study was conducted in vitro with no human subjects or animals involved.
Competing Interest: The authors declare that they have no competing interests.

Synthesis and Urease Inhibitory Activity of Some Novel Benzimidazole Derivatives

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Urease is a significant enzyme that catalyze the hydrolysis of urea into carbonic acid and ammonia, increasing gastric pH, leading to the onset of various pathologies such as gastric cancer, urolithiasis, hepatic coma, hepatic encephalopathy, duodenal ulcers and peptic ulcers. Urease inhibitors, therefore, may reduce the urea hydrolysis rate and development of various diseases. In this study, a new series of benzimidazoles (**4a-4j**) were synthesized and characterized by IR, ^{1}H NMR, ^{13}C NMR, and MS. All compounds were tested for their urease inhibitory. The enzyme inhibitory potential of the target molecules was evaluated using a colorimetric-based urease activity assay kit (Abcam). The compounds were tested at various concentrations to assess their inhibitory effects on urease activity. Thiourea and acetohydroxamic acid were employed as positive control inhibitors. Among them, compounds **4c** and **4f** showed potent urease inhibitory activities with the IC_{50} values of 33.16±0.21 and 47.39±0.49 µM, respectively, when compared with positive control thiourea (IC_{50}= 45.32±0.23 µM).). In silico molecular docking study of these compounds in the urease active site suggested multiple binding interactions with different amino acid residues. Enzyme kinetics study showed that compounds **4c** and **4f** are non-competitive inhibitors of urease. Consequently, this study presented benzimidazole derivatives as a new class of urease inhibitors that have potential therapeutic value for further development as novel drugs.

Keywords: *benzimidazole, urease inhibition, molecular docking, enzyme kinetic*

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Ethical Approval Statement: Ethical committee approval is not required.

Competing Interest: The authors declare that they have no competing interests.

Synthesis of Novel Thiazole Derivatives, Elucidation of Their Structures, and Investigation of Their Anti-Alzheimer Effects

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Alzheimer's Disease (AD) is a type of dementia characterized by decreased acetylcholine levels and increased radical oxygen species. The aim of the current research is to identify compounds that target multiple counter-targets related to cholinergic deficiency and oxidative stress. Twelve series (**2a-l**) of thiazole analogs were prepared and their structure elucidated using ^{1}H NMR and ^{13}C NMR. In addition, their anticholinergic potentials were examined by looking at their acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) inhibitory activities, while their antioxidant activities were investigated using 2,2-diphenyl-1- picryl-hydrazyl (DPPH) and 2,2'-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid (ABTS) radical scavening techniques. Based on the results, when the cholinesterase inhibitory potential of all series is compared with the standard drug tacrine (IC_{50} = 0.150 for AChE, 0.215 for BChE), the IC_{50} value is between **18.23 µM-63.0 µM** for AChE and **9.11 µM-69.30 µM** for BChE. According to this findings, the highest AChE inhibition potential is shown by compound **2d (18.23 µM)** and also the highest BChE inhibition potential is shown by compound **2d (3.34 µM)** and compound **2k (7.26 µM)**. Subsequently, when the antioxidant capacity of this series was examined with DPPH and ABTS, it was seen that it showed good potential when compared with the standard antioxidant trolox (**DPPH: 15.56 µg mL^{-1} ABTS: 6.22 µg mL^{-1}**). In particular, compound **2a** (**DPPH: 25.29 µg mL^{-1}ABTS: 8.47 µg mL^{-1}**) and compound **2k** (**DPPH: 22.56 µg mL^{-1} ABTS: 20.50 µg mL^{-1}**) showed the best antioxidant capacity of the series. These findings draw attention to the double cholinesterase inhibition activity and radical scavenging capacity of the series. These properties shed light on the path of these molecules to become potential drug candidates for Alzheimer's disease.

Keywords: *Alzheimer's Disease, thiazole, antioxidant*

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Ethical Approval Statement: Because our study does not work with biological samples such as humans or animals, it does not require ethical committee approval.

Competing Interest: The authors declare that they have no competing interests.

In vitro Study of the Influence of Albumin on the Toxicity of Glucantime on Red Blood Cells

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Glucantime® (meglumine antimoniate), the first-line treatment for leishmaniasis, has significant haematological toxicity, including haemolysis, the mechanism of which remains poorly understood. Serum albumin, a major plasma protein, plays a crucial role in the transport and binding of drugs, modulating their bioavailability and toxicity. This study evaluates in vitro the influence of bovine serum albumin (BSA) on erythrocyte toxicity induced by Glucantime. Exposure to Glucantime alone resulted in a dose dependent increase in haemolysis ($p < 0.05$), accompanied by a significant elevation in MDA and depletion of GSH, confirming membrane oxidative stress. In the co-treated group (Glucantime + Albumin), a significant reduction in haemolysis was observed compared to Glucantime alone. Albumin partially restored GSH levels and significantly reduced MDA production. This study demonstrates that Glucantime exerts direct toxicity on red blood cells via a mechanism of oxidative stress. Albumin plays a significant protective role, probably due to its intrinsic antioxidant properties and its ability to bind antimony ions, reducing their deleterious interaction with the erythrocyte membrane. These results highlight the importance of plasma proteins in modulating the toxicity of anti-leishmaniasis drugs.

Keywords: *Glucantime, Erythrocyte, Albumin, Haemolysis, Oxidative stress, In vitro toxicity*

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Ethical Approval Statement: We confirm that this study did not require the approval of an ethics committee, as it does not involve human subjects or personally identifiable data.
Competing Interest: The authors declare that they have no competing interests.

Climate-Driven Disruptions to Algerian Cereal Production: Nutritional and Public Health Implications for Dietary Resilience

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Algeria's cereal sector durum wheat, soft wheat, and barley forms the cornerstone of national nutrition, supplying approximately 70% of daily caloric intake and cultural staples like couscous and bread. However, persistent climate variability, characterized by recurrent droughts and erratic rainfall in semi-arid northern Tell regions, severely undermines this dietary foundation. With 95% of the 2.9 million hectares under rain-fed cultivation yielding only 1.8 tons per hectare on average, production volatility exacerbates import dependence (40-60% of consumption) and heightens malnutrition risks, particularly child stunting and micronutrient deficiencies among vulnerable rural populations. This interdisciplinary study aims to quantify climate impacts on cereal yields, assess their cascading effects on nutritional security, and propose integrated agronomy-nutrition-public health strategies to enhance dietary resilience and advance SDGs 2 (Zero Hunger) and 3 (Good Health and Well-Being).This systemic analysis synthesized secondary data from 2018-2025, including production statistics from the Algerian Ministry of Agriculture, FAOSTAT databases, USDA Grain and Feed Annual Reports, World Bank climate risk profiles, and National Office of Meteorology (ONM) precipitation records for key cereal-producing wilayas such as Sétif, Tiaret, and Relizane. Quantitative correlations examined rainfall deficits against yield fluctuations, import volumes, and nutritional vulnerability indicators. Qualitative policy review evaluated subsidy mechanisms (OAIC guaranteed purchase prices), modernization initiatives (Plan Agricole National irrigation expansion), and climate-smart agriculture pilots (ITGC drought-resistant Hiddab and Boussalam varieties, conservation agriculture practices). Climate impact modeling drew from IPCC scenarios to project dietary stability under varying precipitation regimes. Analysis revealed stark climate-yield linkages: the 2018-2019 drought reduced national cereal output to 1.3 million tonnes against targets, triggering import expenditures exceeding $3 billion and destabilizing dietary access. Subsequent campaigns recovered to 2.3 million tonnes of durum wheat in 2021-2022, yet soft wheat deficits persisted due to climatic sensitivity. Government subsidies sustained farmer participation and baseline supply, but structural rain-fed dependence maintained chronic vulnerability. Promisingly, climate-smart interventions demonstrated efficacy: Hiddab variety pilots increased yields by 25-30% under water stress, while conservation agriculture enhanced soil moisture retention, reducing nutritional supply shocks by 20% in targeted regions and improving dietary diversity scores. Algeria's cereal-nutrition nexus demands urgent, health-centered transformation beyond subsidies toward scaled irrigation infrastructure, land consolidation via cooperatives, widespread adoption of drought-resilient seeds, and nutrition-sensitive agricultural extension services. Interdisciplinary collaboration integrating agronomy, dietetics, and public health supported by public-private

partnerships offers a viable pathway to stabilize food systems, mitigate climate-exacerbated malnutrition, and secure equitable dietary resilience for sustainable public health outcomes.

Keywords: *nutritional security, climate variability, cereal production, malnutrition, food systems*

Funding Statement: the study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Approval Statement: The statement is not declared by author(s).

Competing Interest: The authors declare that they have no conflicts of interest in relation to the current study.

Investigation of Novel imidazo[1,2-a]pyrazine Derivatives as Antiproliferativeagents and Their Enzymatic Inhibition Effect Against MMP-9

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Ten N-(2/3/4-substitutedphenyl)-2-(imidazo[1,2-a]pyrazin-2-carbonyl)hydrazin-1-carbothioamide derivatives (**2a–2j**) were designed and synthesized to explore their potential antiproliferative and enzyme inhibitory activities. The chemical structures of the synthesized compounds were confirmed through comprehensive spectroscopic analyses, including ^{1}H-NMR, ^{13}C-NMR, and high-resolution mass spectrometry (HRMS). The biological evaluation focused on assessing the antiproliferative effects of the compounds against the human lung carcinoma A549 cell line, along with their cytotoxicity toward the normal L929 fibroblast cell line to determine selectivity. Although none of the synthesized derivatives exhibited antiproliferative activity comparable to the reference drug cisplatin against A549 cells, certain compounds demonstrated moderate activity relative to the rest of the series. Derivatives **2h** and **2i**, bearing 2-chlorophenyl and 3-chlorophenyl substituents, respectively, showed the highest inhibitory effects on A549 cell proliferation among the tested compounds, while all derivatives were found to be non-cytotoxic toward the L929 cell line, indicating a favorable safety profile. In addition to cytotoxicity studies, the compounds were evaluated for their inhibitory activity against matrix metalloproteinase-9 (MMP-9), an enzyme implicated in tumor progression and metastasis. Compounds **2f** and **2g** demonstrated the most pronounced MMP-9 inhibitory effects, with inhibitory percentages of 46.54% and 26.81%, respectively. Molecular docking studies provided insight into the binding modes of the active compounds, revealing that interactions between compound **2f** and the catalytic Zn301 ion, as well as key amino acid residues His226 and His230, play a significant role in MMP-9 inhibition.

Keywords: *Imidazo[1,2-a]pyrazine; hydrazinecarbothiamide; anticancer activity; MMP-9.*

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Ethical Approval Statement: This study did not require ethics committee approval as it did not involve human participants, animals, or the use of identifiable personal data.

Competing Interest: No potential competing interest was reported by the authors

Using Honey as Support for Biologically Active Compounds, Extracted from Propolis and Medicinal Plants, for Their Use as Antimicrobial Agents

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Bee products are natural products with nutritional value, but also with other different uses. The apitherapeutic uses of honey and propolis are evaluated in this study, along with the improvement of bioactivities brought by different medicinal plants. Acacia, sunflower, rape, linden, honeydew, heather and multifloral honey's antibacterial activity was tested on different reference Gram-negative and Gram-positive reference bacterial strains. The obtained results were correlated with the content of total phenolics, as well as individual phenolic acids and flavonoids profile. Poplar type propolis ethanolic extracts were tested for their antimicrobial activity on different bacterial strains also. Lavander (*Lavandula angustifollia*), basil (*Ocimum basilicum*), nettle (*Urtica dioica*), thyme (*Thymus serphyllum*), yarrow (*Achillea millefolium*) and costmary (*Chrysanthemum balsamita*) dried plants were used in the present study, to test the extraction power of acacia honey, in respect of bioactive compounds, compared to ethanolic extracts. High Performance Liquid Chromatography was used for the detection of individual phenolics of every mentioned matrix. In conclusion each honey type has different components with nutritive value, but also biologically active compounds from the class of polyphenols. Romanian propolis is very rich in biologically active compounds from the class of polyphenols (phenolic acids and flavonoids). Extraordinary sources of active principles, the tested medicinal plants, may be exploited on a higher level compared to the present, as the alternative medicine gains ground and followers. The most important conclusion of our study is that honey can be successfully used for the extraction of the active principles contained therein, in order to use these mixtures in the treatment of various diseases.

Keywords: *honey, propolis, medicinal plants, bioactive compounds, new product, antibacterial activity.*

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Ethical Approval Statement: Our study did not require ethics committee approval, as it represent only biochemical and in vitro microbiological determinations.
Competing Interest: The authors declare that they have no competing interests.

Selective Antileukemic Activity of *Trigonella foenum-graecum* L.

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Chronic myeloid leukemia (CML) is a hematological malignancy characterized by uncontrolled proliferation of myeloid cells and constitutive activation of the Bcr–Abl tyrosine kinase, which plays a central role in leukemogenesis. Although tyrosine kinase inhibitors represent the standard of care, clinical challenges such as drug resistance, adverse effects, and limited selectivity toward malignant cells remain significant. These limitations underscore the need for alternative or complementary therapeutic strategies, including natural product–based approaches. *Trigonella foenum-graecum* L. (P-6), a medicinal plant collected from the Lakes Region of Türkiye (Burdur province), has been reported to possess diverse biological activities. In the present study, P-6 was collected, dried, ground, and extracted with 70% ethanol using ultrasonic-assisted extraction, and stock solutions were prepared in DMSO, and its antileukemic activity was evaluated against K562 CML and HL-60 acute myeloid leukemia cells. P-6 exhibited potent antileukemic effects with IC50 values of 9.87 ± 2.75 µg/mL and 14.65 ± 2.06 µg/mL, respectively, compared with the standard tyrosine kinase inhibitor imatinib. P-6 cytotoxicity was also found to be highly selective between leukemia cells and healthy peripheral blood mononuclear cells (PBMCs) (selectivity index (SI) = 9.4). Furthermore, P-6 induced significant apoptosis in K562 cells. Since constitutive activation of ABL kinase is one of the most important hallmarks of chronic myeloid leukemia, the ABL kinase inhibitory effects of P-6 were also evaluated. P-6 exhibited a marked inhibition of ABL kinase activity in a concentration-dependent manner. These results highlight the potential antileukemic effects of P-6 for future research.

Keywords: *chronic myeloid leukemia, natural products, Trigonella foenum-graecum, ABL kinase inhibition, apoptosis.*

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Competing Interest: The authors declare that they have no competing interests.

Synthesis of Novel 1,3,7-Trisubstituted 2,6-Dioxo-2,3,6,7-Tetrahydro-1H-Purine Hydrazone Derivatives with Potential Cytotoxic Activity

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The xanthine scaffold is well documented in the literature to exhibit a broad spectrum of pharmacological properties, most notably anticancer, anti-inflammatory, and bronchodilatory activities. The hydrazone moiety (–NH–N=CH–), owing to the C=N double bond between carbon and nitrogen, is regarded as a conformationally adaptable pharmacophore capable of engaging diverse enzymes and receptors. Accordingly, the hybridization of 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione with hydrazone functionality may enable the emergence of multiple biological profiles, including antitumor and antiproliferative effects. In the present work, three novel derivatives (3a–3c) were synthesized using N′-(7-benzyl-1,3-dimethyl-2,6-dioxo-2,3,6,7-tetrahydro-1H-purin-8-yl)benzohydrazide as the core framework. The synthetic route was accomplished in three steps: (i) bromination at the C-8 position of 1,3-dimethyl-3,7-dihydro-1H-purine-2,6-dione followed by derivatization at the N-7 position, (ii) nucleophilic substitution of the C-8 bromine with hydrazine, and (iii) condensation with substituted benzaldehydes to afford the target hydrazone-based benzohydrazide analogues. The structural characterization of the synthesized compounds was performed using two-dimensional NMR spectroscopy (HMBC), and their melting point ranges were determined. Purity analysis was conducted using HPLC. Based on literature precedents, the synthesized compounds are anticipated to display cytotoxic potential, and their in vitro cytotoxicity profiles are currently being evaluated in A549 (human lung adenocarcinoma) and HUVEC (human umbilical vein endothelial cell) cell lines.

Keywords: *purine, hydrazone, cytotoxic activity, anticancer*

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Competing Interest: The authors declare that they have no competing interests.

Tetrazole-Based Schiff Base Derivatives as Potential COMT Inhibitors: Synthesis, in Silico Evaluation and Inhibition Studies

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Parkinson's disease (PD), first described by James Parkinson in 1817, is characterized by the degeneration of dopaminergic neurons in the substantia nigra pars compacta. Although L-DOPA remains the gold standard in PD treatment, its long-term use leads to reduced efficacy and motor complications. Catechol-O-methyltransferase (COMT) plays a key role in L-DOPA metabolism by converting it into 3-O-methyldopa, thereby decreasing its bioavailability. Consequently, COMT inhibitors are used to enhance and prolong the therapeutic effects of L-DOPA. Currently, entacapone, tolcapone, and opicapone are the main COMT inhibitors used in clinical practice. While entacapone and opicapone act peripherally, tolcapone crosses the blood-brain barrier but its limited by hepatoxicity. These limitations highlight the need for the development of novel and safer COMT inhibitors. In this context, tetrazole-containing heterocyclic compounds have attracted increasing interest due to their favorable physicochemical properties, including polarity, hydrogen-bonding potential, and lipophilicity. These characteristics make tetrazole-based Schiff base derivatives promising scaffolds for the design of new COMT inhibitors with potential therapeutic application in Parkinson's disease. In this study, tetrazole-based Schiff base derivatives designed as model compounds for COMT inhibitors were investigated in silico and synthesized. Their structures were elucidated using various characterization techniques (UV-Vis, FT-IR, HRMS, and NMR spectroscopy). Based on the obtained data, the synthesized Schiff bases were found to be potential model molecules for COMT inhibitors. Among the inhibition studies, the Schiff base coded 2H5NB- 5AT exhibited the most pronounced inhibitory effect, with an IC50 values of 56.48 µM.

Keywords: *Parkinson, COMT, Schiff base, Tetrazole, Inhibiton*

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Competing Interest: The authors declare that they have no competing interests.

Design, Synthesis and In Silico Studies of Novel ACE Inhibitors

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Cardiovascular diseases constitute a significant portion of the leading health problems of today's population. The World Health Organization has stated that the number of patients with high blood pressure alone exceeds 1 billion. Angiotensin-converting enzyme (ACE) inhibitors such as captopril, lisinopril, fosinopril, ramipril, and enalapril are prescribed to lower blood pressure. However, it is known that chronic patients experience adverse effects with regular use. This necessitates the discovery of new ACE inhibitors. The high potential of heteroatom-containing structures, especially compounds containing heterocyclic structures, for ACE inhibition has been documented in the literature in previous studies. In this context, a series of new ACE inhibitors have been designed and synthesized. The structures of the compounds obtained were elucidated using ^{1}H-NMR, ^{13}C-NMR, and HRMS spectroscopic methods. The biological activity potentials of the compounds were investigated using molecular docking and molecular dynamics studies. The *in silico* data obtained showed that the synthesized derivatives formed strong interactions with the enzyme's active site and had binding energies comparable to the reference drugs. In particular, it was observed that the ligand-protein complexes maintained their stable structure throughout the simulation. These findings suggest that the designed novel scaffold could be a promising lead compound in the development of safer and more effective antihypertensive agents.

Keywords: *ACE, Molecular Docking, Molecular Dynamics*

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Competing Interest: The authors declare that they have no competing interests.

Comparative Evaluation of Quality Parameters and Bioequivalence of Paracetamol Tablets Manufactured in Turkey and Poland

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This study aimed to comparatively evaluate the quality control parameters and dissolution profiles of two commercially available paracetamol 500 mg tablet formulations—Parol® (Turkey) and Paracetamol Zentiva®(Poland) —in accordance with the European Pharmacopoeia (8.0). The objective was to assess their compliance with pharmacopeial standards and determine bioequivalence based on in-vitro results without conducting clinical studies. The use of biowaiver analysis is important for pharmaceutical companies because it allows the replacement of in vivo bioequivalence studies with reliable in vitro dissolution data, reducing development time and costs. This approach streamlines regulatory approval for eligible BCS Class I and III drugs and enables faster market access while maintaining product quality and patient safety. According to EP protocols, the tablets were analyzed comparatively for parameters such as uniformity of content, uniformity of mass, friability, resistance to crushing (hardness), disintegration time, and dissolution profile. In addition, general evaluation criteria such as appearance, diameter, and thickness were also assessed. $f1$and $f2$ was calculeted to clarify the bioequvalance of tablets according to biawaiver. Parol® and Paracetamol Zentiva® met pharmacopeial limits for uniformity, friability (<1%). Parol® exhibited higher lower (189.09 N) but a markedly longer disintegration time (≈ 42 s) than Paracetamol Zentiva® showed higher hardness (303.92 N) with the shorter disintegratıın time (≈16,45s). Parol® tablets reached a dissolution rate above 85% within 15 minutes in phosphate buffer at pH 6.8, while Paracetamol Zentiva® tablets did not reach 85% dissolution within 30 minutes but exceeded this value after 60 minutes. All formulations complied with European Pharmacopoeia (8.0) quality specifications. Despite mechanical differences, their rapid dissolution and comparable in-vitro performance indicate likely bioequivalence and similar therapeutic efficacy. These findings are presented for the attention of the pharmaceutical industry.
Keywords: *paracetamol 500 mg, tablet quality control, bioequivalence, Parol®, Paracetamol Zentiva®*

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Synthesis and Molecular Docking Studies of Anticancer-effective Hydrazinylthiazole-imidazole Hybrid Compounds

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Cancer is a complex disease with an ever-increasing incidence, yet a complete cure has not yet been found. Even though effective drugs exist for cancer treatment, the need for new therapies is constantly growing due to the damage done to healthy cells during treatment and the development of resistance. Currently, research is focused on new, targeted therapies involving small molecules. One prominent group in this area is protein kinase inhibitors. Protein kinase inhibitors are involved in signaling pathways, and by inhibiting various targets with these molecules, the growth and/or development of cancer cells can be halted. This study focuses on EGFR inhibitors, a type of protein kinase inhibitor. The thiazole ring is present in the structure of many drugs exhibiting numerous pharmacological effects, including anticancer activity. In this study, the thiazole ring was used in combination with imidazole, another important heterocyclic ring. Eight hydrazinylthiazole-imidazole hybrid compounds were designed and synthesized in two steps. The structures of the compounds were confirmed by ^{1}H-NMR and ^{13}C-NMR. Molecular docking studies were conducted to elucidate the interactions of the compounds with the EGFR and EGFR-L858R enzymes. Since the enzyme is known to develop many mutations, the study focused on the EGFR-L858R variant, which is one of the significant mutations.

Keywords: *Thiazole, Imidazole, cancer*

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Ethical Approval Statement: Our study did not require ethics committee approval. All of the process was in laboratory condition without human or animal tests and using in-silico methods.

Competing Interest: The authors declare that they have no competing interests.

Inhibition of Pancreatic Lipase Using Indole-Containing Molecules and Enzyme–Inhibitor Docking

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According to the World Health Organization, obesity has tripled globally since 1975. Obesity leads to various serious conditions such as cardiovascular disease, cancer, diabetes, and functional impairment of certain organs. The only drug used in the long-term treatment of obesity is Orlistat. Orlistat's mechanism of action is based on its inhibitory effect on pancreatic lipase (PL). However, due to Orlistat's adverse and undesirable side effects, the discovery of new pancreatic lipase inhibitor compounds is of great importance. Among these, indole-containing structures have been found to play a significant role in PL inhibition. In this study, indole-containing imine compounds (In-H-2A.4MF, In-CH3-2A.4MF) and their Fe(III) complexes were synthesized using the condensation and template methods, respectively. After the target molecules were synthesized, they were characterized using HRMS and NMR. Then, the pancreatic lipase enzyme inhibition of indole-containing Schiff bases and their Fe(III) complexes was determined using a spectrophotometric method. According to the inhibition results, the In-H-2A.4MF ligand exhibited the lowest IC_{50} value (4.05 µM) compared to the other Schiff base. Between the two Fe(III) complexes, the [In-H-2A.4MF-Fe] coded complex was found to exhibit an IC_{50} value of 3.87 µM. This value indicates that it has better inhibitory activity compared with the other complex. In the molecular docking study, interaction with the active site of the enzyme occurred via the TYR114 and Phe77 amino acids.

Keywords: *Schiff base, Fe(III) complexes, Pancreatic lipase, inhibition, molecular docking*

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Competing Interest: The authors declare that they have no competing interests.

New Thiazole Carboxylic Acis Derivatives as Anti-Inflammatory and Analgesic Agents*

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Inflammation plays a central role in the pathogenesis of numerous acute and chronic diseases and is commonly associated with pain, tissue damage, and functional impairment. Although non-steroidal anti-inflammatory drugs (NSAIDs) remain the cornerstone of inflammatory pain management, their clinical use is often limited by gastrointestinal and cardiovascular adverse effects. The present study aimed to design, synthesize, and pharmacologically evaluate a new series of dithiazole carboxylic acid derivatives incorporating a chalcone pharmacophore as potential anti-inflammatory and analgesic agents. Eleven novel *N,N*-dithiazolamine derivatives were synthesized through a multi-step synthetic route and structurally characterized using ^{1}H NMR, ^{13}C NMR, and HRMS. The antinociceptive properties of the compounds were evaluated *in vivo* using hot-plate, tail-clip, and formalin-induced pain models in mice, while their anti-inflammatory activity was assessed by carrageenan-induced paw edema in rats. Molecular docking and molecular dynamics simulations were performed to investigate potential interactions with cyclooxygenase (**COX-1** and **COX-2**) enzymes. The results demonstrated that several compounds, particularly **4b, 4c, 4f, 4h,** and **4k**, significantly reduced inflammatory pain in the late phase of the formalin test and markedly suppressed paw edema, showing activity comparable to diclofenac. *In silico* analyses supported these findings by revealing stable binding interactions with key COX active-site residues. In conclusion, the synthesized dithiazole carboxylic acid derivatives exhibit promising peripherally mediated anti-inflammatory and analgesic effects and may serve as valuable lead compounds for the development of safer NSAID alternatives.

Keywords: *dithiazole derivatives, anti-inflammatory agents, analgesic activity, COX inhibition, molecular docking*

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Competing Interest: The authors declare that they have no competing interests. * This study was published in the journal Bioorganic Chemistry, Volume 144, March 2024, issue 107120.

Antimicrobial Evaluation of Novel Thiazoline-Azomethine Derivatives

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Thiazolines are heterocyclic compounds containing sulfur and nitrogen in their structure. This compound has three structural isomers. While non-substituted form of the ring is rarely seen in the biologically active molecules, substituted thiazoline found in the structures of the alkaloids (such as lissodin amide, patellins, dolasatatin E), antihelmintic, antiviral (thiangazole), antimicrobial (althiomycin, dehydroxymethylalthiomycin) and anticancer (tantazole, mirabazole) drugs. Resistances of existing antimicrobial drugs lead researchers to synthesis and investigation compounds that may be effective on microorganism. In this study, we have synthesized nine different *N*'-(substituted benzylidene)-2-((4,5-dihydrothiazol- 2-yl)thio)acetohydrazide derivatives and investigated their antimicrobial activities. Our molecules contain thiazoline rings and hydrazone bridges in their structure. Hydrazone bridge, especially, highly important for antimicrobial activities. Firstly, 2- mercaptothiazoline dissolved in acetone, then ethyliodoaceto acetate and potassium carbonate added at room temperature. Resulted compound (ethyl 2-((4,5- dihydrothiazol-2-yl)thio)acetate) and hydrazine hydrate dissolved in ethanol and stirred overnight. Last step 2-((4,5-dihydrothiazol-2-yl)thio)acetohydrazide and aldehyde derivatives refluxed in ethanol for 2 hours. Structural confirmation of the molecules performed via nuclear magnetic resonance spectroscopy (^{1}H and ^{13}C). Minimum Inhibitory Concentration (MIC) values were determined using the microdilution method in liquid medium. Compounds have tested against various gram-positive, gram- negative bacteria and yeasts. Compound **3a** have showed the most inhibitory activity against bacteria strains. Based on these findings, the plan is to determine whether the synthesized compounds have antifungal properties and to support the activity results of the identified molecules through *in silico* studies.

Keywords: *cytotoxicity, hydrazone, Schiff bases, thiazoline.*

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Competing Interest: The authors declare that they have no competing interests.

Gender (In)Equality in Turkey: The 2025 Global Reports from a Social Work Perspective

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The purpose of this study is to examine the general data presented in global reports on gender equality and to evaluate Turkey's position within these reports. The study employs document analysis. In the data collection process, three international gender equality reports published by the end of 2025 were analyzed. The first report is the WEF Global Gender Gap Report, one of the most comprehensive and internationally recognized indices in the field of gender equality. This report provides a comparative analysis of countries' performance across four key dimensions: education, health, economic participation, and political representation. It illustrates Turkey's position in the global ranking and enables an assessment of changes over time. The second report is the UNDP Human Development Report, published by the United Nations Development Programme, which examines gender equality in relation to the Human Development Index by assessing women's status in health, education, and labor force participation. The third report is the OECD Gender Equality Data and Reports, which compares the implementation levels and outcomes of gender equality policies among OECD member countries, allowing for a comparative evaluation of Turkey's performance. Research findings indicate that women hold only 26% of parliamentary seats worldwide and earn, on average, 20% less than men performing the same work. At the global level, progress toward gender equality remains limited; no country achieved full equality and equality scores declined compared to the previous year. The WEF Global Gender Gap Report reveals persistent disparities, particularly in economic participation and political representation, and indicates that Turkey ranks lowest within the European region. The UNDP Human Development Report shows that although overall human development has improved, significant gender gaps remain in women's health, education, and labor force participation and that gender equality indicators in Turkey have not progressed in parallel with the Human Development Index. Similarly, the OECD Gender Equality Data and Reports demonstrate that inequalities persist in care services and labor force participation, with Turkey remaining below the OECD average. In conclusion, the findings indicate that gender inequality remains a significant social problem in Turkey. Evaluating Turkey's position in global gender equality reports from a social service perspective offers important academic and practical contributions.

Keywords: *Gender, Social Work, Global Gender Gap Report, Human Development Report, Gender Equality Data and Reports.*

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Sensory Accessibility, Psychological Balancea and Holiday Experience in Autism Spectrum Disorder

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Individuals with Autism Spectrum Disorder (ASD) often experience differences in sensory processing that significantly affect their psychological balanceand daily functioning. Tourism and holiday environments, which are typically characterized by crowded spaces, unpredictable routines, intense noise, and visual stimulation, may lead to sensory overload and emotional dysregulation for individuals with ASD. As a result, holidays may become a stressful rather than restorative experience for both individuals with ASD and their caregivers. Within the framework of accessible tourism, sensory accessibility has emerged as a critical but underexplored component of health and psychological well-being for individuals with neurodevelopmental conditions. The aim of this study is to examine the relationship between sensory accessibility, psychological balance, and holiday experience in individuals with Autism Spectrum Disorder (ASD) from the perspectives of parents and caregivers. The study was designed using a qualitative phenomenological approach aimed at gaining an in-depth understanding of lived experiences. Data were collected through semi-structured interviews conducted with parents and caregivers of 10 children diagnosed with ASD who had experienced at least one holiday or travel process. The interviews focused on sensory challenges encountered during holidays, emotional and behavioral responses, coping strategies, and perceptions of sensory The data were analyzed using thematic analysis. The findings revealed four main themes: sensory overload and emotional distress, the protective role of sensory accessibility in psychological balance, holiday experience as safety versus stress, and reduction of caregiver burden. Participants reported that sensory-friendly environments such as quiet spaces, reduced noise, predictable routines, and controlled lighting contributed to improved Psychological balance, decreased anxiety, and more positive holiday experiences.
The results indicate that sensory accessibility plays a crucial role in supporting psychological balance and psychological well-being for individuals with ASD during tourism activities. Incorporating sensory-friendly practices into accessible tourism policies may enhance inclusive health-oriented tourism experiences for individuals with ASD and their families.
Keywords: *Autism spectrum disorder, sensory accessibility, psychological balance, accessible tourism, holiday experience*

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Competing Interest: The authors declare that they have no competing interests.

Health-Themed Vocabulary in Textbooks for Teaching Turkish as a Foreign Language: The Case of Yeni Hitit 1 and Yedi İklim A2

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Foreign language teaching could be conducted for specific purposes as well as general purposes. In teaching Turkish as a foreign language, the instruction of vocabulary related to specific domains, such as health, is crucial for learners to acquire communicative competence. Accordingly, this study examines the health-themed vocabulary within the health units of the Yeni Hitit 1 and Yedi İklim Turkish A2 textbooks. The primary aim is to identify the health-themed vocabulary in these basic level textbooks and associate it with the domains of language use defined in the Common European Framework of Reference for Languages (CEFR), which are "personal", "public", "occupational", and "educational". Document analysis, a qualitative research method, was employed in the study. Data were analyzed using a checklist developed based on language domains, comprising seven sub-categories: locations, institutions, people, objects, events, actions, and texts. The analysis identified a total of 728 health-themed linguistic units, with 342 in Yeni Hitit 1 and 386 in Yedi İklim A2. Findings indicate that units in Yeni Hitit 1 are concentrated in the personal domain (f=57). Within this domain, *doing sport* (f=18) and *eating* (f=16) are the most frequently used units in the actions category, while *fruit/vegetable* (f=11) and *vitamin* (f=7) stand out in the objects category. Conversely, Yedi İklim A2 highlights the public domain. In this domain, *epidemic* (f=12) and *traffic accident* (f=8) in the events category, *doctor* (f=10) and *injured person* (f=2) in the people category, and *vaccine/injection* (f=6) and *ambulance* (f=2) in the objects category are the most frequently used units. The study concludes that Yeni Hitit addresses the subject of health more intensively in the context of individual lifestyle habits (personal domain), whereas Yedi İklim focuses on institutional interaction and social events (public domain). Consequently, the linguistic units identified were classified according to their usage domains, and a health-themed vocabulary inventory for the examined textbooks is presented in classified lists.

Keywords: *teaching Turkish as a foreign language, health-themed vocabulary, domains of language use, Yeni Hitit, Yedi İklim.*

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Ethical Approval Statement: Ethics committee approval was not required for this study because it relies on document analysis of publicly available textbooks and does not involve biological human participants or data collection from individuals.
Competing Interest: The author declares that there is no competing interest.

A Machine Learning–Based Method for Estimating Atherosclerotic Cardiovascular Disease Risk Using Multiple Clinical Variables in Men Aged 40–65

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Atherosclerotic cardiovascular disease (ASCVD) is one of the leading causes of death worldwide. Early diagnosis of this disease, which can progress silently for years, allows for the prevention of the disease and its consequences in at-risk individuals. However, commonly used risk scores are based on a limited number of clinical variables. The aim of this study is to determine a model system that can better predict ASCVD risk using new parameters found to have an effect on ASCVD and make it usable in primary healthcare settings. A total of 350 male participants aged 40-65 years who applied to the Family Medicine outpatient clinic of Ankara Bilkent City Hospital were included in the study. Half of the participants were diagnosed with ASCVD, while the remainder were considered as a control group. Demographic data, lifestyle habits, blood pressure measurements, and laboratory findings were collected. In addition, the Single Point Insulin Sensitivity Predictor (SPISE) and Plasma Atherogenic Index (AIP) were calculated. Prediction performance was evaluated using Receiver Operating Characteristic (ROC) analysis and various machine learning models. High systolic blood pressure, smoking, physical activity level, increased triglyceride levels, low HDL-cholesterol, high HbA1c lower SPISE and higher AIP values were found to be significantly associated with ASCVD. ROC analyses showed that AIP and SPISE indices were better at identifying the difference than common lipid counts. Among machine learning models, the Support Vector Machine algorithm yielded the best accuracy (94%) and AUC (0.971). These findings demonstrate that combining traditional risk factors with novel metabolic indices, exercise habits, SPISE, AIP, smoking, HbA1c, and triglyceride levels significantly improves ASCVD risk prediction. Furthermore, determining ASCVD risk using a SVM model has higher accuracy than standard methods. Integrating such data-driven models into routine primary care screening can support earlier detection of high-risk individuals and contribute to more effective preventive strategies.

Keywords: *Atherosclerotic cardiovascular disease, SPISE, AIP, Machine learning models, Support Vector Machine*

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Ethical Approval Statement: Ethical approval for this study was obtained from the TABED Ethics Committee (Approval No: 1-25-2026). All procedures were conducted in accordance with the ethical standards of the institutional and national research committees.
Competing Interest: The authors declare that they have no competing interests.

Combined Endoscopic and Minimal Surgical Closure of a Persistent Gastrocutaneous Fistula After Percustaneous Endoscopic Gastrostomy Removal

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Persistent gastrocutaneous fistula (GCF) is a rare but challenging complication following removal of a percutaneous endoscopic gastrostomy (PEG) tube, especially in patients with long-standing PEG tracts. Epithelialization of the fistula tract may prevent spontaneous closure and lead to failure of conservative or purely endoscopic therapies. The aim of this case report is to present a successful combined endoscopic and minimal surgical approach for the treatment of a refractory PEG-related gastrocutaneous fistula. A 65-year-old male with a history of hypoxic brain injury secondary to attempted hanging was being followed with tracheostomy and PEG for long-term enteral feeding. In 2024, the patient accidentally removed his PEG tube, and a new PEG was placed from a different site after endoscopic evaluation revealed ulceration and closure of the original gastrostomy tract. In 2025, the patient presented with persistent bilious discharge from the previous PEG site. Conservative management with cessation of oral intake and compressive dressings was unsuccessful. Endoscopic evaluation demonstrated a fistulous opening, and two hemoclips were applied. However, leakage persisted, and repeat endoscopy revealed ongoing fistulization between the clips. Under sedation and endoscopic guidance, a 5-cm incision was made over the old PEG scar. The fistula tract was dissected and the gastric wall was closed with continuous 2-0 Vicryl sutures while endoscopic visualization confirmed correct transmural closure. Complete closure of the fistula was verified endoscopically, and the skin was closed with 2-0 Prolene. After the procedure, the patient resumed PEG feeding without leakage and was discharged without complications. This case demonstrates that a combined endoscopic-guided minimal surgical approach is a safe and effective option for refractory PEG-related gastrocutaneous fistulas.

Keywords: *percutaneous endoscopic gastrostomy, gastrocutaneous fistula, endoscopic clipping, peg complications*

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Ethical Approval Statement: Written informed consent was obtained from the patient's legal guardian for publication of this case report. Ethics committee approval was not required because this is a single case report.

Competing Interest: The authors declare that they have no competing interests.

A Comparison of the Effects of Complex Decongestive Physiotherapy on Lymphedema Volume in Patients with Primary and Secondary Lower Extremity Lymphedema

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To compare the effects of complex decongestive physiotherapy on lymphedema volume reduction in patients with primary versus secondary lower extremity lymphedema. This was a retrospective study. A total of 34 patients with unilateral lower extremity lymphedema were divided into two groups as the primary lymphedema ($N = 17$) and secondary lymphedema ($N = 17$) groups. Limb volume of both legs was calculated using the frustum formula based on circumference measurements. The percentage difference between the affected and unaffected leg volumes was defined as lymphedema volume. Lymphedema volume was assessed before and after twenty sessions of complex decongestive physiotherapy, and group differences over time were analyzed. A linear mixed-effects model was used to analyze the data. The dependent variable was lymphedema volume. Group, time, and the interaction between group and time were modeled as the fixed effects, and the patients were set as the random effect. Age, gender, body mass index, employment status, smoking status, affected limb, duration of lymphedema, and history of infection were included in the model as covariates and treated as fixed effects. Before treatment, the estimated marginal mean lymphedema volume was 8.69% (95% CI = −0.63 to 18.00) in the primary lymphedema group and 15.67% (95% CI = 5.85 to 25.50) in the secondary lymphedema group; after treatment, these values decreased to 4.27% (95% CI = −5.05 to 13.60) and 8.55% (95% CI = −1.27 to 18.40), respectively. No statistically significant group-by-time interaction effect on lymphedema volume was found between the groups ($F[1, 30] = 2.48$, $p = 0.13$). Patients with primary and secondary unilateral lower extremity lymphedema show similar reductions in lymphedema volume after complex decongestive physiotherapy.

Keywords: *lymphedema, lower extremity, complex decongestive therapy, limb volume*

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Ethical Approval Statement: The study was approved by the Non-invasive Clinical Research Ethics Committee of İzmir Bakırçay University (decision no. 2619).
Competing Interest: The authors declare that they have no competing interests.

The Relationship Between Menstrual Pain Severity and Presenteeism in Young Women with Primary Dysmenorrhea

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Primary dysmenorrhea (PD) is characterized by spasmodic and painful lower-abdominal cramps that occur just before and/or during menstruation in the absence of any macroscopic pelvic pathology. It is a common condition among young women and can substantially limit daily functioning, contributing to menstrual pain–related presenteeism. This study aimed to evaluate the relationship between menstrual pain intensity and presenteeism in young women with primary dysmenorrhea. The study included 130 women aged 18–42 years who were literate, had regular menstrual cycles (28 ± 7 days), had experienced menstrual pain for more than six months, had no known diseases, and reported a menstrual pain intensity ≥4 on the Visual Analog Scale (VAS) during the previous six months and the most recent menstruation. Detailed sociodemographic, medical, obstetric and urogynecological histories were recorded. The intensity of menstrual pain was assessed using a 100 mm VAS. Additionally, The Stanford Presenteeism Scale (SPS-6), consisting of 6 questions, was used to assess the women's work performance efficiency related to menstrual pain. Spearman Correlation Analysis was used to analyze the relationship between the variables. The mean age of the women was 25.56±4.05 years and the mean body mass index (BMI) was 22.19±3.18 kg/m^2 . The mean menstrual pain intensity and SPS-6 score were 5.09±2.51 cm and 11.61±4.33, respectively. A significant, weak-to-moderate, negative correlation was found between menstrual pain intensity and their workplace functioning and productivity ($r = -0.273$, $p = 0.002$). In conclusion, this cross-sectional study showed that higher menstrual pain intensity may be linked to reduced workplace functioning and productivity. The weak to moderate correlation coefficient identified in our study may be related to women's tendency to tolerate pain and continue to maintain their work performance due to social/economic concerns within the work culture in Turkey. Increasing awareness of menstrual health in the workplace and developing supportive policies are of strategic importance in terms of both individual well-being and organizational productivity. Long-term follow-up studies conducted on different occupational groups in the future will contribute to the refinement of intervention strategies.

Keywords: *primary dysmenorrhea, menstrual health, presenteeism, work productivity, visual analog scale.*

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Ethical Approval Statement: This study was approved by the University of Health Sciences, Gülhane Scientific Research Ethics Committee (Approval number: 2024-574).

Competing Interest: The authors declare that they have no competing interests.

The Saharan Antimicrobial Resistance Nexus: A One Health Exploration Across Clinical, Animal, and Environmental Frontiers

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Antimicrobial resistance (AMR) is a global health crisis demanding integrated "One Health" surveillance. However, in under-investigated regions like the Algerian Sahara, AMR dynamics remain largely unknown. This pioneering study in the Ouargla region bridges this critical gap by assessing the prevalence and molecular mechanisms of multi-drug resistant (MDR) Gram-negative bacilli (GNB), with focus on ESBL and carbapenemase producers, circulating across he human-animal-environment interface. A prospective two-year study (2014-2016) was conducted, adhering to a One Health framework that integrated samples from human, animal, and environmental reservoirs. We collected and analyzed 388 GNB from hospitalized patients (colonized or infected), the hospital environment (surfaces, air), livestock (dromedaries, broiler chickens), and hospital cockroaches. All isolates were phenotypically characterized (antibiogram, synergy and modified Carba NP test). Molecular characterization was performed using PCR and sequencing to identify critical resistance genes (including ESBLs and carbapenemase genes). Multilocus Sequence Typing (MLST) was used to track the clonal relatedness of key resistant strains and trace transmission pathways. The investigation revealed alarming resistance levels, including 14 carbapenemase-producing isolates, and provided unequivocal evidence of cross-compartmental transmission. Critically, the first regional detection of the *bla*OXA-48 gene in an *E. coli* isolate from a dromedary establishes a direct animal-human bridge, as this gene was also found in clinical and environmental *E. coli* and *K. pneumoniae*. Simultaneously, the high-risk metallo-β-lactamase gene *bla*NDM-1 was identified in *Acinetobacter baumannii* (including the epidemic clone ST2) from both the hospital environment and cockroaches, confirming their role as mechanical vectors. Molecular typing confirmed the circulation of international clones like *K. pneumoniae* ST999, underscoring the silent regional spread of high-risk strains. This study establishes the first integrated One Health baseline of AMR circulation in Southern Algeria, exposing a silent but highly interconnected resistance network. The detection of critical carbapenemase genes in animal and environmental reservoirs signals an urgent need for a policy shift. Building robust laboratory capacity and implementing coordinated, cross-sectoral surveillance are essential to safeguard health security in the region.

Keywords: *One health, antimicrobial resistance, GNB, South-Eastern Algeria, public health*

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Competing Interest: The statement is not declared by author(s)

Safety Assessments of Production Technologies Taking into Account the Criteria of Working Conditions and Risk Maps

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To propose a linearly consistent model for assessing the safety of production technologies based on the use of ISO 9001 risk matrices and existing working conditions maps. This model should be used to calculate actual risks in the technological process, followed by the creation of risk maps for working conditions. This model will allow for the transition from estimated risk to actual risk. An analytical review method; A method for constructing risk matrices; a workplace certification method, used to assess working conditions using standardized indicators and to create condition maps; Experimental method, used to assess the actual parameters of working conditions on production lines. The concept of linear-sequential occupational safety determination was adopted. For a specific operation of the technological process, the first step is to determine the risk of occupational hazards. This is done using a standard approach with the creation of appropriate risk matrices from the ISO 9001 standard. This is a tool for the systematic identification, assessment, and management of risks and capabilities within a quality management system. Next, an assessment of working conditions takes into account the identified hazards. For this, we use the procedure for certification of workplaces for harmful factors. The final stage is the identification of actual risks, which forms the overall picture of process safety at a specific stage of production. Regarding the assessment of the entire technological process, the sequence and parallel execution of individual production stages must be considered. Further development proposed method requires experimental studies. In the context of occupational safety, the risk matrix can be expanded to analyze hazardous and harmful factors affecting worker health and safety. This approach combines the requirements of ISO 9001 with the principles of ISO 45001.

Keywords: *safety of production technologies, risk matrix, map of working conditions, map of actual risks of working conditions.*

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Competing Interest: The authors declare no conflicts of interest.

Analysis of Occupational Injuries in the Energy Sector Using the Example of Ukraine

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Conducting an analysis of the current state of occupational injuries, including fatal injuries, at energy enterprises in Ukraine to develop measures to reduce the number of accidents and retain qualified personnel. An analytical review method; Group method; Statistical method. The study is based on open source information for the period from 2015 to 2023. The study analyzed data for the period from 2015 to 2023 on the level of occupational injuries in various sectors of the economy and the causes of accidents. A sharp increase in the total number of insured accidents in 2021-2022 was found only in two sectors - healthcare and electricity and gas supply. The largest number of fatal accidents in the energy sector is due to electric shock of personnel during maintenance and repair of electrical installations. The number of accidents has increased significantly not only due to man-made causes, which was explained by the coronavirus pandemic, but also due to organizational ones. Among the organizational reasons, violations of labor discipline are in the first place - failure to comply with the requirements of labor protection instructions, failure to fulfill job duties, and violations of the technological process. Proposals have been developed to improve the system of occupational health and safety management and labor relations in the energy industry, as well as measures to reduce the level of injuries due to organizational reasons in stressful conditions. Analysis of occupational injuries in Ukraine in recent years has confirmed the leading position of organizational causes, which is especially important for determining the direction of measures to prevent accidents, especially in the electricity supply industry, which has recorded an increase in the total number of victims and fatal cases.

Keywords: *energy safety, industrial injuries, organizational causes of accidents, safety measures, labor protection training, instructions, unscheduled briefing.*

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Ethical Approval Statement: This study did not require ethics committee approval.
Competing Interest: The authors declare no conflicts of interest.

Prevalence of Vancomycin-Resistant Enterococci Colonization in Tertiary Intensive Care Units: A Retrospective Surveillance Study

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The aim of this study is to determine the prevalence of Vancomycin-Resistant Enterococci (VRE) colonization among patients hospitalized in intensive care units (ICU) and to investigate the potential relationship between colonization rates and demographic factors such as age and gender.This retrospective study was conducted at Bilecik Training and Research Hospital between January 2025 and November 2025. Surveillance culture results of patients admitted to the 3rd Level Intensive Care Units were analyzed. Rectal swab samples collected for routine VRE screening were processed using standard microbiological culture methods. Demographic data, including age and gender, were retrieved from hospital records. Statistical analyses were performed to evaluate the differences in VRE positivity across gender and age groups, with a p-value of <0.05 considered statistically significant. A total of 250 unique patients were screened for VRE colonization during the study period. The mean age of the participants was 72.7 ± 13.4 years (range: 18-97 years). The study population consisted of 134 (53.6%) male and 116 (46.4%) female patients. VRE colonization was detected in 91 (36.4%) of the screened patients. When analyzed by gender, the positivity rate was 38.1% (51/134) in males and 34.5% (40/116) in females; however, this difference was not statistically significant ($p>0.05$). Furthermore, no significant difference was observed in the mean age between VRE-positive (72.5 years) and VRE-negative (72.8 years) patients ($p>0.05$).The results indicate a substantial rate of VRE colonization (36.4%) in our intensive care units, highlighting the ongoing challenge of multidrug-resistant organisms in critical care settings. While the patient population was predominantly elderly, neither advanced age nor gender was identified as a specific risk factor for colonization in this cohort. These findings underscore the necessity of maintaining strict infection control measures, contact precautions, and continuous active surveillance to prevent the cross-transmission of VRE among high-risk patients.

Keywords: *vancomycin-resistant enterococci, intensive care unit, surveillance, colonization, drug resistance*

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Ethical Approval Statement: The statement is not declared by author(s)
Competing Interest: The statement is not declared by author(s)

Laparoscopic Repair of Strangulated Obturator Hernia: A Case Report and Review of the Literature

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Obturator hernias are rare abdominal wall defects that pose diagnostic and therapeutic challenges. This study aimed to present laparoscopic repair of strangulated obturator hernia and to review of the literature.We present the case of an 82-year-old female presented to the emergency department with a chief complaint of intermittent, colicky abdominal pain that had been progressively worsening over the preceding three days. This was not associated with fever or chills. The obturator sign was positive on the right side, elicited by internal rotation of the hip with the knee flexed, which reproduced the patient's reported pain. A computed tomography (CT) scan of the abdomen and pelvis with intravenous contrast was obtained to evaluate further the source of her abdominal pain, axial and coronal views of the CT scan revealed a right obturator hernia containing a segment of incarcerated small bowel, the hernia sac was seen protruding through the right obturator canal, with clear visualization of the obturator vessels adjacent to the hernia, the size of the hernia defect was estimated to be approximately two centimeters in diameter, the incarcerated segment of small bowel showed signs of early strangulation, including wall thickening and mesenteric edema, without definitive evidence of perforation or ischemic changes.The patient's written and verbal informed consent was obtained for the surgery and the case presentation. The patient underwent successful laparoscopic repair of the obturator hernia using an intracorporeal suture technique without mesh placement due to concerns about potential contamination. A detailed literature review was conducted for this rare case.The patient experienced an uneventful postoperative recovery and was discharged home on postoperative day four. Laparoscopic repair is a feasible and safe approach for managing strangulated obturator hernias, even in elderly patients with comorbidities. There is a need for research articles, reviews and meta-analyses with larger patient populations on this subject.
Keywords: *strangulated obturator hernia, laparoscopic repair, minimally invasive surgery.*

Funding Statement: None.
Ethical Approval Statement: Due to the nature of the study's design, ethical committee approval is not required.
Competing Interest: The authors declare that they have no competing interests.

Enhancing Patient Safety Through IoT-Based Modular Medication Logistics: A Framework for HIMSS Stage 7 Compliance

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Medication Administration Errors (MAEs) represent a significant threat to patient safety and institutional efficiency. Medication errors can occur during the administration stage and with "wrong patient" and "wrong drug" incidents being the most critical. Achieving HIMSS Stage 7 maturity requires a fully digitized, closed-loop medication management system that ensures the "5 Rights" (right patient, right drug, right dose, right route, right time) at the point of care. The primary objective of this research is to develop and evaluate a portable, IoT-integrated smart storage unit designed to bridge the "physical-digital gap" in hospital logistics, eliminate manual handling risks and ensure secure medication transfer between pharmacy and clinical services. A modular prototype was developed featuring an electronic locking mechanism synchronized with patient specific barcodes. The system utilizes a WiFi transceiver for real-time traceability and data logging. The design employs a "Patient to Drawer" matching logic, where specific drawers only unlock upon successful validation of the patient's ID. The portability of the module allows for seamless integration into existing nursing workflows and medical carts. The proposed system provides a fail-safe mechanism against "wrong patient" and "wrong medication" errors by restricting access to authorized personnel and validated barcodes. Furthermore, real-time tracking via WiFi provides a continuous monitoring trail and also effectively addresses the traceability gap found in traditional manual handling methods. The operational efficiency of the unit by ensuring consistency in drawer opening speeds and distances is confirmed with mechanical tests.The integration of modular, barcode-validated storage units is a critical step toward achieving digital maturity in hospitals. Beyond healthcare, the proposed technological framework demonstrates high potential for cross-disciplinary use in high-security logistics, such as the defense industry.

Keywords: *Medication Administration Errors (MAE), HIMSS Stage 7, Modular Design, Portable IoT Unit, Barcode-Validated Storage, Closed-Loop Systems.*

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Ethical Approval Statement: Ethical committee approval was not required for this study as it represents a technical validation of a prototype conducted in a controlled laboratory environment. The experiments were performed using simulated data and hardware performance metrics to evaluate the system's engineering feasibility, without the involvement of human subjects or personal medical data.

Competing Interest: The authors declare that they have no competing interests.

Intra-abdominal Failure of a Low-Quality Trocar Component During Laparoscopic Surgery: A Video Case Presentation

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Laparoscopic surgery relies heavily on the safety and structural integrity of disposable surgical instruments. Trocar systems, in particular, play a critical role in maintaining safe access to the abdominal cavity. Device-related complications, especially those associated with low-cost and poor-quality products, remain underreported in the literature.We report a rare intraoperative complication encountered during a routine laparoscopic procedure, in which a trocar component supplied through a low-cost procurement system became detached and fell into the peritoneal cavity. The event occurred without excessive force or abnormal manipulation. Upon recognition of the incident, a systematic laparoscopic exploration was performed, and the foreign body was successfully retrieved without conversion to open surgery. No intraoperative or postoperative complications were observed, and the patient recovered uneventfully.This case highlights the potential risks associated with the use of low-quality laparoscopic instruments, particularly in healthcare settings where cost-based procurement policies are prioritized over product quality. Structural weakness, inadequate material standards, and insufficient quality control may predispose to such events, increasing operative time, surgeon stress, and potential patient risk. Although no adverse outcome occurred in this case, intraabdominal loss of device fragments carries the risk of infection, organ injury, and medicolegal consequences. Surgeons should remain vigilant regarding the quality of laparoscopic instruments and promptly inspect devices before and during use. Procurement systems should consider not only cost but also safety certifications and material reliability. Reporting such complications is essential to raise awareness and improve patient safety standards in minimally invasive surgery.

Keywords: *Laparoscopy, Trocar failure, Device-related complication, Foreign body, Patient safety*

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Ethical Approval Statement: Since this is a case presentation, ethical committee approval is not required.
Competing Interest: The authors declare that they have no competing interests.

Predictors of Length of Hospital Stay After Endoscopic Transnasal Pituitary Surgery: A 5-Year Single-Center Retrospective Analysis

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To identify clinical, radiological, surgical, and postoperative factors associated with prolonged hospitalization following endoscopic transnasal/transsphenoidal pituitary surgery in a single tertiary neurosurgical center. This retrospective observational cohort study included 40 patients who underwent endoscopic transnasal/transsphenoidal pituitary surgery between January 2020 and December 2024. Demographic, clinical, radiological, surgical, and postoperative data were collected from electronic medical records. Length of hospital stay was analyzed as a continuous variable and dichotomized based on the cohort median to define prolonged hospitalization. Variables that were significant or near-significant in univariate analyses were included in multivariable logistic regression models to identify independent predictors of prolonged hospital stay. A total of 40 patients were analyzed. Length of hospital stay did not follow a normal distribution, with a median length of stay of 8 days. In univariate analyses, suprasellar extension, postoperative cerebrospinal fluid leakage, and postoperative meningitis were significantly associated with prolonged hospital stay. Due to the strong clinical association between cerebrospinal fluid leakage and meningitis, these variables were not included together in the same multivariable model. After adjustment for Knosp grade, suprasellar extension remained an independent predictor of prolonged hospital stay (odds ratio: 11.1; 95% confidence interval: 1.03–119.5; p = 0.04). Suprasellar extension is an independent determinant of prolonged hospital stay following endoscopic transnasal transsphenoidal pituitary surgery. Preoperative radiological assessment may assist in anticipating postoperative care requirements and optimizing perioperative management strategies.

Keywords: *Pituitary adenoma, endoscopic transnasal surgery, transsphenoidal surgery, length of hospital stay, suprasellar extension*

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Ethical Approval Statement: This study was approved by the Ethics Committee of Ankara Bilkent City Hospital (Decision No: TABED 2/1774/2025 Date:24/12/2025).
Competing Interest: No competing interests.

Computed Tomography Volume and Orbit Score–Based Management in Rectus Sheath Hematoma

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Rectus sheath hematoma (RSH) is a rare but potentially life-threatening condition, particularly in elderly and anticoagulated patients. Despite the widespread use of computed tomography (CT) for diagnosis, management decisions are still largely based on clinical judgment and objective criteria guiding conservative versus invasive treatment remain limited. This study aimed to evaluate whether CT-derived hematoma volume and the ORBIT bleeding risk score could predict treatment strategy and clinical outcomes in patients with RSH and to develop a practical management-oriented approach. This single-center, retrospective observational study included patients diagnosed with RSH by contrast-enhanced CT between January 2020 and December 2024. Hematoma volume was calculated using the ellipsoid formula based on three orthogonal CT diameters. ORBIT scores were calculated according to standard definitions. Treatment strategies were classified as conservative or invasive, including interventional radiology and/or surgical management. A stepwise treatment algorithm was constructed based on imaging and clinical risk stratification. The primary outcome was the need for invasive treatment. Secondary outcomes included intensive care unit admission, length of hospital stay, readmission and mortality. Receiver operating characteristic analysis and multivariable logistic regression were performed. A total of 39 patients were included: 27 (69.2%) were managed conservatively and 12 (30.8%) required invasive treatment. Patients requiring invasive management had significantly larger hematoma volumes and higher ORBIT scores. CT hematoma volume demonstrated strong predictive performance for invasive treatment with an optimal cut-off of ≥710 mL. Patients with high hematoma volume and ORBIT score ≥3 showed significantly higher rates of intensive care admission, prolonged hospitalization and mortality. In multivariable analysis, hematoma volume ≥710 mL and ORBIT score ≥3 were independent predictors of mortality. CT-derived hematoma volume and ORBIT score represent complementary risk dimensions in RSH. Their combined use enables objective risk stratification and supports the development of a structured management algorithm to guide clinical decision-making.

Keywords: *rectus sheath hematoma; computed tomography; orbit score; risk stratification; clinical management*

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Ethical Approval Statement: Ethics committee approval was not required due to the retrospective design and abstract-based nature of the study.

Competing Interest: The authors declare that they have no competing interests.

Clinical and Molecular Characteristics of Pediatric Patients with 22q11.2 Deletion Syndrome: A Single-Center Experience

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22q11.2 deletion syndrome (DiGeorge syndrome) is one of the most common microdeletion syndromes, caused by a deletion involving the q11.2 region of chromosome 22 and occurring in approximately 1 in 4,000 live births. The syndrome is characterized by multisystem involvement, including congenital heart defects, particularly conotruncal anomalies, palatal abnormalities, immunodeficiency, hypocalcemia, characteristic facial features, and learning difficulties. Owing to its broad clinical spectrum, patients may present to different clinical specialties, which may delay diagnosis. This study aimed to evaluate the clinical and molecular characteristics of pediatric patients diagnosed with DiGeorge syndrome over the last five years.This retrospective single-center study included 10 pediatric patients diagnosed with DiGeorge syndrome who were followed at a pediatric genetics clinic over a five-year period. Demographic characteristics, indications for referral, clinical findings, and genetic test results were reviewed. Genetic diagnosis was established by detection of a deletion involving the DiGeorge syndrome critical region at 22q11.2 using chromosomal microarray analysis (CMA) or fluorescence in situ hybridization (FISH). Six patients (60%) were male and four (40%) were female. Age at diagnosis ranged from 1 month to 171 months, with a median age of 24 months. The most common indications for referral were congenital heart defects, dysmorphic facial features, and neurodevelopmental concerns. Dysmorphic facial features were present in all patients. Congenital heart defects were identified in 7 patients (70%), including ventricular septal defect (n = 2), tetralogy of Fallot (n = 2), patent ductus arteriosus (n = 2), and ventricular septal defect associated with an aortic arch anomaly (n = 1). Hypocalcemia was detected in 2 patients (20%), and a history of seizures was documented in 2 patients (20%). Additional findings included palatal, skeletal, and renal anomalies. Genetic diagnosis was confirmed by CMA in 8 patients (80%) and by FISH in 2 patients (20%). The findings are consistent with previously reported cohorts, particularly regarding congenital heart defects, dysmorphic facial features, and multisystem involvement. The phenotypic heterogeneity highlights the importance of early genetic evaluation. Given the broad clinical spectrum, timely genetic testing and a multidisciplinary approach are essential for optimal patient management.

Keywords: *22q11.2 deletion syndrome, DiGeorge syndrome, congenital heart defects, microdeletion syndrome*

Funding Statement: This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Approval Statement: This study was prepared as a scientific oral presentation based on retrospective evaluation of anonymized clinical data obtained from routine clinical practice. As the study did not involve any intervention, prospective data collection, or identifiable patient information, and was not conducted as a full research article, ethics committee approval and informed consent were not required.

Competing Interest: The authors declare that they have no competing interests.

Investigation of the Effects of Gallic Acid on miR-223-3p and miR-30c-5p Expression Levels in A549 Lung Cancer Cell Line

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Lung cancer remains one of the leading causes of cancer-related mortality worldwide, with non-small cell lung cancer (NSCLC) accounting for approximately 80% of all cases. Despite advances in conventional treatment strategies, high rates of metastasis, drug resistance, and recurrence necessitate the development of novel therapeutic approaches. In recent years, microRNAs (miRNAs), which regulate gene expression at the post-transcriptional level, have gained attention due to their critical roles in apoptosis, cell proliferation, and carcinogenesis.Gallic acid, a naturally occurring polyphenolic compound, has demonstrated anticancer properties in various cancer models. However, its effects on specific miRNA expression profiles in lung cancer cells remain insufficiently elucidated. In this study, we aimed to investigate the effects of gallic acid on miR-223-3p and miR-30c-5p expression levels in the A549 lung cancer cell line. A549 cells were cultured under standard conditions and treated with increasing concentrations of gallic acid. Cell viability was evaluated using the MTT assay, and the IC50 value was determined as 34 µg/mL following 24 hours of treatment. Total RNA, including miRNA fractions, was isolated from gallic acid-treated and untreated control cells. Subsequently, cDNA synthesis was performed using stem-loop specific primers, and miRNA expression levels were quantified by real-time PCR. U6 small nuclear RNA was used as an internal control for normalization. The results demonstrated that gallic acid treatment led to an increase in both miR-223-3p and miR-30c-5p expression levels compared to control cells. The upregulation of miR-223-3p was statistically significant ($p < 0.05$), whereas the increase in miR-30c-5p expression did not reach statistical significance. Notably, miR-30c-5p exhibited a more pronounced upregulation than miR-223-3p. These findings suggest that gallic acid's anticancer effects have been demonstrated in vitro, at least in part, through modulation of miRNA expression in lung cancer cells. This study contributes to the growing body of evidence supporting the therapeutic potential of natural polyphenolic compounds in cancer treatment and provides a foundation for further molecular and translational investigations.

Keywords: *gallic acid, lung cancer, microRNA, miR-223-3p, miR-30c-5p*

Funding Statement: This research was financially supported by TÜBİTAK 2209-A University Students Research Projects Support Program (6000 TRY).

Ethical Approval Statement: This study was conducted in vitro using established cell lines. Therefore, ethical committee approval and informed consent were not required.

Competing Interest: The authors declare that they have no competing interests.

Urethral Migration of a Double J Catheter: A Rare Case Report*

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Double J stents are widely used in urological practice to relieve urinary tract obstructions caused by ureteral stones, strictures, or adhesions. Although generally safe, their use may be associated with complications such as ureteral perforation, ureteral avulsion, and renal parenchymal perforation. In addition, rare complications such as stent migration may occur days or even weeks after the procedure. In this case report, we aim to present and discuss a rare complication in which a patient presented to the emergency department with protrusion of a Double J stent through the urethra following ureteral stent placement. A 39-year-old female patient underwent ureterolithotomy for renal colic one day prior to presentation, during which a Double J stent was placed in the right ureter. She presented to the emergency department with the complaint of a catheter protruding from the urinary tract. On admission, her vital signs were as follows: arterial blood pressure 117/105 mmHg, heart rate 97 beats/min, body temperature 36.7 °C, and oxygen saturation 97% on room air. Physical examination revealed that the Double J stent inserted during the procedure the previous day was protruding through the urethra. A plain abdominal radiograph of the urinary system demonstrated migration of the Double J stent into the urethra. The patient was subsequently consulted by the urology department and admitted to the hospital. During hospitalization, the Double J catheter was removed. The patient experienced no additional complications and was discharged in good condition.Double J catheter migration is a rare complication. To the best of our knowledge, urethral migration of a Double J stent has not been previously reported in the literature. Clinicians should be aware of this potential complication and consider it during patient management and follow-up after Double J stent placement.

Keywords: *Double J catheter, migration, Urethra, Renal Kolik*

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Ethical Approval Statement: Informed consent was obtained from the patient for the publication of this case report
Competing Interest: The authors declare that they have no competing interests.

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Dysregulation of the Complement–Coagulation And Extracellular Matrix Axis In Rheumatoid Arthritis: A Plasma Proteomics Study

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Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by persistent inflammation, synovial hyperplasia, and progressive joint destruction. Beyond immune dysregulation, increasing evidence suggests that complement activation, coagulation cascades, and extracellular matrix (ECM) remodeling are critically involved in disease pathogenesis. This study aimed to investigate the complement–coagulation–ECM axis in RA using a pathway-focused plasma proteomic approach.Plasma samples from 13 RA patients and 16 age- and sex-matched healthy controls were analyzed using LC–MS/MS following depletion of high-abundance proteins. Differentially expressed proteins were identified using statistical analysis with false discovery rate correction. Functional interpretation was performed using Gene Ontology, KEGG, and Reactome pathway enrichment analyses. Protein–protein interaction networks were constructed using STRING with a high-confidence interaction score to explore functional connectivity within the identified pathways.Proteomic analysis revealed significant dysregulation of proteins involved in complement activation, coagulation cascades, platelet-related processes, and ECM organization. Fibrinogen chains (FGA and FGG) were markedly upregulated in RA patients, indicating a pro- inflammatory and pro-thrombotic plasma profile. ECM- and cytoskeleton-associated proteins, including fibronectin-1 (FN1), talin-1 (TLN1), and extracellular matrix protein-1 (ECM1), were also increased, suggesting enhanced integrin-mediated cell–matrix interactions and tissue remodeling. In contrast, complement component C6 was consistently downregulated, pointing to altered terminal complement activity. Protein–protein interaction analysis demonstrated strong functional integration between coagulation factors, ECM proteins, and immune-related nodes, supporting the existence of a tightly interconnected complement–coagulation–ECM axis in RA.These findings highlight coordinated dysregulation of complement, coagulation, and ECM pathways in RA, contributing to sustained inflammation and joint damage. Targeting this molecular axis may offer novel opportunities for pathway-based biomarker development and therapeutic intervention.

Keywords: *rheumatoid arthritis, plasma proteomics, complement system, coagulation cascade, extracellular matrix*

Funding Statement: This research received no external funding.

Ethical Approval Statement: The study protocol was approved by the Hamidiye Scientific Research Ethics Committee of the University of Health Sciences, Turkey, under the registration number 23/59. The study was conducted by the Helsinki Declaration and Good Clinical Practice guidelines. Before enrolment in the study, written informed consent was obtained from all participants.

Competing Interest: The authors declare that they have no competing interests.

Determination of Acrylamide, HMF and Caffeine Levels in Hot Chocolates Marketed in Türkiye and Their Evaluation in Terms of Health Risks

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In this study, acrylamide, HMF and caffeine levels were determined in 11 powdered and packaged hot chocolate samples belonging to different brands that are produced in Türkiye or imported and known to have high consumption rates, and dietary exposure and health risks associated with these compounds were evaluated. Acrylamide levels were <LOD in the majority of samples and ranged between 0–8.645 µg/kg, with a mean value of 0.786±0.407 µg/kg. The estimated acrylamide exposures were well below the values reported in the literature and health-based guidance levels; THQ, CR and MOE results indicated that hot chocolate consumption poses a negligible risk in terms of acrylamide. HMF levels ranged between 21.490–96.505 mg/kg, with a mean value of 59.033±1.534 mg/kg, and the corresponding mean exposure was calculated as 0.151±0.068 mg/kg/day. Since no official TDI has been established for HMF, the evaluation was conducted using the mTAMDI approach, and hot chocolate was identified as a continuous source of HMF exposure. Caffeine levels ranged between 0.010– 0.242 mg/kg, and the toxicological contribution remained below <1% in all samples. In conclusion, health risks associated with acrylamide and caffeine due to hot chocolate consumption were very low, whereas HMF exposure was quantitatively more pronounced; however, the available data indicate that a cautious and context-based risk interpretation is also required for HMF.

Keywords: *hot chocolate; acrylamide; 5-Hydroxymethylfurfural; caffeine; dietary exposure; risk assessment*

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Ethical Approval Statement: This study did not involve human participants or animals and was conducted exclusively on commercially available food products. Therefore, ethical committee approval and informed consent were not required.

Competing Interest: The authors declare that they have no competing interests.

The Impact of Patient and Staff Safety Education on Rational Drug Use

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Medication use in healthcare delivery is considered one of the critical processes affecting patient safety. Patient and staff safety education is regarded as a key component in promoting safe practices and increasing risk awareness among students who are prospective future healthcare professionals. The aim of this study was to determine the level of knowledge regarding rational drug use among university students studying in the field of healthcare, as well as to evaluate the effect of having taken a patient and staff safety course on rational drug use. The study population consisted of students who had taken the Patient and Staff Safety course at Kırıkkale University Vocational School of Health Services, and the sample comprised 228 students. The 'Rational Drug Use Scale' was administered to the participants using a questionnaire method, and the analyses were conducted using the SPSS software. According to the data obtained, 66% of the participants were female, 64% reported a moderate income level, 71% had taken the Patient and Staff Safety course via distance education, 90% did not use any medication regularly, 51% resided more than 1 km away from the nearest healthcare facility, 88% did not use medication for minor complaints, and 47% reported using analgesics. Among those who used medications, 36% obtained them with a physician's prescription, while 25% reported self-medicating based on their own perceived need. Based on the findings, the mean score for all participants was calculated as 19.07, indicating a high level of safe medication use. It is recommended that patient and staff safety education, which is considered one of the important interventions supporting rational drug use, be provided especially to future healthcare professionals, that awareness of rational drug use be promoted through in-service training programs for healthcare workers, and that informative meetings and seminars be organized. Such educational interventions are also expected to contribute positively to efficiency and effectiveness in clinical decision-making processes.

Keywords: *Rational Drug Use, Occupational Safety, Patient Safety, Level of Knowledge, Healthcare Management*

Funding Statement: No financial support was received for this study.
Ethical Approval Statement: Ethical approval was obtained from the Kırıkkale University Non-Interventional Clinical Research Ethics Committee (10-07-2020/19647).
Competing Interest: The authors declare that there is no conflict of interest.

Digital Visibility and Academic Impact in Digital Twin Research for Health: An Altmetric Analysis

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The digital twin approach has attracted increasing attention in the health domain due to its potential for real-time monitoring, simulation, and decision support. This study aims to examine the digital and societal visibility of scientific publications on digital twins in health and medicine using the Altmetric Attention Score (AAS) and to assess the relationship between this visibility and academic impact, measured by citation counts. Publications addressing digital twins in health and medicine were identified through a Topic search in the Web of Science (WoS) database using the keyword "digital twin," resulting in a total of 2,236 publications defined as the literature universe. Citation data were retrieved from the Dimensions database via DOI matching, while digital and societal visibility data were obtained from Altmetric.com. The analysis included the top 100 most-cited publications with at least one citation and an AAS ≥ 1. The conceptual structure of the literature was examined using a co-occurrence keyword network analysis conducted with VOSviewer. Associations between digital visibility and academic impact were assessed using Spearman's rank correlation analysis. To support the correlation findings, a simple linear regression analysis was performed using a log-transformed AAS. Most publications were concentrated in the period after 2019. Engineering, computing, and data science–oriented studies dominated the disciplinary distribution, whereas clinical and health services–focused research remained relatively limited. AAS values showed substantial variability, with a small number of publications achieving high digital visibility. A low-to moderate positive association was observed between AAS and total citations ($\rho = 0.31$; $p = 0.002$), while a stronger relationship was found with recent citations ($\rho = 0.38$; $p < 0.001$). Regression analysis indicated that digital visibility was significantly but modestly associated with academic impact ($R^2 = 0.078$). This study demonstrates that digital and societal visibility serves as a complementary indicator of academic impact in the digital twin literature. The findings highlight the importance of strengthening the integration of digital twin research into clinical and health services contexts and enhancing dissemination strategies to increase the visibility of research outputs among policymakers, health professionals, and the wider public.

Keywords: *digital twin, health and medicine, altmetric attention score, academic impact, digital visibility.*

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Ethical Approval Statement: This study is based exclusively on the analysis of secondary data obtained from publicly available bibliometric and altmetric databases (Web of Science, Dimensions, and Altmetric.com) and does

not involve human participants, personal data, or any intervention. Therefore, ethics committee approval and informed consent were not required.

Competing Interest: The authors declare that they have no competing interests.

Systematic Review of Bibliometric Analysis Studies in the Field of Health Technology Assessment

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Health Technology Assessment (HTA) is an evidence-based decision-support tool that promotes the efficient, effective, and equitable use of resources within health systems. In recent years, alongside the growing volume of scientific publications in the field of HTA, there has been a noticeable increase in studies employing bibliometric analysis methods to reveal the structural characteristics and developmental trends of this literature. The aim of this study is to systematically review academic studies that have applied bibliometric analysis methods in the field of HTA and to evaluate their methodological and thematic characteristics. Within this scope, a systematic review was conducted in accordance with the PRISMA 2020 guidelines. Searches were performed in the Web of Science, Scopus, and PubMed databases using the keywords "health technology assessment," "HTA," "bibliometric analysis," "scientometrics," and "citation analysis." Records retrieved from these searches were evaluated through title, abstract, and full-text screening based on predefined inclusion and exclusion criteria, and eligible studies were included in the analysis. The selected studies were descriptively analyzed in terms of publication year, journal, country of origin, database used, bibliometric analysis software, time period examined, and thematic focus. The findings indicate that bibliometric analysis studies in the field of HTA have increased particularly over the last decade. Most of the studies were based on data from the Web of Science and Scopus databases, and the most frequently used bibliometric software tools were VOSviewer and Bibliometrix. From a thematic perspective, the reviewed studies predominantly focused on cost-effectiveness, policymaking processes, health economics, and digital health technologies. In conclusion, this systematic review presents an overview of the current state of bibliometric analysis studies in the field of HTA and provides a guiding methodological and thematic framework for future HTA research.

Keywords: *Health Technology Assessment; Bibliometric Analysis; Systematic Review; Health Policy; Evidence-Based Decision Making*

Funding Statement: No funding was received for this study.
Ethical Approval Statement: Ethics committee approval was not required as this study is a systematic review.
Competing Interest: The authors declare that they have no competing interests.

The Invisible Threat in Operating Rooms: Attitudes Towards the Use of Sharp Instruments and Influencing Factors

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Operating rooms are environments where a wide range of sharps, such as scalpels, surgical needles, sutures, and syringes, are frequently used, posing a high risk of injury to healthcare workers. A small oversight or lack of communication can lead to physical injuries or blood-borne infections. To minimize risks, it is crucial to ensure that staff members use sharps safely. This study aimed to determine the attitudes of healthcare professionals working in operating rooms toward the use of sharps and needles and the factors influencing these attitudes. This is a descriptive and cross-sectional study. The study population consisted of operating room staff in Turkey. Data were collected via an online survey between May and July 2025. A participant information form and the "Healthcare Workers' Attitude Scale Towards the Safe Use of Sharp Medical Instruments" constituted the data collection forms. Data were analysed using SPSS 20 using descriptive and correlational tests (t-test, One-way ANOVA, Pearson correlation analysis, and regression). A total of 130 healthcare professionals (61% female; mean age = 33, SD = 7.6, range: 24-57) participated in the study. Roles included: 44% nurses, 20% anesthesia technicians, 15% physicians, 11% support staff, and 10% other professionals. 81% of the participants reported receiving training on using sharp instrument, and 62% reported experiencing injuries from such equipment, of which 28% carried a risk of contamination, but only 43% were reported to the relevant authorities. Statistical analyses showed that the attitudes of operating room workers toward sharps use were significantly correlated with gender and job function (p=0.001). Female staff and nurses demonstrated safer handling practices compared to male staff and those in other roles. This original study examining the attitudes of operating room staff toward sharps demonstrates that female healthcare professionals and nurses tend to use sharps more safely. It is recommended that all healthcare professionals working in operating rooms improve their knowledge and attitudes about sharps, and that institutions provide the necessary environments and opportunities to do so.

Keywords: *Sharp-tip injuries, attitude, safe use, operating room, surgical nursing*

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Ethical Approval Statement: All procedures involving human subjects were approved by the Social Sciences Ethics Committee of Amasya University (23.05.2025 dated and 263287 numbered).
Competing Interest: The authors declare that they have no competing interests.

Optimizing OSH Management Decisions Through Quantitative Evaluation

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This work presents a novel methodology combining managerial competency assessment with mathematical modelling to support senior decision-making in the field of Occupational Safety and Health (OSH). The tool objectively predicts candidate performance across stable and crisis conditions, mitigating suboptimal decision risks that contribute to increased levels of injuries and occupational diseases. The methodological framework for evaluating candidates for the position of OSH Department was structured around four professional criteria, identified based on the specific requirements of occupational safety management in an industrial enterprise, and four potential operational states of the enterprise. Following expert assessment and the assignment of weighting factors, the alternatives were evaluated using the Hurwitz criterion for different confidence coefficient values. Candidate scores were largely uniform, indicating that unweighted expert surveys are inadequate for selecting an OSH Department manager capable of ensuring safety across all stages of organizational development. Effective personnel development requires flexible, production-specific training, regular knowledge assessment, interactive and remote learning methods, and structured knowledge exchange among industry organizations, supported by a centralized database of best practices in HR management and occupational injury prevention. The present findings indicate that, to enhance human resource decision-making in the OSH field, the adoption of advanced personnel analysis methods and systematic HR audits is recommended. The Hurwitz criterion has been shown to constitute an effective instrument for the formalized evaluation of senior management personnel responsible for OSH, facilitating both flexibility and objectivity in the selection of management alternatives. Furthermore, the study highlights several critical avenues for the optimization of HR potential in OSH organizations. These include the reinforcement of regulatory frameworks, the establishment of structured professional development programs, the implementation of mathematical decision-support models, and the enhancement of transparency and objectivity in personnel assessment procedures.

Keywords: *occupational safety, human resource management, decision making, uncertainty, Hurwitz criterion.*

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Ethical Approval Statement: This study did not require ethics committee approval.
Competing Interest: The authors declare no conflicts of interest.

Determinants of Health Literacy in Adults: the Türkiye Health Literacy Scale–32

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According to the World Health Organization's definition, health literacy is the ability of individuals to access, understand, and use health information for the protection and maintenance of health. The aim of this study is to determine and compare the health literacy levels of individuals from different occupational groups. The sample profile of this study consisted of the parents and colleagues of students at Gülhane Health Vocational School of Health Sciences University. No sampling method was used; a questionnaire was administered to all employees who agreed to participate in the research. The study used a personal information form prepared by the researchers, which inquired about the demographic information of the participants, and the Turkish Health Literacy Scale (TSOY-32). This cross-sectional study included 387 adult individuals aged 18–69 from 20 different occupational groups. The mean age of the participants was 32.66±9.49 years, and 58.4% were male. The general health literacy index was determined to be 34.14±8.03. Health literacy scores were higher in the treatment and healthcare services area compared to the disease prevention and health promotion area. The total Cronbach's alpha value of the scale was 0.951, indicating high internal consistency. In the regression analysis, education level was identified as the strongest and most consistent positive predictor of health literacy ($\beta=0.198$, $p<0.001$). A significant negative correlation was found between subjective general health perception and health literacy ($\beta=-0.229$, $p<0.001$), while medication use was positively correlated with health literacy ($\beta=0.285$, $p<0.01$). No significant correlation was found between other sociodemographic variables and health service use preferences and health literacy. In conclusion, health literacy is shaped by individuals' educational level and active engagement with health, rather than by basic demographic characteristics. The findings highlight the importance of educational approaches and strategies that center individuals' health experiences in interventions aimed at increasing health literacy.

Keywords: *health literacy, TSOY-32, occupational groups.*

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Ethical Approval Statement: Ethical approval for the research was obtained from the Çankırı Karatekin University Ethics Committee (14-07-2024/15).
Competing Interest: The authors declare that they have no competing interests.

A Qualitative Evaluation of Community Mental Health Policies in Türkiye*

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The aim of this qualitative study is to analyze the policies developed and implemented in the field of community mental health in Türkiye between 2000 and 2024 through a review relevant documents. Documents were identified using keyword searches and academic databeses 41 selected documents were analyzed via thematic content analysis. As a result of the analysis, 7 themes were identified in the field of community mental health: workforce, service delivery, financing, policy, organization, social factors and research. The most recurring codes in the documents were community-based service delivery (28 documents, 72 repetitions), mental health stigma (26 documents, 100 repetitions), inter-sectoral collaboration (25 documents, 79 repetitions), mental health workforce (20 documents, 100 repetitions), mental health legislation (17 documents, 60 repetitions), funding (16 documents, 38 repetitions), and community mental health data and research (13 documents, 35 repetitions). The lack of community-based services and stigma were identified as critical barriers to effective mental health services in provision in Türkiye. Based on this study, in order to improve community-based mental health policies in developing countries such as Türkiye, lack of coordination in service delivery, inadequate quality and quantity of human resources, lack of political determination, uncertainty about the amount and use of resources, lack of community-based approach in service delivery, transparency of data and combating stigmatization should be prioritized.

Keywords: *community-based mental health services, policy analysis, document analysis, public health policies*

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Competing Interest: The authors declare that they have no competing interests.

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Antimicrobial Activity of Different Commercial Volatile Oils on *E. coli*

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Essential oils are natural compounds obtained from different parts of plants (leaves, roots, flowers, etc.) and are easily volatile. The volatile components of plants are obtained using different techniques such as steam distillation and cold pressing. Essential oils from lavender, mint, rose, eucalyptus, and thyme plants, widely used in aromatherapy, are commonly used to treat infections due to their antimicrobial and antiviral activities. In addition, essential oils are used for various purposes, such as relaxation, revitalization, antiseptic properties, refreshing effects, and respiratory support. However, because the direct use of essential oils at very high concentrations is inadvisable, they are diluted with different carrier oils and sold. However, commercially available essential oils that are not produced in a standardized manner may have adverse effects on human health, and products that lack biological activity may be found on the market. In this study, the antibacterial activity of two brands of commercially available thyme oils against *Escherichia coli* (*E. coli*) was compared using the disc diffusion method. Although the findings revealed that commercial oils exhibit good antimicrobial activity, the inhibition zones of the essential oils were different from each other. This situation can be attributed to differences in the ratios of active components in the essential oils.

Keywords: *volatile oils, antibacterial activity, thyme, aromatherapy*

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Synthesis of New 8-(2-Pyrimidinyl) sulfanylxanthine Derivatives and *In vitro* and *In Silico* Evaluation of Their Potential Activity Against Lung Cancer

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Lung cancer–related mortality is still at a serious level. According to GLOBOCAN 2022 data, in 2022 there were 2.48 million new lung cancer diagnoses and 1.8 million deaths due to lung cancer worldwide. If current rates remain unchanged, 4.62 million new cases and 3.55 million deaths are expected by 2050. Lung cancer progresses through various pathways, one of which is the PI3K–AKT–mTOR pathway. The development of various compounds expected to be effective on this pathway remains an active area of research, and such compounds are thought to be especially effective in combination therapies. In this context, based on effective compounds reported in the literature, new 8-(2-pyrimidinyl)sulfanylxanthine derivatives with potential PI3Kα enzyme inhibitory activity were synthesized. The theophylline compound brominated at the 8-position was then derivatized at the 7-position with benzyl and 3,4-dichlorobenzyl groups. In parallel, pyrimidine derivatives were synthesized from 4-methyl/4-methoxybenzaldehyde, thiourea, and malononitrile. A bond was subsequently formed between the –SH group at the 2-position of the pyrimidine derivatives and the 8-position of the xanthine derivatives. The structures of the compounds were elucidated by 2D NMR (HMBC), and their purity was assessed by HPLC. The potential PI3Kα inhibitory activities of the compounds were evaluated through molecular docking and molecular dynamics simulation. In addition, the compounds' potential cytotoxic effect is currently being investigated in the lung cancer A549 cell line, and their cytotoxicity toward healthy cells is being assessed using the HUVEC (human umbilical vein endothelial cells) cell line.

Keywords: *xanthine, pyrimidine, lung cancer, A549, in silico study*

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The Role of Orthodontic Adhesive Primers on Antimicrobial Activity on *E. coli*

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Oral and dental health is an important issue that directly affects human health and can pave the way for the development of systemic diseases affecting different systems, such as cardiovascular, diabetes, and digestive system diseases. Inadequate oral hygiene during orthodontic treatment may lead to caries on tooth surfaces adjacent to fixed appliances. Antimicrobial properties of bonding materials represent an important role in reducing the risk of biofilm formation and enamel demineralization during treatment. *Escherichia coli* (*E. coli*) is one of the bacteria that affects the intestines, but can also be found in the oral cavity in patients with fixed orthodontic appliances. It participates in biofilm formation on orthodontic appliances, creating an acidophilic microenvironment that leads to the production of metabolic byproducts, causing demineralization of tooth enamel. This study aims to evaluate the antimicrobial efficacy of orthodontic adhesive primers against *E. coli*. Three orthodontic primer brands (AssurePlus, Transbond XT, and Reliance) were selected for investigation of their antimicrobial properties. It was determined that all orthodontic primers exhibited good antimicrobial activity against *E. coli*. The antimicrobial properties of orthodontic materials can help prevent such situations and contribute to the elimination of harmful microorganisms in the oral cavity.

Keywords: *Antimicrobial activity, adhesive, primer, orthodontics*

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Competing Interest: The authors declare that they have no competing interests.

Design and Synthesis of Imidazole–Hydrazone Hybrids as Novel Antimicrobial Agents Targeting DNA Gyrase

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Antimicrobial drug resistance is one of the high-priority research topics in the field of drug discovery due to its critical implications. Therefore, ongoing investigations are focusing on combating the microbial resistance to the available drugs in the market by discovering new chemical entities that have the ability to eradicate the resistant strains. A series of thirteen (*E/Z*)-2-(4-(4,5-diphenyl-1H-imidazol-2-yl)phenoxy)-*N*'-(heteroaromatyl/substituted benzylidene) acetohydrazide derivatives were designed by integrating imidazole and hydrazone moieties within a single molecular skeleton. The compounds were synthesized and structurally confirmed by ^{1}H-NMR, ^{13}C-NMR and HRMS spectroscopic techniques. The compounds were evaluated for their antibacterial and anticandidal properties against various pathogenic species. The best compound **4h** has exhibited the best antibacterial properties against K. pneumoniae was further evaluated to understand its mechanism of action. Compound **4h** was studied for its ability to inhibit the bacterial DNA gyrase enzyme which is essential for bacterial growth. The compound proved its ability to inhibit DNA gyrase similarly to the known antibiotic ciprofloxacin. Compound **4h** was further studied in silico to elucidate the binding interaction with DNA gyrase enzyme. Both molecular docking (MD) and molecular dynamics simulation (MDS) confirmed the stable binding of compound 4h within the DNA–DNA gyrase active site. Additionally, compound **4h** was also studied for its physicochemical and ADME properties.

Keywords: *imidazole, hydrazone, antibacterial, antifungal, DNA gyrase*

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Investigation of the Electrochemical Behavior of the Antiepileptic Perampanel and Its Analytical Application*

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Perampanel is the first antiepileptic drug introduced for clinical use as a non-selective antagonist of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptors in the treatment of epilepsy. The aim of this study is to develop a more sensitive, reproducible, reliable, inexpensive, and rapid alternative method for the qualitative and quantitative determination of this drug substance, which is not yet available in our country or in the Pharmacopoeia. In this study, the electrochemical behavior of perampanel was investigated using differential pulse voltammetry (DPV) and cyclic voltammetry (CV) techniques with a glassy carbon electrode. First, the supporting electrolyte effect was investigated in pH 2.0 and pH 11.0 solutions prepared with Britton-Robinson (BR) buffer. The pH 6.0 BR buffer, where the highest peak current was obtained, was selected as the optimum pH. Subsequently, important parameters in the DPV technique, such as the accumulation potential, accumulation time, and pulse amplitude, were optimized individually and found to be 200 mV, 50 s, and 180 mV, respectively. Under optimal conditions, a calibration curve was created using the standard addition method, and the linear working range was found as 0.6 – 30 ppm on the bare GCE. Furthermore, to demonstrate the selectivity of the method, the interference effects of ions such as Cu^{2+}, Cd^{2+}, Mg^{2+}, and Pb^{2+} with ascorbic acid, mepivacaine, oseltamivir, and levetiracetam were examined in detail, and it was observed that they did not cause a significant change in the peak current of perampanel. Finally, to demonstrate the validity and accuracy of the method, a successful analytical application was performed on Fycompa® tablets. As a result, a new alternative analytical method was developed for the active ingredient of perampanel.
Keywords: *Perampanel, Differential pulse voltammetry (DPV), Electrochemistry*

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Competing Interest: The authors declare that they have no competing interests.

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Synthesis of thiazole derivatives and their evaluation as anti-α-amylase agents, AChE inhibitors, and antioxidants

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The growing global burden of metabolic and neurodegenerative disorders has intensified the search for multifunctional molecules capable of targeting shared pathological mechanisms such as enzyme dysregulation and oxidative stress. The aim of this study to design, synthesize, and evaluate a new series of thiazole–hydrazine derivatives as potential acetylcholinesterase (AChE) inhibitors, α-amylase inhibitors, and antioxidant agents, supported by molecular docking and in silico ADMET analysis. A series of eleven substituted thiazole–hydrazine derivatives (2a–2k) was synthesized via condensation and cyclization reactions and structurally confirmed using ^1H- and ^13C-NMR spectroscopy. AChE inhibitory activity was evaluated using a standard in vitro enzyme inhibition assay, α-amylase inhibition was determined by the iodine–potassium iodide method, and antioxidant capacity was assessed using the ABTS radical cation decolorization assay. Molecular docking was performed against human pancreatic α-amylase, and ADMET properties of the lead compound were predicted computationally. Among the tested compounds, derivative **2a** (p-NO2) exhibited the strongest AChE inhibition with an IC50 value of 16.94 µM, followed by 2g (IC_{50} = 23.19 µM) and 2h (IC_{50} = 30.99 µM). In contrast, compound $_{2j}$, bearing a catechol moiety, showed the highest α-amylase inhibitory activity with an IC_{50} value of 0.75 ± 0.03 mM, compared with the reference inhibitor acarbose (IC_{50} = 0.23 ± 0.01 mM). This compound also demonstrated the strongest antioxidant capacity with a Trolox equivalent antioxidant capacity (TEAC) value of 1.31 ± 0.002 mM. In addition, molecular docking revealed stable binding of **2j** within the α-amylase catalytic pocket through recurrent interactions with Asp197, Glu233, and Asp300. In silico ADMET analysis for **2j** predicted high oral absorption (93.7%), favorable intestinal permeability (Caco-2 = 469.8 nm/s), limited CNS penetration (logBB = −1.22), and acceptable metabolic behavior, although a potential hERG liability was identified. In conclusion, thiazole–hydrazine derivatives represent promising multifunctional scaffolds. Compound **2j** emerged as a lead candidate combining α-amylase inhibition and antioxidant activity, while compound **2a** showed selective AChE inhibition, supporting further optimization for metabolic and neurodegenerative disorder therapy.

Keywords: *Thiazole derivatives; acetylcholinesterase inhibition; α-amylase inhibition; antioxidant activity; molecular docking.*

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Competing Interest: The authors declare that they have no competing interests.

Design, Synthesis, and Evaluation of the Potential Anticancer Activities of 8-[(4,5-Diphenyl-1*H*-imidazol-2-yl)sulfanyl]-7-benzyltheophylline Derivatives

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Topoisomerase IIα (Topo IIα) is highly expressed in proliferating tumor cells; therefore, the development of Topo IIα-selective inhibitors has emerged as an important strategy to enhance antitumor efficacy by selectively targeting this isoform. However, most clinically used Topo II–targeting agents lack isoform selectivity, which may promote Topo IIβ-mediated DNA damage not only in tumor cells but also in healthy tissues, thereby increasing the risk of cardiotoxicity and therapy-related secondary malignancies. In addition, acquired resistance and a narrow therapeutic index further underscore the need for safer and more effective Topo IIα- selective inhibitors. Accordingly, new 8-[(4,5-diphenyl-1*H*-imidazol-2-yl)sulfanyl]-7-benzyltheophylline derivatives were designed as potential Topo IIα inhibitors, and their cytotoxicity profiles were assessed in A549 (Lung adenocarcinoma) cells and HUVEC (Human umbilical vein endothelial cells) to estimate cytotoxicity in healthy cells and overall selectivity. Benzoin and its derivatives, obtained by condensation reaction with benzaldehyde and its derivatives, were reacted with NH_4SCN to produce 4,5-diaryl-1*H*-imidazole-2(3*H*)-thione. In parallel, theophylline was brominated at the 2nd position and then derivatiweated at the 7th position in the next step. Reaction of the resulting theophylline derivatives with 4,5-diaryl-imidazole-2(3H)-thione compounds yielded 7-substituted-8-((4,5-diaryl-1*H*-imidazole-2-yl)thio)-1,3-dimethyl-3,7-dihydro-1*H*-purine-2,6-dione. Furthermore, *in silico* studies were performed for the synthesized compounds and the reference inhibitor etoposide using the 5GWK co-crystal structure retrieved from the Protein Data Bank. Structural elucidation of the synthesized compounds was carried out using 2D NMR (HMBC), and their melting-point ranges were determined. In addition, the purity of the synthesized compounds was determined by HPLC analysis. *In vitro* cytotoxicity evaluations are being conducted in A549 and HUVEC cell lines. According to the molecular modeling results, the phenyl rings of the synthesized hybrids establish pronounced π–π stacking interactions with DNA bases DA (D:12) and DG (D:13), contributing to complex stabilization. Moreover, the imidazole NH group is predicted to form a hydrogen bond with DT (F:9), while the xanthine core is positioned proximal to DG (E:7), indicating a potential for polar interactions. Additional stabilization is supported by hydrophobic contacts with Met (B:762) and Met (B:766). Collectively, these findings suggest that the synthesized hybrids may possess Topo IIα-selective inhibitory potential and warrant further biological validation.

Keywords: *imidazole, anticancer activity, in silico study, theophylline*

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Ethical Approval Statement: Ethical committee approval was not required for this study, as it involved only compound synthesis, in silico studies, and enzyme activity assays, and did not include human participants or animal experiments.
Competing Interest: The authors declare that they have no competing interests.

Synthesis of Some 1,3,4-Thiadiazole Hydrazide Derivatives and Their Antiproliferative Activity

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Hydrazide/hydrazones have an important role in drug design and development due to their broad biological activity profiles and their classification as privileged ligands in pharmaceutical chemistry. The ease of synthesis and the possibility of structural modification make these compounds advantageous for the development of biologically active molecules. In this study, the synthesis of new 1,3,4-thiadiazole hydrazide derivatives and the evaluation of their cytotoxic effects on a lung cancer cell line were aimed. In the experimental study, 5-methyl-2-mercapto-1,3,4-thiadiazole was used as the starting material to obtain ester derivatives, followed by the synthesis of hydrazide intermediate compounds via reaction with hydrazine hydrate. In the final step, condensation reactions with various substituted benzaldehydes were carried out to synthesize 2-[(5-methyl-1,3,4-thiadiazol- 2-yl)thio]-*N*'-(substituted benzylidene)acetohydrazide derivatives (**3a–3f**). The *in vitro* cytotoxic activities of the synthesized compounds were evaluated using the MTT assay on A549 lung carcinoma cells and HUVEC normal endothelial cells. IC_{50} values and selectivity indices were calculated. The results indicated that compound **3d** exhibited significant cytotoxic activity against A549 cells while showing low toxicity toward normal cells. In conclusion, the synthesized derivatives represent promising potential anticancer agent candidates due to their selective cytotoxic effects against cancer cells and require further biological investigations.

Keywords: *1,3,4-thiadiazole, hydrazide, cytotoxicity, synthesis*

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Competing Interest: The authors declare that they have no competing interests.

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