



3rd SUSTAINABILITY, QUALITY AND AI
CONGRESS IN HEALTH SCIENCES
24-25 April 2026 (In Person and Online)
International Hellenic University, Thessaloniki, Greece



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3rd Health Sciences Congress

"Sustainability, Quality and AI"



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EXAMINING THE LEVELS OF CROSS-CULTURAL SENSITIVITY AND HEALTH TOURISM AWARENESS AMONG STUDENTS IN THE HEALTH MANAGEMENT DEPARTMENT

Havva Ceylan¹ Dilruba İzgüden² Aynur Toraman³

ABSTRACT

Purpose: This study aims to determine the levels of intercultural sensitivity and health tourism awareness among Health Management students and to examine whether these levels differ according to variables such as taking a health tourism course, intention to work in the health tourism sector after graduation, and foreign language proficiency. In addition, the relationship between intercultural sensitivity and health tourism awareness is investigated.

Method: This study adopts a cross-sectional quantitative design. The sample consists of 271 students enrolled in the Department of Health Management at a university in Türkiye. Data were collected via an online questionnaire using the Intercultural Sensitivity Scale and the Health Tourism Awareness Scale. Descriptive statistics, independent samples t-tests, ANOVA, and Pearson correlation analyses were conducted at a 95% confidence level.

Findings: The findings indicate that students' mean scores for intercultural sensitivity (81.5 ± 10.1) and health tourism awareness (72.8 ± 9.5) are above the neutral level. Intercultural sensitivity significantly differs according to class level, foreign language proficiency, and intention to work in the health tourism sector. Health tourism awareness shows significant differences based on gender, class level, foreign language proficiency, taking or intending to take a health tourism course, and intention to work in the sector. No statistically significant relationship was found between intercultural sensitivity and health tourism awareness.

Conclusion: The results suggest that intercultural sensitivity and health tourism awareness are independent yet complementary competencies. These findings highlight the importance of adopting a holistic approach in health management education to support students' professional development in global health services.

Keywords: Intercultural Sensitivity, Health Tourism, Awareness, Health Management Students

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SUSTAINABILITY IN HEALTHCARE: A WEBSITE CONTENT ANALYSIS OF ACCREDITED HOSPITALS IN TÜRKIYE

Yonca Özatkan⁴ Perihan Şenel Tekin⁵

ABSTRACT

Purpose: Sustainability has increasingly become a strategic priority for healthcare organizations due to their significant environmental footprint, intensive resource use, and broad social responsibilities. Hospitals are expected not only to implement sustainability practices but also to communicate these initiatives transparently to stakeholders. The main aim of this research is to identify sustainability-related themes presented on the official websites of accredited hospitals in Türkiye and to examine how hospitals communicate these activities to stakeholders.

Method: The study employs website content analysis as a qualitative research method. The data were obtained by examining the official websites of 56 hospitals in Türkiye holding international or national accreditation (39 accredited by Joint Commission International – JCI and 17 accredited by the Turkish Healthcare Quality and Accreditation Institute – TÜSKA). All publicly accessible website sections related to sustainability, environmental practices, corporate responsibility, quality initiatives, and institutional policies were reviewed. Sustainability-related content was coded according to predefined categories reflecting environmental, social, and governance (ESG) dimensions. The collected data were analyzed using qualitative content analysis supported by descriptive statistics.

Findings: The analysis revealed that sustainability-related information on hospital websites primarily focuses on social sustainability themes, including patient safety, employee well-being, and community-oriented initiatives. Environmental sustainability topics—such as waste management, energy efficiency, and environmentally responsible facility management—were present but less frequently emphasized, while critical issues such as climate strategies and carbon footprint measurement were largely absent. Governance-related themes, including quality management systems, accreditation, and ethical practices, were commonly identified; however, structured sustainability reporting and clearly defined sustainability strategies were rarely observed. Overall, sustainability communication appeared fragmented and predominantly operational rather than strategic, with notable imbalances across ESG dimensions.

Conclusion: This research provides an overview of how accredited hospitals in Türkiye communicate sustainability-related activities through their websites. The findings suggest that sustainability initiatives are often communicated in a fragmented and operational manner rather than through comprehensive strategies or standardized reporting frameworks. Furthermore, the presence of sustainability-related content on websites does not necessarily reflect actual implementation, indicating a potential risk of “greenwashing.” The results contribute to ongoing discussions on sustainability communication in healthcare and highlight the need for more systematic, transparent, and verifiable reporting practices, as well as stronger integration of sustainability criteria into accreditation and quality management systems.

Keywords: Accreditation, Content Analysis, Hospitals, Sustainability, Website

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ARTIFICIAL INTELLIGENCE AND EXPERIENTIAL LEARNING IN HEALTH SCIENCES: NAVIGATING OPPORTUNITIES AND POLICY NEEDS

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ABSTRACT

Purpose: The main aim of this research is to explore how artificial intelligence (AI) can enhance experiential learning in health sciences education and to identify the related policy opportunities and challenges. The study also aims to examine how AI-driven educational tools, such as virtual patients, simulations, and adaptive learning platforms, can improve clinical competence, interprofessional collaboration, and decision-making skills.

Method: The study employs qualitative content and policy analysis, using data from peer-reviewed literature, AI platform documentation, pilot program reports, and policy guidelines to examine opportunities, challenges, and recommendations for AI-enhanced experiential learning in health sciences.

Findings: The analysis revealed that AI tools offer safe, repeatable, and personalized learning experiences, supporting improved clinical reasoning and reflective practice. Key challenges include inequitable access to AI technologies, ethical concerns, and gaps in accreditation and regulatory standards. Effective integration of AI in health sciences education requires clear policies addressing these challenges, ensuring both technological innovation and educational quality.

Conclusion: This research provides actionable insights for universities, policymakers, and AI developers, including guidelines for ethical implementation, curriculum integration, and equitable access. By aligning AI innovation with policy guidance, health sciences education can better prepare professionals who are clinically competent, ethically aware, and equipped to meet modern healthcare demands.

Keywords: Artificial intelligence, experiential learning, health sciences education, policy, ethics, virtual simulations

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MIDWIFERY STUDENTS' METAPHORICAL PERCEPTIONS AND ATTITUDES REGARDING SUSTAINABLE NUTRITION

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ABSTRACT

Purpose: The aim of this study is to determine midwifery students' metaphorical perceptions and attitudes about sustainable nutrition.

Method: The sample for this study consisted of 30 students enrolled in the nutrition course at the Midwifery Department of the Faculty of Health Sciences, Giresun University, during the 2024-2025 academic year. This study, based on a phenomenological design, utilized a purposive sampling method. After obtaining ethical committee approval, data were collected using a Demographic Information Form and a semi-structured interview form. Thematic analysis was performed to identify the main and sub-themes.

Findings: The thematic analysis yielded three main themes: 1) Metaphorical perceptions of sustainable nutrition (Consuming only what is needed, Using resources efficiently, Taking care of oneself and nature, and Transformation from individual behavior to society), 2) The effects of sustainable nutrition on health and the environment (Weight management and reduced disease risk, Physical and psychosocial well-being, and a clean environment for future generations), and 3) The process of individual transformation towards sustainable nutrition (Behavioral change and individual responsibility through education and awareness, self-control, and regulation of consumption habits).

Conclusion: This study determined that midwifery students' metaphorical perceptions of sustainable nutrition are related to a transformation process based on individual awareness and social responsibility. Students view sustainable nutrition not only as healthy and balanced eating, but also as a lifestyle integrated with respect for nature, efficient use of resources, and the awareness of leaving a clean environment for future generations. This finding demonstrates that the understanding of sustainable nutrition can be transferred from individual behaviors to the societal level.

Keywords: Midwifery student, Sustainability, Nutrition, Thematic Analysis

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ADAPTATION OF THE DIGITAL HEALTH LITERACY INSTRUMENT FOR THE ELDERLY INTO TURKISH AND DETERMINATION OF RELATED FACTORS

Günay Erdem, Rojan Gümüş⁹, Berfin Varışlı

ABSTRACT

Purpose: With the increasing use of smart devices and mobile phones, elderly individuals, like all age groups, benefit from the opportunities offered by the internet and technological tools, but also struggle with the challenges and dangers that await them. In particular, elderly individuals may experience difficulties in accessing and understanding digital health technologies due to their inadequate technology use, difficulties in accessing the internet and mobile devices, and deteriorating physical and mental health. This study aims to adapt the DHLI, designed to measure digital health literacy, into Turkish for elderly individuals and to identify related factors.

Method: The translation and retranslation of the English version of DHLI into Turkish followed the guidelines suggested by Sousa and Rojjanasrirat (2011). The sample of the study consisted of individuals over 65 years of age in Diyarbakır province and its districts. This study, conducted between December 2025 and April 2026 and designed with a cross-sectional and correlational model, used a random sampling method. 400 questionnaires obtained from elderly individuals interviewed at 2400 addresses requested from TUIK were evaluated. The surveys were conducted face-to-face by three scholarship students and two faculty members. The study results were analyzed using SPSS 30 and AMOS 30 software.

Findings: According to the results of the study, the Turkish adaptation of the DHLI for Older Individuals was found to be valid and reliable. Initial results indicate that older individuals have above-average DHL levels. Participants who were female, older, single, had low income, or had low education levels had lower DHL levels. Participants living in central districts had higher DHL levels. Those with higher DHL levels were found to consume less alcohol, exercise more, and prioritize sleep. Ease of access to the internet and frequent internet use were positively correlated with DHL. Those with higher DHL levels reported better health status.

Conclusion: The research resulted in a valid and reliable Turkish DHLI for the elderly. The study findings revealed disadvantaged groups in terms of DHL among elderly individuals. Future studies are important for educating, supporting, and monitoring these disadvantaged groups.

Keyword: Elderly, Digital Health Literacy, Turkish Adaptation

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A TEXT MINING AND THEMATIC ANALYSIS OF ARTIFICIAL INTELLIGENCE- POWERED CLINICAL DECISION SUPPORT SYSTEMS IN NURSING

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ABSTRACT

Purpose: The primary objective of this study is to conduct a comprehensive content analysis of academic articles published in the PubMed database regarding Artificial Intelligence (AI)-powered Clinical Decision Support Systems (CDSS) for nursing practices. The research aims to identify thematic trends, dominant research methodologies, utilized algorithms, and research gaps in the existing literature through quantitative data.

Method: The dataset was constructed using a comprehensive search strategy on PubMed, incorporating terms such as "Decision Support Systems, Clinical", "Artificial Intelligence", and "Nursing". Following this search, the titles and abstracts of 120 identified articles were imported into the R Studio environment. Four fundamental text mining techniques were applied to the data: (1) word cloud and frequency (unigram) analysis for the general conceptual framework, (2) bigram analysis for methodological trends, (3) TF-IDF analysis to determine the unique contributions of the articles, and (4) heat map analysis to visualize thematic clusters.

Findings: Frequency analysis revealed that the most dominant terms were "ai", "clinical", "care" and "nursing", indicating that the literature is heavily AI-focused and directly related to patient care. Bigram analysis demonstrated a transition from traditional rule-based systems to predictive models based on machine learning and deep learning. Among the algorithms used, "random forest", "neural network", and natural language processing techniques stood out. Heat map analysis evidenced that research is moving beyond general CDSS discussions and deepening into nursing sub-specialties such as "hemodynamy," "midwifery," and "palliative" care.

Conclusion: This analysis indicates a paradigm shift in the field of nursing informatics. The findings suggest that AI-supported CDSS research has evolved beyond discussing general concepts toward developing specific, data-driven models for nursing issues and "precision nursing" applications. Future research should focus on the clinical integration of these models.

Keywords: Nursing Informatics, Clinical Decision Support Systems, Text Mining, Precision Nursing.

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THE ROLE OF MOBILE APPLICATIONS IN MEDICATION MANAGEMENT AMONG OLDER ADULTS: A QUALITATIVE ANALYSIS OF USER EXPERIENCES AND REAL-LIFE CHALLENGES

Ayten Kaya¹² Furkan Uysal¹³

ABSTRACT

Purpose: The aim of this study is to analyze user comments on medication reminder mobile health applications, to identify the satisfaction and complaint dimensions of these applications, and to evaluate the findings in relation to the real-life challenges faced by older adults in medication management.

Method: The study was conducted using qualitative content analysis. Data were obtained from user comments on three different medication reminder mobile applications (Google Play Store) and user experiences shared on the Reddit platform. A total of more than 100 user comments were analyzed, and thematic saturation was considered achieved. The data were analyzed using an inductive content analysis approach. User comments were coded, and themes and sub-themes were developed. The findings were then interpreted within a thematic framework.

Findings: The findings were grouped under five main themes. Cognitive difficulties, polypharmacy, physical limitations, and challenges in technology use were prominent in medication management among older adults. Mobile applications were positively evaluated in terms of reminders, ease of use, and multi-medication tracking. However, notification issues, technical problems, complexity of use, and lack of personalization were identified as major complaints. Additionally, alternative solutions such as pill organizers and smart devices were also utilized. It was found that mobile applications alone are not sufficient and that caregiver support is often required.

Conclusion: Although mobile health applications provide important advantages in medication reminders and health monitoring, they are insufficient in addressing the multidimensional medication management needs of older adults. Effective medication management requires the integration of mobile applications with physical solutions and caregiver support.

Keywords: Mobile health, Medication management, Older adults, Content analysis, User experience

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VIRTUAL REALITY AND RADIOTHERAPY

Apostolina Ouzouni¹⁴, Maria Lavdaniti¹⁵

ABSTRACT

Purpose: The purpose of this study is to explore the role and effectiveness of Virtual Reality (VR) as a supportive intervention in patients with cancer undergoing radiotherapy. Specifically, it aims to evaluate whether VR can reduce psychological symptoms, while also improving patient understanding, treatment compliance, and overall experience.

Method: A narrative review and synthesis of recent literature were conducted, focusing on studies investigating the use of Virtual Reality (VR) in oncology and radiotherapy settings. Relevant peer-reviewed articles were identified through electronic databases, including Scopus and PubMed. The search strategy incorporated keywords such as 'virtual reality', 'radiotherapy', 'cancer', 'patient education', 'anxiety', 'psychological support', as well as combinations of these terms. A total of 18 articles were included based on their relevance to the research topic.

Findings: The reviewed studies suggest that Virtual Reality (VR) may be an effective supportive intervention in radiotherapy, enhancing patient education through immersive simulations of the treatment process and improving understanding while reducing uncertainty. VR-based interventions were also associated with decreased levels of anxiety, and emotional distress during treatment, as well as improved mood states and greater patient satisfaction. Furthermore, VR facilitated communication between healthcare professionals and patients, promoting a more patient-centered approach and better engagement with treatment. Overall, these findings highlight VR as a valuable adjunct to standard radiotherapy practice.

Conclusion: Virtual Reality represents a promising and innovative tool in radiotherapy care, with the potential to reduce psychological burden, enhance patient education, and improve the overall treatment experience. Its integration into clinical practice may support a patient-centered care and contribute to better psychosocial and treatment-related outcomes in cancer patients.

Keywords:

Virtual Reality, Radiotherapy, Cancer, Anxiety, Psychological Support

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GREEN MIDWIFERY: REDISCOVERING SUSTAINABILITY IN TRADITIONAL BIRTH PRACTICES

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ABSTRACT

Purpose: Environmental and economic crises that have shaken the world in recent years have necessitated a rethinking of sustainability in healthcare systems, as in all other fields. The fundamental problem in healthcare is the high cost of current approaches and the heavy environmental footprint they leave behind. In this context, traditional birth practices represent a strategic pillar for sustainable healthcare, rather than being merely a cultural heritage. Midwife-led care models demonstrate the sustainable approach that is fundamentally needed today. Taking this process a step further, "Green Midwifery" is a sustainable midwifery philosophy that treats the natural cycle of birth, the woman's inner strength, and the ecological balance whole. Embracing every birth as a "gift" to the world, this approach aims to minimize environmental harm at every stage, from the materials used to the care methods. This study aims to examine the historical link between traditional birth practices and sustainability while discussing the solutions that the concept of Green Midwifery offers to the modern healthcare system.

Method: In this review based on an extensive literature search, current sources and reports on green midwifery, ecological health, and traditional birth methods were examined. The literature indicates that traditional practices exhibit cultural diversity and can contribute to maternal and neonatal health when integrated with modern healthcare services. It is observed that low-intervention and sensory-based methods such as breathing techniques, massage, aromatherapy, and therapeutic touch support the natural birth process and provide advantages in terms of environmental sustainability. It is emphasized that midwife-led green birth initiatives improve waste management and contribute to reducing the carbon footprint.

Conclusion: In conclusion, this study demonstrates that the holistic approaches of midwives can heal both the mother and the world simultaneously; thus, showing that a sustainable future is possible by preserving the inherent simplicity at the core of birth.

Keywords: Green Midwifery, Sustainability, Traditional Birth, Ecological Health,

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A CBT-BASED PSYCHOEDUCATIONAL INTERVENTION FOR EMERGENCY DEPARTMENT NURSES: STUDY PROTOCOL AND PRELIMINARY BASELINE FINDINGS

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ABSTRACT

Purpose: Emergency department nurses are exposed to high-intensity clinical environments that challenge both psychological well-being and physiological stress regulation. Supporting the mental health of healthcare professionals is essential for sustainable healthcare systems. The present study aims to investigate the effects of Cognitive Behavioral Therapy (CBT)-based psychoeducational intervention on occupational stress, health anxiety, psychological resilience, and cortisol levels among emergency department nurses.

Method: This study employs a quasi-experimental design with an intervention group and a control group. A total of 40 nurses from the Emergency Department of the General Hospital of Kavala were recruited and assigned to the two groups. The intervention consists of a structured CBT-based psychoeducational program. Standardized self-report instruments were used, including the Effort–Reward Imbalance Questionnaire (ERI), the Short Health Anxiety Inventory (SHAI), and the Connor–Davidson Resilience Scale (CD-RISC-25). Cortisol levels were assessed as a physiological stress marker through the morning blood sample analysis. Data collection is ongoing, and the present abstract reports preliminary baseline findings.

Findings: Preliminary baseline data indicate moderate-to-high levels of occupational stress (ERI; Mean±SD: 1.27±0.35), and low-to-moderate levels of psychological resilience among participants (CD-RISC-25; 69.83±8.28). Health anxiety levels were generally mild but showed variability across individuals (SHAI; 18.10±6.97). Mean baseline cortisol levels were 15.96±4.67 µg/dL. These findings are consistent with the significant psychological demands associated with emergency care settings, highlight the substantial psychological burden associated with emergency care settings, and support the rationale for targeted, mechanism-informed interventions.

Conclusion: The study addresses the need for integrative interventions targeting both psychological and biological dimensions of stress in high-risk healthcare environments. By combining CBT-based psychoeducation with physiological stress assessment, it advances a biopsychological framework for understanding and managing occupational stress in emergency department nurses.

Keywords: Cognitive Behavioral Therapy (CBT); Occupational Stress; Emergency Department Nurses; Cortisol; Resilience; Health Anxiety; Healthcare Sustainability

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PERCEPTIONS AND EXPECTATIONS OF HEALTHCARE PROFESSIONALS REGARDING THE FUTURE OF AUTONOMOUS SURGERY: A QUALITATIVE STUDY

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ABSTRACT

Purpose: With technological advancements in healthcare, AI-supported autonomous surgical systems, an advanced stage of robotic surgery, are increasingly discussed. This study aims to examine the perceptions, future expectations, and professional and ethical concerns of healthcare professionals working in surgical units or with prior experience regarding autonomous surgery.

Method: This study was designed using the phenomenological approach, one of the qualitative research methods. Data were collected through semi-structured in-depth interviews with healthcare professionals experienced in surgical settings (e.g., surgeons, nurses, anesthesia technicians). The interview transcripts were analyzed using thematic analysis within the framework of six predefined main questions: perceptions, future projections, differences from conventional surgery, barriers/facilitators, ethical/legal aspects, and patient-related aspects. In the analysis process, both manual coding conducted by the researchers and the MAXQDA computer-assisted qualitative data analysis software were utilized.

Findings: As a result of the thematic analysis, six main themes were identified: “Associations and General Perceptions of Autonomous Surgery,” “Future Projections, Professional Identity, Concerns, and Education,” “Differences from Human-Performed Surgery,” “Barriers and Facilitators of Autonomous Surgery,” “Responsibility and Possible Solutions,” and “Perspectives of Patients and Their Relatives.” The findings revealed that healthcare professionals perceive autonomous surgery positively due to its potential for mechanical precision and speed; however, they also express significant concerns regarding ethical uncertainties, fundamental changes in professional roles, legal responsibility ambiguities, and the lack of human interaction.

Conclusion: The findings indicate that healthcare professionals believe in the speed and mechanical precision offered by autonomous surgery; however, they have substantial reservations regarding its human, legal, and professional implications. For the successful integration of autonomous surgery into the healthcare system, technological investment alone will not be sufficient. Updating malpractice laws, revising healthcare education curricula through a multidisciplinary approach, and utilizing “semi-autonomous” systems as transitional models are recommended.

Keywords: Autonomous Surgery, Artificial Intelligence, Health Technology

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AI-AUGMENTED VIRTUAL SCREENING OF CHARANTIN AGLYCONE DERIVATIVES FROM MOMORDICA CHARANTIA AS POTENTIAL IL-17A INHIBITORS FOR PSORIASIS

Gamze Altıntaş Kazar²⁴

ABSTRACT

Purpose: Psoriasis is a chronic autoimmune disorder driven by the IL-17A/IL-17RA axis. While biological therapies are effective, high costs and parenteral administration necessitate the discovery of cost-effective, orally bioavailable small-molecule inhibitors. This study implements a generative AI-driven strategy to design novel inhibitors for the IL-17A interface by modifying the charantin aglycone scaffold from *Momordica charantia*.

Method: The crystal structure of human IL-17A (PDB ID: 4HSA) was refined using PyMOL. The WADDAICA (Webserver-Aided Drug Design by Artificial Intelligence and Classical Algorithm) platform was employed to generate a library of 100 innovative derivatives constructed on the charantin aglycone scaffold. Molecular docking was performed using the AutoDock Vina Tools for thermodynamic sampling.

Findings: The AI-guided workflow successfully prioritized Compound 52 as the lead candidate. It exhibited a superior binding affinity of -8.9 kcal/mol, significantly outperforming the parent scaffold. Visual analysis in PyMOL confirmed that AI-generated modifications allowed the molecule to anchor precisely into the ASP-42 hotspot, a critical residue for receptor recruitment. The interaction network featured stable hydrogen bonds with SER-41, ASP-42, and a remarkably short, high-strength bond with PRO-126 (2.0 Å). These results validate that AI-driven structural modifications effectively optimized the ligand for the IL-17A binding pocket.

Conclusion: This study demonstrates that the integration of generative AI into phytochemical research represents a major advancement in drug discovery for complex diseases like psoriasis. By using WADDAICA to transform the charantin aglycone into more potent derivatives, we identified Compound 52 as a high-affinity lead candidate. This AI-centric approach not only accelerates the discovery of small-molecule inhibitors but also provides a more accurate and efficient alternative to traditional trial-and-error screening methods.

Keywords: artificial intelligence (AI), psoriasis, drug discovery, *Momordica charantia*, molecular docking, IL-17A inhibitors, charantin aglycone derivatives, generative design

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INTEGRATION OF GENERATIVE ARTIFICIAL INTELLIGENCE AND THE INTERNET OF MEDICAL THINGS (IOMT): SYSTEMATIC LITERATURE REVIEW FOR THE 2021–2025 PERIOD

İlknur Sayan²⁵, Ülkü Veranyurt²⁶, Didem İstafiloğlu²⁷

ABSTRACT

Purpose: This study comprehensively examines the integration of Generative Artificial Intelligence (GenAI) models with Internet of Medical Things (IoMT) systems by systematically reviewing the literature published between 2021 and 2025.

Method: Sixteen eligible studies compiled from the PubMed, IEEE Xplore, Springer Nature, ACM Digital Library, and arXiv databases were analyzed using the PRISMA method.

Finding: The findings indicate that Generative Adversarial Networks (GANs), Large Language Models (LLMs), Variational Autoencoders (VAE), and Diffusion Models have driven significant transformations in critical IoMT applications such as remote patient monitoring (RPM), clinical decision support systems (CDSS), synthetic medical data generation, anomaly detection, and privacy-preserving federated learning.

Conclusion: Regulatory compliance (HIPAA, GDPR), model explainability, the risk of hallucinations, and limited computational capacity on edge devices emerge as key research gaps.

Keywords: Internet of Medical Things (IoMT), Generative Artificial Intelligence, Large Language Models (LLMs), Generative Adversarial Networks (GANs), Federated Learning, Remote Patient Monitoring, Clinical Decision Support, Synthetic Health Data, Digital Twin

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SUSTAINABILITY IN DATA SECURITY IN HEALTHCARE SERVICES

Altuğ ÇAĞATAY²⁸, Nur Banu ÇAĞATAY²⁹

ABSTRACT

Purpose: The rapid digitalization of healthcare has intensified structural vulnerabilities related to data security, privacy, and integrity worldwide. Centralized health information systems have become increasingly exposed to cyberattacks, ransomware disruptions, unauthorized access, and governance failures, resulting in large-scale data breaches that undermine patient safety and institutional trust. This study aims to examine the structural causes of healthcare data security incidents at the global level and to evaluate the potential of blockchain technology as a governance-oriented solution framework rather than merely a technical cybersecurity tool.

Method: This study adopted a qualitative research design based on thematic analysis of globally reported healthcare data breaches. Data were collected from peer-reviewed academic literature, regulatory reports, cybersecurity firm publications, court rulings, and verified international media sources. Healthcare-specific incidents involving cyberattacks, ransomware, unauthorized access, and system disruptions were systematically coded and categorized into thematic patterns. These themes were then conceptually mapped against blockchain's core features, including distributed ledger architecture, immutability, cryptographic verification, and smart contract-based access control mechanisms.

Findings: The findings indicate that healthcare data breaches are primarily driven by centralized system architectures, weak authorization mechanisms, third-party integration vulnerabilities, and institutional governance deficits. Beyond compromising confidentiality, these incidents threaten care continuity, clinical decision accuracy, and organizational trust. The analysis further demonstrates that blockchain's distributed and immutable architecture, combined with cryptographic access controls, aligns structurally with these risk domains and offers a governance-oriented framework capable of mitigating systemic vulnerabilities in healthcare data ecosystems.

Conclusion: The study concludes that the healthcare data security crisis constitutes a governance challenge rather than merely a technical problem. Blockchain technology should therefore be conceptualized not as a standalone cybersecurity tool but as a foundational data governance infrastructure capable of enabling patient-centered data ownership, institutional accountability, transparency, and system resilience. When embedded within appropriate legal, ethical, and organizational frameworks, blockchain-based architectures represent a strategic opportunity to support the development of trustworthy and sustainable digital health systems.

Keywords: Health data security, blockchain, electronic health records, digital health governance

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DIGITAL HISTOPATHOLOGY AND ARTIFICIAL INTELLIGENCE INTEGRATION: A LITERATURE SYNTHESIS ON DEEP LEARNING AND TRANSFORMER-BASED APPROACHES

Bilal Gümüş³⁰, Cafer Budak³¹, Rojan Gümüş³²

ABSTRACT

Purpose: The main aim of this study is to narratively synthesize current research on the integration of digital histopathology and artificial intelligence, and to analyze methodological approaches, emerging trends, and their reported applicability in histopathological image analysis. Additionally, the study aims to assess the characteristics of advanced deep learning architectures, including Transformer-based models, in the context of diagnostic processes.

Method: This study adopts a selective narrative literature review approach. Existing studies on digital histopathology, Whole Slide Imaging (WSI), and artificial intelligence-based image analysis methods were reviewed and narratively synthesized. In this context, convolutional neural networks (CNN), Multiple Instance Learning (MIL), attention mechanisms, and Transformer-based architectures such as Vision Transformer (ViT) were examined and compared in terms of their methodological structures and reported application capabilities in histopathological data analysis.

Findings: The reviewed literature indicates that artificial intelligence-based systems can improve the efficiency and consistency of histopathological image analysis by enabling scalable processing of gigapixel WSI data. CNN and MIL-based approaches show competitive performance in capturing local and multi-scale features, while attention mechanisms contribute to contextual understanding. Furthermore, Transformer architectures demonstrate advantages in modeling long-range dependencies and global context. Vision Transformer (ViT) models, in particular, represent a viable alternative to traditional CNN-based methods through patch-based image representations and attention mechanisms.

Conclusion: The reviewed literature suggests that the integration of artificial intelligence into digital histopathology may contribute to reducing observer variability, improving diagnostic consistency, and supporting clinical decision-making processes. The growing adoption of AI-assisted diagnostic systems and Transformer-based approaches broadens the scope of histopathological analysis. Furthermore, the proposed Complementary Expertise Integration (TUE) framework offers a task-specific operationalization of human-AI collaboration in histopathology, structured around dynamic task stratification, decision integration, and an explainability bridge. Overall, the study synthesizes current methodological approaches and identifies directions for future research in AI-assisted digital pathology.

Keywords: Digital Histopathology, Artificial Intelligence, Deep Learning, Whole Slide Imaging, Multiple Instance Learning, Explainable Artificial Intelligence, Clinical Decision Support Systems

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DIGITAL TRANSFORMATION AND HEALTH: A BIBLIOMETRIC ANALYSIS BETWEEN 2016-2026

Arzu Kurşun³³

ABSTRACT

Purpose: Digital transformation is a process aimed at improving an entity by triggering significant changes in its characteristics through combinations of information, communication, and connectivity technologies. This study aims to guide future research by examining the trends and structures of studies related to digital transformation applied in healthcare services.

Method: Bibliometric analysis was used in the study. The research examined articles and reviews in English published between 2016 and 2026, and 422 documents were filtered based on their relevance to the topic.

Findings: A total of 254 documents were analyzed as a result of the filtering. According to the analysis results, the most documents were published in 2025 (107). The most cited article, with 495 citations, is "Digital technology, tele-medicine and artificial intelligence in ophthalmology: A global perspective" by Ji Peng Olivia Li et al. (2021). In the country analysis, the United States of America ranks first with 72 documents and 2571 citations. The United Kingdom ranks second with 38 documents and 1871 citations; Germany ranks third with 28 documents and 1265 citations. When considering connectivity, the leading research institution is Argentix Informatics Inc. (Canada). Aterys (United States) ranks second, and UT MD Anderson Cancer Center (United States) ranks third. Frequently used keywords include artificial intelligence (59), digital health (57), digital transformation (34), telemedicine (31), machine learning (21), precision medicine (14), and telehealth (13).

Conclusion: The study shows that publications primarily address digital transformation through its components, and there are very few roadmaps for the digital transformation process in healthcare. Furthermore, this study has some limitations. The study is based solely on Scopus data.

Keywords: Digital Transformation, Medicine, Healthcare Services, Bibliometric Analysis

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PATIENT ATTITUDES TOWARD TELEHEALTH IN PRIMARY HEALTH CARE: A QUALITATIVE EVIDENCE SYNTHESIS FOR SUSTAINABLE AND QUALITY-ORIENTED DIGITAL TRANSFORMATION

Perihan Şenel Tekin³⁴, Yonca Özatkan³⁵

ABSTRACT

Purpose: Telehealth has become a central component of digital transformation in primary health care. Although its operational benefits are well documented, a clearer understanding of patient attitudes is essential for ensuring patient-centred, equitable, and sustainable service delivery. This study aimed to explore and synthesise adult patients' attitudes toward telehealth in primary health care, with particular attention to perceived benefits, experienced difficulties, and contextual influences on acceptance.

Method: This study was designed as a qualitative evidence synthesis and reported in accordance with the ENTREQ statement. Systematic searches were conducted in PubMed/MEDLINE, Scopus, and Web of Science to identify peer-reviewed qualitative studies published in English between 1 January 2025 and 31 December 2025. Eligible studies examined adult patients' experiences, perceptions, or attitudes regarding telehealth in primary care or primary-care-linked services. Two reviewers independently screened studies, extracted data, and appraised methodological quality using the CASP Qualitative Checklist. The study selection process was documented in accordance with the PRISMA framework. Data were synthesised through thematic synthesis, including line-by-line coding, development of descriptive themes, and generation of higher-order analytical interpretations.

Findings: Seventeen studies were included. The synthesis showed that telehealth was generally perceived as a valuable but conditional mode of care. Patients particularly valued improved access, convenience, reduced travel burden, and support for follow-up and self-management. At the same time, they reported important concerns related to limited physical examination, communication quality, impersonality, technical difficulties, and uneven digital capability. Attitudes were strongly shaped by consultation purpose, continuity of care, prior patient–clinician relationships, and broader social and technological conditions.

Conclusion: Adult patients' attitudes toward telehealth in primary health care are nuanced and context-dependent rather than uniformly positive or negative. Sustainable integration of telehealth requires more than technological availability; it depends on relational continuity, clear communication, clinical appropriateness, and equitable digital access. Telehealth is most likely to be accepted when implemented as part of a hybrid, patient-centred primary care model.

Keywords: telehealth; primary health care; digital transformation; patient attitudes; qualitative evidence synthesis; sustainability

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FINANCIAL SUSTAINABILITY IN HEALTHCARE INSTITUTIONS

Erkan Sarıkeklik³⁶

ABSTRACT

Purpose: The foundation of sustainability in the healthcare system is the issue of financial sustainability, which is at the center of healthcare policy discussions. The aging of the world's population, the emergence of new technological developments, increasing expectations and demand for the healthcare system, easier access to healthcare services, and the search for quality healthcare services are factors that have begun to place significant pressure on healthcare systems and threaten their financial sustainability. In addition, unhealthy lifestyles such as poor nutrition, lack of physical activity, and tobacco, alcohol, and drug use are also increasing this burden. These factors indicate that the healthcare system in Turkey will face increasing spending pressures to meet future needs. In order to increase public spending on healthcare services, it is necessary to create new sources of funding and to use existing resources more efficiently and effectively. The trend of continuously rising healthcare costs and overall healthcare spending, which generally increases faster than national economies, are seen as serious threats to the sustainability of healthcare systems. The primary objective of healthcare institutions is to provide healthcare services rather than to generate profit. However, achieving this objective is impossible without financial sustainability. Financially unsustainable institutions struggle to provide quality and accessible healthcare services. Therefore, financial sustainability is considered a fundamental condition for the continuity of healthcare services. There is no universally accepted definition of the concept of financial sustainability. This concept can generally be defined as a government's ability to sustain its current expenditures, taxes, and other fiscal policies in the long term. Healthcare institutions that cannot achieve financial sustainability face serious risks such as a decline in service quality, increased borrowing, delayed investments, and even the cessation of operations.

Method: This study attempts to explain the concept of financial sustainability, which is the most important factor in the sustainability of healthcare systems. To this end, articles containing the keywords “sustainability in healthcare organizations” and “financial sustainability in healthcare organizations” in the DergiPark database were analyzed using a systematic review method. Twenty-six articles were reviewed in accordance with the inclusion criteria of the study. Seventeen of the reviewed articles included concepts of sustainability in healthcare organizations, while nine articles included concepts of financial sustainability in healthcare organizations.

Conclusion: The majority of the reviewed articles indicated that the unnecessary or misuse of healthcare services, limited revenue sources or low reimbursement rates, inefficient use of materials and medical technology, and management information deficiencies were among the main factors negatively affecting financial sustainability. Personnel expenses, medical supplies and drug expenses, energy and maintenance-repair expenses are the main expenditure items of healthcare institutions, with personnel expenses in particular accounting for a significant share of total expenses.

Keywords: Healthcare System, Sustainability, Financial Sustainability, Financial Sustainability in Healthcare Systems

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ASSESSMENT OF MATERNAL DIETARY INTAKE, PHYSICAL ACTIVITY STATUS, AND BODY COMPOSITION DURING PREGNANCY: A CROSS-SECTIONAL STUDY IN GREECE

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ABSTRACT

Purpose: This study aimed to estimate the Greek populations maternal dietary intake, physical activity status, and body composition during pregnancy.

Method: Forty-nine women during pregnancy, with a mean age of 31.08 ± 4.90 years old, were asked to fill in the Pregnancy Physical Activity Questionnaire (PPAQ) to assess their physical activity levels, the Food Frequency Questionnaire (FFQ) to assess the maternal dietary intake, and a Bioelectrical Impedance Analysis (BIA) to evaluate different body composition indices.

Findings: Variance analysis showed that the pregnancy trimester's effect on various indices of BIA was statistically significant. Moreover, the results showed that pregnant women consume a median of 2135 kcal and 2012.10 mL of water per day, regardless of their trimester. The Pearson correlation analysis unveiled a significant positive correlation between energy ($r = 0.795$, $p < 0.001$), water ($r = 0.759$, $p < 0.001$), fat ($r = 0.535$, $p = 0.029$), and dietary fibers ($r = 0.310$, $p < 0.001$) with pregnancy trimester. PPAQ results showed third-trimester women were more sedentary than those in earlier trimesters. Lastly, multiple regression analysis showed that pregnancy trimester ($p = 0.005$), employment status ($p = 0.040$), economic status ($p = 0.037$), and higher BMI ($p = 0.013$), BFMI ($p = 0.017$), and FFMI ($p = 0.024$) values had a significant contribution to the model. Notably, the National Nutrition Committee of the Ministry of Health in Greece selected the above published data to support updating Greece's national dietary guidelines for pregnant women, to be released in 2026.

Conclusions: Pregnancy trimester has a significant impact on different indices of BIA and nutrients based on the FFQ, while physical activity levels decrease dramatically during pregnancy. Nurses and other healthcare professionals may play a key role in nutritional and physical assessment and implementing pregnancy guidelines.

Keywords: Pregnancy, Physical Activity, Nutrition Questionnaire, Bioelectrical Impedance Analysis

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HEALTHY AGING: THE CASE OF UNIVERSITY STUDENTS

Leyla Özgen⁴⁰

ABSTRACT

Purpose: The aim of this study is to evaluate the “Healthy Aging” status of university students and to raise awareness about healthy aging.

Method: A mixed-method design was employed. The quantitative dimension of the study was conducted through the administration of the “Healthy Lifestyle Behaviors Scale II” and the “Successful Aging Scale” to students. In the qualitative dimension, a case study approach was used to determine students’ views through the “Opinions on Preparations for Healthy Aging” and “Researcher Diaries.” The study consists of two study groups. For the first study group, the needs related to healthy aging were identified and a “Healthy Aging Education Program” was developed. A total of 100 volunteer students studying at Gazi University during the 2022–2023 academic year were selected. For the second study group, designed as a quasi-experimental group, 30 volunteer students studying at Gazi University were selected. The “Healthy Aging Education Program” was implemented once a week for six weeks, with each session lasting 55 minutes. Data collection tools included the “Personal Information Form,” the “Form for Determining Opinions on Preparations for Healthy Aging,” the “Healthy Lifestyle Behaviors Scale II,” the “Successful Aging Scale,” and the “Researcher Diaries Form.”

Findings: Of the students, 33.0% were male and 67.0% were female, with a mean age of 22.50 years. A significant difference was found in the post-test and one-month retention test scores of the physical activity” sub-dimension of the Healthy Aging II Scale [(t(29) = -6.84, p < 0.00)]. In the qualitative dimension of the project, based on the six-week training and the “Researcher Diaries,” student Ö11 stated that the “interpersonal relationships” sub-dimension is important in healthy aging.

An effort was made to raise awareness among today’s students—who are the potential older adults of tomorrow through a six-week educational program. It can be said that this program is important in terms of minimizing disease, maximizing health, preventing inequalities, and contributing to the national economy.

Keywords: Healthy aging, university students, successful aging

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BIAS AND SOCIAL INEQUALITY IN ARTIFICIAL INTELLIGENCE LITERATURE: A SYSTEMATIC AND METHODOLOGICAL ANALYSIS

Aslı Metin⁴¹

ABSTRACT

Purpose: This study aims to systematically examine the representation of bias and social inequality in the AI-related healthcare literature. It also aims to evaluate how different search and filtering strategies affect the visibility of these concepts and how the overall structure is shaped.

Method: In this study, a search was conducted in the Scopus database using concepts such as "artificial intelligence", "machine learning", "bias", "justice", "inequality" and "healthcare," initially identifying 318 records. Following a multi-step filtering process involving document type selection keyword-based search and abstract-level evaluation, 66 studies were deemed suitable for analysis. Furthermore, a weighted scoring approach based on AI, bias and inequality indicators was applied to identify the 20 most relevant studies for in-depth analysis. Data were analyzed using thematic classification, frequency analysis and topic modeling techniques.

Findings: The findings reveal that most studies focus on the technical aspects of AI, bias is frequently addressed, and social inequality is relatively underrepresented in keyword-based searches. However, themes related to inequality become more visible after abstract-level scanning. The results also show that AI systems often reflect and in some cases reinforce, existing inequalities related to race, gender and socioeconomic status. Various bias reduction techniques were found to improve fairness measures. In addition, it was observed that methodological choices, particularly scanning strategies, significantly influenced which themes would emerge in the final sample.

Conclusion: AI in healthcare does not operate in a neutral context; rather, it interacts with existing structural inequalities. The study highlights that literature results are shaped not only by research content but also by methodological decisions. These findings underscore the need for more comprehensive and equity-focused approaches in AI research and systematic reviews.

Keywords: AI, bias, social inequality, healthcare, systematic review, fairness

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DEPRESSION, ANXIETY, STRESS, AND MENSTRUAL SYMPTOMS IN WOMEN DURING THE COVID-19 PANDEMIC

Şeyma Çatalgöl⁴², Yaprak Utuş⁴³

ABSTRACT

Purpose: This study was conducted to examine the relationship between menstrual symptom levels and anxiety, depression, and stress in women aged 18–45, and to determine the role of these variables in menstrual symptoms.

Method: This descriptive and cross-sectional study was conducted between March 25, 2021 and July 17, 2021. Data were collected online via Google Forms from women aged 18–45 years who were reached through email invitations. The sociodemographic information form, the Menstrual Symptom Scale (MSS), and the Depression Anxiety Stress Scale-21 (DASS-21) were used for data collection. Descriptive statistics, correlation analysis, and multiple linear regression analysis were performed. Ethical approval for this study was obtained from the Clinical Research Ethics Committee of Uşak University (Decision dated 10.03.2021, No: 06).

Findings: The mean MSS total score was 67.88 ± 18.80 , indicating that menstrual symptoms were above a moderate level. The mean scores of DASS-21 subscales were 4.75 ± 4.61 for anxiety, 6.55 ± 5.96 for depression, and 8.00 ± 6.09 for stress. Correlation analysis revealed significant positive relationships between MSS and anxiety ($r=0.348$; $p<0.01$), depression ($r=0.282$; $p<0.01$), and stress ($r=0.356$; $p<0.01$). According to multiple regression analysis, the model was statistically significant ($F=45.192$; $p<0.05$), and anxiety ($\beta=0.207$; $p<0.05$) and stress ($\beta=0.239$; $p<0.05$) were significant predictors of menstrual symptoms, whereas depression was not significant. The model explained 14.6% of the variance in MSS.

Conclusion: Menstrual symptoms are associated with anxiety and stress, with stress showing a stronger role. Depression does not appear to significantly affect menstrual symptoms. These findings suggest that menstrual symptoms are more closely related to acute psychological states, highlighting the importance of stress and anxiety management in women's health.

Keywords: Menstrual symptoms, anxiety, depression, stress, women,

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A CONCEPTUAL STUDY ON THE CAUSES OF THE FEAR OF LEADERSHIP

Betül Odabaş, Mustafa Amarat⁴⁴

ABSTRACT

Purpose: This study aims to examine the fear experiences managers feel and live through in the process of exercising managerial authority across psychological, physiological, and social dimensions, and to identify the reasons for the internalized fear of managing that managers experience.

Method: This study is a qualitative research based on a literature review. Within the scope of the research, national and international literature on the concepts of fear, management, and fear of managing was examined, and academic studies on the subject were evaluated.

Findings: As a result of the literature review, it was seen that fear is one of the basic emotions that arise in response to situations that threaten or are perceived as threatening an individual's life, and that it has physiological, cognitive, and social dimensions. It is understood that fear is not only a biological response but also related to the individual's perceptions, experiences, and the social structure in which they live. In the context of management, it was determined that managers can experience fear of managing for various reasons. These reasons include lack of knowledge and skills, fear of making mistakes, fear of failure, fear of criticism, fear of legal repercussions, fear of negative reactions from superiors, fear of losing their position, fear of their interests being harmed, and fear of negative news.

Conclusion: The study concludes that fear can affect management processes, and the fear of managing can influence managers' decision-making and management practices. In this context, it is concluded that understanding the elements that cause fear in the management process is important for managers to overcome their fears and anxieties and adopt a supportive management approach.

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A DECISION SUPPORT SYSTEM APPROACH FOR CHRONIC KIDNEY DISEASE DIAGNOSIS USING MACHINE LEARNING

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ABSTRACT

Purpose: Chronic kidney disease (CKD) is a progressive condition in which early detection is essential for improving patient outcomes and reducing healthcare burden. This study purpose a machine learning based approach as a clinical decision support mechanism to assist in the early identification of CKD using routinely collected patient data.

Method: A benchmark dataset comprising 400 patient records with demographic, laboratory, and clinical features was utilized. A structured preprocessing pipeline was implemented to address missing values and heterogeneous data types through imputation, normalization, and encoding. Three supervised learning models, Logistic Regression, Random Forest, and K-Nearest Neighbors (KNN) were evaluated using a stratified 80:20 train test split, with performance assessed via accuracy and F1 score.

Finding: All models demonstrated strong predictive performance, with Logistic Regression achieving perfect classification (accuracy = 1.000, F1-score = 1.000). Feature analysis highlighted clinically relevant biomarkers, including hemoglobin, packed cell volume, specific gravity, and albumin, as key predictors of CKD.

Conclusion: The results suggest that machine learning models, particularly when integrated into a decision support system, can support clinicians in early CKD detection and risk assessment. Such systems have the potential to enhance diagnostic accuracy, facilitate timely intervention, and improve health management processes.

Keywords: Chronic Kidney Disease, Machine Learning, Classification, Medical Data Analysis, Clinical Decision Support

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DIGITALIZATION, QUALITY AND SUSTAINABILITY IN HEALTHCARE: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

Purpose: This study examines digitalization, quality, and sustainability three key drivers of healthcare transformation from a holistic perspective. The literature was analyzed in terms of publication year, language, journals, countries, authors, and institutions, while collaboration patterns, citation networks, and research trends were explored using bibliometric mapping techniques.

Method: A comprehensive literature search was conducted in the Web of Science (WoS) database using the following keyword combinations: (“digital health” OR “e-health” OR “telemedicine” OR “artificial intelligence” OR “health information systems” OR “digital medicine”) AND (“quality of care” OR “healthcare quality” OR “service quality” OR “clinical quality” OR “quality improvement”) AND (“sustainab*” OR “resilien*” OR “green healthcare” OR “sustainable healthcare”). After applying predefined inclusion and exclusion criteria, a total of 237 publications were included. The data were analyzed using bibliometric methods and visualized with VOSviewer software.

Results: The findings indicate a significant growth in publications, particularly after 2020. The literature is predominantly published in English and concentrated in high-impact SCI-EXP indexed journals. The United States holds a central position in publication output and citation networks, followed by the United Kingdom, Germany, China, and Australia, while Türkiye remains relatively peripheral. Citation network analysis reveals a multi-centered and interdisciplinary structure. Keyword analysis shows a strong focus on “telemedicine,” “digital health,” and “quality of care,” with COVID-19 acting as a major turning point. The sustainability theme, however, remains comparatively underrepresented.

Conclusion: The results suggest that the digital health literature primarily focuses on quality improvement, whereas the long-term sustainability dimension remains underexplored. Future studies should emphasize sustainability, strengthen international collaboration, and enhance Türkiye’s integration into global academic networks.

Keywords: Healthcare, Digitalization, Quality, Sustainability, Bibliometric Analysis

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THE IMPACT OF ELECTRONIC PRESCRIBING SYSTEMS ON MEDICATION ERRORS IN COMMUNITY PHARMACIES: A SYSTEMATIC REVIEW

Merve Kişı⁵¹

ABSTRACT

Purpose: This study aims to examine the impact of electronic prescribing (e-prescribing) systems on medication errors in community pharmacy settings. It also seeks to explore how these systems transform the types of errors and to evaluate pharmacists' experiences with e-prescribing systems.

Method: A systematic review was conducted using data obtained from Scopus and PubMed databases. The literature search was conducted using combinations of the following keywords: "electronic prescription", "e-prescription", "electronic prescribing", "medication error", "prescribing error", "dispensing error", and "community pharmacy". These terms were combined using Boolean operators (AND, OR) to refine the search strategy across databases. Following the PRISMA guidelines, a total of 137 records were identified. After removing duplicates and applying title, abstract, and full-text screening, 6 studies were included in the final analysis. Data were analyzed using thematic analysis, and the findings were categorized into key themes related to medication errors, system-related challenges, and pharmacist experiences.

Findings: The findings revealed that e-prescribing systems reduce traditional medication errors, particularly those related to illegibility and incomplete prescriptions. However, new types of errors were identified, including incorrect drug selection, data entry issues, and missing or unclear instructions. System-related challenges such as interoperability problems and communication failures were also observed. Additionally, pharmacists continue to play a crucial role in identifying and correcting errors, indicating that human oversight remains essential. Emerging technologies such as artificial intelligence and blockchain were highlighted as potential solutions to enhance medication safety.

Conclusion: While e-prescribing systems improve medication safety by reducing traditional errors, they also introduce new types of errors related to data entry, drug selection, and system communication. The findings emphasize the continued importance of pharmacists' role in ensuring patient safety. Furthermore, the lack of studies conducted in the Turkish context highlights an important research gap.

Keywords: Electronic prescribing, medication errors, community pharmacy, patient safety, digital health.

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THE FUTURE OF WORK AND THE SUSTAINABILITY OF LONELINESS

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ABSTRACT

Purpose: The future of work in healthcare management is increasingly shaped by digital transformation, the expansion of telehealth, artificial intelligence, and flexible employment models. Although these developments are often evaluated in terms of efficiency, cost control, and performance, their implications for social sustainability within healthcare organizations remain underexplored. This study examines the sustainability of loneliness as an emerging organizational risk in healthcare management.

Method: This study adopts a qualitative research design based on a literature review and conceptual analysis. Interdisciplinary sources from the fields of health management, organizational behavior, and information systems are utilized. A systematic review is conducted to identify recurring patterns regarding the social and psychological consequences of artificial intelligence use in the workplace. In addition, recent industry reports are used to better understand the use and prevalence of artificial intelligence technologies. This methodological approach enables a theoretical and holistic understanding of loneliness as an emerging organizational risk in the context of the future of work.

Findings: The findings suggest that increasing reliance on artificial intelligence, remote coordination, and technology-mediated decision-making weakens team cohesion, reduces informal communication, and erodes professional support networks. Furthermore, a reciprocal (vicious) cycle between AI use and loneliness is identified, in which each reinforces the other. These dynamics negatively affect employee well-being, organizational commitment, and service quality.

Conclusions: The study concludes that professional loneliness should be addressed not merely as an individual psychological issue but as a structural outcome of organizational design. Integrating social connectedness into workforce planning and management strategies is essential for sustaining long-term organizational performance and resilience in healthcare institutions.

Keywords: Artificial Intelligence, Professional Loneliness, Healthcare Management, Algorithmic Management, Social Interaction, Digital Transformation, Social Sustainability

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A STRUCTURED TELE-REHABILITATION MODEL FOR CHRONIC NECK PAIN: CLINICAL EFFECTIVENESS AND SUSTAINABILITY OUTCOMES IN A 6-WEEK PROSPECTIVE PILOT STUDY

Ali Yıldırım⁵⁴

ABSTRACT

Purpose: Chronic neck pain is a prevalent musculoskeletal condition that often affects physical function and quality of life. Digitally delivered rehabilitation strategies can maintain treatment quality while increasing accessibility. This study aimed to evaluate the clinical effectiveness and sustainability outcomes of a structured 6-week remote rehabilitation program in individuals with nonspecific mechanical chronic neck pain.

Method: This prospective single-group pilot study included 20 individuals aged 25–55 years. All participants had non-specific mechanical chronic neck pain lasting at least three months and a baseline Visual Analog Scale score ≥ 4 . Individuals with cervical radiculopathy, previous cervical surgery, neurological deficits, serious spinal pathology, or ongoing physiotherapy treatment were excluded. Participants followed a standardized online exercise program for six weeks. The program was performed three times per week, and each session lasted 30 minutes. It consisted of progressive cervical stabilization, mobility, and postural control exercises delivered through structured video guidance. Weekly remote follow-up was conducted to monitor adherence and maintain intervention consistency. Pain intensity was assessed using the Visual Analog Scale, and functional disability was evaluated with the Neck Disability Index.

Findings: The mean age of the participants was 39.4 ± 8.2 years, with 40% female and 60% male. After the six-week program, both Visual Analog Scale and Neck Disability Index scores decreased significantly ($p < 0.05$). Overall adherence was above 85%, and no adverse events occurred during the study period.

Conclusion: The tele-rehabilitation program led to positive short-term clinical outcomes, with good adherence and no safety concerns. These findings suggest that digital rehabilitation may be a practical and sustainable option for individuals with non-specific mechanical chronic neck pain.

Keywords: Chronic neck pain; Tele-rehabilitation; Sustainability; Digital physiotherapy; Pilot study

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THE HIDDEN DANGER IN YOUNG ADULTS: PREDICTING DIABETES RISK IN UNIVERSITY STUDENTS USING MACHINE LEARNING ALGORITHMS

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ABSTRACT

Purpose: This study aimed to analyze risk factors for diabetes and develop predictive models using machine learning (ML) algorithms to identify high diabetes risk among university students.

Method: This cross-sectional study was conducted with 1,418 students aged 18–25 years at Çanakkale Onsekiz Mart University between March 30, 2025 and March 30, 2026. Data were collected face-to-face using an Introductory Information Form and the Finnish Diabetes Risk Score (FINDRISK). In descriptive analyses, FINDRISK total scores and risk categories were evaluated. For logistic regression and ML analyses, high diabetes risk was defined as FINDRISK ≥ 15 . The dataset was split into 80% training and 20% test sets using stratified sampling. To address class imbalance, SMOTE was applied to the training data. Ten ML algorithms, including logistic regression (LR), decision tree, random forest, support vector machine (SVM), k-nearest neighbors, gradient boosting, LightGBM, XGBoost, AdaBoost, and CatBoost, were trained with 10-fold cross-validation. Model performance was evaluated using accuracy, precision, recall, F1-score, and ROC-AUC.

Findings: The prevalence of high diabetes risk was 8.46%. Multivariable LR showed that being married (OR=1.91, 95% CI: 1.10–3.32, $p=0.021$) and having a history of cardiovascular disease (OR=2.43, 95% CI: 1.25–4.74, $p=0.009$) were independently associated with high diabetes risk. Among the ML models, SVM yielded the best overall discrimination performance with a ROC-AUC of 0.6272 and a recall of 0.6250. Threshold optimization improved recall to 0.7500 at the cost of lower specificity.

Conclusion: Although the predictive performance of the models was modest, the findings suggest that ML-based approaches may support early identification of university students at elevated diabetes risk. These results may contribute to risk screening and preventive health strategies targeting young adults.

Keywords: Diabetes risk, FINDRISK, university students, machine learning, prediction

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ARTIFICIAL INTELLIGENCE-ASSISTED VISUALIZATION IN MEDICAL EDUCATION AND PATIENT INFORMATION: A NEW APPROACH TO ENHANCING HEALTH LITERACY

Çiğdem Başaran⁵⁸, Aslı Fatma Bülbül⁵⁹

ABSTRACT

Purpose: Today, the increase in information produced in the field of health makes it difficult for individuals to understand this information and renders health literacy a critical issue. Health literacy encompasses individuals' abilities to access, understand, evaluate, and use health information, playing a decisive role in individual health outcomes and the effectiveness of health systems. This study aims to examine the potential of AI-supported visualization approaches in increasing health literacy during medical education and patient information processes.

Method: The role of artificial intelligence technologies in data analysis and clinical decision support processes is considered alongside the capacity of visualization techniques to make complex health data understandable.

Findings: In line with the literature, it is observed that AI-supported visualization transforms health information from static content into a dynamic, personalized, and interactive learning experience. It has been determined that this approach enhances the clinical insight of medical students and contributes to patients' better understanding of their own health conditions. However, the risk of oversimplification in visualization, ethical issues, and differences in users' levels of technological understanding emerge as significant limitations.

Conclusion: AI-supported visualization offers an innovative and effective approach to increasing health literacy; however, for this potential to be sustainable, it must be supported by pedagogical, ethical, and user-centered design principles.

Keywords: Health Literacy, Artificial Intelligence, Visualization, Medical Education, Digital Health.

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FAMILY PLANNING METHOD USE IN RELATION TO ATTITUDES, RELIGIOUS ORIENTATION, AND FATALISTIC TENDENCIES: A CROSS-SECTIONAL STUDY SUPPORTED BY MACHINE LEARNING

Gözde Özsezer⁶⁰, Seher Sude Ogurlular⁶¹

ABSTRACT

Purpose: This study aimed to examine the relationships between family planning attitudes, religious orientation, and fatalistic tendencies, and to identify the factors associated with family planning method use. A secondary aim was to compare the predictive performance of different machine learning algorithms in classifying family planning method use.

Method: This descriptive cross-sectional study was conducted with 272 participants. Data were collected using a Descriptive Information Form, the Family Planning Attitude Scale, (FPAS) the Religious Orientation Scale (ROS), and the Fatalism Tendency Scale (FTS). Descriptive statistics, Spearman correlation analysis, chi-square tests, Mann–Whitney U tests, and univariate and multivariate logistic regression analyses were performed. In addition, Logistic Regression, Decision Tree, Random Forest, and K-Nearest Neighbors algorithms were trained and evaluated using 10-fold cross-validation in Python.

Findings: The mean age of the participants was 25.29 ± 7.38 years. FPAS scores showed a weak positive correlation with ROS scores ($\rho=0.269$, $p<0.001$), whereas ROS scores showed a moderate positive correlation with FTS scores ($\rho=0.440$, $p<0.001$). Family planning method users were significantly older and had lower religious orientation and fatalism scores than non-users ($p<0.001$). In the final multivariable logistic regression model, being married, older age, and lower religious orientation scores were significantly associated with family planning method use. In machine learning analyses, Random Forest showed the best overall classification performance (accuracy=0.849, F1=0.794), while Logistic Regression achieved the highest ROC-AUC value (0.904)

Conclusion: Family planning method use was associated with sociodemographic and psychosocial factors, particularly marital status, age, and religious orientation. The combined use of conventional statistical analyses and machine learning provided both interpretability and predictive value for understanding family planning behavior.

Keywords: Family planning, religious orientation, fatalism, machine learning

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DIGITAL HEALTH TECHNOLOGIES IN CHRONIC DISEASE MANAGEMENT: A SYSTEMATIC REVIEW OF EFFECTIVENESS, BARRIERS, AND IMPLEMENTATION STRATEGIES

Kübra Candemir Gül⁶²

ABSTRACT

Purpose: The global burden of chronic diseases continues to escalate, placing unprecedented pressure on healthcare systems. Digital health technologies encompassing mobile health (mHealth) applications, telehealth, artificial intelligence (AI)-driven clinical decision support, and electronic health records (EHRs) have emerged as promising solutions to enhance disease management, improve patient outcomes, and reduce healthcare costs. This systematic review aims to synthesize current evidence on the effectiveness of digital health interventions in managing chronic conditions, identify key barriers to adoption and implementation, and propose strategic recommendations for health policymakers and practitioners.

Methods: A systematic literature search was conducted across PubMed, Scopus, Web of Science, and the Cochrane Library databases, covering publications from January 2010 to December 2024. Studies were selected according to PRISMA guidelines. Eligible studies included randomized controlled trials, quasi-experimental studies, and high-quality systematic reviews examining digital health technologies in adults with chronic diseases.

Findings: Forty-two studies met the inclusion criteria. Digital health interventions demonstrated statistically significant improvements in medication adherence, glycemic control, blood pressure monitoring, and patient-reported outcomes. Telehealth was associated with reduced hospital readmission rates and improved patient satisfaction. AI-based decision support systems enhanced diagnostic accuracy and care coordination. Major barriers included digital literacy gaps, data privacy concerns, interoperability limitations, and inequitable access to technology.

Conclusions: Digital health technologies hold significant potential to transform chronic disease management. However, equitable integration requires addressing systemic barriers through comprehensive policy frameworks, digital health literacy programmes, and robust data governance mechanisms. Future research should prioritize long-term outcome measurement and cost-effectiveness analyses.

Keywords: digital health; e-health; mHealth; telehealth; chronic disease management; electronic health records; artificial intelligence; systematic review

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AI-POWERED QUALITY AND SUSTAINABILITY IN HEALTHCARE: A SERVICE MANAGEMENT AND MARKETING PERSPECTIVE

Ömer Faruk Şarkbay⁶³, Aslı Kaya⁶⁴, Murat Başal⁶⁵

ABSTRACT

Purpose: This study investigates the impact of artificial intelligence (AI)-supported applications in healthcare on organizational quality and sustainability outcomes, utilizing an integrated framework that combines service management and service marketing perspectives. It specifically examines how AI-based decision support systems, personalized service delivery, and process automation affect perceived service quality, operational efficiency, and value creation, as well as how these factors contribute to organizational performance and long-term sustainability goals.

Method: A quantitative research design was employed. Data were collected via an online survey administered through Google Forms to healthcare professionals and managers working in public and private healthcare organizations in Istanbul, where AI-supported digital applications are widely implemented. A total of 400 valid responses were obtained, ensuring adequate statistical power for model estimation. Measurement instruments were adapted from original, validated scales commonly used in prior research. Perceived service quality, perception of AI, organizational performance, and sustainability (encompassing environmental, social, and economic dimensions) were operationalized using multi-item constructs. Internal consistency and reliability were confirmed, with Cronbach's alpha values exceeding recommended thresholds ($\alpha = 0.88-0.91$). The proposed research model was tested using structural equation modeling to assess both direct and indirect relationships among the study variables.

Findings: The results indicate that AI-supported applications are positively and significantly associated with perceived service quality and operational efficiency in healthcare organizations. These relationships, in turn, contribute to improved organizational performance and the development of more sustainable service models. Additionally, perceived AI-assisted service quality plays a facilitating role in value co-creation processes among healthcare providers, professionals, and patients.

Conclusions: The findings suggest that artificial intelligence in healthcare extends beyond a purely technological role, serving as a strategic enabler of sustainable value creation. From a service-dominant logic perspective, AI contributes to long-term quality, performance, and sustainability outcomes, highlighting its increasing significance in the evolution of healthcare service ecosystems.

Keywords: AI-Powered Healthcare, Sustainable Service Quality, Service Management, Service Marketing, Organizational Performance

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NEUROPHYSIOLOGICAL SIGNATURES OF MOOD AND ANXIETY DISORDERS: INTEGRATING EEG AND ARTIFICIAL INTELLIGENCE

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ABSTRACT

Purpose: This study examines the neurophysiological signatures associated with mood and anxiety disorders using electroencephalography (EEG) and evaluates the potential of artificial intelligence (AI) techniques to identify objective neural biomarkers. In addition, it explores whether AI-driven EEG models can improve diagnostic accuracy and support biomarker-based stratification within the framework of precision psychiatry.

Method: A structured integrative review approach was employed. A systematic literature search was conducted in the PubMed, Scopus, Web of Science, and IEEE Xplore databases, covering studies published between 2000 and 2024. The search strategy combined controlled vocabulary and free-text keywords using Boolean operators as follows: ("EEG" OR "electroencephalography") AND ("mood disorder" OR "major depressive disorder" OR "anxiety disorder") AND ("machine learning" OR "deep learning" OR "artificial intelligence" OR "classification" OR "biomarker"). After removing duplicates, titles and abstracts were screened according to predefined inclusion criteria (peer-reviewed human studies, EEG-based analyses, and AI-driven classification or biomarker identification). From an initial 186 records, 72 studies met the eligibility criteria and were included in the final synthesis. The review focused on EEG spectral features, neural oscillatory dynamics, functional connectivity metrics, and machine learning or deep learning architectures used for diagnostic classification and predictive modeling.

Findings: Mood and anxiety disorders are consistently associated with alterations in neural oscillatory activity and dysregulation of large-scale brain networks. Mood disorders frequently exhibit frontal alpha asymmetry and increased theta power, reflecting disrupted affective regulation and cortical inhibitory processes. By contrast, anxiety disorders are characterized by elevated beta activity, increased cortical excitability, and hyperactivation of threat-related neural circuits. Disturbances in fronto-limbic connectivity and reduced network integration further indicate impaired top-down regulatory control. With regard to classification performance, several AI-based EEG models have reported diagnostic accuracy rates ranging from 75% to 92%. Deep learning architectures, particularly convolutional neural networks (CNNs) and recurrent neural networks (RNNs), have achieved area under the curve (AUC) values exceeding 0.85 in distinguishing patient groups from healthy controls. In many studies, sensitivity and specificity values were also reported above 0.80. However, methodological heterogeneity, relatively small sample sizes, and limited external validation continue to constrain cross-study comparability and clinical generalizability.

Conclusion: The integration of electrophysiological assessment with advanced computational modeling represents a promising approach for identifying objective and reproducible biomarkers in mood and anxiety disorders. Although current evidence highlights considerable diagnostic and translational potential, larger multi-center datasets, standardized methodologies, and longitudinal investigations are required to improve clinical applicability and advance precision psychiatry.

Keywords: Mood Disorders, Anxiety Disorders, Electroencephalography, Artificial Intelligence, Neural Oscillations, Computational Psychiatry

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ANXIETY AND ATTITUDES TOWARD ARTIFICIAL INTELLIGENCE AMONG NURSES: A SYSTEMATIC REVIEW

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ABSTRACT

Purpose: This systematic review aimed to synthesize empirical evidence regarding nurses' and nursing students' anxiety and attitudes toward artificial intelligence (AI), while identifying current research trends and gaps in literature.

Methods: The review was conducted in accordance with the PRISMA 2020 guidelines. A comprehensive literature search was performed in PubMed, Google Scholar, DergiPark, and TR Dizin databases using the keywords “artificial intelligence anxiety,” “AI anxiety,” “yapay zekâ kaygısı,” and “yapay zekâ tutumu.” Studies published between 2021 and 2024 were included if they involved nurses or nursing students and quantitatively evaluated AI-related anxiety or attitudes. Full-text empirical studies meeting the inclusion criteria were screened and analyzed. A total of 15 studies, including 4 international and 11 national studies, were included in the review.

Findings: Most of the included studies (73.3%) employed a cross-sectional design. Overall, nurses and nursing students demonstrated moderate levels of AI-related anxiety. Educational interventions generally contributed to reducing anxiety and fostering more positive attitudes toward AI; however, several studies indicated that increased awareness and initial exposure to AI technologies could temporarily elevate anxiety levels. Perceived digital leadership, professional experience, technological competence, and psychological well-being emerged as significant determinants of AI anxiety. Positive attitudes toward AI were associated with lower anxiety levels, whereas insufficient knowledge and limited practical experience were linked to increased anxiety.

Conclusion: AI-related anxiety represents a critical factor influencing nurses' adaptation to emerging healthcare technologies. This anxiety is shaped by multiple individual, educational, and organizational factors, including professional experience, managerial support, psychological resilience, and digital literacy. The successful integration of AI into healthcare settings requires targeted educational initiatives, ethics-oriented curricula, digitally competent leadership, and accessible psychosocial support mechanisms. Future longitudinal and experimental research is needed to evaluate the long-term effectiveness of these interventions and their impact on healthcare outcomes and professional adaptation.

Keywords: artificial intelligence anxiety, attitudes toward artificial intelligence, nursing students, nurses, healthcare technology adoption, AI in nursing

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A COMPARATIVE EXAMINATION OF PROFESSIONAL ANXIETY LEVELS AND GENERAL ATTITUDES TOWARD ARTIFICIAL INTELLIGENCE AMONG EMPLOYEES OF A FOUNDATION UNIVERSITY

Selman Çelik⁷¹, Şirin Göroğlu⁷²

ABSTRACT

Purpose: The primary aim of this study is to comparatively examine the levels of occupational anxiety and general attitudes toward Artificial Intelligence (AI) among academic staff, nurses, administrative (office) employees, security personnel, and cleaning staff working at a foundation university.

Method: The data were collected through face-to-face interviews using a data collection form that included participants' demographic characteristics, the Artificial Intelligence Anxiety Scale (AIAS), and the General Attitude Towards Artificial Intelligence Scale (GAAIS). The study has ethical committee approval.

Findings: The individuals participating in the study are aged 38% (18-34), are aged 34% (35-44), and are 28% (45) years old and above. Among the participants, 64% are female and 36% are male. The highest anxiety score was observed in high school graduates (53.2 ± 14.1), while the lowest anxiety score was found among doctoral graduates (36.7 ± 12.6). Among occupational groups, the highest anxiety score was recorded in cleaning workers (52.5 ± 15.1), and the lowest anxiety score was seen in nurses (42.0 ± 13.7). The lowest negative attitude score was found in the 18-34 age group (21.6 ± 5.8), while the highest was in participants aged 45 and above (26.0 ± 7.2). The lowest anxiety level was in the 18-34 age group (42.2 ± 13.1), and the highest anxiety level was in the 45 and above age group (47.9 ± 16.5). According to education levels, the lowest negative attitude score was observed among doctoral graduates (20.7 ± 5.8), and the highest score was in high school graduates (26.4 ± 7.2). Among occupational groups, the highest negative attitude score was seen in security workers (27.6 ± 6.5), while the lowest negative attitude scores were found in administrative (office) employees (21.0 ± 5.5) and nurses (21.7 ± 5.1). Regarding education levels, the lowest positive attitude was in primary school graduates (33.3 ± 9.93), and the highest positive attitude was observed in doctoral graduates (46.0 ± 5.01). Among occupational groups, the highest positive attitudes were recorded in academicians (44.5) and nurses (43.2).

Conclusion: The analyses revealed significant differences between participants' demographic characteristics and their levels of negative attitude, positive attitude, and professional anxiety towards artificial intelligence. Individuals using AI in their work and following AI developments exhibited significantly lower negative attitudes and professional anxiety, alongside higher positive attitudes. These findings suggest that familiarity with AI plays a crucial role in shaping attitudes and anxiety levels. In conclusion, the integration of AI into professional life appears to reduce anxiety and foster more positive attitudes toward the technology.

Keywords: Artificial Intelligence, Anxiety, Attitude, Job

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ANALYSIS OF TÜRKİYE IN THE LIGHT OF THE GLOBAL BURDEN OF DISEASE AND HEALTH POLICY RECOMMENDATIONS

Asiye Gökçe⁷³

ABSTRACT

Purpose: This study evaluates Türkiye's current health profile in light of the Global Burden of Disease (GBD) 2023 results and recent Ministry of Health data, and offers policy recommendations.

Methods: Data were obtained from the Republic of Türkiye Ministry of Health *Health Statistics Yearbook 2024* and the IHME GBD 2023 report. Years of Life Lost (YLL), Years Lived with Disability (YLD), Disability-Adjusted Life Years (DALY), and Healthy Life Expectancy (HALE) were comparatively examined for the 2002–2023 period by age, sex, causes, and risk factors.

Findings: In 2023, the leading cause of YLL in Türkiye was exposure to natural forces, mainly due to the earthquake disaster. Total DALY reached 29,727 per 100,000 population, approaching the OECD average. In YLD, the greatest increase was observed in diabetes, rising by 165%. Life expectancy at birth in Türkiye (78.1 years) was above the world average (73.3), but below the OECD (81.3) and EU (80.8) averages. Similarly, HALE in Türkiye (65.1 years) exceeded the world average (63.1), but remained below the EU (69.3), high-income country (67.7), and OECD (67.7) averages. These findings indicate a substantial morbidity burden, with individuals spending nearly 13 years of life with disease or disability.

Conclusion: Although Türkiye has made notable progress in the control of communicable diseases, it still faces a considerable chronic disease burden, as indicated by a HALE value nearly four years below the EU average. The effect of the 2023 earthquake on mortality, combined with diabetes-related productivity losses, threatens health system sustainability. Improving quality of life requires prioritizing digital health literacy, AI-supported personalized preventive medicine, value-based healthcare delivery, and disaster-resilient health system planning.

Keywords: Global Burden of Disease, Türkiye, DALY, diabetes, disaster management

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GREEN PATIENT BEHAVIOR SCALE: A SCALE DEVELOPMENT STUDY

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ABSTRACT

Purpose: The aim of this study is to develop a valid and reliable scale for measuring the environmentally sensitive behaviors of healthcare service users.

Method: This study was designed as a methodological research for scale development and psychometric evaluation. An initial item pool of 65 items was created based on the literature review, conceptual framework, and researcher evaluations. Content validity was assessed using the Lawshe technique based on the opinions of 11 experts from the fields of health management, environmental engineering, public health, and nursing. Following expert evaluation, a 32-item preliminary form was obtained, and analyses were conducted on 30 items after the removal of reverse-coded items. Data were collected from 276 participants. SPSS 27 and JASP software were used for data analysis. Exploratory factor analysis, confirmatory factor analysis, item analysis, reliability analysis, correlation analysis, and ROC analysis were performed.

Findings: As a result of the exploratory factor analysis, the scale was found to exhibit a four-dimensional structure. The KMO value was 0.941, and Bartlett's test of sphericity was significant ($\chi^2=6074.65$; $p<0.001$). The four-factor structure explained 66.24% of the total variance. The dimensions were named environmental awareness, green healthcare preferences, green behavior, and green support. The overall Cronbach's alpha coefficient of the scale was 0.953, while the alpha coefficients of the sub-dimensions ranged between 0.740 and 0.939. Item-total correlation values ranged from 0.489 to 0.828. As a result of the confirmatory factor analysis, the final structure of the scale was determined to consist of 24 items and four dimensions, and the model fit indices were found to be at acceptable and good levels ($\chi^2/df=2.06$; CFI=0.945; TLI=0.938; RMSEA=0.062; SRMR=0.052). In the ROC analysis, the AUC value was found to be 0.751, and the cut-off point of the scale was determined as 99.50.

Conclusion: The findings indicate that the Green Patient Behavior Scale is a valid and reliable measurement tool for evaluating the environmentally sensitive behaviors of healthcare service users. The scale is expected to contribute to future studies and practices focusing on sustainable healthcare services and environmentally friendly health policies.

Keywords: Green patient behavior, scale development, validity, reliability, sustainability.

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THE EFFECT OF INCOME LEVEL ON DEMAND FOR HEALTHCARE SERVICES: AN ECONOMETRIC ANALYSIS OF TÜRKİYE

Ezgi Doğan⁸⁰, Damla Akbeyaz⁸¹

ABSTRACT

Purpose: The primary objective of health economics is to ensure that individuals have access to their right to a healthy life through the efficient use of scarce resources, within a framework of equity and efficiency. In this context, the demand for healthcare services plays a decisive role in the development of the healthcare sector and the effective delivery of services. Analysing the factors influencing the demand for healthcare services is of great importance for the planning of healthcare services and resources allocated to health, as well as for the development of policies. When examining the elements influencing the demand for healthcare services, various factors emerge, such as price, income level, perceptions of health, accessibility of healthcare services, principal-agent relationships, preferences and personal characteristics. A review of the literature reveals that an individual's income level is a significant factor affecting access to and demand for healthcare services.

Method: This study examines the relationship between healthcare demand and income in Turkey for the period 2013–2023. In the study, a logarithmic transformation was first applied, and the model was subsequently estimated using the Ordinary Least Squares (OLS) method. The aim of the study is to examine the effect of individuals' income levels on healthcare demand using econometric methods and to develop policy recommendations based on the empirical results.

Findings: The findings of the study indicate that an increase in income levels leads to an increase in individuals' demand for healthcare services. The regression analysis revealed a positive and statistically significant relationship between real GDP per capita and the number of doctor visits per capita. In the linear model, the coefficient of the income variable was found to be positive, and the model was generally significant. According to the log-log model results, income elasticity was calculated as 0.4504. The findings indicate that a 1% increase in per capita income is associated with an approximate 0.45% increase in per capita doctor visits.

Conclusion: In this context, it is evident that policies aimed at reducing inequalities in access to healthcare services are crucial. In addition to income support policies for low-income groups, policies such as expanding health insurance coverage and improving access to healthcare services in rural areas are of great importance for the effective functioning and sustainability of the healthcare system. Policies implemented in this context will also enhance social welfare.

Keywords: Health economics, demand for healthcare services, income level

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INTEGRATING ARTIFICIAL INTELLIGENCE FRAMEWORKS TO ENHANCE HEALTHCARE QUALITY AND OPERATIONAL SUSTAINABILITY: A RESEARCH PROTOCOL

Konstantinos Matenoglou⁸²

ABSTRACT

Purpose: The rapid digital transformation of healthcare systems necessitates a robust evaluation of Artificial Intelligence (AI) integration. This study aims to explore the intersection of AI-driven clinical decision support systems and healthcare quality. The primary objective is to identify how AI algorithms can minimize medical errors, optimize resource allocation, and contribute to the long-term sustainability of modern healthcare organizations.

Method: This research follows a two-phase methodological approach. Initially, a systematic literature review is conducted across major databases (PubMed, Scopus, IEEE Xplore) to map existing AI applications in quality management. The second phase outlines a research protocol for a cross-sectional study involving healthcare professionals, utilizing structured questionnaires to assess the perceived efficacy and ethical challenges of AI implementation in clinical settings.

Findings: Preliminary analysis suggests that AI integration significantly improves diagnostic accuracy and predictive analytics for patient outcomes. However, a "quality gap" remains regarding the standardization of AI protocols. The research identifies that while AI enhances operational efficiency, the sustainability of these systems depends heavily on continuous staff training and data governance.

Results: The expected results of this ongoing research highlight a positive correlation between AI maturity and healthcare service excellence. The study concludes that AI is not merely a technological tool but a strategic asset for sustainable healthcare development, provided that it is governed by strict quality assurance frameworks.

Keywords: Artificial Intelligence, Healthcare Quality, Sustainability, Digital Health, Clinical Decision Support.

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EVIDENCE-BASED PRACTICE COMPETENCE AMONG NURSING STUDENTS: FINDINGS FROM MULTIPLE INSTITUTIONS

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ABSTRACT

Purpose: The study aims to evaluate evidence-based practice (EBP) competence among nursing students and factors predicting it.

Method: A cross-sectional study was conducted among undergraduate and postgraduate nursing students from three universities in Albania, Cyprus and Greece (n = 2,150). The Evidence-Based Practice Questionnaire (EBP-COQ) was used to explore nursing students' attitudes, knowledge and skills toward EBP. A convenience sampling method was used to collect data between January and May 2022. Statistical analysis included descriptive statistics, reliability/validity tests, t-test, ANOVA, and Pearson correlation.

Findings: A total of 899 students participated in this survey. Almost 46.6% of the students were enrolled at a Greek university, 39.5% were from Albania, and the remainder were from Cyprus. A significant positive attitude toward EBP and readiness to adopt it in clinical practice was shown. A total of 84% (n=714) agreed that EBP contributes to health-related decisions, and 78% recognized that EBP is beneficial for patients. In contrast, their knowledge and skills in EBP were moderate, with the main gaps related to their inability to search (60%), evaluate (58%), and analyse the practical utility of scientific research (80%). Statistically significant associations were observed between academic year ($p < 0.001$), hours spent in research methodology education ($p < 0.001$), and the number of research papers reviewed in the past month ($p < 0.001$).

Conclusion: Although students have positive attitudes toward EBP, their skills and knowledge need improvement through tailored educator interventions, such as integrating EBP courses into curricula.

Keywords: evidence-based practice; nursing education; nursing students; competence

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TECHNOLOGY ENGAGEMENT AND EHEALTH LITERACY AMONG NURSING STUDENTS IN THREE COUNTRIES

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ABSTRACT

Purpose: The main purpose of this study is to explore nursing students' knowledge and attitudes toward technology, internet use, and eHealth literacy.

Method: A cross-sectional study was conducted among undergraduate and postgraduate nursing students across the Nursing Departments at three universities in Albania, Cyprus, and Greece. Approximately 2,150 enrolled students were invited to complete a four-factor questionnaire (Technophilia, Internet Use, eHealth Literacy Scale, and Technology and Electronic Health in Nursing Education). Participants were recruited using convenience sampling from January to May 2022. Descriptive statistics and inferential tests, including t-tests and ANOVA, were applied.

Findings: A total of 899 students participated: 46.6% from Greece, 39.5% from Albania, and 13.9% from Cyprus. Most students ($n = 719$) were enrolled in BSc Nursing programs. Nearly 89.9% reported using the internet mainly for social networking. About 30% accessed health-related information several times daily or almost daily. Students knew how and where to search for this information; however, only 25.6% felt confident using it. Most students ($n = 621$) agreed/strongly agreed that eHealth literacy will be a core competence in their nursing career. Significant differences were observed between Albania and Greece on the first subscale ($p < 0.001$), while Cyprus scored higher on the last ($p < 0.001$). No significant differences were found in the second and third subscales.

Conclusion: Nursing students are strongly engaged with technology and internet use, particularly for social networking and accessing health-related data. However, a notable gap exists regarding their ability to critically evaluate this information.

Keywords: eHealth; internet; nursing; student; technology

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THE USE OF ARTIFICIAL INTELLIGENCE IN NURSING CARE IN THE INTENSIVE CARE UNIT: A REVIEW STUDY

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ABSTRACT

Purpose: The Intensive Care Unit (ICU) is a highly demanding environment where nurses are required to manage complex clinical data and make critical decisions under time constraints. The integration of Artificial Intelligence (AI) into nursing practice is emerging as an innovative tool that can enhance the quality and safety of care. This review examines how AI supports ICU nurses in making decisions, preventing complications, and improving patient outcomes.

Method: We reviewed literature in PubMed, Scopus, and Google Scholar from 2015 to 2025. We included original studies and systematic reviews on AI in ICU nursing, selecting studies for relevance and methodological validity.

Findings: The results show that AI significantly supports nursing work through early recognition of clinical deterioration, prediction of complications such as sepsis and respiratory failure, and automation of monitoring processes. In addition, it contributes to reducing workload and enhancing the accuracy of nursing interventions. However, challenges such as the need for nurse training and ethical issues are highlighted.

Conclusion: AI is a valuable tool for enhancing nursing care in the ICU, improving the quality of services and patient safety. Its successful integration requires appropriate training, interdisciplinary collaboration, and the development of clear implementation frameworks.

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ARTIFICIAL INTELLIGENCE-BASED DECISION SUPPORT SYSTEMS IN HEALTHCARE MANAGEMENT: A BIBLIOMETRIC AND CONTENT ANALYSIS

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ABSTRACT

Purpose: The main aim of this study is to examine the literature on artificial intelligence (AI)-based decision support systems in healthcare management. The study also aims to identify the main research themes, application areas, and general trends in the existing literature.

Method: The study employs bibliometric analysis and qualitative content analysis. The data were obtained from 30 academic studies indexed in the Web of Science (WoS) Core Collection database. A systematic search strategy was applied, and the studies were evaluated through a two-stage screening process based on title and abstract review. The selected studies were analyzed to determine their thematic focus, application areas, and management levels.

Findings: The findings indicate that the number of studies on AI-based decision support systems in healthcare management has increased in recent years, particularly after 2024. The literature is largely dominated by clinical applications, while studies focusing on healthcare management and system-level decision-making remain limited. The analysis shows that AI applications are mainly concentrated in operational management, population health management, and digital transformation processes. In addition, topics such as governance, ethics, and strategic decision-making are relatively underrepresented in the literature.

Conclusion: The study reveals that although AI technologies are increasingly used in healthcare, their integration into managerial and strategic decision-making processes is still limited. The findings highlight the need for further research focusing on management-oriented applications of AI-based decision support systems in healthcare.

Keywords: Artificial intelligence, healthcare management, decision support systems, digital transformation

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DESIGNING AN AI-POWERED SUSTAINABLE MHEALTH GUIDE FOR PERICONCEPTIONAL CARE IN WOMEN WITH CHRONIC DISEASES: A LOVABLE APPLICATION

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ABSTRACT

Purpose: The primary aim of this study is to design an artificial intelligence-supported gamified mobile health (mHealth) application model that optimizes periconceptional and antenatal care processes for women with chronic diseases, based on evidence-based clinical algorithms outlined in the Turkish Ministry of Health's "Management Guide for High-Risk Pregnancies." The secondary objective is to conceptually present the potential effects of eco-focused gamification dynamics framed around the United Nations Sustainable Development Goals (SDGs), intended to enhance medication adherence and alleviate stress among expectant mothers.

Method: A conceptual design and rapid prototyping approach was adopted in this study. The AI-powered development platform Lovable was utilized for user interface (UI) and user experience (UX) design. The platform enabled rapid transformation of complex medical algorithms into interactive prototypes with minimal coding, seamless integration of nature-themed visual metaphors into the interface, and iterative testing of gamification processes. Risk assessment criteria derived from the national guideline were algorithmized, and recommendations, such as folic acid supplementation and fluid intake, were converted into a "Daily Tasks" module, modelled with gamification elements that contribute to SDG targets.

Findings: Users are securely registered via email and password, enabling longitudinal monitoring throughout the application. The dashboard features a circular "Sustainability Health Score" reflecting treatment adherence numerically, alongside a digitally growing "Life Tree" module that evolves in parallel with user compliance. The Daily Tasks screen lists health-promoting actions such as adequate hydration, physical exercise, and outdoor walking aimed at reducing Venous Thromboembolism (VTE) risk. An "Impact Store" system was integrated into the model, converting points earned from completed tasks into ecological rewards, including tree planting and clean water donations, aligned with SDGs 6, 12, and 13.

Conclusion: The proposed conceptual model transforms obligatory medical routines for women with chronic diseases into a nature-themed, motivating experience. This innovative approach, which integrates sustainability-based gamification with medical adherence, is anticipated to have significant potential to protect maternal health while simultaneously raising global ecological awareness.

Keywords: Artificial intelligence, Chronic diseases, Periconceptional care

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THE HIDDEN SIDE OF CLINICAL SKILLS TRAINING: A QUANTITATIVE WASTE ANALYSIS IN THE BASIC SKILLS LABORATORY

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ABSTRACT

Purpose: This study aims to determine the amount, type, and specific per-student load of medical, sharps, and packaging waste generated during the laboratory practical examination of the "Basic Principles and Practices" course for first-year midwifery students, thereby highlighting the environmental and economic impacts of educational processes.

Methods: This descriptive, cross-sectional study was conducted during a practical examination involving 67 students performing individual modules (intramuscular, intravenous, intradermal, and subcutaneous injections, blood collection, and intravenous catheterization). The generated waste was segregated at the source, weighed using a precision scale, and a detailed inventory count of all consumables (syringes, gloves, ampoules, etc.) was recorded.

Findings: Measurements revealed a total of 28,450 g of medical waste, 2,621 g of packaging waste, and 597 g of sharps waste generated in the laboratory. The process involved intensive material consumption, including 1,521 needle tips, 1,675 non-sterile gloves, and 536 ampoules. An average of 120.5 items of waste was generated per student during the examination, of which approximately 41 items were sharps posing a risk of injury.

Conclusions: Clinical skills training leads to a high volume of medical waste and exposes students to significant contact with hazardous materials. This unseen waste burden not only increases disposal costs for institutions but also poses concrete occupational health and safety risks. For sustainability, it is essential that healthcare professional curricula place greater emphasis on waste minimization strategies and proper segregation at the source.

Keywords: Medical waste management, midwifery education, sustainability, occupational health and safety, laboratory waste.

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THE MODERATING EFFECT OF PSYCHOLOGICAL RESILIENCE ON THE RELATIONSHIP BETWEEN WELL-BEING AND JOB ENGAGEMENT AMONG NURSES

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ABSTRACT

Purpose: The primary aim of this research is to examine whether psychological resilience acts as a moderator in the relationship between nurses' mental well-being and their overall job engagement. The study tests the hypothesis that resilience enhances the positive effects of well-being on occupational engagement.

Method: A quantitative research design was employed using a sample of 1,232 clinical and school nurses. Participants completed a series of standardized psychometric tools, including the DASS-21, CD-RISC 10, and UWES-15 scales. Hayes's PROCESS macro in SPSS was then used to test the moderation hypothesis and evaluate interaction effects at different levels of the moderator.

Findings: A significant positive correlation was confirmed between psychological well-being and job engagement ($p < .001$) through statistical analysis. The results also revealed a significant interaction effect between well-being and resilience in predicting job engagement ($p < .001$). These results imply that the positive relationship between well-being and job engagement is stronger for highly resilient individuals. This suggests that, rather than merely acting as a baseline trait, resilience allows individuals to more effectively translate personal well-being into professional engagement.

Conclusion: This research underscores the significance of psychological resilience as a proactive resource that fosters positive organizational and individual outcomes. The findings suggest that interventions aimed at fostering resilience can significantly increase the effectiveness of well-being initiatives. From clinical and professional perspectives, cultivating resilience is crucial for maintaining high engagement levels and ensuring the long-term sustainability of the nursing workforce.

Keywords: psychological resilience, job engagement, mental well-being, nursing profession

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OCCUPATIONAL SETTING AND MENTAL HEALTH: A COMPARATIVE ANALYSIS BETWEEN HOSPITAL-BASED AND COMMUNITY-BASED NURSING PROFESSIONALS

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ABSTRACT

Purpose: This study examines the impact of the primary work environment on the mental health of nursing professionals. Specifically, it compares the perceived psychological distress and well-being levels of hospital-based employees with those of community-based healthcare service employees.

Method: A cross-sectional comparative study was conducted with 1,232 healthcare professionals, who were divided into two groups: clinical nurses and school nurses. The participants completed two questionnaires: the 21-item Depression, Anxiety, Stress Scale (DASS-21) and the 23-item PERMA Profiler Scale. Independent samples t-tests were performed in SPSS to analyze the data and identify statistically significant differences in mean scores for the examined variables between the two groups.

Findings: The results of the t-test analysis revealed significant differences based on occupational setting ($p < .01$). Professionals working in hospital environments reported significantly higher levels of perceived stress, anxiety, and depressive symptoms than those working in community settings. Conversely, community-based employees exhibited higher mean scores in psychological well-being. These results suggest that the demanding nature of hospital-based care is linked to heightened psychological distress.

Conclusion: This comparative analysis reveals that hospital-based nursing professionals experience increased psychological distress. The evidence underscores the importance of context-specific interventions that alleviate emotional strain and enhance professional fulfillment in high-pressure clinical environments. It is essential to prioritize mental health resources that address the unique structural demands of each setting in order to sustain a resilient and high-performing nursing workforce.

Keywords: clinical nurses, community nurses, psychological distress, psychological well-being, mental health

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THE USE OF ARTIFICIAL INTELLIGENCE SYSTEMS IN IMPROVING HAND HYGIENE COMPLIANCE: REVIEW OF THE LITERATURE AND CLINICAL DATA

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ABSTRACT

Purpose: The aim of this review is to examine the effectiveness of artificial intelligence (AI) systems in improving hand hygiene compliance, as well as to evaluate their impact on reducing hospital-acquired infections and improving the quality of care.

Method: A systematic literature research was conducted in the PubMed and Google Scholar databases for studies published over the past ten years. Studies assessing the use of AI systems for automated monitoring of hand hygiene in hospital settings were included.

Findings: AI systems provide objective, continuous, and real-time monitoring, helping to reduce errors associated with the subjectivity of human observation. They also offer immediate feedback, enhancing awareness and accountability among healthcare professionals. Most studies demonstrated a significant increase in healthcare professionals' compliance with hand hygiene when AI systems were used, while a trend toward reduction in associated infections was also observed.

Conclusions: Hand hygiene has long been one of the most important measures for preventing hospital-acquired infections, particularly in critical settings such as Intensive Care Units (ICUs). Despite its well-documented importance, compliance among healthcare professionals often remains low, leading to infections such as CLABSIs, CAUTIs, and others. The use of AI technologies appears to significantly improve hand hygiene compliance and may contribute to the reduction of hospital-acquired infections. The integration of such systems into daily hospital practice could serve as a crucial tool in infection prevention.

Keywords: AI and Hand Hygiene, HAI and AI

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THE USE OF TELENURSING IN ADULT CANCER CARE: A PILOT IMPLEMENTATION IN A UNIVERSITY SETTING

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ABSTRACT

Purpose: To describe the application of telenursing in adult cancer patient care and to present its pilot implementation within a university laboratory setting.

Method: A pilot implementation of a digital telenursing system was conducted at the «Care in Adult cancer patients» Lab of the Nursing Department, International Hellenic University (IHU). The system includes a digital clinic platform with integrated audio-visual communication capabilities. Five demo patient accounts and one nurse account were created to simulate real-world interactions. Nursing students were invited to engage with the platform using a dedicated mobile application and user manual, enabling experiential learning and evaluation of system functionality.

Results: Telenursing facilitates the delivery of nursing care through information and communication technologies, enabling remote patient assessment, education, and support. Its importance was highlighted during the COVID-19 pandemic. The pilot system supports symptom monitoring, patient guidance, emotional support, and timely referrals across the cancer care continuum, including palliative care. Nurses assess symptom severity, guide patients in symptom self-management and provide continuous support. Telenursing service are delivered through video conferencing, phone communication, mobile applications, and smart devices. The digital clinic enables vital signs monitoring, session scheduling, and patient record management. Initial observations suggest that telenursing improves accessibility, reduces hospital visits and associated costs, enhances time efficiency, and strengthens the nurse-patient relationship by bridging hospital-based and home care.

Conclusions: Telenursing represents a promising model for delivering patient-centered oncology care. There is a need for further research to evaluate its effectiveness and establish it as a standard care model for a diverse variety of patients

Keywords: Telenursing, cancer, care, nursing

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SUSTAINABILITY OF HUMAN RESOURCES IN GREECE: THE IMPACT OF HEALTH-PROMOTING BEHAVIORS ON MORAL RESILIENCE AND QUALITY OF CARE

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ABSTRACT

Purpose: The primary aim of this research was to investigate the determinants of moral resilience among healthcare professionals in Greece, focusing on the role of health-promoting behaviors—such as sleep quality, mindful eating, and physical activity—as pillars of organizational sustainability and total quality management. The study sought to identify how these lifestyle factors, alongside psychosocial indicators like self-esteem and professional burnout, influence a professional's ability to maintain ethical integrity and provide high-quality care under pressure.

Method: A cross-sectional analytical study was conducted at the General Hospital of Kalamata, Greece, in 2025. The sample consisted of 185 healthcare professionals from various specialties who completed anonymous self-administered questionnaires. Validated measurement tools were employed, including the Rushton Moral Resilience Scale (RMRS-16), Pittsburgh Sleep Quality Index (PSQI), Mindful Eating Questionnaire (MEQ), and the Single Item Burnout Measure (SIB). Data analysis was performed using SPSS v.24.0, incorporating descriptive statistics and multivariate linear regression.

Findings: Participants displayed a high level of moral resilience (mean 41.51). Moral resilience was positively correlated with self-esteem ($\rho=0.197$, $p=0.007$) and subjective assessment of sleep quality ($\rho=0.261$, $p<0.001$). Conversely, levels of mindful eating and physical activity were recorded as low (MEQ: 17.74 ± 2.35 , total physical activity: 547.4 ± 128 $\text{met}\cdot\text{min}\cdot\text{wk}^{-1}$). In the multivariate analysis, which was overall statistically significant (adjusted $R^2=0.189$, $F=6.532$, $p<0.001$), independent predictors of higher moral resilience were higher education level ($\beta=0.182$, $p=0.020$), working in closed units ($\beta=0.254$, $p=0.001$), higher self-esteem ($\beta=0.159$, $p=0.040$), and lower professional burnout ($\beta=-0.241$, $p=0.004$). These data highlight a critical gap in organizational wellness strategies despite the high individual resilience scores.

Conclusion: This research demonstrates that the sustainability of the Greek healthcare workforce depends on moving beyond clinical skills to fostering personal health behaviors. By recognizing moral resilience as a quality indicator, health administrations can implement "caring for the caregiver" policies—such as sleep hygiene training and mindful nutrition programs—to mitigate burnout and ensure long-term organizational viability and patient safety.

Keywords: Healthcare Professionals, Moral Resilience, Sleep Quality, Sustainability, Total Quality Management.

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INFORMAL CAREGIVERS AS A PILLAR OF SUSTAINABILITY IN HOME-BASED CARE IN GREECE: PSYCHOSOMATIC BURDEN AND SYSTEM-LEVEL GAPS IN ADVANCED NON-MALIGNANT CHRONIC CONDITIONS

Karagkounis Chrysovalantis¹¹⁷, Bellali Thalia¹¹⁸

ABSTRACT

Purpose: Palliative care (PC) in Greece remains predominantly oncology-oriented, leaving patients with advanced non-malignant chronic conditions with limited access to structured, community-based services. Within this context, informal caregivers act as the primary co-providers of home-based care. This study aims to reconceptualize the sustainability of home-based care by positioning informal caregivers as a central pillar, with a focus on their psychosomatic burden and interactions with the healthcare system as key determinants of care quality and sustainability.

Method: A qualitative study design was employed using Husserlian descriptive phenomenology. This approach allowed for the investigation of the phenomenon as it is perceived by the participants, free from preconceived notions through the process of bracketing. Semi-structured interviews were conducted with fourteen informal caregivers recruited through the “Help at Home” program in Katerini, Greece. Data analysis followed Colaizzi’s (1978) seven-step descriptive phenomenological method, ensuring a rigorous transition from individual significant statements to the formulation of the fundamental structure of the experience.

Findings: The sustainability of home-based care is highly dependent on caregivers operating under substantial psychosomatic strain. Caregivers reported cumulative physical exhaustion, emotional distress, and chronic sleep disruption associated with continuous vigilance, alongside significant social restriction. Their interaction with the healthcare system was characterized by fragmentation, limited access to home-based services, and a lack of structured support and guidance. As a result, caregivers frequently assumed extended clinical, monitoring, and coordination roles without formal training, effectively compensating for systemic deficiencies. Although family support and spirituality functioned as important coping resources, they were insufficient to offset the absence of integrated, community-based palliative care services.

Conclusion: The current model of home-based care in Greece is structurally unsustainable, as it relies disproportionately on unsupported informal caregivers. Ensuring both sustainability and quality of care requires a transition toward integrated, community-based PC systems that prioritize caregiver preparedness, structured education, psychosocial support, and accessible home-based services. Strengthening caregiver capacity is essential for achieving equitable, high-quality, and sustainable PC delivery.

Keywords: Advanced Non-Malignant Chronic Conditions, Caregiver Preparedness, Home-Based Care, Informal Caregivers, Palliative Care, Psychosomatic Burden, Sustainability

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NEONATAL INTENSIVE CARE UNITS (NICUS) IN THE ERA OF AI

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ABSTRACT

Purpose: The present study aims to investigate the current applications of AI in Neonatal Intensive Care Units (NICUs), identify the systemic and clinical barriers hindering its widespread adoption, and highlight its potential for a safer and more efficient daily clinical practice.

Methods: A comprehensive literature search was performed to identify scientific articles, textbooks, and relevant studies published within the last five years. Sources were retrieved from the electronic databases PubMed, Google Scholar, and Scopus, using keywords including AI, Deep Learning, Machine Learning, and NICU.

Findings: Research surrounding AI in NICUs has highlighted significant clinical applications, which are nevertheless accompanied by critical systemic barriers. Specifically, in the field of infections, machine learning algorithms continuously analyze heart rate characteristics (HRC) to provide early warning systems for late-onset neonatal sepsis, such as the HeRO score, which has been proven to contribute to reduced mortality. Concurrently, for Necrotizing Enterocolitis (NEC), AI systems identify predictive patterns through physiological data, such as reduced heart rate variability, and microbiome analysis (omics), guiding diagnosis even before classic radiological findings appear. In neurological care, algorithms such as ANSer are being developed for the continuous and automated detection of neonatal seizures on electroencephalograms (EEG), allowing for faster treatment without requiring the continuous presence of a pediatric neurologist. Additionally, in the field of nutrition, innovative systems like TPN2.0 standardize and optimize Total Parenteral Nutrition (TPN) compositions by extracting data from Electronic Health Records (EHR). This approach limits subjectivity and medical errors, mitigating the risk of severe morbidities such as NEC and cholestasis. Furthermore, automated image analysis improves screening for Retinopathy of Prematurity (ROP), while specialized algorithms manage the nonlinear relationship between oxygen saturation (SpO₂) and fraction of inspired oxygen (FiO₂) for the personalized titration of oxygen therapy, reducing false alarms. Despite this impressive technological progress, the clinical integration of AI encounters significant challenges. Low data quality, data fragmentation (data silos), and mislabeling drastically degrade model performance. Concerns are also raised by inherent disparities in medical devices, such as the varying accuracy of pulse oximeters across different races, which translate into algorithmic bias. Moreover, the lack of transparency (the "black box" phenomenon) regarding the decision-making mechanism breeds distrust among healthcare professionals. One of the most prominent hurdles is the absence of ecological validity, as most systems are tested in controlled, idealized research environments that do not reflect the chaos and high workload of a real-world NICU.

Conclusions: AI holds the undeniable potential to drastically enhance NICU care by facilitating highly personalized, precise, and rapid interventions. Nevertheless, to ensure its viability within the sensitive pediatric environment, it is imperative to shift the focus from mere theoretical algorithm development to actual clinical integration. This necessitates demonstrating ecological validity, establishing clear frameworks for clinical accountability, and employing a participatory design approach to ensure these systems serve—rather than replace or burden—healthcare professionals. Only through such a multidisciplinary approach will AI emerge as an invaluable partner in the preservation and protection of neonatal life.

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ETHICAL CHALLENGES AND COMPETENCY GAPS IN HEALTH INFORMATION SYSTEMS: A STUDY PROTOCOL

Avraam Dimitriadis¹²⁰, Maria Lavdaniti¹²¹, George Tsekouropoulos¹²², Polixeni Liamopoulou¹²³

ABSTRACT

Purpose: The rapid integration of Health Management Information Systems (HMIS) and AI-driven tools in healthcare has transformed clinical decision-making and service delivery. However, limited evidence exists regarding healthcare professionals' competencies, perceptions, and ethical challenges associated with these systems. This study aims to investigate these dimensions and explore their implications for quality and sustainable healthcare systems.

Methods: A cross-sectional study will be conducted among healthcare professionals working in public and private healthcare settings in Greece. Data will be collected using structured questionnaires based on validated instruments assessing informatics competency, technology acceptance, and ethical decision-making. The study will include approximately 250 participants, ensuring adequate statistical power. Descriptive and inferential statistical analyses will be performed to examine relationships between competencies, perceptions, ethical awareness, and demographic variables.

Results: The study is expected to identify variability in informatics competencies and highlight key ethical concerns, including data privacy, algorithmic transparency, professional responsibility, and the risk of over-reliance on automated decision-support systems. It is anticipated that higher levels of competency and ethical awareness will be associated with more effective and responsible use of HMIS.

Conclusions: Understanding the human and ethical dimensions of digital health systems is essential for ensuring quality, safety, and sustainability in healthcare. The findings will provide evidence to support the development of targeted educational interventions, ethically aligned system design, and policy frameworks that promote responsible AI integration in clinical practice.

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THE RIGHTS OF CHILDREN WITH CHRONIC DISABILITIES IN SCHOOL

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ABSTRACT

Purpose: The objective of this review paper is to underscore the entitlements of children with ongoing impairments in school and instruction, fostering their complete integration into the academic framework.

Method: A survey of literature covering articles and investigative reports released across the previous decade was undertaken. The research was sourced from electronic repositories such as Pub Med and Google Scholar.

Findings: The Pacton the Entitlements of the Youngster (1989) underscores that every youngster possesses the entitlement to schooling without disparity (Article 28), whilst distinct focus is given to children with limitations in Article 23, pointing out the necessity for specific assistance and backing to attain their utmost feasible growth. Moreover, the Pacton the Entitlements of Individuals with Limitations (2006) establishes the entitlement to integrated instruction, emphasizing that nations must assure an educational structure devoid of exclusion at every tier. One of the core entitlements of youngsters with ongoing infirmities is the furnishing of tailored scholastic backing. This encompasses crafting Individualized Education Plans (IEPs), utilizing dedicated instructional resources, and aid from expert personnel such as specialized instructors, counselors, and speech therapists. Additionally, employing enabling learning apparatus considerably eases access to comprehension. Just as vital is the entitlement of these youngsters to a secure and encouraging scholastic setting. Instructors bear a vital function, as via their viewpoints and methods they can boost the involvement of every pupil.

Conclusions: Children with ongoing handicaps possess the entitlement to an education that honors their necessities and proficiencies, encourages their involvement, and advances their self-governance.

Keywords: encompassing school, instruction, youngsters, ailments, ongoing impairment, and entitlements of youngsters with handicaps.

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PREVENTION OF RESPIRATORY INFECTIONS IN SCHOOL SETTINGS

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ABSTRACT

Purpose: The objective of this review piece is to examine respiratory contagion in academic settings and their prophylaxis, to safeguard children's wellness and guarantee the fluid operation of the learning process.

Method: A literature review of papers and investigative works published over recent ten years was performed. The studies were obtained from digital archives such as PubMed and Google Scholar.

Findings: Respiratory infections encompass ailments like the common cold, flu, and various viral or bacterial contagions. These sicknesses are mainly spread through droplets discharged during hacking, sneezing, or speaking, talking, in addition to soiled surfaces. One of the most foremost protective actions is appropriate hand cleanliness. Consistent hand washing with cleanser and water for a minimum of 20 seconds, or the use of alcohol-based hand rubs, can notably lessen onward movement of germs. Moreover, sticking to respiratory etiquette is equally vital. Pupils ought to cover their mouth and nose with a tissue or their forearm when coughing or sneezing, thus curbing the dispersal of microbes into the air. Correct discarding of used tissues also helps in averting spread. Sufficient airflow in classroom settings is another main preventative action. Routine air refreshment in rooms is especially vital, predominantly throughout the colder seasons when sicknesses are more rampant. Additionally, remaining at home when unwell is vital in restricting the propagation of diseases.

Conclusions: Educators, working alongside guardians and medical experts, can encourage wholesome practices among kids and cultivate a conscientious approach toward well-being, thereby assisting in stopping respiratory infections in academic environments.

Keywords: school, education, youngsters, ailments, persistent impairment, and entitlements of disabled children.

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COMPARATIVE COST ANALYSIS OF OPEN AND LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Purpose: The primary objective of this comprehensive review is to delineate the variances in inpatient expenditures associated with open versus laparoscopic cholecystectomy, and to examine their implications for both healthcare infrastructure and individual patients.

Method: A systematic literature review, encompassing scholarly articles and research investigations published within the past ten years, was performed. Relevant studies were identified from prominent electronic databases, including PubMed and Google Scholar.

Findings: The primary surgical modalities for managing gallbladder pathologies are open cholecystectomy and laparoscopic cholecystectomy. Over recent decades, laparoscopic cholecystectomy has emerged as the favored approach, attributable to its numerous benefits, such as diminished postoperative discomfort, expedited recuperation, and a curtailed inpatient period. Conversely, the open technique entails a more substantial incision, prolonged convalescence, and extended inpatient care. From an economic standpoint, laparoscopic cholecystectomy necessitates a greater upfront direct investment, primarily driven by the requisite specialized instrumentation and advanced technological components, which encompasses laparoscopic tools, advanced imaging systems, and personnel training. Nevertheless, the aggregated inpatient expenditures are frequently diminished when compared to open cholecystectomy. The fundamental determinant of this disparity is the abridged hospital stay, resulting in reduced expenditures for patient care, pharmaceuticals, and nursing support. Furthermore, patients' quicker reintegration into their daily routines and employment mitigates indirect costs associated with lost productivity.

Conclusions: The diminished duration of hospitalization, accelerated patient recuperation, and reduced incidence of complications collectively establish the laparoscopic methodology as a more economically advantageous option in comparison to open cholecystectomy.

Keywords: gallbladder, bile, cholelithiasis, open cholecystectomy, laparoscopic cholecystectomy, and cost.

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SOCIAL AND DEMOGRAPHIC RAMIFICATIONS OF COVID-19

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ABSTRACT

Purpose: This historical review study endeavors to delineate the substantial role of COVID-19 in instigating transformations within daily human existence, thereby establishing novel circumstances with enduring repercussions.

Method: The methodology involved a systematic search for pertinent review articles and empirical research within prominent electronic databases, specifically PubMed and Google Scholar.

Findings: The COVID-19 pandemic instigated substantial transformations in societal norms and individual lifestyles. Interventions such as physical distancing protocols, remote employment, and digital learning platforms precipitated a decline in interpersonal engagements and an escalation of social seclusion. Concurrently, marginalized populations, including the elderly and those of lower socioeconomic strata, experienced exacerbated vulnerabilities, thereby widening existing social disparities. The economic repercussions, encompassing elevated unemployment rates and diminished incomes, disproportionately burdened the most susceptible societal segments. Concurrently, a discernible surge in mental health issues, such as heightened anxiety and depressive states, was attributable to prevailing uncertainties and imposed limitations. The educational landscape also underwent profound modifications. The cessation of in-person schooling and the subsequent pivot to virtual instruction underscored pre-existing social inequalities, consequently strengthening the 'digital divide' and detrimentally influencing the academic trajectories of numerous students. Demographically, the pandemic exerted influence on fundamental metrics, specifically mortality rates, birth rates, and migratory patterns. The escalation in fatalities, particularly prevalent within older cohorts, contributed to a transient reduction in life expectancy across numerous nations.

Conclusions: In conclusion, the COVID-19 pandemic yielded multifaceted social and demographic ramifications. A thorough comprehension of these effects is paramount for formulating robust policies designed to fortify the adaptive capacity of societies.

Keywords: COVID-19, coronavirus, social impacts, and demographic development.

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THE INTEGRAL ROLE OF EDUCATORS IN CULTIVATING THE PROFESSIONAL IDENTITY OF ASPIRING NURSES

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ABSTRACT

Purpose: This scholarly review endeavors to elucidate the significant contribution of academic staff to the evolution of professional identity among nursing undergraduates, as well as to the fostering of fundamental values, ethical dispositions, and appropriate professional conduct.

Method: A systematic literature review was performed on scholarly articles and research investigations published over the preceding decade. Relevant studies were retrieved from esteemed electronic databases, including PubMed and Google Scholar.

Findings: Educators substantially aid in the formation of professional identity through didactic instruction and the conveyance of specialized knowledge. Concurrently, the integration of theoretical principles with practical application significantly enhances the development of clinical reasoning and sound professional judgment. Learners observe and assimilate the demeanor, principles, and operational methods exhibited by their instructors, particularly within real-world clinical environments. Qualities such as compassion, reverence for patients, and adherence to ethical standards are implicitly transmitted through regular interpersonal engagement. A further critical dimension of the educator's role involves student mentorship. The provision of constructive feedback facilitates heightened self-awareness and professional maturation, while consistent encouragement bolsters self-assurance. Additionally, practical clinical instruction represents a cornerstone in the establishment of professional identity. The educator, acting as a clinical preceptor, assists students in synthesizing conceptual understanding with experiential practice, cultivating a sense of professional accountability, and comprehending the specific responsibilities of the nurse within the wider healthcare system.

Conclusions: In essence, through pedagogical instruction, comprehensive guidance, exemplary conduct, and sustained support, the educator makes an indispensable contribution to nurturing accomplished healthcare practitioners endowed with requisite knowledge, essential proficiencies, and sound ethical principles.

Keywords: nursing, nursing students, education, professional identity, and professional behavior.

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SIMULATION AND VIRTUAL REALITY IN NURSING PEDAGOGY

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ABSTRACT

Purpose: This review endeavors to elucidate the significant contribution of virtual reality and simulation methodologies in fostering the development of proficient and safe healthcare practitioners, with a particular emphasis on the nursing profession.

Method: A systematic examination of scholarly literature and empirical investigations published within the preceding ten years was undertaken. Relevant studies were sourced from prominent electronic repositories, including PubMed and Google Scholar.

Findings: Simulation-based learning encompasses the utilization of specialized pedagogical models, high-fidelity human patient simulators, and meticulously crafted scenarios designed to mirror authentic clinical environments. These instruments provide learners with invaluable opportunities to cultivate practical proficiencies, refine critical judgment, and enhance their aptitude for managing urgent clinical scenarios. Conversely, Virtual Reality facilitates the construction of immersive digital environments where students can engage with simulated patients and hypothetical clinical situations. Through dedicated hardware, such as head-mounted displays, users are afforded a profoundly realistic experiential setting, thereby augmenting pedagogical efficacy via immersive engagement. This technological capability enables iterative practice of diverse scenarios and targeted training for infrequent or high-stakes clinical occurrences that are seldom encountered in authentic clinical settings. A paramount benefit derived from both simulation and virtual reality is the notable augmentation of patient well-being and safety. Learners are afforded the unique opportunity to engage in error-making and subsequent remediation within a risk-free environment, thereby contributing significantly to the mitigation of future clinical inaccuracies. Furthermore, the instantaneous constructive criticism provided during simulated exercises actively fosters continuous professional refinement and bolsters self-assurance in professional capabilities.

Conclusions: In conclusion, the integration of simulation and virtual reality within nursing curricula constitutes an efficacious instrument, profoundly optimizing didactic outcomes and fostering the holistic professional maturation of aspiring nurses.

Keywords: nursing, nursing students, healthcare professionals, virtual reality, simulation, and education.

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A SUSTAINABLE MODEL OF CONTINUOUS PREVENTIVE HEALTHCARE SUPPORTED BY DIGITAL TOOLS

Evanthia Kaitanoglou¹⁴²

ABSTRACT

Purpose: The main aim of this study is to propose a sustainable healthcare model based on continuous preventive care, addressing the limitations of reactive, episodic treatment approaches. The study also aims to explore how digital health tools can support ongoing patient monitoring and improve long-term health outcomes.

Method: This study is based on a conceptual and exploratory approach and uses existing literature in preventive medicine from a holistic perspective, behavioral health, and digital health. A model of continuous care is developed by synthesizing key principles related to patient treatment compliance, early intervention based on everyday metrics and sustained patient-provider interaction. Additionally, a pilot implementation scenario is examined to demonstrate the potential application of the proposed model in a real-world healthcare setting.

Findings: The proposed model highlights that continuous engagement between patients and healthcare providers, supported by digital tools, may improve compliance to treatment plans, reduce relapse rates and prevent healthcare issues by early identification and intervention. The overall result is better patient outcomes. The integration of preventive strategies and digital monitoring contributes to more efficient and patient-centered healthcare delivery. The model also reflects key dimensions of sustainability, including improved quality of care, accessibility, and long-term system efficiency.

Conclusion: This study contributes to the ongoing discussion on transforming healthcare systems toward more sustainable and preventive approaches. The findings suggest that continuous care models supported by digital technologies can play a significant role in improving health maintenance and outcomes, as well as system performance. Future research is needed to empirically evaluate the effectiveness of such models across different populations and healthcare contexts.

Keywords: Preventive Healthcare, Sustainability, Digital Health, Patient Adherence, Continuous Care

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WORKPLACE MOBBING IN HOSPITALS AND ITS IMPLICATIONS FOR HEALTHCARE SYSTEM SUSTAINABILITY

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ABSTRACT

Purpose: Workplace mobbing, also referred to as workplace bullying or psychological harassment, constitutes a significant occupational challenge within healthcare environments. Healthcare professionals are frequently exposed to hostile behaviors including intimidation, humiliation, exclusion, and persistent criticism. Organizational stress, staff shortages, excessive workload, and hierarchical workplace structures appear to increase the prevalence of mobbing in hospital settings. The present review aims to examine the impact of workplace mobbing on healthcare professionals and explore its implications for the sustainability and effectiveness of healthcare systems.

Method: A narrative review of contemporary literature was conducted using published studies and international reports addressing workplace mobbing, occupational health, nursing work environments, and organizational outcomes in healthcare settings.

Findings: Current evidence suggests that workplace mobbing is strongly associated with burnout syndrome, anxiety, depression, sleep disturbances, reduced job satisfaction, and increased intention to leave the profession. Furthermore, workplace harassment negatively affects healthcare organizations by contributing to workforce instability, staff turnover, absenteeism, reduced quality of patient care, increased risk of medical errors, and higher organizational costs. Nurses and early-career healthcare professionals appear particularly vulnerable to psychological harassment and its occupational consequences.

Conclusions: Workplace mobbing represents a major occupational and organizational challenge that threatens healthcare workforce well-being and healthcare system sustainability. Preventive interventions, including zero-tolerance organizational policies, leadership training, reporting mechanisms, and supportive workplace cultures, are essential to promote safe, effective, and sustainable healthcare environments. Promoting psychologically safe and collaborative workplace environments should be considered a strategic priority for modern healthcare organizations aiming to ensure workforce well-being, patient safety, and healthcare system sustainability.

Keywords: Workplace mobbing, workplace bullying, nurses, healthcare professionals, burnout, patient safety, healthcare sustainability.

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SUSTAINABLE PRACTICES IN CARDIOVASCULAR HEALTHCARE

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ABSTRACT

Purpose: Cardiovascular diseases continue to be the foremost cause of mortality worldwide, imposing a substantial burden on healthcare systems. Concurrently, growing demands for sustainability within healthcare have underscored the need to incorporate environmentally responsible practices into cardiovascular care. Within this context, nurses hold a central role in facilitating this transition due to their direct involvement in patient care and their essential contribution to health promotion initiatives. The aim of this study is to explore sustainable practices in cardiovascular healthcare and highlight the contribution of nursing practice in achieving more efficient and environmentally conscious care delivery.

Methods: A narrative review was conducted, based on recent relevant literature retrieved from electronic databases, including PubMed, Scopus, and Google Scholar, using keywords such as “sustainability,” “cardiovascular care,” “nursing practice,” and “green healthcare.”

Findings: Findings indicate that sustainability in cardiovascular care can be supported through prevention, patient education, telehealth, and remote monitoring, which reduce disease burden and healthcare utilization. Environmental impact is further lowered through efficient waste management and energy-conscious clinical practices. Nurses are central to care coordination and patient education, although challenges include inadequate support, training, and awareness.

Conclusion: In conclusion, embedding sustainability within cardiovascular care is fundamental to the evolution of healthcare delivery. Nurses are key agents in this transition, linking clinical quality with environmental responsibility.

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DIGITAL AND ELECTRONIC TRANSFORMATION IN THE HEALTH SECTOR: PROGRESS, CHALLENGES AND STRATEGIC PRIORITIES

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INTRODUCTION

Digital and electronic transformation in the health sector is changing how patients access and receive medical care. The aim is to offer continuous health services around the clock — 24 hours a day, 7 days a week — so that patients do not have to travel long distances or wait in queues to be seen. This study is part of ongoing postgraduate research within the MSc ManagiDITH programme (Managing Digital Transformation in the Health Sector, IHU), and draws on first-hand experience as a public servant working in the health sector within Greek public administration. Areas such as e-prescriptions, patient records, telemedicine and online appointments are all moving forward, though much work still remains (Vial, 2019; Kruse et al., 2018).

RESEARCH OBJECTIVES

- Review the current progress of digital services across the health sector
- Highlight telemedicine as the key tool for round-the-clock patient care
- Look at why health information systems struggle to work together
- Examine data security risks when moving medical records online

METHODOLOGY

- Literature review: health digitalisation studies (2015–2024)
- Comparison of e-health approaches across EU member states
- Case study: digital projects within the Greek NHS (ESY)
- Review of telemedicine delivery models and service frameworks
- Assessment of GDPR compliance and cybersecurity in health data

CONCEPTUAL FRAMEWORK



Fig. 1 Five key areas of digital transformation in health (author's own model)

KEY FINDINGS

- Telemedicine is the most important digital tool: it lets doctors see patients remotely, at any hour, removing distance and time as barriers to care
- Digital health services are moving forward on all fronts, but the work is not finished — gaps remain across different levels of the system
- The biggest structural problem is that health IT systems do not talk to each other, making it hard to share patient data between hospitals and clinics
- Keeping medical data safe and meeting GDPR rules is a serious challenge that slows down digital projects across the sector
- Without strong political will and clear leadership, digital health projects lose momentum and fail to reach their goals
- Health workers need proper training on new digital tools, and patients need step-by-step guidance and someone to call when things go wrong

BARRIERS TO TRANSFORMATION

- Health IT systems work in silos — patient data cannot move freely between services
- Cybersecurity risks when storing and sharing sensitive medical information
- Many patients, especially older adults, are not confident using digital services
- Health staff often lack the training needed to use new digital platforms
- Laws and regulations around e-health have not kept pace with technology

STRATEGIC IMPLEMENTATION ROADMAP

- 1 Set a clear national e-health strategy with political commitment (Foundation)
- 2 Build shared IT infrastructure that lets health systems connect (Phase 1)
- 3 Roll out telemedicine so patients can be seen any time, anywhere (Phase 2)
- 4 Strengthen data security and put GDPR compliance in place (Phase 3)
- 5 Train health workers and help patients use digital services (Phase 4)

CONCLUSIONS

Digital transformation in health will only work if two things happen: leaders at every level must genuinely commit to making it happen, and patients must receive the information and support they need to use digital services with confidence. Telemedicine is the most promising development in this field — it can provide care at any hour of the day — but it will only reach its potential once health systems can share data freely and patient information is properly protected. Progress is being made; the challenge now is to make sure no one is left behind.

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Mindfulness-Based Strategies for Managing Burnout in ICU Nurses: A Systematic Evidence Synthesis

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BACKGROUND

Intensive Care Units (ICUs) represent highly demanding clinical environments characterized by high patient acuity, exposure to mortality, and continuous time pressure.

These conditions place ICU nurses at increased risk of occupational stress and burnout. Burnout is typically manifested through emotional exhaustion, depersonalization, and reduced personal accomplishment, negatively affecting both healthcare professionals' well-being and quality of patient care.

In recent years, mindfulness-based interventions have emerged as non-pharmacological approaches aiming to enhance emotional regulation, resilience, and psychological well-being among healthcare professionals.

AIM

The aim of this study was to systematically review the international literature on the effectiveness of mindfulness interventions in reducing occupational stress and burnout among ICU nurses.

METHODS

This study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

A systematic search was conducted in three databases: PubMed, Scopus, and Web of Science. The search included studies published between 2019 and 2025 in English.

Search strategy:

• (mindfulness OR "mindfulness-based intervention*" OR MBSR OR MBCT OR meditation) AND (burnout OR "emotional exhaustion" OR stress OR presenteeism) AND ("ICU nurse*" OR "critical care nurse*")

Inclusion criteria:

- Studies involving ICU nurses
- Mindfulness-based interventions or mindfulness levels
- Outcomes related to stress, burnout, or emotional exhaustion
- Primary studies or systematic reviews
- Peer-reviewed publications

Exclusion criteria:

- Non-ICU populations
- Non-mindfulness interventions
- Conference abstracts or opinion papers
- Non-English publications

A total of 13 studies met the inclusion criteria and were included in the final synthesis.

RESULTS

The findings consistently demonstrate that mindfulness interventions are associated with:

- Reduction in emotional exhaustion and depersonalization
- Decrease in work-related stress
- Improvement in self-compassion and emotional regulation
- Enhancement of professional efficacy
- Strengthening of psychological resilience
- Intervention studies, particularly structured programs lasting approximately 8 weeks, showed the strongest evidence of effectiveness.

Additionally, mindfulness interventions contributed to:

- Improved sleep quality
- Reduced impact of the "second victim" phenomenon
- Lower levels of presenteeism
- Correlational studies further supported the protective role of mindfulness, showing that higher mindfulness levels are associated with lower burnout and stress.

DISCUSSION

The evidence suggests that mindfulness is not only effective in reducing negative psychological outcomes but also in enhancing positive psychological resources among ICU nurses.

Structured mindfulness programs appear to be particularly beneficial, especially in high-stress contexts such as the COVID-19 pandemic.

However, the included studies show methodological heterogeneity in design, measurement tools, and sample characteristics, limiting the generalizability of findings.

Furthermore, limited long-term follow-up data restrict conclusions regarding the sustainability of intervention effects.

CONCLUSIONS

Mindfulness interventions represent an effective strategy for reducing occupational stress and burnout in ICU nurses.

They contribute to both the mitigation of negative outcomes and the enhancement of psychological resilience and professional functioning.

Future research should focus on:

- Long-term effectiveness of interventions
- Standardization of intervention protocols
- Larger and more diverse samples

IMPLICATIONS FOR PRACTICE

1. Integration of mindfulness programs in hospital settings
2. Support for ICU staff mental health
3. Improvement of patient care quality through staff well-being