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“Digital healthcare: The future is now”



INTERNATIONAL
HELLENIC
UNIVERSITY

Introduction to the Book of Abstracts of ICOHEMA 2024

"Digital healthcare: The future is now"

In recent decades, the growth and acceleration of digital technology has brought changes to almost every aspect of human activity. The healthcare industry as a whole is already excited about new tools and technologies that promise to revolutionize the delivery of medical services by increasing productivity and improving patient care.

Digital healthcare opens up a wide range of opportunities and has the potential to provide patients with advanced diagnostic tools, minimally invasive surgery, and cutting-edge treatments, transforming the healthcare industry. Revolutionary developments, such as cloud computing, artificial intelligence, machine learning, blockchain, digitally mediated diagnosis and treatment, telemedicine and consumer-facing mobile health applications in digital health are changing health, medicine and biomedicine, redefining the tools needed to create a healthier future. These developments promise to facilitate early diagnosis and intervention, improve outcomes and empower the patients. To help achieve these objectives and share the results of knowledge and research in this field from experts all over the world, the International Hellenic University has successfully organized and hosted the fourth ICOHEMA. The event was held virtually from 4th to 6th of October, 2024.

Throughout the three days, all attendees enjoyed informative, dynamic conversations and had a great opportunity to expand their knowledge and learn about the latest research in healthcare management.

The research track of the conference explored the overall theme of “Digital Healthcare: The future is now” and focused on subthemes like:

- AI in Healthcare
- Health Management and Business Intelligence
- Information & Communication Technologies in Health Management
- Quality Assurance in Health Units
- E-health policies
- Digital Healthcare Systems and Transformation
- Simulation, Education and Digital Literacy

ICOHEMA was a scientific meeting point for both local and foreign scientists, academicians, healthcare professionals and managers involved in all aspects of Medical and Healthcare management. In addition to the contributed papers, prominent specialists from several countries were also invited to deliver keynote and invited speeches at ICOHEMA 2024. In total, the scientific schedule comprised two keynote lectures, fifty nine plenary talks with both academic and scientific sessions and four round tables, providing a unique chance to advance knowledge and research in the field.

Finally, on behalf of the Scientific and Organizing committee, we would like to thank you all for your valuable contributions to the event and look forward to seeing you at the next ICOHEMA.

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AI IN HEALTHCARE

AI, HEALTH DATA, AND HEALTHCARE IN EU GOVERNANCE: FORECASTING POLICY OPTIONS, AI APPLICATIONS AND ETHICAL CHALLENGES

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ABSTRACT

Objectives: The present paper aims to explore three legislative documents of the European Union’s regulatory framework launched in the period 2022-2024 as follows:

(a) the study realized by the European Parliament (EP) in 2022 on artificial intelligence (AI) application and concerns at the societal, medical and ethical levels;

(b) the European Commission Decision of 24 January 2024 establishing the European Artificial Intelligence Office (C/2024/1459);

(c) the report P9_TA(2024)0138 entitled “Artificial Intelligence Act” issued on 13 March 2024 by the EP processing the AI and health sector requirements and needs and the impact on fundamental rights of the human person.

The selected legislation advances the EU’s latest legal, social and ethical developments across the relationship between AI, health data and healthcare framing a mindmap analysis and leading to an actionable monitoring and evaluation of the EU governance and health data.

Methods and methodology: The research methodology uses Mermaid Live Editor to detail complex diagrams of the legal, social and health terms of the selected legal texts. The complex diagrams are generated based on JavaScript diagramming and collaborative terms and analytic tools aimed to display real-time accessibility and visualization of the relevant sequence diagrams and textual concepts and flowcharts.

Findings and discussion: The generated mindmap for each document shows how the main concepts and terms are typically used and connected based on connecting elements and the same related color for a specific domain of analysis. In Figure 1, we illustrate the research results for the EP Study on AI (EP, 2022) by visualizing the main

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concepts of the report by connecting and relating the usage of the Javascript diagramming tools. Figure 1 also shows the representation between the AI technologies and applications and the need for an accurate clinical evaluation, codes of practice and specific legislation (Figure 1).

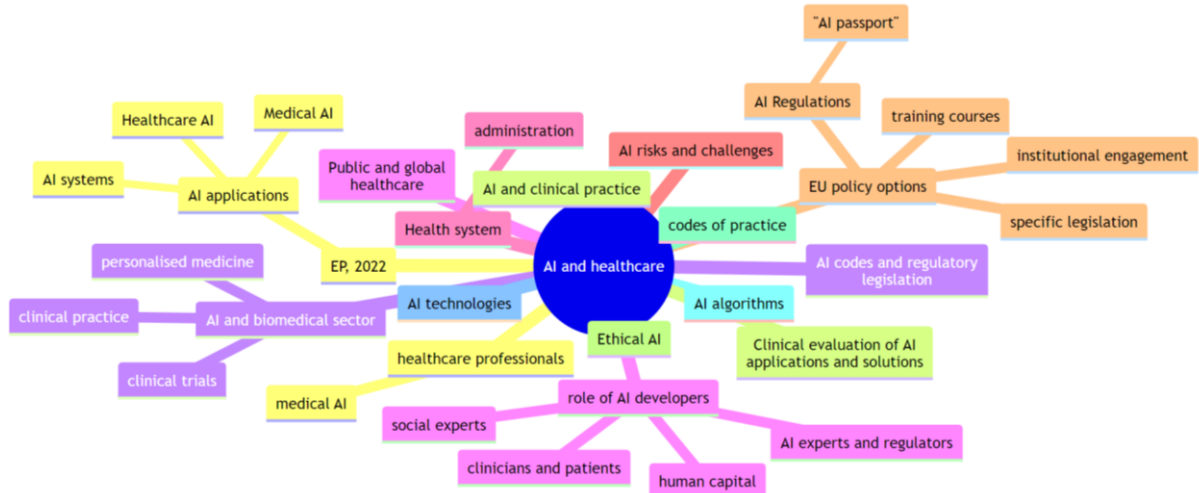


Figure 1. Illustration of the Mermaid v10.9.0 Live Editor results for the analysis of the EP Study (2022) PE 729.512 – June 2022

The results also scale the concept-based inputs for the analysis of the European Commission Decision (C/2024/1459) establishing the European Artificial Intelligence Office. Figure 2 focuses on the institutional governance of the EU AI Office covering the governance structure and functioning, data and other revealing insights by indicating a decentralized approach to the health sector and fundamental rights.

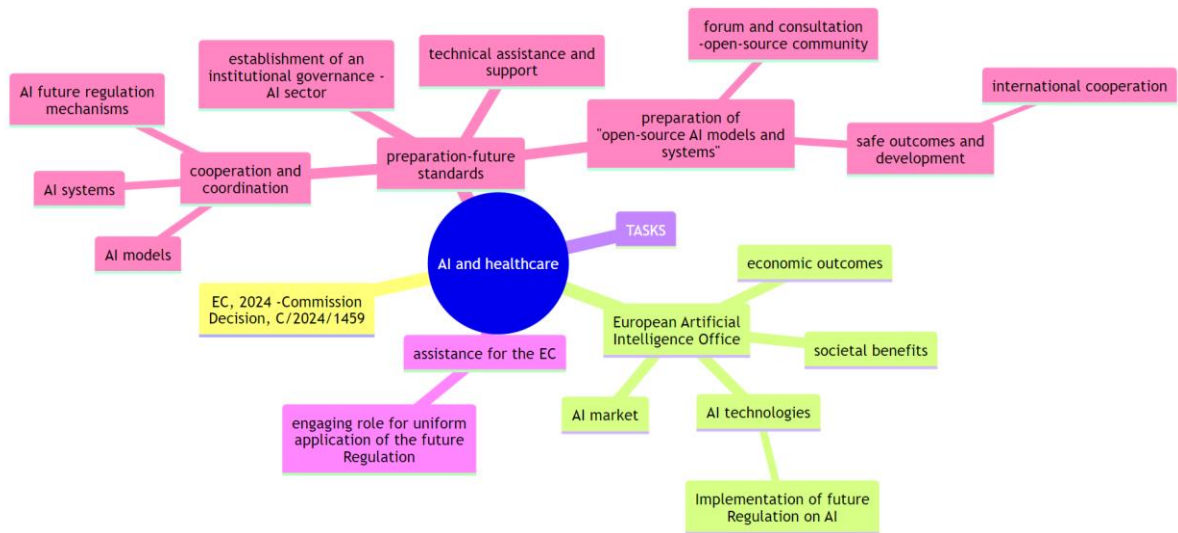


Figure 2. Illustration of the Mermaid v10.9.0 Live Editor results for the analysis of the EC Decision (C/2024/1459)

Figure 3 indicates the efficiency and inclusivity of the relationship between the AI proposing regulation and the implementation framework, but also the organizational,

social and ethical outcomes and challenges assigning complex roles and responsibilities for the health sector.

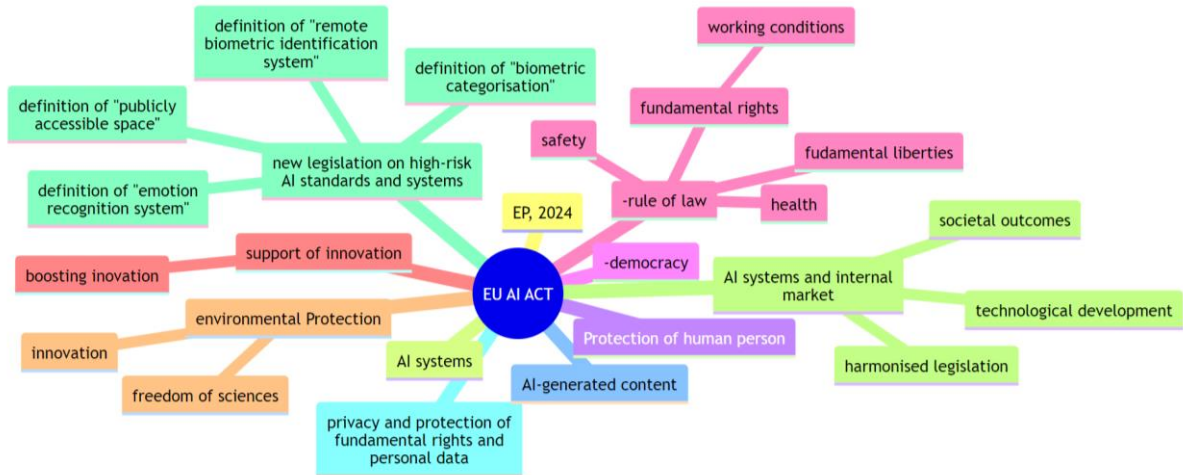


Figure 3. Illustration of the Mermaid v10.9.0 Live Editor results for the analysis of the report P9_TA(2024)0138

Conclusions: The results and findings of the research lead to an objective evaluation of the EU policy options and AI tools and application in the period 2022-2024 engaging a multi-dimensional approach to the analytical concepts and decision-making standards, institutional roles, communication mechanisms, stakeholders' structures in AI and healthcare sectors, and also the innovation, sustainability and adaptability capacities and practices.

Key Words: artificial intelligences, applications, ethics, European Union, governance, health data, healthcare.

REFERENCES

- European Commission (2024). European Commission Decision of 24 January 2024 establishing the European Artificial Intelligence Office (C/2024/1459). <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32024D01459> [Accessed the 20th of April 2024, 12:00]
- European Parliament (2022). Directorate-General for Parliamentary Research Services, Lekadir, K., Quaglio, G., Tselioudis Garmendia, A. et al. Artificial intelligence in healthcare – Applications, risks, and ethical and societal impacts. EPRS | European Parliamentary Research Service Scientific Foresight Unit (STOA), PE 729.512 – June 2022. <https://data.europa.eu/doi/10.2861/568473> [Accessed the 20th of April 2024, 14:50]
- European Parliament (2024). P9_TA(2024)0138 Artificial Intelligence Act European Parliament legislative resolution of 13 March 2024 on the proposal for a regulation of the European Parliament and of the Council on laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union Legislative Acts (COM(2021)0206 – C9-0146/2021 – 2021/0106(COD)) (Ordinary legislative procedure: first reading) https://www.europarl.europa.eu/doceo/document/TA-9-2024-0138_EN.pdf [Accessed the 20th of April 2024, 18:00]

- Kenny, L.M., Nevin, M. and Fitzpatrick, K. (2021). Ethics and standards in the use of artificial intelligence in medicine on behalf of the Royal Australian and New Zealand College of Radiologists. *J Med Imaging Radiat Oncol*, 65: 486-494. <https://doi.org/10.1111/1754-9485.13289> [Accessed the 17th of April 2024, 18:00]
- Jarrahi, M. H., Lutz, C., Boyd, K., Oesterlund, C. and Willis, M. (2023). Artificial intelligence in the work context. *Journal of the Association for Information Science and Technology*, 74(3): 303–310. <https://doi.org/10.1002/asi.24730> [Accessed the 19th of April 2024, 11:00]
- Olimid, A. P. and Olimid, D. A. (2020). Ethical review of patient safety and public health in EU clinical trials legislation: impact of COVID-19 pandemic. *Romanian journal of morphology and embryology = Revue roumaine de morphologie et embryologie*, 61(1): 277–281. <https://doi.org/10.47162/RJME.61.1.34>
- Olimid A.P. and Olimid D.A. (2020). Ethical review of patient safety and public health in EU clinical trials legislation: impact of COVID-19 pandemic. *Romanian J Morphol Embryol.*, 61(1): 277–81. <https://rjme.ro/RJME/resources/files/610120277281.pdf> [Accessed the 18th of April 2024, 18:00]
- Olimid, D.A., Olimid, A.P. and Chen, F.I. (2018). Ethical governance of the medical research: clinical investigation and informed consent under the new EU Medical Devices Regulation (2017/745). *Rom J Morphol Embryol*, 59(4):1305–1310 <https://rjme.ro/RJME/resources/files/59041813051310.pdf> [Accessed the 19th of April 2024, 18:00]
- Paul, R. (2024). European artificial intelligence “trusted throughout the world”: Risk-based regulation and the fashioning of a competitive common AI market. *Regulation & Governance*. <https://doi.org/10.1111/rego.12563> [Accessed the 20th of April 2024, 18:00]
- Tamò-Larrieux, A., Guitton, C., Mayer, S. and Lutz, C. (2024). Regulating for trust: Can law establish trust in artificial intelligence?. *Regulation & Governance*. <https://doi.org/10.1111/rego.12568> [Accessed the 20th of April 2024, 18:00]
- Yarali, A. (2021). Artificial Intelligence, 5G, and IoT. In *Intelligent Connectivity*, A. Yarali (Ed.). <https://doi.org/10.1002/9781119685265.ch14> [Accessed the 20th of April 2024, 18:00]

ARTIFICIAL INTELLIGENCE IN NURSING: A REVIEW OF STUDIES CONDUCTED BY NURSES AND NURSING STUDENTS IN TÜRKIYE

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ABSTRACT

Aim: This review examines the current state of research on artificial intelligence (AI) conducted by nurses and nursing students in Turkey, focusing on the integration of AI into nursing practice and education.

Method: The study utilizes a descriptive document analysis method to explore literature from various databases, including Science Direct, Google Scholar, and Medline, using keywords such as "nursing" and "artificial intelligence." A total of 15 research articles were identified, offering insights into the evolving role of AI in nursing and highlighting the perspectives, challenges, and opportunities perceived by nurses and nursing students.

Results: The earliest study on AI in nursing in Turkey was published in 2021, with a marked increase in research activity in subsequent years—three studies in 2022, two in 2023, and nine in 2024. This upward trend reflects the growing interest in AI within the nursing field. The studies were diverse in their focus, with eight exploring the attitudes and perceptions of nurses, nursing managers, and nursing students regarding AI, including their views on future opportunities, potential threats, and AI-related anxiety. Two studies specifically investigated the use of AI tools like ChatGPT in nursing education, examining how these technologies could be effectively integrated into nursing curricula to enhance learning outcomes and prepare students for the digital healthcare landscape.

Several studies employed bibliometric analysis to assess the scope and trajectory of AI research in nursing, revealing significant growth in the number of publications and identifying key trends and focus areas. These analyses underscored the importance of understanding research patterns to guide future studies and policy development. For example, Alp et al. (2023) conducted a bibliometric analysis of graduate theses on AI in health, identifying key themes and gaps in the current research landscape. Similarly, Özkaya and Körükcü (2024) highlighted the surge in AI-related nursing research over the past four years, indicating a broadening recognition of AI's relevance to nursing.

The studies reviewed also highlighted several challenges associated with AI adoption in nursing. A recurring theme was AI-related anxiety, driven by factors such as limited knowledge of AI technologies, concerns about job displacement, and uncertainties regarding the ethical implications of AI in patient care. Gümüş and Uysal (2022) used the Artificial Intelligence Anxiety Scale to measure these concerns among nurses, finding that anxiety levels varied based on educational background and familiarity with AI. Çobanoğlu and Oğuzhan (2023) found that lower educational levels and skepticism about AI's impact on patient care were linked to higher anxiety levels, underscoring the need for targeted educational interventions.

Studies on AI in nursing education demonstrated the potential of AI tools like ChatGPT to support the development of nursing knowledge and skills, particularly when integrated with educational theories such as Benner's Beginner to Expert Theory. Göktaş et al. (2024) explored practical guidelines for the effective use of ChatGPT in nursing education, emphasizing the need for well-structured, ethical, and context-specific implementation strategies.

The development of AI-powered tools, such as robot nurses designed to perform routine tasks, illustrated the transformative potential of AI in reducing the workload of nurses and enhancing the efficiency of healthcare delivery. However, the successful integration of these technologies depends on addressing ethical considerations and ensuring that AI complements rather than replaces human care.

In conclusion, the growing body of research on AI in nursing in Turkey reflects a dynamic field that holds significant promise for enhancing nursing practice and education. However, to fully harness the benefits of AI, it is crucial to address the challenges identified, including AI-related anxiety, ethical concerns, and the need for comprehensive training and support for nurses and nursing students. Continued research and thoughtful integration of AI into nursing will be key to advancing the profession in an increasingly digital healthcare environment.

Key words: Artificial Intelligence, AI Integration, AI Readiness, ChatGPT in Nursing, Nursing

REFERENCES

- Alp, F., İşbay, B., & Öner, Ö. (2023). Bibliometric analysis of published graduate thesis studies on artificial intelligence in the field of health in the National Thesis Center database. *Journal of Nursing Informatics*, 34(2), 130-138.
- Bodur, G., Dinçer, M., Tutak, Z., Ertaş, G., Uyanık, S., & Kuvan, D. (2022). University students' views on the effects of artificial intelligence on the future of nursing and healthcare. *International Journal of Nursing Education*, 45(3), 215-223.
- Gümüş, E., & Uysal, E. (2022). Determining the artificial intelligence anxiety levels of nurses working in Turkey in the health ecosystem. *Nursing & Health Sciences*, 20(4), 477-485.
- Eminoğlu, A., & Çelikkanat, Ş. (2024). Examining the relationship between nurse managers' leadership self-efficacy, medical AI readiness scale scores, and personal characteristics. *Journal of Nursing Management*, 32(1), 196-204.

- Göktaş, P., Küçükkaya, A., & Karaçay, P. (2024). Using GPT 4.0 with fast learning in nursing education: A case study approach based on Benner's theory. *Nurse Education Today*, 51(5), 210-219.
- Yalcinkaya, T., & Yucel, S. C. (2024). Bibliometric and content analysis of ChatGPT studies in nursing education: The rabbit hole in nursing education. *Nurse Education in Practice*, 60(7), 320-328.
- Özdemir, N., Kızıllı, H., & Yılmaz, A. (2024). Developing a robot nurse to take over routine tasks. *Journal of Healthcare Robotics*, 8(2), 164-172.
- Çobanoğlu, A., & Oğuzhan, H. (2023). Artificial intelligence anxiety of nurses and related factors. *Journal of Nursing Practice*, 29(6), 120-128.
- Menekli, T., & Şentürk, S. (2022). The relationship between internal medicine nurses' artificial intelligence concerns and spiritual care perceptions. *Journal of Holistic Nursing*, 38(4), 477-485.
- Kandemir, F., & Azizoğlu, F. (2024). Investigation of nurses' general attitudes towards artificial intelligence. *Journal of Clinical Nursing*, 33(3), 276-283.
- Yılmaz, Y., Uzelli Yılmaz, D., Yıldırım, D., Akın, E., & Özer Kaya, D. (2021). Opinions of faculty of health sciences students on artificial intelligence and the use of artificial intelligence in health. *Journal of Medical Education*, 40(5), 182-190.
- Özkaya, M., & Körükcü, Ö. (2024). Artificial intelligence trend in nursing from 2004 to 2024: Bibliometric analysis based on Web of Science. *Journal of Advanced Nursing*, 80(1), 164-172.
- Azizoğlu, F., & Terzi, B. (2024). Global trends on the use of artificial intelligence in nursing: A descriptive and evaluative bibliometric analysis study. *Nursing Research and Practice*, 30(3), 220-229.
- Ongun, P., Gül, B., Muslu, I. E., Oşe, M. M., & Ergun, S. (2024). Determination of artificial intelligence anxiety status of nursing students: A cross-sectional-descriptive study. *Journal of Nursing Education and Practice*, 12(4), 243-252.
- Korkmaz, A. C. (2024). Artificial intelligence trends and current issues in nursing research: Bibliometric analysis and science mapping. *Journal of Nursing Research*, 31(2), 210-218.

Ethical Governance: Impact of Robotics and Artificial Intelligence on Physician-Patient Relationships

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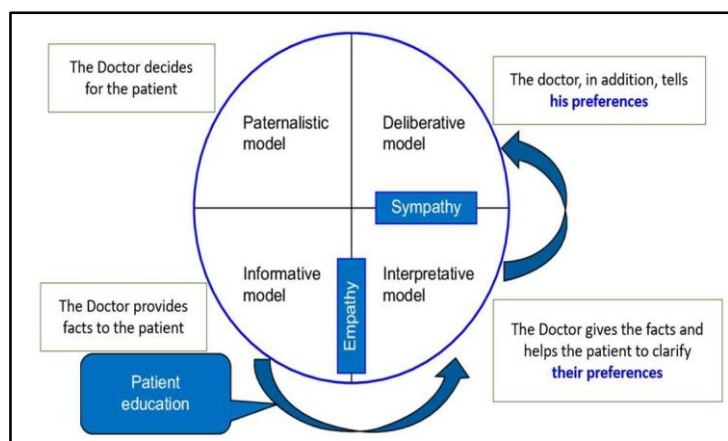
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ABSTRACT

Health Technology assessments and health outcomes deals with two areas of focus when put into practice. The relationship between physicians and patients which is the utmost importance to broaden healthcare system and efficacy of Artificial Intelligence (AI) and robotics technologies in support to mitigate healthcare burdens through symptoms assessment and treatment. (Dowrick, 1997) However, the rapid advancement of AI technology has produced ethical standards, laws, and regulations redundant. (European Commission 2018: 8; Rigby, 2019), as new technologies, like the use of AI in healthcare diagnosis and treatment, can raise ethical concerns and it is critical to examine these concerns in greater detail and update the ethical standards. The trust in these technologies compared to traditional physician-patient dynamics, is often in doubt and perceived as an apprehension or even threat. Medical ethicists recognized various challenges in the models introduced by (Emanuel & Emanuel, 1992) and the most successful approach of shared decision-making. This study evaluated the impact and perception of AI and robotic technologies on Physician-Patient interaction and



presented a ‘Instructive Model of Physician-Patient Relationship’. This study examined asymmetries in decision-making, influence on patient-centric interpersonal interactions, public perceptions of technologies and addressed transparency concerns for both healthcare professionals and patients.

Figure 1: Physician-patient relationship Models according to Emanuel and Emanuel, The research questions for this empirical review revolve around the theoretical framework of Physician- patient relationship models (Emanuel and Emanuel, 1992) focusing on the scientific basis needed for its real-life implementation into our everyday healthcare practices. Like in any kind of incorporation of new interventions and technologies in healthcare, decisions must be made that are strongly supported by the results of a thorough Health Technology Assessment (HTA), which englobes the results of experts’ interdisciplinary analysis, covering from variables like effectiveness of the treatment decisions, cost-effectiveness aspects and ethical governance that will generate and contribute to the outcome of implementing a new treatment or technology into a highly complex structure like the healthcare system of any given country. (World Health Organization - Guidelines on ethical issues in public health surveillance, 2021) The research questions are:

RQ1: How effective is AI and robotic technologies in correlation to physician-patient relationship and healthcare decisions ?

RQ2: What are the asymmetries in ethical margins in healthcare decisions following to surveillance?

RQ3: How strongly are attitudes towards AI and robotic technologies on the quality of interpersonal interaction between a patient and a physician ?

A thorough systematic surveillance and analysis was the selected method. Online survey was conducted and databases were utilized entering different keywords, as well as subdividing the search inputs from 104 participants from Asian and European countries. The results show correlations with concepts like effectiveness and acceptance concentrate on the Pearson Chi-Square test, one of the significant tests offered by SPSS. The respondents refuted being afraid of AI’s potential impact on medical treatments when asked about trust regarding AI. Following a comparison of statistic, an asymptotic (2-sided) p-value of 0.001 (stated as $p < .01$) is obtained as well as how well can the technology acceptance Model works effectively.

The results shows an exponential participation (healthcare professionals 82.1% resp. non-healthcare professionals 77.6%) on receptive using AI for decision-making. In the practice of medical care, 13.9% of participants either utilize or have access to robotics or AI technologies. Another findings of this paper was the fact that a small number of 1.9% of respondents refer to ethical considerations as the primary rationale behind their reluctance to engage with AI-based services, as long as physicians are always enrolled and data protection is guaranteed.

The integration of AI-automated technologies aims to enhance the quality of care. The results call for better understanding of the effects of attitudes on effectiveness AI and robotics technologies in routine healthcare the perception and acceptance of the implementation. The proposed new ‘Instructive Physician-Patient Relationship Model’

envisions physicians as orchestrators who prescribe diagnostic tests and seek specialized expertise while utilizing Autonomous Algorithmic Decision-Making Systems (AADMS) within the framework of the General Data Protection Regulation (GDPR) ensuring the protection of patients' rights. From the perspective of physician-patient relationship the system seems to be ready to embrace the 'Fourth industrial revolution' and how these are mediated by the Technology Acceptance Model and the real-life implementation in our Healthcare Systems.

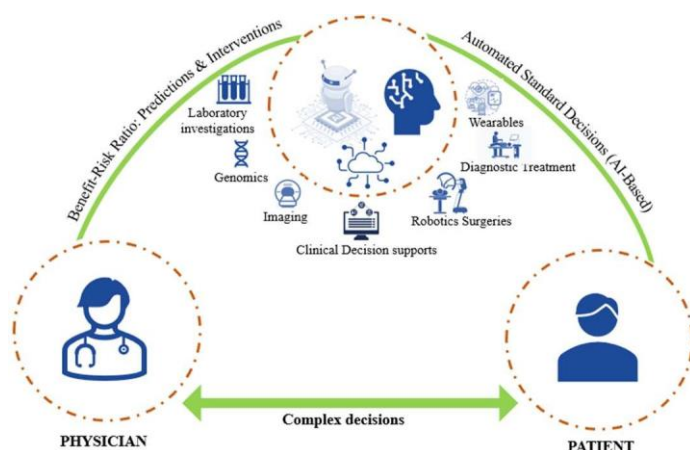


Figure 2: Instructive Model of Physician-Patient Relationship

Key Words: Artificial Intelligence, Robotics technology, Physician-Patient relationship, Ethics governance

REFERENCES

- Dowrick, C. (1997). Rethinking the doctor-patient relationship in general practice. *Health & Social Care in the Community*, 5(1), 11-14.
- Emanuel, E. J. and Emanuel, L. L. (1992) 'Four Models of the Physician-Patient Relationship', *JAMA*, 267(16), pp. 2221-2226
- Recommendation of the Council on Artificial Intelligence (OECD Legal Instruments. OECD/ LEGAL/O449). Paris: Organization for Economic Co-operation and Development; 2019 ([https:// legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449#mainText](https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449#mainText), accessed 2 December 2020).
- World Health Organization (2021) . WHO guidelines on ethical issues in public health surveillance.
- Rigby, M. J. (2019). Ethical dimensions of using artificial intelligence in health care. *AMA Journal of Ethics*, 21(2), 121-124.
- Wang, W., & Siau, K. (2018). Ethical and moral issues with AI-a case study on healthcare robots. In *Emergent research forum (ERF)*. Accessed October (Vol. 20, p. 2019).
- Veatch RM. A theory of medical ethics. New York: Basic Books Inc.; 1981: 327–330.)
- Schwalbe, N., & Wahl, B. (2020). Artificial intelligence and the future of global health. *The Lancet*, 395(10236), 1579-1586.

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AI Applications in Oncology: Current data and future perspectives.

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ABSTRACT

Introduction: Artificial Intelligence is considered as a very important development in the field of computer science (Hunt, 2014). Relating multiple science fields, AI consists a rapid revolution that deals with the design and implementation of computer systems with the primary goal of being able to imitate human behaviour and intelligence (Jackson, 2019; Nilsson (2014). AI finds various applications in healthcare, while speaking more specifically about the oncology field, is used in investigations-diagnosis and therapeutic approach, but also in the prediction of possible relapses, complications and the cancer’s recurrence (Kaul & Enslin et al., 2020; Holzinger & Langs et al., 2019).

Purpose: Exploring the contribution of Artificial Intelligence in the oncology field, taking into consideration current data and future perspectives.

Method: A bibliographic review was carried out in the electronic database google scholar, medline and pubmed in Greek and English with the following key words and phrases: AI, Oncology, Applications, Data, Perspectives for the period 2010-2024. 21 articles were finally included.

Results: The applications of AI in oncology include the optimization of cancer research, the improvement of clinical practice (prediction of treatment efficacy, patient’s prognosis progression) and a better understanding in tumor’s molecular biology (Kann & Hosny et al.,2021; Shimizu & Nakayama, 2020).

AI can be applied in preclinical settings such as basic or translational research for the development of potential anticancer drugs, facilitating patients’ selection based on their inclusion and exclusion criteria. It can also assist in the evaluation of various tumors for the possibility of their malignant nature, as well as in the correct reading of mammograms and ultrasounds with the ability to minimize false positive or negative findings through the use of algorithms so as to analyze the imaging data and minimizing toxicity and patients’ complications (Marusyk & Almendro et al., 2012; Bi & Hosny et al.,2019) Regarding to therapeutic options through artificial intelligence, the possibility of thorough analysis of the genome of a large number of cancer tumors has revealed

almost millions of gene alterations (Nagendran & Chen et al., 2020; Esteva & Robicquet et al., 2019; Ming & Viassolo et al., 2020). There is also the ability of predicting the likelihood of a malignancy responding to treatment, the frequency of emergency room visits and hospital admissions due to symptoms related to cancer treatment. The use of these in daily clinical practice helps to provide a better preventive supportive approach to high-risk patients (Mittendorf & Hunt et al 2012; Hong & Eclov et al, 2020). AI-based algorithms have shown better accuracy for predicting survival than conventional analytical approaches, which can help tailor oncology strategies for each patient (Creutzberg & Van Stiphout et al., 2015; Nitta & Tsutsumi et al, 2019; Lu & Hsu et al., 2018) The disease’s risk recurrence or relapse after one treatment can be predicted using intelligent computational models. The use of these is important in the context of modern oncology, as it contributes to the optimization of the patient's personalized follow-up plan (Salim, Wählin et al, 2020; Kuznar, 2015).

Conclusion: It is clear that, AI in oncology has demonstrated accurate technical performance in image analysis, predictive analytics, and precision oncology delivery and may potentially be used to facilitate primary cancer prevention in the future (Kelly & Karthikesalingam et al., 2019; Shimizu & Nakayama, 2020). Nevertheless, correct use and utilization of artificial intelligence in oncology needs training and interdisciplinary collaboration. Therefore, establishing partnerships across healthcare systems, academia, industry and public agencies may be essential to AI implementation in the era of big data in oncology (Wilkinson & Dumontier et al., 2016).

Key Words: AI, Oncology, Applications, data, perspectives.

REFERENCES

- Bi, W. L., Hosny, A., Schabath, M. B., Giger, M. L., Birkbak, N. J., Mehrtash, A., ... & Aerts, H. J. (2019). Artificial intelligence in cancer imaging: clinical challenges and applications. *CA: a cancer journal for clinicians*, 69(2), 127-157.
- Creutzberg, C. L., Van Stiphout, R. G., Nout, R. A., Lutgens, L. C., Jürgenliemk-Schulz, I. M., Jobsen, J. J., ... & Lambin, P. (2015). Nomograms for prediction of outcome with or without adjuvant radiation therapy for patients with endometrial cancer: a pooled analysis of PORTEC-1 and PORTEC-2 trials. *International Journal of Radiation Oncology* Biology* Physics*, 91(3), 530-539.
- Esteva, A., Robicquet, A., Ramsundar, B., Kuleshov, V., DePristo, M., Chou, K., ... & Dean, J. (2019). A guide to deep learning in healthcare. *Nature medicine*, 25(1), 24-29.
- Holzinger, A., Langs, G., Denk, H., Zatloukal, K., & Müller, H. (2019). Causability and explainability of artificial intelligence in medicine. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, 9(4), e1312.
- Hong, J. C., Eclov, N. C., Dalal, N. H., Thomas, S. M., Stephens, S. J., Malicki, M., ... & Palta, M. (2020). System for high-intensity evaluation during radiation therapy (SHIELD-RT): A prospective randomized study of machine learning–directed clinical evaluations during radiation and chemoradiation. *Journal of Clinical Oncology*, 38(31), 3652-3661.
- Hunt, E. B. (2014). *Artificial intelligence*. Academic Press.

- Jackson, P. C. (2019). Introduction to artificial intelligence. Courier Dover Publications.
- Kann, B. H., Hosny, A., & Aerts, H. J. (2021). Artificial intelligence for clinical oncology. *Cancer Cell*, 39(7), 916-927.
- Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, 92(4), 807-812.
- Kelly, C. J., Karthikesalingam, A., Suleyman, M., Corrado, G., & King, D. (2019). Key challenges for delivering clinical impact with artificial intelligence. *BMC medicine*, 17, 1-9.
- Kuznar, W. (2015). The push toward value-based payment for oncology. *American Health & Drug Benefits*, 8(Spec Issue), 34.
- Lu, C. F., Hsu, F. T., Hsieh, K. L. C., Kao, Y. C. J., Cheng, S. J., Hsu, J. B. K., ... & Chen, C. Y. (2018). Machine learning-based radiomics for molecular subtyping of gliomas. *Clinical Cancer Research*, 24(18), 4429-4436.
- Marusyk, A., Almendro, V., & Polyak, K. (2012). Intra-tumor heterogeneity: a looking glass for cancer?. *Nature reviews cancer*, 12(5), 323-334.
- Ming, C., Viassolo, V., Probst-Hensch, N., Dinov, I. D., Chappuis, P. O., & Katapodi, M. C. (2020). Machine learning-based lifetime breast cancer risk reclassification compared with the BOADICEA model: impact on screening recommendations. *British journal of cancer*, 123(5), 860-867.
- Mittendorf, E. A., Hunt, K. K., Boughey, J. C., Bassett, R., Degnim, A. C., Harrell, R., ... & Hwang, R. F. (2012). Incorporation of sentinel lymph node metastasis size into a nomogram predicting nonsentinel lymph node involvement in breast cancer patients with a positive sentinel lymph node. *Annals of surgery*, 255(1), 109-115.
- Nagendran, M., Chen, Y., Lovejoy, C. A., Gordon, A. C., Komorowski, M., Harvey, H., ... & Maruthappu, M. (2020). Artificial intelligence versus clinicians: systematic review of design, reporting standards, and claims of deep learning studies. *bmj*, 368.
- Nilsson, N. J. (2014). Principles of artificial intelligence. Morgan Kaufmann.
- Nitta, S., Tsutsumi, M., Sakka, S., Endo, T., Hashimoto, K., Hasegawa, M., ... & Nishiyama, H. (2019). Machine learning methods can more efficiently predict prostate cancer compared with prostate-specific antigen density and prostate-specific antigen velocity. *Prostate international*, 7(3), 114-118.
- Salim, M., Wählin, E., Dembrower, K., Azavedo, E., Foukakis, T., Liu, Y., ... & Strand, F. (2020). External evaluation of 3 commercial artificial intelligence algorithms for independent assessment of screening mammograms. *JAMA oncology*, 6(10), 1581-1588.
- Shimizu, H., & Nakayama, K. I. (2020). Artificial intelligence in oncology. *Cancer science*, 111(5), 1452-1460.
- Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., ... & Mons, B. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific data*, 3(1), 1-9.

Performing the Virtual Body: The Impact of Digital Avatars on Patient Identity in Telehealth Interactions

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ABSTRACT

Telehealth platforms have evolved with advancements in digital technology, introducing new ways for patients and healthcare providers to interact. One key development is the use of digital avatars, which serve as virtual representations of patients during consultations. (Bonsignore, Canga and Hall, 2019:377). This paper investigates how these avatars shape patient identity, communication dynamics, and therapeutic outcomes in digital healthcare spaces. A performative framework is used to examine the roles of embodiment, identity construction, and healthcare delivery in avatar-mediated interactions.

This study aims to explore the impact of avatars on patient identity, self-perception, and communication, as well as their influence on patient-provider relationships and therapeutic outcomes. Explores how avatars would affect relationships with patients and providers of care, trust, and engagement. It determines the knowledge gaps that exist in the ethical, psychological, and social implications of avatars in health and recommends their further investigation.

This research draws on a review of studies from databases like PubMed and Google Scholar, along with qualitative interviews from patients and providers who have

engaged with telehealth avatars. A performative lens was applied to analyze the findings, focusing on how patients perform their identities in digital spaces.

Results

Identity and Performativity

Avatars play an active role in how patients construct and express their digital identities. By choosing and customizing their avatars, patients engage in a performative act of self-representation, which can either align with or diverge from their real-world identity. This performative process can empower patients by allowing greater control over their self-presentation, though it may also create a sense of disconnection from their physical selves.

Communication and Trust

Avatars shape communication dynamics by acting as mediators between patients and providers. Some patients feel more comfortable interacting through avatars, which can enhance engagement, especially for those with social anxiety or disabilities. However, the absence of non-verbal cues through digital avatars may hinder trust and rapport in some interactions, making it challenging for providers to assess patients' needs effectively.

Therapeutic Outcomes

The use of avatars can influence therapeutic outcomes by impacting how patients engage with their healthcare. While avatars offer patients autonomy and a more comfortable interaction space, their disembodied nature may create barriers to authentic communication, potentially leading to misinterpretations or feelings of detachment.

Ethical Considerations

The ethical implications of using avatars in telehealth include concerns about privacy, data security, and the risk of patients' digital identities misaligning with their physical selves. These concerns highlight the need for further research into the long-term psychological and social effects of digital avatars and the development of ethical guidelines for their use in healthcare.

Conclusion

Digital avatars represent a powerful tool in telehealth that offers both benefits and challenges. They can enhance patient engagement and autonomy while raising questions about identity, authenticity, and communication. Healthcare providers must be mindful of the performative aspects of avatar use to ensure that telehealth consultations remain empathetic and supportive. Future research should focus on developing ethical guidelines to protect patients and enhance therapeutic outcomes.

REFERENCES

- Baym, N. K. (2010). *Personal connections in the digital age*. Polity Press.
- Bonsignore, M., Canga, B., & Hall, C. (2019). Virtual health avatars: The next frontier in patient engagement? *Health Affairs*, 38(3), 374-378.
- Butler, J. (1990). *Gender trouble: Feminism and the subversion of identity*. Routledge.

- Enfield, N. J., & Kockelman, P. (Eds.). (2017). *Distributed agency*. Oxford University Press.
- Goffman, E. (1959). *The presentation of self in everyday life*. Anchor Books.
- Gorlick, A., & Giraud-Carrier, C. (2020). Digital avatars in healthcare: A review of applications and impacts on health communication. *Journal of Medical Internet Research*, 22(6), e16283. <https://doi.org/10.2196/16283>
- Kruse, C. S., Krowski, N., Rodriguez, B., Tran, L., Vela, J., & Brooks, M. (2017). Telehealth and patient satisfaction: A systematic review and narrative analysis. *BMJ Open*, 7(8), e016242. <https://doi.org/10.1136/bmjopen-2017-016242>
- Schechner, R. (2013). *Performance studies: An introduction* (3rd ed.). Routledge.
- Shin, S., Park, S., & Kim, J. (2022). The use of avatars in telemedicine and patient outcomes: A meta-analysis of virtual health interventions. *Journal of Telemedicine and Telecare*, 28(1), 44-53.
- Smith, A. C., Thomas, E., Snoswell, C. L., Haydon, H., Mehrotra, A., Clemensen, J., & Caffery, L. J. (2020). Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *Journal of Telemedicine and Telecare*, 26(5), 309-313.

AI IN HEALTHCARE

Use of artificial intelligence in health units

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ABSTRACT

Rapidly evolving technological developments create new possibilities and perspectives that affect everyday life. The advancement of this technology leads to the development of artificial intelligence. Through its use, the very fast analysis of huge amounts of health data, the automatic diagnosis of many diseases, the prediction of the occurrence of diseases and the creation of personalized treatments that would otherwise require a lot of time are achieved (Athanasopoulou et al. 2022).

In order to use it properly in such an important sector of society as health, it is necessary to understand the possibilities it offers and to acquire the appropriate and prerequisite knowledge and experience (Aung et al. 2021). Artificial intelligence is essentially the branch of computer science that deals with the design of appropriate computing and information systems and algorithms that simulate human behavior. These computing systems have the ability to provide and process much more data than humans and at a much faster pace, contributing significantly to advancing healthcare delivery and improving services (Joshi et al. 2024). In many countries of the world the use and application of Artificial Intelligence is considered advanced and its use more widespread (Diaz-Flores et al. 2022).

A typical example and sample of its increased use abroad is the fact that many applications and uses of Artificial Intelligence have received the necessary licensing and approval from the Food and drug administration (FDA) in order to be utilized (Lee et al. 2021). Most of them concern participation in health procedures such as radiodiagnosis and oncology, hematology, cardiology, neurology, ophthalmology, gastroenterology, microbiology and others (Tran et al. 2021). It is important to recognize the significant concerns arising from its implementation. The preservation of democracy, the protection of personal data and the observance of ethical standards in the field of health care, as well as ethical concerns in general, are of concern to many people who consider the possible consequences of the widespread trust and development of Artificial Intelligence for the full and correct implementation, use and

adoption of artificial intelligence in health units, the application of motivation theory is required. The application of motivation in the health sector can be based on many different theories on the subject, but a combination of several motivation theories is considered most appropriate (Lambrou et al. 2010).

As mentioned, the purpose of using technology and artificial intelligence is to optimize and improve the efficiency of health systems. Of course, a necessary condition for a successful transition to the era of technological progress and the full exploitation that it offers is the continuous evaluation of the services applied and the control of the processes in the care provided through artificial intelligence to identify errors and problems, in order to improve and further advance the use of artificial intelligence for the benefit of the patient himself. In addition, it must be emphasized that artificial intelligence will not be able to replace the doctor or nurse mainly due to the specificity of the specific profession and the need to provide personalized medical care and the special relationship that develops between the doctor and the nurse with the patient (Gürbüz et al. 2014). Artificial intelligence must be tested and evaluated for its performance as well as its usefulness and of course always work in addition to medical and nursing staff.

REFERENCES

- Athanasopoulou, K., Daneva, G. N., Adamopoulos, P. G., & Scorilas, A. (2022). Artificial intelligence: the milestone in modern biomedical research. *BioMedInformatics*, 2(4), 727-744.
- Aung, Y. Y., Wong, D. C., & Ting, D. S. (2021). The promise of artificial intelligence: a review of the opportunities and challenges of artificial intelligence in healthcare. *British medical bulletin*, 139(1), 4-15.
- Diaz-Flores, E., Meyer, T., & Giorkallos, A. (2022). Evolution of artificial intelligence-powered technologies in biomedical research and healthcare. *Smart biolabs of the future*, 23-60.
- Gürbüz, S., Şahin, F., & Köksal, O. (2014). Revisiting of Theory X and Y: A multilevel analysis of the effects of leaders' managerial assumptions on followers' attitudes. *Management Decision*, 52(10), 1888-1906.
- Joshi, G. Jain, A. Araveeti, S.R. Adhikari, S. Garg, H. Bhandari, M. (2024). FDA-Approved Artificial Intelligence and Machine Learning (AI/ML)-Enabled Medical Devices: An Updated Landscape. *Electronics*.
- Lambrou, P., Kontodimopoulos, N., & Niakas, D. (2010). Motivation and job satisfaction among medical and nursing staff in a Cyprus public general hospital. *Human resources for health*, 8(1), 26.
- Lee, D., & Yoon, S. N. (2021). Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. *International journal of environmental research and public health*, 18(1), 271.
- Tran, K. A., Kondrashova, O., Bradley, A., Williams, E. D., Pearson, J. V., & Waddell, N. (2021). Deep learning in cancer diagnosis, prognosis and treatment selection. *Genome Medicine*, 13, 1-17.

LET'S TALK BIOETHICS: REGULATORY AND ETHICAL CONSIDERATIONS IN DIGITAL HEALTH

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ABSTRACT

The integration of digital health technologies, including artificial intelligence (AI), telemedicine, and wearable devices, has significantly transformed healthcare by improving clinical decision-making, patient monitoring, and treatment outcomes. However, these innovations raise complex ethical challenges, particularly in maintaining patient confidentiality, ensuring equitable access, and protecting data privacy. Bioethics, through principles such as autonomy, beneficence, non-maleficence, and justice, provides a framework for addressing these issues and guiding the responsible development and use of digital health technologies.

Autonomy, a key bioethical principle, emphasizes patients' rights to make informed decisions about their healthcare. In digital health, this is particularly relevant to the use of personal health data, as these technologies rely on such data for effective functioning. Informed consent must be clear, comprehensive, and allow patients to opt-out without negatively affecting their care. However, research indicates that many patients are unaware of how their data is used, especially for secondary purposes like AI model training. This highlights the need for transparency, digital literacy, and patient education to ensure individuals maintain control over their health information.

The principles of beneficence and non-maleficence further guide the integration of digital health tools. Beneficence requires that these technologies enhance patient care by promoting well-being and reducing harm, as seen in AI-driven diagnostic tools that improve accuracy and reduce human error. However, these benefits must be balanced against non-maleficence, which obligates healthcare providers to avoid harm. AI systems, for example, need diverse, high-quality data to function effectively. If trained on biased or incomplete datasets, AI can perpetuate health disparities, leading to worse outcomes for minority populations. The opaque nature of AI decision-making, often referred to as a “black box,” raises concerns about accountability, especially when misdiagnosis or harmful treatment recommendations occur. To mitigate risks, AI must be rigorously tested, regularly monitored, and used under the oversight of human clinicians.

Justice, another core principle, emphasizes equitable access to healthcare resources. While digital health technologies can improve access, particularly for underserved populations, the “digital divide” poses significant ethical challenges. Many individuals in rural or low-income areas lack access to the necessary technology, such as high-speed internet or smartphones, to fully benefit from telemedicine and other digital health tools. Additionally, vulnerable groups may face barriers due to limited digital

literacy. Addressing these inequities requires policy efforts to expand digital infrastructure, provide digital literacy education, and ensure inclusive AI training on diverse populations.

Finally, patient confidentiality faces new risks in the era of digital health, as electronic health records (EHRs), wearable devices, and AI systems collect and store vast amounts of personal data. Cyberattacks and data breaches are increasingly common, threatening patient privacy. Regulatory frameworks such as the GDPR and HIPAA provide guidelines for data security, but ongoing updates are needed as technologies evolve. Transparent AI and strong cybersecurity measures are essential to safeguarding patient trust. In conclusion, bioethical principles are critical for guiding the integration of digital health technologies. Upholding bioethical principles are essential for ensuring responsible use and maintaining trust in the healthcare system.

Key Words: Bioethics, Digital health technologies, Medical ethics, Regulatory frameworks, Patient confidentiality.

REFERENCES

- European Commission. (2020). Ethics Guidelines for Trustworthy AI. Brussels: EC.
- Health and Human Services Office for Civil Rights. (2020). Healthcare Data Breach Report.
- International Medical Informatics Association. (2022). "Global Standards for Digital Health." *Journal of Medical Ethics*.
- Nebeker, C., Torous, J., & Bartlett Ellis, R. J. (2019). Building the case for actionable ethics in digital health research supported by artificial intelligence. *BMC Medicine*, 17(1), 137. <https://bmcmmedicine.biomedcentral.com/articles/10.1186/s12916-019-1377-7>. [Accessed the 13th of September 2024, 10:15]
- Obermeyer, Z., Powers, B., Vogeli, C., & Mullainathan, S. (2019). Dissecting racial bias in an algorithm used to manage the health of populations. *Science*, 366(6464), 447–453. <https://doi.org/10.1126/science.aax2342>. [Accessed the 12th of September 2024, 14:30]
- Ross, C., & Swetlitz, I. (2018). IBM’s Watson recommended ‘unsafe and incorrect’ cancer treatments. STAT News.
- The Lancet Digital Health. (2019). "Racial bias in healthcare algorithms." *The Lancet Digital Health*.
- Topol, E. (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*.
- Basic Books.
- World Health Organization. (2021). Ethics and governance of artificial intelligence for health. Geneva: WHO.
- World Health Organization. (2021). Global strategy on digital health 2020–2025. Geneva: WHO.

**CLINICAL DECISION SUPPORT SYSTEM IN PRIMARY
HEALTH CARE:
CASE STUDY HEALTH CENTER OF SIATISTA AND HEALTH
CENTER OF DESKATI**

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ABSTRACT

In today's era of rapid technological developments, the medical community is called upon to manage an abundance of information, bibliographic and research content, in order to make the right decisions. In critical patient cases, the need to provide important information and data becomes more imperative.

Clinical decision support systems are one of the fastest growing areas in medical informatics. However, the term medical information first appeared in the mid-1970s from the French expression *informatique medicale*.

The Directorate of the 3rd Regional Health Authority in collaboration with the IT Directorate applied a clinical decision support system, in two Health Centers, in Deskati Health Center and in Siatista Health Center. The application was made with the funding of the software system, from NSRF (National Strategic Reference Framework) 117/2022 Taking into account the quality in the provision of health services, the optimal making of medical decisions and the fastest service to patients, the clinical decision support system UpToDate was chosen after a competitive process was followed. The reasons for selection were obtained after examining factors such as the speed of

displaying results, the variety of content in terms of the medical specialties of the health centers, the compatibility of devices and software, the renewability of the content, ease of use and safety. The UpToDate system is an evidence-based clinical decision support system. It includes a collection of medical and patient information, access to drug monographs, drug interactions and a number of medical calculators. It is available both online and offline on personal computers or mobile devices. In addition, scientific research has proven that UpToDate can play an important role as every country, like Greece, is constantly trying to improve the quality and efficiency of its health care system.

Each Health Center was given registration and usage instructions for the specialties of the doctors, while there was also a trial period of one month in order for the users to adapt and also to report any problems or difficulties they encountered. In order to measure the Health Centers Quality Performance Index using UpToDate, HQA process measures were used for 3 conditions from the 1st semester of 2024: childhood allergies, respiratory infections, hypercholesterolemia-heart disease risk. For these metrics, he counted the fact that Health Centers join the heart failure network.

In Health Centers there are 2 General Medicine Clinics, 2 Rural Clinics, 1 Pediatric Clinic and 1 Dental Clinic operating in Deskatis. Accordingly, in H.C.. There are 5 General Medicine Clinics, 1 Rural Clinic, 1 Dental Clinic, 1 Dietetic Clinic operating in Siatistas.

We created summary scores for each condition and an overall summary score of health centers for performance across all indicators. Reported patients with the above conditions showed faster improvement and better response to medication, and this may be related to the use of UpToDate by the respective medical specialties.

70% of physicians adopted the daily use of UpToDate expressing positive impressions and problem-free handling, 10% of physicians refused to use it considering the search process time-consuming, while 20% use the system up to 3 times a week.

It is also worth mentioning that the specialty that adopted its daily use is in both Health Centers is pediatrics while at Health Center of Siatista is used daily by the Dietitian.

From the above, it is clear that the entry of technology into the field of medicine creates opportunities to solve problems but also to develop it, as in the scientific community, a wealth of information is disseminated daily, which the medical staff is called upon to manage.

Key Words: UpToDate, decision support systems, e-health, primary health care

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REFERENCES

- Kensaku Kawamoto, Caitlin A Houlihan, E Andrew Balas and David F Lobach, (2005). Improving clinical practice using clinical decision support systems: A systematic review of trials to identify features critical to success, *British Medical Journal*, 330:765-768
- Pickstone JV. (2000). *Ways of Knowing. A New History of Science, Technology and Medicine*. Manchester Univ. Press, (pp. 99-210), U.K.
- Walden RR, Woodward NJ, Wallace RL. (2019). Reevaluating point-of-care resources: community engagement in difficult collection choices. *Med Ref Serv Q*. 38(1):22–30.
- Fox, G. N., & Moawad, N. (2003). UpToDate: a comprehensive clinical database. *The Journal of family practice*, 52(9), 706–710.
- Fenton SH, Badgett RG. (2007). A comparison of primary care information content in UpToDate and the National Guideline Clearinghouse. *J Med Libr Assoc*. (3):255-9.
- Isaac, T., Zheng, J., & Jha, A. (2011). Use of UpToDate and outcomes in US hospitals. *Journal of Hospital Medicine*, 7(2), 85–90.
- Lazaridou A. (2005) *Information Clinical Health*, Athens: Kleidarithmos

THE IMPACT OF ARTIFICIAL INTELLIGENCE IN HEALTH CARE

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ABSTRACT

Introduction: AI can be defined as the ability of machines to learn and perform tasks that traditionally require human intelligence, such as data analysis, pattern recognition and decision making (Hostmaster, 2024). Research and development of technological systems based on artificial intelligence (AI) in healthcare have increased in recent years, highlighting its powerful potential. The current challenge is to translate these technological advances into clinical benefits for patients through more advanced, accurate, practical, efficient, cost-effective and personalised care. The potential of AI to improve the diagnosis, treatment and management of patients has created new opportunities for the evolution of the healthcare system. However, alongside the opportunities offered by AI, important challenges such as ethical issues, transparency, data security and staff training are also emerging (Hern, 2017).

Aim: The aim of this paper is to explore the impact of AI in the health sector and the challenges that need to be addressed for its effective integration.

Methodology: A literature review was conducted on the databases PubMed, Scopus, and Google Scholar. Articles in Greek and English were used. The review focused mainly on three main areas: (a) technological advances and the potential of AI in healthcare, (b) ethical and safety challenges, and (c) changes needed in the education of healthcare professionals.

Results: The findings of the study confirm the significant impact of AI in healthcare (Pailaha, 2023; Rony et al. 2024). AI algorithms, particularly in areas such as radiology (Póζος, 2023), ophthalmology (Κυριακίδης, 2023), nephrology, etc., demonstrate excellent efficiency, with the potential to provide more accurate diagnoses and personalised treatments (Niel, O., et al. 2019; Bellocchio, F., et al. 2023). For example, studies show that machine learning algorithms can identify diseases in X-ray images with an accuracy similar to that of experienced physicians. Most applications based on artificial intelligence and machine learning are in the early stages of development and positive outcomes for patients have yet to be fully demonstrated. At the same time, the research has highlighted important challenges that need to be addressed (Ho, et al. 2021). The lack of a comprehensive and adequate legislative framework to protect privacy, ethical issues around accountability for medical decisions, resistance to change, lack of education of healthcare professionals and public awareness, diminished resources and the increased need for transparency of algorithms are preventing widespread adoption of AI.

Conclusions: Artificial intelligence (AI) offers significant opportunities to improve health services, but its integration must be done with caution as there are many challenges that need to be addressed. Ethical concerns and privacy are central issues that need to be resolved, while transparency of algorithms is a prerequisite for building trust. In addition, the development of an appropriate legal framework is crucial for the proper use of AI. Equally important is the training of health professionals to enable them to make effective use of new technologies. AI has the potential to bring about substantial changes in the health sector if implemented with a balanced and holistic approach.

REFERENCES

- Bellocchio, F., & Zhang, H. (2023). Editorial: Artificial intelligence in nephrology. *Frontiers in Nephrology*, 3. <https://doi.org/10.3389/fneph.2023.1270769>
- Hern, A. (2017). DeepMind announces ethics group to focus on problems of AI. *The Guardian*. <https://www.theguardian.com/technology/2017/oct/04/google-deepmind-ai-artificial-intelligence-ethics-group-problems>
- Ho, C. W.-L., & Caals, K. (2021). A Call for an Ethics and Governance Action Plan to Harness the Power of Artificial Intelligence and Digitalization in Nephrology. *Seminars in Nephrology*, 41(3), 282–293. <https://doi.org/10.1016/j.semnephrol.2021.05.009>
- Hostmaster, A. C. N. (2024). The role of AI in modern nursing practice. *Australian College of Nursing*. <https://www.acn.edu.au/nurseclick/the-role-of-ai-in-modern-nursing-practice>
- Κυριακίδης, Θ. Α. (2023). Τεχνητή νοημοσύνη στο πρόσθιο και οπίσθιο ημιμόριο του οφθαλμού.
- Niel, O., & Bastard, P. (2019). Artificial Intelligence in Nephrology: Core Concepts, Clinical Applications, and Perspectives. *Am J Kidney Dis.*, XX(XX), 1–8.
- Pailaha, A. D. (2023). The Impact and Issues of Artificial Intelligence in Nursing Science and Healthcare Settings. *SAGE Open Nursing*, 9, 23779608231196847. <https://doi.org/10.1177/23779608231196847>
- Ρόζος, Π. (2023). Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Τμήμα Νοσηλευτικής Διδρυματικό Πρόγραμμα Μεταπτυχιακών Σπουδών, Ειδίκευση: Πληροφορική της Υγείας, Εφαρμογές της Τεχνητής Νοημοσύνης σε Ιατρικές Εικόνες.
- Rony, M. K. K., Kayesh, I., Bala, S. D., Akter, F., & Parvin, Mst. R. (2024). Artificial intelligence in future nursing care: Exploring perspectives of nursing professionals - A descriptive qualitative study. *Heliyon*, 10(4), e25718. <https://doi.org/10.1016/j.heliyon.2024.e25718>

Keywords: Artificial Intelligence(AI), Machine learning(ML), Healthcare

HEALTH MANAGEMENT AND BUSINESS INTELLIGENCE

ADVANCING JOB SATISFACTION AND DIGITAL TRANSFORMATION IN HEALTHCARE THROUGH INNOVATIVE METHODOLOGIES

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ABSTRACT

In the healthcare sector, job satisfaction is vital for ensuring high-quality patient care and the sustainability of healthcare systems. This study examines the intricate relationship between organizational culture and job satisfaction within healthcare settings, focusing on innovative strategies to enhance employee well-being and care quality. Recognizing that satisfied employees are essential for superior patient service, the research emphasizes the need for healthcare organizations to prioritize streamlined work processes and supportive environments.

The study highlights that an organizational culture emphasizing employee well-being can significantly improve job satisfaction (Ayodele et al., 2020). By reducing workplace stress through operational improvements and minimizing bureaucratic obstacles, healthcare organizations can create conditions that foster employee satisfaction (Bhatnagar & Srivastava, 2012). Key factors influencing job satisfaction, such as work environment quality, compensation structures, recognition initiatives, and opportunities for professional development, are examined in detail (Bussing et al., 1999). The research also identifies prevalent challenges in healthcare, including long work hours, increased stress levels, and emotional labor, which negatively impact job satisfaction (Khamlub et al., 2013).

Additionally, the study introduces the integration of Green Lean Six Sigma (GLSS) methodologies as an effective strategy for enhancing job satisfaction while driving digital transformation in healthcare environments (Zhu et al., 2018). GLSS combines Lean and Six Sigma principles with a commitment to environmental sustainability, offering a comprehensive framework for improving operational efficiency, employee engagement, and technological advancement. By systematically eliminating non-value-added activities and involving staff in problem-solving, GLSS empowers healthcare professionals and enhances their sense of ownership and participation in their work (Sreedharan et al., 2018). This empowerment is crucial for enhancing job satisfaction. Moreover, GLSS supports the digital transformation of healthcare by streamlining processes and incorporating advanced digital tools (Narayanamurthy et al., 2018). This transformation not only improves efficiency and accuracy but also reduces administrative burdens, enabling healthcare workers to focus more on patient care and professional development (Lasalvia et al., 2021). Aligning digital strategies with GLSS principles ensures a smooth transition to user-friendly systems, further boosting job satisfaction.

The 'green' aspect of GLSS adds another dimension of job satisfaction by aligning organizational processes with sustainability goals. In an era increasingly focused on

ecological balance, healthcare professionals find motivation and pride in working for organizations committed to minimizing their environmental impact. This alignment with personal values fosters a stronger connection to the organization, enhancing job satisfaction (Babapour Chafi et al., 2021; Hoxha et al., 2024).

In summary, this study contributes to the fields of health, well-being, and sustainability by exploring the mechanisms of job satisfaction in healthcare settings. It aims to cultivate a research community focused on refining innovative approaches and recognizing the significant influence of organizational culture on successful initiatives. By optimizing GLSS strategies within supportive environments, the research offers practical implications for creating healthier, more efficient healthcare systems. The findings underscore the critical role of job satisfaction in enhancing healthcare quality and organizational effectiveness, ultimately benefiting healthcare professionals and improving patient care. Key recommendations for healthcare organizations include implementing GLSS strategies to enhance job satisfaction and overall performance.

Key Words: Job Satisfaction in Healthcare, Digital Transformation, Green Lean Six Sigma (GLSS), Healthcare Quality, Organizational culture, Environmental sustainability.

REFERENCES

- Ayodele, T. O., Ekemode, B. G., Oladokun, S., &Kajimo-Shakantu, K. (2020). The nexus between demographic correlates, career and organizational commitment: The case of real estate employees in Nigeria. *Journal of Facilities Management*, 18(4), 521–545.
- Awan, S., Diwan, M. N., Aamir, A., Allahuddin, Z., Irfan, M., Carano, A., Vellante, F., Ventriglio, A., Fornaro, M., &Valchera, A., et al. (2022). Suicide in healthcare workers: Determinants, challenges, and the impact of COVID-19. *Frontiers in Psychiatry*, 12, 792925. [PubMed]
- BabapourChafi, M., Hultberg, A., &Bozic Yams, N. (2021). Post-pandemic office work: Perceived challenges and opportunities for a sustainable work environment. *Sustainability*, 14(1), 294.
- Bhatnagar, K., & Srivastava, K. (2012). Job satisfaction in health-care organizations. *Industrial Psychiatry Journal*, 21(1), 75–78. [PubMed]
- Bussing, A., Bissels, T., Fuchs, V., &Perrar, K. M. (1999). A dynamic model of work satisfaction: Qualitative approaches. *Human Relations*, 52(8), 999–1028.
- Hoxha, G., Simeli, I., Theocharis, D., Vasileiou, A., &Tsekouropoulos, G. (2024). Sustainable Healthcare Quality and Job Satisfaction through Organizational Culture: Approaches and Outcomes. *Sustainability*, 16(9), 3603.
- Khamlub, S., Harun-Or-Rashid, M. D., Sarker, M. A. B., Hirotsawa, T., Outavong, P., & Sakamoto, J. (2013). Job satisfaction of health-care workers at health centers in Vientiane Capital and Bolikhamsai Province, Lao PDR. *Nagoya Journal of Medical Science*, 75(3–4), 233. [Google Scholar] [PubMed]
- Lasalvia, A., Amaddeo, F., Porru, S., Carta, A., Tardivo, S., Bovo, C., Ruggeri, M., &Bonetto, C. (2021). Levels of burn-out among healthcare workers during the COVID-19 pandemic and their associated factors: A cross-sectional study in a tertiary hospital of a highly burdened area of north-east Italy. *BMJ Open*, 11(1), e045127.

- Narayanamurthy, G., Gurumurthy, A., Subramanian, N., & Moser, R. (2018). Assessing the readiness to implement lean in healthcare institutions—A case study. *International Journal of Production Economics*, 197, 123–142.
- Shiu, Y. M., & Yu, T. W. (2010). Internal marketing, organisational culture, job satisfaction, and organisational performance in non-life insurance. *Service Industries Journal*, 30(6), 793–809.
- Soto-Rubio, A., Giménez-Espert, M. D., & Prado-Gascó, V. (2020). Effect of emotional intelligence and psychosocial risks on burnout, job satisfaction, and nurses' health during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 17(21), 7998. [PubMed]
- Sreedharan, R. V., Sandhya, G., & Raju, R. (2018). Development of a Green Lean Six Sigma model for public sectors. *International Journal of Lean Six Sigma*, 9(2), 238–255.
- Suresh, S., Kodikal, R., & Kar, S. (2015). Measuring job satisfaction and impact of demographic characteristics among Doctors of Teaching Hospitals. *International Journal of Multidisciplinary Health*, 1(1), 29–38. [Google Scholar]
- Tabatabaei, S., Ghaneh, S., Mohaddes, H., & Khansari, M. M. (2013). Relationship of job satisfaction and demographic variables in pars ceram factory employees in Iran. *Procedia - Social and Behavioral Sciences*, 84, 1795–1800.
- Vakola, M., & Nikolaou, I. (2005). Attitudes towards organizational change: What is the role of employees' stress and commitment? *Employee Relations*, 27(2), 160–174.
- Zhu, Q., Johnson, S., & Sarkis, J. (2018). Lean six sigma and environmental sustainability: A hospital perspective. *Supply Chain Forum: An International Journal*, 19(1), 25–41.

INTEGRATING HEALTHCARE AND TOURISM FOR SUSTAINABLE GROWTH IN CENTRAL MACEDONIA / GREECE

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ABSTRACT

The rapid growth of medical tourism, fueled by socio-economic factors and a focus on sustainability, has emerged as a pivotal segment in the global tourism sector (Ile & Tigu, 2017; Vrana, 2023). This paper provides a thorough examination of medical tourism strategies with a specific emphasis on the Region of Central Macedonia (RCM) in Greece, seeking to optimize this sector for sustainable growth. Employing a combination of traditional methodologies, such as Systematic Literature Review (SLR) and primary quantitative research, this study also integrates insights from Green Lean Six Sigma (GLSS) principles to foster sustainability within medical tourism practices. Medical tourism, which merges healthcare and tourism, presents significant economic advantages while necessitating careful consideration of its environmental and social implications (Suess, 2018; Tsekouropoulos et al., 2023). Recognizing the intricate nature of this integration, the research addresses the varied conceptual frameworks and definitions prevalent in the field. The primary aim is to construct a strategic framework that promotes sustainable medical tourism in RCM, capitalizing on the region’s unique attributes to attract both local and international medical travelers.

The methodology employed consists of a detailed literature review that establishes a solid theoretical framework, incorporating GLSS principles. This methodology blends Lean and Six Sigma approaches to improve efficiency, optimize processes, reduce waste, and enhance quality, all while embedding sustainable practices that minimize environmental impact. In addition, quantitative research methods, including surveys and statistical analyses, yield insights into factors affecting medical tourism and its repercussions on local healthcare systems, with a pronounced focus on efficiency and sustainability (Kaswan & Rathi, 2021; Pagan & Horsfall, 2020).

Findings indicate that RCM possesses substantial strengths, such as its thermal springs and advanced healthcare facilities, which serve as key attractions for medical tourists. However, it also faces challenges, including the urgent need for improved infrastructure, enhanced service quality, and focused marketing strategies. The research underscores sustainability factors—such as environmental conservation and economic viability—as critical components in formulating an effective medical tourism strategy (Tsekouropoulos et al., 2023; Zhu et al., 2018).

Strategic recommendations for RCM include establishing a medical tourism cluster that facilitates stakeholder collaboration, developing targeted marketing campaigns, and incorporating GLSS principles to maximize resource efficiency and minimize environmental harm (Swarnakar et al., 2021). Specific steps for implementation involve creating partnerships among healthcare providers, tourism operators, and local governments, conducting market research to identify target demographics, and launching campaigns that highlight the region's unique offerings. Additionally, policies advocating sustainable practices, community engagement, and long-term growth are

recommended to align with the United Nations' Sustainable Development Goals (SDGs).

In conclusion, this research enhances the understanding of medical tourism by proposing a comprehensive strategy that weaves together sustainability principles and insights from GLSS methodologies. It offers valuable guidance for policymakers, healthcare providers, and tourism operators seeking to leverage the economic potential of medical tourism while promoting sustainable development in Central Macedonia. The study emphasizes the importance of interdisciplinary approaches and innovative practices in realizing a sustainable medical tourism sector that benefits both the region and its visitors.

Key Words: Medical tourism, Health tourism, Central Macedonia, Sustainable growth, Green Lean Six Sigma (GLSS), Economic opportunities

REFERENCES

- Henrique, D. B., Filho, M. G., Marodin, G., Jabbour, A. B., & Chiappetta Jabbour, C. J. (2021). A framework to assess sustaining continuous improvement in lean healthcare. *International Journal of Production Research*, 59(10):2885-904.
- Ile, F. L., & Tıgu, G. (2017, March). Medical tourism market trends-an exploratory research. In *Proceedings of the International Conference on Business Excellence* (Vol. 11, No. 1, pp. 1111-1121).
- Kaswan, M. S., & Rathi, R. (2021). An inclusive review of Green Lean Six Sigma for sustainable development: readiness measures and challenges. *International Journal of Advanced Operations Management*, 13(2):129-66.
- Pagan, R., & Horsfall, D. (2020). Medical tourism markets: Models of sustainability. The case of Spain and the Costa del Sol (Malaga). *Sustainability*, 12(21), 8818.
- Suess, C., Baloglu, S., & Busser, J. A. (2018). Perceived impacts of medical tourism development on community wellbeing. *Tourism management*, 69, 232-245.
- Swarnakar, V., Bagherian, A., & Singh, A. R. (2021). Modeling critical success factors for sustainable LSS implementation in hospitals: an empirical study. *International Journal of Quality & Reliability Management*, 39(5):1249-80.
- Tsekouropoulos, G., Gkouna, O., Theocharis, D., & Gounas, A. (2022). Innovative sustainable tourism development and entrepreneurship through sports events. *Sustainability*, 14(8), 4379.
- Tsekouropoulos, G., Vasileiou, A., Hoxha, G., Dimitriadis, A., & Zervas, I. (2023). Sustainable Approaches to Medical Tourism: Strategies for Central Macedonia/Greece. *Sustainability*, 16:121.
- Vrana, V. (2023). Sustainable tourism development and innovation: recent advances and challenges. *Sustainability*, 15(9), 7224.
- Zhu, Q., Johnson, S., & Sarkis, J. (2018). Lean six sigma and environmental sustainability: a hospital perspective. In *Supply Chain Forum: An International Journal* (Vol. 19, No. 1, pp. 25-41). Taylor & Francis.

TRANSFORMING HEALTHCARE WITH GREEN LEAN SIX SIGMA: CHALLENGES AND OPPORTUNITIES IN THE DIGITAL ERA

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ABSTRACT

In the healthcare sector, operational efficiency is essential for patient well-being and organizational sustainability. Green Lean Six Sigma (GLSS) has emerged as a powerful approach to drive positive change by combining Lean principles, which focus on eliminating non-value-added activities, with Six Sigma’s data-driven problem-solving techniques. This integrated approach helps healthcare organizations improve performance, enhance sustainability, and deliver higher-quality care (Hines et al., 2004; Kaswan & Rathi, 2021; Farrukh, 2020).

This study provides a comprehensive review of literature on GLSS in healthcare, employing qualitative and narrative synthesis methodologies (Denyer & Tranfield, 2006). It explores the key requirements, challenges, and impacts of GLSS implementation, focusing on how it enhances environmental performance, operational efficiency, and quality of care. The review covers publications from 1990 to 2024, with particular emphasis on the post-2023 surge in GLSS research, driven by the global shift toward sustainability following the COVID-19 pandemic (Swarnakar et al., 2021; Tsekouropoulos et al., 2023; Kaswan et al., 2023).

Key findings indicate that the TQM Journal is a leading source for GLSS-related publications, with substantial contributions from scholars such as Antony and others. The United States leads in publication volume, particularly through institutions like the VA Medical Center. Organizational culture is identified as a critical factor for successful GLSS implementation, with management commitment, employee engagement, and teamwork being essential. A culture that promotes continuous improvement and sustainability is vital to overcoming resistance and embedding GLSS into everyday operations.

Some practical recommendations for healthcare organizations implementing Green Lean Six Sigma (GLSS) include fostering a culture of sustainability and continuous improvement, promoting staff training in GLSS methodologies, and investing in digital tools to enhance data-driven decision-making. Successful case studies demonstrate that GLSS can significantly improve operational efficiency, as seen in U.S. healthcare systems where patient wait times were reduced, and care quality was enhanced (Antony, 2015; Chugani et al., 2017).

Despite significant progress in GLSS research, gaps remain, particularly in developing digital tools to streamline implementation and in formalizing best practices for key processes, such as patient handoff. Future research should focus on creating comprehensive guidelines and advancing digital innovations that can further enhance GLSS adoption in healthcare (Henrique et al., 2021; Al-Balushi et al., 2014; Lawal et al., 2014).

GLSS aligns with broader sustainability goals by reducing waste, improving resource management, and fostering a culture of continuous improvement. These objectives have become more urgent due to the economic and operational pressures exacerbated by the COVID-19 pandemic. By adopting GLSS, healthcare units can address these challenges while supporting their mission to deliver high-quality care (Kaswan & Rathi, 2021).

In conclusion, this study underscores the strategic potential of GLSS for healthcare organizations and highlights the need for further investigation into digital innovations and readiness factors. Implementing GLSS can significantly enhance both operational efficiency and sustainability, positioning healthcare organizations to better navigate future challenges (Zhu et al., 2018; Sfakianaki & Kakouris, 2019).

Key Words: Green Lean Six Sigma (GLSS), Healthcare Units, Sustainability, Digital Tools, Organizational Culture, Continuous Improvement.

REFERENCES

- Al-Balushi, S., Sohal, A. S., Singh, P. J., Al Hajri, A., Al Farsi, Y. M., & Al Abri, R. (2014). Readiness factors for lean implementation in healthcare settings—a literature review. *Journal of Health Organization and Management*, 28(2):135-53.

- Antony, J. (2015). Six-sigma for improving top-box customer satisfaction score for a banking call Centre. *Production Planning and Control*, 26(16):1291-1305.
- Chugani, N., Kumar, V., Garza-Reyes, J. A., Rocha-Lona, L., & Upadhyay, A. (2017). Investigating the green impact of lean, six-sigma and lean six-sigma: a systematic literature review. *International Journal of Lean Six Sigma*, 8(1):7-32. doi:10.1108/IJLSS-11-2015-0043.
- Denyer, D., & Tranfield, D. (2006). Using qualitative research synthesis to build an actionable knowledge base. *Management Decision*, 44(2):213-27.
- Henrique, D. B., Filho, M. G., Marodin, G., Jabbour, A. B., & Chiappetta Jabbour, C. J. (2021). A framework to assess sustaining continuous improvement in lean healthcare. *International Journal of Production Research*, 59(10):2885-904.
- Hines, P., Holweg, M., & Rich, N. (2004). Learning to evolve: A review of contemporary lean thinking. *International Journal of Operations & Production Management*, 24(1):994-1011.
- Kaswan, M. S., & Rathi, R. (2021). An inclusive review of Green Lean Six Sigma for sustainable development: readiness measures and challenges. *International Journal of Advanced Operations Management*, 13(2):129-66.
- Kaswan, M. S., Rathi, R., Antony, J., Cross, J., Garza-Reyes, J. A., Singh, M., Singh, I. P., & Sony, M. (2023). Integrated Green Lean Six Sigma-Industry 4.0 approach to combat COVID-19: from literature review to framework development. *International Journal of Lean Six Sigma*. Ahead-of-print.
- Lawal, A. K., Rotter, T., Kinsman, L., Sari, N., Harrison, L., Jeffery, C., & Flynn, R. (2014). Lean management in healthcare: definition, concepts, methodology and effects reported (systematic review protocol). *Systematic Reviews*, 3(1):1-6.
- Swarnakar, V., Bagherian, A., & Singh, A. R. (2021). Modeling critical success factors for sustainable LSS implementation in hospitals: an empirical study. *International Journal of Quality & Reliability Management*, 39(5):1249-80.
- Tsekouropoulos, G., Vasileiou, A., Hoxha, G., Dimitriadis, A., & Zervas, I. (2023). Sustainable Approaches to Medical Tourism: Strategies for Central Macedonia/Greece. *Sustainability*, 16:121.
- Zhu, Q., Johnson, S., & Sarkis, J. (2018). Lean six sigma and environmental sustainability: a hospital perspective. In *Supply Chain Forum: An International Journal* (Vol. 19, No. 1, pp. 25-41). Taylor & Francis.

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ENHANCING MEDICAL TOURISM FOR SPECIAL NEEDS AND ELDERLY PATIENTS THROUGH DIGITAL INNOVATION AND GREEN LEAN SIX SIGMA

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ABSTRACT

The intersection of medical tourism and digital innovation presents unique opportunities for enhancing the travel experience and healthcare services for people

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with special needs and the elderly (Ribeiro et al., 2018; Li et al., 2022). This paper explores through a Literature Review how advanced technologies can be harnessed to create an inclusive, efficient, and comfortable medical tourism experience for these demographic groups. It delves into several key areas where digital innovations can make significant impacts: telemedicine, accessible online platforms, customized travel planning, enhanced communication tools, smart healthcare facilities, data analytics, integrated health, travel insurance, training, education, and feedback systems.

Telemedicine and virtual consultations are fundamental in providing preliminary healthcare assessments, enabling patients to interact with healthcare providers from either the comfort of their homes before making travel arrangements, or during their traveling and vacations. Remote monitoring tools provide continuous health updates, ensuring that any medical issues are promptly addressed (Gogia, 2019; Chauhan et al., 2024).

Accessible online platforms and apps are crucial for facilitating easy access to information and services. Websites and mobile applications designed with accessibility features such as voice commands, larger text options, and intuitive navigation ensure that people with disabilities can easily plan and manage their medical travel. AI-powered tools can generate personalized itineraries, while VR tours of medical facilities and accommodations help in making informed decisions (Chang et al., 2016).

Communication is another critical area where digital innovation can make a difference. Real-time translation services and AR tools help overcome language barriers and provide on-the-spot guidance, making the travel experience smoother and more enjoyable for patients and their companions (Shaw et al., 2020; Nambisan et al., 2017). Integrated health and travel insurance plans specifically designed for people with special needs and the elderly provide comprehensive coverage, including emergency services and medical evacuations. Digital claims processing systems streamline the insurance process, making it more accessible and less stressful for patients (Harris, et al. 2019).

Education and training for the professionals in the tourism industry are essential for maintaining high standards of care and service. Online training programs ensure they are well-equipped to meet the unique needs of these groups regarding travel logistics, and support services (Awad et al., 2021).

Finally, digital feedback systems enable continuous improvement by collecting and analyzing patient feedback. AI-powered surveys can identify areas for enhancement, ensuring that services evolve to meet the changing needs and expectations of patients. Moreover, integrating Green Lean Six Sigma (GLSS) principles into these innovations ensures sustainability and efficiency (de Freitas et al., 2017; Bhat et al., 2020; Farrukh et al., 2020):

Process Optimization: Apply Lean Six Sigma techniques to streamline processes, reduce waste, and improve service delivery in medical tourism.

Sustainability Initiatives: Implement green practices in healthcare facilities, such as energy-efficient systems and waste reduction programs, to create eco-friendly medical tourism options.

Continuous Improvement: Use GLSS methodologies to continuously monitor, analyze, and improve healthcare services, ensuring they remain effective and efficient for special needs and elderly patients.

In conclusion, integrating digital innovation and Green Lean Six Sigma into medical tourism can significantly improve the accessibility, efficiency, and overall experience for people with special needs and the elderly. By leveraging advanced technologies and sustainable practices, medical tourism providers can offer safer, more personalized, and higher-quality services, ensuring that these vulnerable groups can fully benefit from the opportunities of medical travel.

Key Words: Medical tourism, digital innovation, special needs, elderly, healthcare accessibility, Green Lean Six Sigma (GLSS).

REFERENCES

- Awad, A., Trenfield, S. J., Pollard, T. D., Ong, J. J., Elbadawi, M., McCoubrey, L. E., et al. (2021). Connected healthcare: Improving patient care using digital health technologies. *Advanced Drug Delivery Reviews*, 178:113958.
- Bhat, S., Antony, J., Gijo, E. V., & Cudney, E. A. (2020). Lean Six Sigma for the healthcare sector: a multiple case study analysis from the Indian context. *International Journal of Quality & Reliability Management*, 37(1):90-111.
- de Freitas, J. G., Costa, H. G., & Ferraz, F. T. (2017). Impacts of Lean Six Sigma over organizational sustainability: A survey study. *Journal of Cleaner Production*, 156:262-275.
- Chang, I. C., Chou, P. C., Yeh, R. K. J., & Tseng, H. T. (2016). Factors influencing Chinese tourists' intentions to use the Taiwan Medical Travel App. *Telematics and Informatics*, 33(2):401-409.
- Chauhan, P., Bali, A., & Kaur, S. (2024). Breaking Barriers for Accessible Health Programs: The Role of Telemedicine in a Global Healthcare Transformation. In *Transformative Approaches to Patient Literacy and Healthcare Innovation* (pp. 283-307). IGI Global.
- Farrukh, A., Mathrani, S., & Taskin, N. (2020). Investigating the theoretical constructs of a green lean six sigma approach towards environmental sustainability: a systematic literature review and future directions. *Sustainability*, 12(19):8247.
- Gogia, S. (Ed.). (2019). *Fundamentals of Telemedicine and Telehealth*. Academic Press.
- Harris, D. C., Davies, S. J., Finkelstein, F. O., Jha, V., Donner, J. A., Abraham, G., et al. (2019). Increasing access to integrated ESKD care as part of universal health coverage. *Kidney International*, 95(4):S1-S33.
- Li, Z., Wang, D., Abbas, J., & Mubeen, R. (2022). Tourists' health risk threats amid COVID-19 era: role of technology innovation, transformation, and recovery implications for sustainable tourism. *Frontiers in Psychology*, 12:769175.
- Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital innovation management. *MIS Quarterly*, 41(1):223-238.
- Ribeiro, F. R., Silva, A., Barbosa, F., Silva, A. P., & Metrôlho, J. C. (2018). Mobile applications for accessible tourism: overview, challenges and a proposed platform. *Information Technology & Tourism*, 19:29-59.
- Shaw, S. E., Seuren, L. M., Wherton, J., Cameron, D., A'Court, C., Vijayaraghavan, S., et al. (2020). Video consultations between patients and clinicians in diabetes,

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cancer, and heart failure services: linguistic ethnographic study of video-mediated interaction. *Journal of Medical Internet Research*, 22(5):e18378.

ORIENTATION PROGRAM FOR NEWLY QUALIFIED NURSES AT AHEPA UNIVERSITY GENERAL HOSPITAL

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ABSTRACT

The Nursing Directorate of AHEPA University General Hospital aims in providing safe and high-quality nursing care services to patients. In this context, it has organised and implements, in collaboration with our Nursing Education department, an innovative Orientation Program for New Employees.

Purpose:

The purpose of the program is the swift and effective integration of recently employed nurses into hospital departments. For this reason, the program provides the necessary training, support, and guidance to ensure quick adaptation to their new work environment.

Methodological tools:

The Program includes:

Welcoming the new staff

Tour of the Hospital premises

Organizational structure of the Hospital – Informing about employee rights and obligations

Hospital safety rules

Health and safety within the Hospital

Ergonomics in the hospital environment

Infection prevention in the Hospital

Hospital waste management

Nursing Code of Ethics / protocols

Basic Life Support Seminar

Transplants - Tissue and organ donation – Bone marrow donation

The role of the Hospital Library

Effective communication – Conflict management

Introduction to the Nursing Services Education Office

Blood Center operation

Implementation of ODIPY forms - Incident reporting

Results:

The Program commenced as a pilot project in May 2023 and it is being implemented shortly after the commencement of employment or internship, lasting five days. So far, four training cycles have been completed, including 27 trainers who delivered theoretical and practical lessons from all hospital departments. It is being organized with a minimum of 25 participants, and to date, 155 employees and 110 students have completed it.

Conclusion:

The implementation of this innovative Program contributes to creating a safe and supportive work environment and a competent and dedicated staff, ensuring the smooth and effective integration of new nursing employees into the Hospital. At the same time, it improves their performance and job satisfaction and promotes their continuous improvement and development.

That is way it is considered as a potential «investment» for the Nursing Directorate of AHEPA University General Hospital, as it ensures the swift and effective integration of newly qualified nurses into the Hospital, whilst providing high-quality nursing care to patients at all times.

Keywords: Orientation Program, New Employees, Education Office, Nursing Services Directorate, Nursing care

INFORMATION AND COMMUNICATION TECHNOLOGIES IN HEALTH MANAGEMENT

HOW BLOCKCHAIN CAN BE LEVERAGED IN HEALTHCARE SYSTEMS TO IMPROVE USER SATISFACTION

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ABSTRACT

Blockchain technology is regarded as a disruptive core technology, which became popular through the successful foundation of cryptocurrencies such as Bitcoin (El Faqir et al., 2020) and Ethereum (Chen et al., 2020), with the potential to revolutionize numerous industries, notably including healthcare industry. Blockchain is essentially a decentralized and distributed database comprising and stored in chronological order sets of digital transactions and records, with are interlinked together in a chain of blocks using cryptography (Moschotoglou et al., 2022). Digital healthcare systems are tailored to meet the needs of both health specialists and patients, providing efficiency and accessibility to healthcare services (Chopade et al., 2023). However, the challenges that arise are based on the fact that data processing and storage rely on centralized systems, creating the possibility of mistrust, privacy tampering and single point of failure (Attaran, 2022).

The integration of blockchain technology in healthcare sector has the potential to securely decentralize both data stored and the operations of the industry in general (Yaqoob et al., 2022). The core characteristics of the blockchain technology, including immutability, decentralization and security, immediate enhance the delivery and quality of health services. A wide range of features includes the verification and authentication of records (Koteska et al., 2017; Andrew et al., 2023), the develop of an efficient system for the storage of health records (Puthal et al., 2018; Kuo et al., 2019), which should also be interoperable (Agbo et al., 2019).

In healthcare industry, the importance of trust is crucial, therefore any failure can lead to a lower level of trust and thus eventually lead to a decrease in patients' satisfaction with the services provided (Andaleeb, 2001; Ferreira et al., 2023). In addition, the configuration of communication plays an important role in overall patient satisfaction and experience. However, in existing research around the impact of blockchain technology in the healthcare industry, there is a marked lack of empirical studies focusing on patient satisfaction through the use of blockchain. Blockchain technology is still in its developmental stage, with the result that the existing literature is largely limited to only theoretical approaches related to data security and system interoperability. Accordingly, there is a necessity to examine and assess the influence of the blockchain technology on patient satisfaction, confidence in the healthcare system, and more broadly, on their comprehensive experience delivered through the utilization of digital healthcare systems. This research aims to elucidate the impact of blockchain technology on the overall experience that will have in digital healthcare systems.

To conduct this research, a qualitative study was conducted in order to explore the impact of blockchain technology on the experience through the use of digital healthcare systems. Four specialists and five patients from the National Health System of Greece were selected for in-depth, semi-structured interviews. The questions focused on factors related to trust, security, transparency, data integrity, and overall satisfaction through

the use of blockchain-based healthcare systems. First of all, a briefing on blockchain technology and the potential benefits it offers to the healthcare industry was provided. The research indicated that blockchain technology has a positive impact on customer experience in digital healthcare systems. The key benefits that identified are enhanced data security, increased patients’ level of trust, improved convenience and accessibility of health records on time, and greater transparency and accountability in data management. They have reported greater levels of satisfaction among patients and more efficient work processes as a result of blockchain-based systems. However, a number of challenges were also highlighted. A high initial implementation cost, complexity, and the need for technical expertise and interoperability with existing systems were reported.

In conclusion, it can be posited that blockchain technology has the potential to positively impact customer satisfaction, digitisation and the decentralisation of operations within a healthcare system. Security and the decentralisation of data, transparency and trust are considered fundamental elements that could enhance customer satisfaction in a healthcare system. Despite the numerous challenges, including increased cost of implementation and interoperability, industry experts suggest that blockchain technology will play a vital role in the broader development of the healthcare system in the future. In order to reap the full benefits of blockchain technology, it is critical to address the issues and do additional research. This is critical for improving patient happiness and overall healthcare delivery.

REFERENCES

- Agbo, C. C., Mahmoud, Q. H., & Eklund, J. M. (2019, April). Blockchain technology in healthcare: a systematic review. In *Healthcare* (Vol. 7, No. 2, p. 56). MDPI.
- Andaleeb, S. S. (2001). Service quality perceptions and patient satisfaction: a study of hospitals in a developing country. *Social science & medicine*, 52(9), 1359-1370.
- Andrew, J., Isravel, D. P., Sagayam, K. M., Bhushan, B., Sei, Y., & Eunice, J. (2023). Blockchain for healthcare systems: Architecture, security challenges, trends and future directions. *Journal of Network and Computer Applications*, 103633.
- Attaran, M. (2022). Blockchain technology in healthcare: Challenges and opportunities. *International Journal of Healthcare Management*, 15(1), 70-83.
- Chen, T., Li, Z., Zhu, Y., Chen, J., Luo, X., Lui, J. C. S., Xiaodong, L. & Zhang, X. (2020). Understanding ethereum via graph analysis. *ACM Transactions on Internet Technology (TOIT)*, 20(2), 1-32.
- Chopade, S. S., Gupta, H. P., & Dutta, T. (2023). Survey on sensors and smart devices for IoT enabled intelligent healthcare system. *Wireless Personal Communications*, 131(3), 1957-1995.
- El Faqir, Y., Arroyo, J., & Hassan, S. (2020, August). An overview of decentralized autonomous organizations on the blockchain. In *Proceedings of the 16th international symposium on open collaboration* (pp. 1-8).
- Ferreira, D. C., Vieira, I., Pedro, M. I., Caldas, P., & Varela, M. (2023, February). Patient satisfaction with healthcare services and the techniques used for its assessment: a systematic literature review and a bibliometric analysis. In *Healthcare* (Vol. 11, No. 5, p. 639). MDPI.

- Koteska, B., Karafiloski, E., & Mishev, A. (2017). Blockchain implementation quality challenges: a literature. In SQAMIA 2017: 6th workshop of software quality, analysis, monitoring, improvement, and applications (Vol. 11, p. 2017).
- Kuo, T. T., Zavaleta Rojas, H., & Ohno-Machado, L. (2019). Comparison of blockchain platforms: a systematic review and healthcare examples. *Journal of the American Medical Informatics Association*, 26(5), 462-478.
- Moschotoglou, P., Tsifitopoulou, S., Kefalidou, V., Avdimiotis, S., & Kassianidis, P. (2022). Blockchain technology applications in healthcare industry. In *Proceedings of the 3rd ICOHEMA* (pp. 49-51).
- Puthal, D., Malik, N., Mohanty, S. P., Kougianos, E., & Yang, C. (2018). The blockchain as a decentralized security framework [future directions]. *IEEE Consumer Electronics Magazine*, 7(2), 18-21.
- Yaqoob, I., Salah, K., Jayaraman, R., & Al-Hammadi, Y. (2022). Blockchain for healthcare data management: opportunities, challenges, and future recommendations. *Neural Computing and Applications*, 1-16.

DIGITAL INNOVATION IN HEALTHCARE GOVERNANCE: OPPORTUNITIES AND HUMAN RIGHTS CHALLENGES

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ABSTRACT

Digital innovation, involving Artificial Intelligence (AI), is gaining increasing prominence at multiple sectors of the economy and society, including the healthcare sector (OECD, 2024). In this regard, it is claimed that digital innovation, and particularly Artificial Intelligence, in healthcare governance is redefining and reshaping the right to health and as such AI represents a profound opportunity for enhancing the availability, accessibility, acceptability and quality of health services, while at the same time entailing serious human rights challenges due to its multifaceted nature, that require immediate and concerted regulatory action (UN General Assembly, 2023). Within this context, the United Nations (UN) High Commissioner for Human Rights cautioned that: “[N]o other technological development of recent years has captured the public imagination more than artificial intelligence (AI), in particular machine-learning technologies. Indeed, these technologies can be a tremendous force for good, helping societies overcome some of the great challenges of the current time. However, these technologies can also have negative, even catastrophic, effects if deployed without sufficient regard to their impact on human rights” (UN Human Rights Council 2021: para 2).

Crucially, it must be conceded that when deploying AI in healthcare governance more attention should be given to: (i) the application of fundamental principles, such as equality and non-discrimination, participation and accountability, principles that are also at the heart of the Sustainable Development Goals and the Guiding Principles on Business and Human Rights; (ii) the introduction of effective judicial and non-judicial remedies for those who suffer human rights violations and abuses relating to the use of AI in healthcare delivery; (iii) the establishment of data privacy frameworks and the review and/or adoption of a broader range of laws to address the challenges of AI in a rights-respecting way; (iv) the implementation of stricter legal requirements for the use of AI technology when the risks for human rights in sectors, like healthcare, are higher; (v) the systematic exercise of comprehensive human rights due diligence throughout the life cycle of AI systems, as well as prior big data held about individuals, are shared or used; (vi) the regular implementation of comprehensive health rights impact assessments, a significant element of human rights due diligence; (vii) the promotion of transparency around the use of AI in the healthcare sector by developers, marketers, operators and users of AI systems, while enabling independent and external auditing of automated systems; and (viii) the promotion of participation of all stakeholders in decisions on AI development, deployment and use, in particular affected individuals

and groups (see in relation, UN Human Rights Council, 2021; UN General Assembly, 2023). Hence, drawing on existing evidence, this paper seeks to examine the value of digital innovation in healthcare governance as well as identify an operational regulatory framework for addressing the complex human rights challenges to healthcare governance stemming from the use of AI, and ultimately for advancing health rights in the digital era.

Key Words: Artificial Intelligence, Digital Innovation, Governance, Healthcare, Human Rights.

REFERENCES

OECD (2024). AI in Health: Huge Potential, Huge Risks (Policy brief). OECD publishing. Paris.

UN General Assembly (2023). Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health, 53rd Sess., Agenda Item 3. UN doc. A/HRC/53/65.

UN Human Rights Council (2021). Report of the UN High Commissioner for Human Rights: The Right to Privacy in the Digital Age. UN doc A/HRC/48/31.

PRIVACY CHALLENGES IN DIGITAL HEALTH GOVERNANCE: ETHICAL IMPLICATIONS

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ABSTRACT

Introduction: Digital health is a rapidly expanding medical field grounded on the accessibility of ever augmenting amounts of data about people’s lifestyles, habits, clinical histories and pathophysiological features. From wearable devices to telehealth and telemedicine platforms, mobile health (mHealth), health information technology (IT) and personalized medicine, digital health innovations provide unprecedented opportunities to improve patient care, results, and access to medical services. Though, the defining trait of digital health relates to data rather than technology (Vagena et al., 2018). In this regard, what is interesting about digital health, is that through wearable, portable, ingestible or implantable devices, it invokes a “seamless flow of critical medical data between patients, their families and their physicians” (Eisenstein, 2012, 1013-4; Vagena et al., 2018). However, the rapid application of digital technologies raises ethical issues and privacy challenges that must be addressed in order to assure responsible and secure data use (Vagena et al., 2018).

Methodology: The paper draws on existing literature research and applies a systematic document analysis/a systematic review. Electronic databases such as Web of Science (WoS), Scopus, Pub Med and Google Scholar, as well as documents by the European Commission (EC), the Official Journal of the European Union, the World Health Organization (WHO) etc. regarding issues, inter alia, of digital health technologies, data and privacy protection and governance, as well as the ethical values to foster ethical digital health, will be extensively searched based on the search strategy pertaining to the purpose of this paper.

Discussion: From the extensive review of the existing scientific literature, it is well established that there is an exigent need for ethical boundaries that need to be placed which determine a principal ethical framework predominantly targeted to individual action, responsibility and overall conduct in relation to the digitalization of health governance, primarily encompassing respect for human dignity, individuals’ autonomy, decision making and individual privacy rights. From a practical perspective, it is claimed that this framework puts forward six ethical values involved in digital health, which are i. justice: equity in access, exclusion, equal treatment, non-discrimination, non-stigmatization, data ownership, empowerment; ii. autonomy: freedom of choice, informed consent, awareness of data collection and use, right to (not) know results; iii. privacy: data protection, confidentiality, data sharing, intended/unintended uses of data;

iv. security: data storage, safety of information, protection against unauthorized access and use of data; v. responsibilities: trust, balance of power, relation between stakeholders, benefits and benefit sharing, data ownership; vi. procedural values: transparency, accountability, inclusiveness (Brall, Schröder-Bäck and Maeckelberghe, 2019; Royakkers, Timmer, Kool and van Est, 2018).

Conclusion: Against this backdrop, digital health technologies offer immense opportunities to transform health systems governance by broadening health coverage and spreading health information and literacy. Moreover, healthcare costs can potentially be curtailed and efficiency can be reinforced. Yet, digital health technologies also provoke challenges with regard to digital illiteracy, data governance and privacy human rights bringing about inequities in access and informed consent, which need to be addressed. Hence, it is crucial for all stakeholders, especially digital health providers, to ensure that digital health technologies are designed, deployed, implemented and governed in an ethical, fair, equitable, appropriate and human centered way. Establishing these regulations is a presupposition for ensuring that digital health technologies will be fit for the purpose of serving the public good (Brall, Schröder-Bäck and Maeckelberghe, 2019).

Key words: Digital Health, Digital Ethics, Data Governance, Privacy Challenges

REFERENCES

- Brall, C., Schröder-Bäck, P., Maeckelberghe, E. (2019). Ethical aspects of digital health from a justice point of view. *European Journal of Public Health*, 29(3): 18–22.
- Eisenstein, M. (2012). Miniature wireless sensors presage smart phone medicine. *Nature Biotechnology* 30(11):1013–4. doi: <http://dx.doi.org/10.1038/nbt1112-1013>.PubMed.
- Royakkers L., Timmer J., Kool L., van Est R. (2018). Societal and ethical issues of digitization. *Ethics and Information Technology*, 20:127–42.
- Vayena E., Haeusermann T., Adjekum A., Blasimme A. (2018). Digital health: meeting the ethical and policy challenges. *Swiss Medical Weekly*, 148: 1-9. <https://doi.org/10.4414/smw.2018.14571>

THE DYNAMICS OF THE DIGITAL AGE IN GERONTOLOGICAL CARE: IMPLICATIONS FOR COMMUNITY AND HOMECARE SETTINGS

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ABSTRACT

Telemedicine began in the late 50s in the United States, but the COVID-19 pandemic outbreak in March 2020 served as a catalyst for the revision, updating, and widespread implementation of new healthcare technologies. Furthermore, the integration of new technologies into gerontological care in community and homecare within Primary Health Care settings has played a critical role in improving health outcomes, reducing social isolation and loneliness, and improving the quality of life of frail older people with comorbidities.

Innovations such as telemedicine, remote monitoring and mobile health applications are improving healthcare delivery while addressing challenges such as technology literacy, accessibility and ethical concerns (including Technology-based Ageism) for healthcare professionals, patients and caregivers. Community nurses serve as the critical link in achieving this objective. In this context, this paper explores the transformative opportunities arising from the digital age in community and home care for older people. It examines how these innovations provide significant benefits, including improved access to healthcare and better chronic disease management. In addition, it highlights the impact of digital tools and technologies in community care settings on improving and promoting interdisciplinarity, family support, advocacy, patient independence, satisfaction and safety, and care coordination, ensuring integration within the concept of a person-centered care outcomes.

Future research should focus on improving user preparation and developing supportive frameworks for technology adoption. There is an urgent need for a collaborative approach between health professionals, policymakers, caregivers and the older people to ensure that digital innovations effectively improve the level of their care within community and home care settings worldwide. This collaboration is critical to promote

the concept of healthy and dignified aging while minimizing potential health disparities within this vulnerable group of healthcare users.

Key Words: Digital Age, gerontology, nursing, community care, home care, Technology-based Ageism

REFERENCES

- Actis, G. C. (2022). Telemedicine: Historical roots, basic concepts, and today's use. *Minerva Gastroenterology*, 68(1), 1–3. <https://doi.org/10.23736/S2724-5985.21.02933-8>
- Bernardo, J., Apóstolo, J., Loureiro, R., Santana, E., Yaylagul, N. K., Dantas, C., Ventura, F., Duque, F. M., Jøranson, N., Zechner, M., van Staaldunin, W., Luca, V. de, Illario, M., & Silva, R. (2022). Ehealth Platforms to Promote Autonomous Life and Active Aging: A Scoping Review. *International Journal of Environmental Research and Public Health*, 19(23). <https://doi.org/10.3390/ijerph192315940>
- Drazich, B. F., Lee, J. W., Bowles, K. H., Taylor, J. L., Shah, S., Resnick, B., Kim, N., & Szanton, S. L. (2023). Pandemic-Related Changes in Technology Use Among a Sample of Previously Hospitalized Older Adult New Yorkers: Observational Study. *JMIR Aging*, 6, e41692. <https://doi.org/10.2196/41692>
- Facchinetti, G., Petrucci, G., Albanesi, B., Marinis, M. G. de, & Piredda, M. (2023). Can Smart Home Technologies Help Older Adults Manage Their Chronic Condition? A Systematic Literature Review. *International Journal of Environmental Research and Public Health*, 20(2). <https://doi.org/10.3390/ijerph20021205>
- Fjellså, H. M. H., Husebø, A. M. L., & Storm, M. (2022). Ehealth in Care Coordination for Older Adults Living at Home: Scoping Review. *J Med Internet Res*, 24(10), e39584. <https://doi.org/10.2196/39584>
- Garnett, A., Northwood, M., Ting, J., & Sangrar, R. (2022). Mhealth Interventions to Support Caregivers of Older Adults: Equity-Focused Systematic Review. *JMIR Aging*, 5(3), e33085. <https://doi.org/10.2196/33085>
- Kalaitzaki, A., Rovithis, M., Dimitropoulos, A., Koukouli, S., Linardakis, M., Katsiri, E., Rikos, N., Vasilopoulos, G., Tsolas, G., Papachristou, A., Dimitrantzou, A., Katsiris, D., & Stavropoulou, A. (2023). Promoting Self-Management and Independent Living of Older Individuals with Chronic Diseases through Technology: A Study of Self-Reported Needs, Priorities, and Preferences. *Medicina (Kaunas, Lithuania)*, 59(8). <https://doi.org/10.3390/medicina59081493>
- Karimi-Shahanjarini, A., Shakibazadeh, E., Rashidian, A., Hajimiri, K., Glenton, C., Noyes, J., Lewin, S., Laurant, M., & Colvin, C. J. (2019). Barriers and facilitators to the implementation of doctor-nurse substitution strategies in primary care: A qualitative evidence synthesis. *The Cochrane Database of Systematic Reviews*, 4(4), CD010412. <https://doi.org/10.1002/14651858.CD010412.pub2>
- Kokorelias, K. M., La Nelson, M., Tang, T., Steele Gray, C., Ellen, M., Plett, D., Jarach, C. M., Xin Nie, J., Thavorn, K., & Singh, H. (2022). Inclusion of Older Adults in Digital Health Technologies to Support Hospital-to-Home

- Transitions: Secondary Analysis of a Rapid Review and Equity-Informed Recommendations. *JMIR Aging*, 5(2), e35925. <https://doi.org/10.2196/35925>
- Li, K. S., Nagallo, N., McDonald, E., Whaley, C., Grindrod, K., & Boluk, K. (2022). Implementing Technology Literacy Programs in Retirement Homes and Residential Care Facilities: Conceptual Framework. *JMIR Aging*, 5(3), e34997. <https://doi.org/10.2196/34997>
- Lu, S. Y., Yoon, S., Yee, W. Q., Heng Wen Ngiam, N., Ng, K. Y. Y., & Low, L. L. (2024). Experiences of a Community-Based Digital Intervention Among Older People Living in a Low-Income Neighborhood: Qualitative Study. *JMIR Aging*, 7, e52292. <https://doi.org/10.2196/52292>
- Mace, R. A., Mattos, M. K., & Vranceanu, A.-M. (2022). Older adults can use technology: Why healthcare professionals must overcome ageism in digital health. *Translational Behavioral Medicine*, 12(12), 1102–1105. <https://doi.org/10.1093/tbm/ibac070>
- Majcherek, D., Hegerty, S. W., Kowalski, A. M., Lewandowska, M. S., & Dikova, D. (2024). Opportunities for healthcare digitalization in Europe: Comparative analysis of inequalities in access to medical services. *Health Policy (Amsterdam, Netherlands)*, 139, 104950. <https://doi.org/10.1016/j.healthpol.2023.104950>
- Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S. C., McDonnell-Naughton, M., Wouters, E. J. M., & van Zaaen, Y. (2019). Inclusion of Older Adults in the Research and Design of Digital Technology. *International Journal of Environmental Research and Public Health*, 16(19). <https://doi.org/10.3390/ijerph16193718>
- Ngwa, W., Olver, I., & Schmeler, K. M. (2020). The Use of Health-Related Technology to Reduce the Gap Between Developed and Undeveloped Regions Around the Globe. *American Society of Clinical Oncology Educational Book*, 40(40), 1–10. https://doi.org/10.1200/EDBK_288613
- Xie, X., Huang, C., Sitar, S., & Qiao, X. (2023). Community engagement and loneliness in older adults in China: Mediation effects of social support in the wake of COVID-19. *Frontiers in Public Health*, 11, 1199577. <https://doi.org/10.3389/fpubh.2023.1199577>

SERVICES MANAGEMENT FOR HEALTH UNITS, INFORMATION & COMMUNICATION TECHNOLOGIES. THE CASE OF DIGITAL TRIAGE, BENEFITS AND CHALLENGES.

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ABSTRACT

Service management should influence the logic in all types of organizations (Vargo & Lusch, 2004). In that manner, a patient may be referred to as a customer of health services (Du Gay & Salaman, 1992; Scot et al., 2000) and service management and administration management, used vice versa, could be applied in pre-hospital triage. Pre-hospital triage refers to the process of assessing and categorizing patients before they reach a hospital or are examined by a physician or a nurse in person. This can also be achieved through digital triage, with the use of algorithms that interact with patients, or through a telephone-based service that could triage via emergency lines. Pre-hospital triage ensures timely care and directs patients to appropriate facilities. (Robertson-Steel, 2006; Safari et al., 2015; Magnusson, Herlitz, & Axelsson, 2020; Yancey & O'Rourke, 2023).

The term “service” refers to all those characteristics that shape the experience of care for the patients (Kenagy, Berwick & Shore, 1999). Thus, service management or administration management affects the effectiveness of pre-hospital care in these instances and hinges on establishing a common communication code between pre-hospital and emergency hospital care to determine incident priority. AI enhances triage accuracy, but incomplete algorithms and reliance on patient judgment risk over-triage or under-triage. Pre-hospital digital triage struggles without algorithms for categorizing all conditions, working best for simpler cases like stroke or trauma. Many cases remain

"undifferentiated," requiring alternative triage methods. (Bhaumik et al., 2022, Ilicki, 2022, Kim & Oh, 2023, Alowais et al., 2023, Zarzecki et al., 2024, Burns et al., 2024). Remote screening and prioritization of patients during pandemics, such as Covid-19, help minimize virus transmission by reducing the need for physical interactions (Ziebart et al., 2024; Bielajs et al., 2008).

In the UK, the NHS uses a digital triage algorithm, where an AI assistant guides patients through self-assessment, directing them to appropriate care. Similar services are available via telephone-based emergency lines. (NHS, 2024). Also, there is Symptomate, a digital virtual triage (VT) engine, which uses AI to provide 24/7 symptom assessment and care recommendations. (Gellert et al., 2024).

Health care is the most personal and important service that consumers buy, but there is a wide variation in the quality of care delivered (McGlynn et al., 2003; Wennberg & Fisher, 2006) and in the patients' ability to evaluate that quality (Adams and Biros, 2002). It is suggested that a universally accepted, standardized pre-hospital triage tool be developed with a common communication code between pre-hospital and emergency care. Further research is recommended to design and implement this tool globally in real time, along with studies to analyze its costs and assess its value. (Kim, & Oh, 2023; Zarzecki et al., 2024). Therefore, it may be beneficial for countries to review the indicators and tools currently in use and take into consideration which factors most influence effective triage, also, exploring the integration of AI in healthcare management (Bazyar et al., 2022; Abdul et al., 2024).

To improve pre-hospital triage, key questions include: How can digital systems enhance the accuracy of patient-reported symptoms? What measures can reduce the risks of self-reported inaccuracies?

Policy implications include standardized patient training on accurate symptom reporting and continuous refinement of triage algorithms to cover more conditions. Additionally, a clear policy framework should ensure seamless integration of digital triage systems with emergency departments to maintain consistent patient care. These measures could enhance pre-hospital triage reliability, improve patient outcomes, and reduce the burden on emergency healthcare systems.

The implementation of these strategies could decrease the risks that are associated with digital triage and would ensure that patients receive the most appropriate and immediate care based on their real condition.

Key Words: Services management, digital triage, pre-hospital triage, triage algorithm, digital virtual triage

REFERENCES

- Abdul, S., Adeghe, E. P., Adegoke, B. O., Adegoke, A. A., & Udedeh, E. H. (2024). AI-enhanced healthcare management during natural disasters: Conceptual insights. *Engineering Science & Technology Journal*, 5(5), 1794-1816. <https://doi.org/10.51594/estj.v5i5.1155>

- Adams, J., & Biros, M. (2002). The Elusive Nature of Quality. *Academic Emergency Medicine*, 9 (11), 1067-1070. doi.org/10.1197/aemj.9.11.1067
- Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., Aldairem, A., Alrashed, M., Bin Saleh, K., Badreldin, H. A., Al Yami, M. S., Al Harbi, S., & Albekairy, A. M. (2023). Revolutionizing healthcare: The role of artificial intelligence in clinical practice. *BMC Medical Education*, 23(1), 689. <https://doi.org/10.1186/s12909-023-04698-z>
- Bazyar, J., Farrokhi, M., Salari, A., Safarpour, H., & Khankeh, H. R. (2022). Accuracy of triage systems in disasters and mass casualty incidents: A systematic review. *Archives of Academic Emergency Medicine*, 10(1). <https://doi.org/10.22037/aaem.v10i1.1526>
- Bhaumik, S., Hannun, M., Dymond, C., DeSanto, K., Barrett, W., Wallis, L. A., & Mould-Millman, N. K. (2022). Prehospital triage tools across the world: A scoping review of the published literature. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 30(1), 32. <https://doi.org/10.1186/s13049-022-01019-z>
- Bielajs, I., Burkle, F. M., Archer, F. L., & Smith, E. (2008). Development of prehospital, population-based triage-management protocols for pandemics. *Prehospital and Disaster Medicine*, 23(5), 420-430. <https://doi.org/10.1017/s1049023x00006154>
- Burns, A., Fitzpatrick, J. M., Teahan, Á., Clements, K., Lee, C., Lovett, H., & Long, J. (2024). Safety and effectiveness of remote pre-hospital triage for appropriate emergency department attendances and service use.
- Du Gay, P., & Salaman, G. (1992). The cult[ure] of the customer. *Journal of Management Studies*, 29, (5), 615-33.
- Gellert, G. A., Kabat-Karabon, A., Gellert, G. L., Rasławska-Socha, J., Gorski, S., Price, T., Kuszczynski, K., Marcjasz, N., Palczewski, M., Jaszczak, J., Loh, I. K., & Orzechowski, P. M. (2024). The potential of virtual triage AI to improve early detection, care acuity alignment, and emergent care referral of life-threatening conditions. *Frontiers in Public Health*, 12. <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1362246>
- Ilicki, J. (2022). Challenges in evaluating the accuracy of AI-containing digital triage systems: A systematic review. *PLoS One*, 17(12), e0279636. <https://doi.org/10.1371/journal.pone.0279636>
- Kenagy, J.W., Berwick, D.M., & Shore, M.F. (1990). Service Quality in Health Care. *JAMA*, 281 (7), 661–665. doi:10.1001/jama.281.7.661
- Kim, K., & Oh, B. (2023). Prehospital triage in emergency medical services system: A scoping review. *International Emergency Nursing*, 69, 101293.
- Magnusson, C., Herlitz, J., & Axelsson, C. (2020). Pre-hospital triage performance and emergency medical services nurse's field assessment in an unselected patient population attended to by the emergency medical services: A prospective observational study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 28(1), 81. <https://doi.org/10.1186/s13049-020-00766-1>
- McGlynn, E. A., Asch, S. A., Adams, J., Keeseey, J., Hicks, J., DeCristofaro, A., et al. (2003). The Quality of Health Care Delivered to Adults in the United States. *The New England Journal of Medicine*, 348, 2635-2645.
- NHS. (2024). How NHS 111 online works. <https://www.nhs.uk/nhs-services/urgent-and-emergency-care-services/when-to-use-111/how-nhs-111-online-works/>

- Robertson-Steel, I. (2006). Evolution of triage systems. *Emergency Medicine Journal*, 23(2), 154-155. <https://doi.org/10.1136/emj.2005.030270>
- Safari, S., Rahmati, F., Baratloo, A., Motamedi, M., Forouzanfar, M. M., Hashemi, B., & Majidi, A. (2015). Hospital and pre-hospital triage systems in disaster and normal conditions; a review article. *Iranian journal of emergency medicine*, 2(1), 2-10.
- Scott, W., Ruef, M., Mendel, P.J., & Caronna, C.A. (2000). *Institutional Change and Healthcare Organizations*. Chicago: University of Chicago Press.
- Vargo, S.L., & Lusch, R.F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68, 1-17. doi:10.1509/jmkg.68.1.1.24036
- Wennberg, J. E., & Fisher, E. S. (2006). *The Care of Patients with Severe Chronic Illness, An Online Report on the Medicare Program by the Dartmouth Atlas Project, The Dartmouth Atlas of Healthcare*, Hanover, New Hampshire: Center for The Evaluative Clinical Sciences, Dartmouth Medical School.
- Yancey, C. C., & O'Rourke, M. C. (2023). Emergency department triage. In StatPearls [Internet]. StatPearls Publishing. Available from <https://www.ncbi.nlm.nih.gov/books/NBK557583/>
- Zarzecki, K., Cecot, J., Mandryk, M., Plizga, J., & Gluszczyk, A. (2024). Artificial intelligence applicability in emergency departments—a new promising tool. *Disaster and Emergency Medicine Journal*. <https://doi.org/10.5603/demj.101493>
- Ziebart, C., Kfrerer, M. L., Stanley, M., & Austin, L. C. (2023). A digital-first health care approach to managing pandemics: Scoping review of pandemic self-triage tools. *Journal of Medical Internet Research*, 25, e40983. <https://doi.org/10.2196/40983>

A COMPARATIVE ANALYSIS OF THE EFFICACY OF THE BODY INTERACT (VIRTUAL PATIENT) APPLICATION AND HIGH-FIDELITY SIMULATOR TRAINING IN ADULT PATIENTS WITH HYPOGLYCAEMIA

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ABSTRACT

The results of a multicentre study conducted on nursing and medical students show that the use of Body Interact (virtual patient) is an effective method for training communication techniques, group and conflict management skills. Studies show that virtual patient application is an effective tool for the development and regulation of clinical reasoning and decision-making skills. The effectiveness of a virtual patient model was evaluated in terms of its potential to improve the quality of nursing education. The findings showed that the use of virtual patients can facilitate the development of students' clinical decision-making skills. The aim of this study was to compare the effectiveness of Body Interact (Virtual Patient) and High Fidelity Simulator Training in an Adult Patient with Hypoglycaemia.

The study was designed as an experimental research. The sample consisted of 288 nurses who were planned to participate in nursing orientation training at Acibadem Mehmet Ali Aydınlar University CASE laboratory. Prior to the simulation-based training, 102 newly recruited nurses with different experiences and backgrounds were assigned a training programme consisting of 20 topics from the Acibadem Academy system. Those who completed the assigned training were then directed to the "Nursing

Orientation Webinar Programme" consisting of 20 online topics and completed in 14 hours. In the training programme, it was explained how to approach hypoglycaemic patients. The trained nurses participated in orientation training at the CASE Simulation Centre, which included scenario application and performance evaluation in a simulated environment. This programme consisted of a 40-minute physical examination and a 20-minute nursing history. The 18 participants were randomly divided into two groups of nine participants each. One group was given a virtual patient to interact with to gain experience in approaching a hypoglycaemia patient, while the other group was presented with a scenario to navigate using a manikin simulator. Participants' performance was assessed using the same performance checklist. Since a priori information about the experimental design was not available, the effect size was evaluated as 0.5.

While the mean score of the participants' virtual patient application pre-test was 47, the mean score of the case study pre-test was 45. While the mean post-test score of the virtual patient application was 79, the mean post-test score of the case study was 75.

There is no significant difference between the participants who performed virtual patient application and the participants who performed case study.

Anahtar Kelimeler: Nurse, Simulation, Virtual Patient, Case Analysis

REFERENCES

- Alinier, G., Hunt, B., Gordon, R. ve Harwood, C. (2006), Lisans hemşirelik eğitiminde orta düzeyde sadakat simülasyon eğitim teknolojisinin etkinliği. İleri Hemşirelik Dergisi, 54: 359-369. <https://doi.org/10.1111/j.1365-2648.2006.03810.x>
- Gündoğdu, H. Dikmen Y. (2017). Hemşirelik Eğitiminde Simülasyon: Sanal Gerçeklik ve Haptik Sistemler. J hum rhythm – December, 3(4):172-176
- Sarıkoç, G.(2016). Sağlık Çalışanlarının Eğitiminde Sanal Gerçekliğin Kullanımı. Hemşirelikte Eğitim ve Araştırma Dergisi,13 (1): 11-15
- Ulupınar, F. Toygar, Ş.A. (2020) Hemşirelik Eğitiminde Teknoloji Kullanımı ve Örnek Uygulamalar. Fiscaeconomia, Vol.4(2) 524-537
<https://blog.bodyinteract.com/2020/11/23/global-impact-study-in-clinical-education/>
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INFORMATION AND COMMUNICATION TECHNOLOGIES IN HEALTH MANAGEMENT

GAIN THROUGH LOSS: A POSTTRAUMATIC GROWTH INTERVENTION FOR CHILDREN BASED ON MINDFULNESS AND CHARACTER STRENGTHS

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ABSTRACT

World around individuals and communities have been facing a challenging period due to the global spread of coronavirus, known as COVID-19. Several reviews have synthesized the negative psychological impact of the COVID-19 pandemic on children's mental health (Ma et al., 2021). However positive outcomes through COVID-19 experience are also possible (Bhushan et al., 2022; Tamiolaki, & Kalaitzaki, 2020). Researchers have used the term posttraumatic growth (PTG) to describe the positive changes that occur through the struggle with challenging situations such as pandemics (Tedeschi & Calhoun, 2004). PTG can be manifested in many ways, including an increased sense of personal strength, greater appreciation of life, more meaningful interpersonal relationships, perception of new possibilities and priorities, and a richer existential and spiritual life (Tedeschi & Calhoun, 2004). A Mindfulness-based strengths practices intervention (MSPI) was designed to be delivered both offline and online to increase PTG and well-being and decrease posttraumatic stress symptoms (PTS) among children.

This work will present the intervention (duration, frequency, content, etc) and preliminary results of its effectiveness examined offline through a randomized control trial (assessments at baseline, post-intervention, and follow-up) among 395 Greek children of both genders aged between 8 and 10 years. Twenty Greek schools located in the town of Heraklion in Crete participated in the study. Schools were selected to

have similar social backgrounds and were randomly assigned to the intervention (ten schools) or control group (ten schools). The Revised Post-Traumatic Growth Inventory for Children (PTGI-C-R, Kilmer et al., 2009), the Child PTSD Symptom Scale Self-Report Version for the DSM-5 (CPSS-SR-5, Foa et al., 2017) and the World Health Organization Five Well-being Index (WHO-5) were used to measure PTG, PTS and wellbeing.

The post-intervention results revealed that the children of the intervention group experienced significantly increased PTG, well-being, and decreased PTS symptoms compared to the control children, and these positive effects were maintained at follow-up. This study demonstrated that Mindfulness and character strengths were important pathways in helping children acknowledge life difficulties as challenging experiences that serve as catalysts for promoting PTG and overall mental health. Delivering mental health interventions to children via the Internet may help overcome geographical barriers, promote access to specialized care, and foster disclosure of intimate or potentially shameful content. The present intervention can also be delivered via the Internet and its efficacy needs to be examined in future studies.

Key Words: Children, pandemic, posttraumatic growth, mindfulness, character strengths.

REFERENCES

- Bhushan, B., Basu, S., & Ganai, U. J. (2022). Post-traumatic Stress and Growth Among the Children and Adolescents in the Aftermath of COVID-19. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.791263>
- Foa, E. B., Asnaani, A., Zang, Y., Capaldi, S., & Yeh, R. (2017). Psychometrics of the Child PTSD Symptom Scale for DSM-5 for Trauma-Exposed Children and Adolescents. *Journal of Clinical Child & Adolescent Psychology*, 47(1), 38–46. <https://doi.org/10.1080/15374416.2017.1350962>
- Kilmer, R. P., Gil-Rivas, V., Tedeschi, R. G., Cann, A., Calhoun, L. G., Buchanan, T., & Taku, K. (2009). Use of the revised Posttraumatic Growth Inventory for Children. *Journal of Traumatic Stress*, 22(3), 248–253. <https://doi.org/10.1002/jts.20410>
- Ma, L., Mazidi, M., Li, K., Li, Y., Chen, S., Kirwan, R., ... & Wang, Y. (2021). Prevalence of mental health problems among children and adolescents during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Affective Disorders*, 293, 78–89. <https://doi.org/10.1016/j.jad.2021.06.021>
- Tamiolaki, A., & Kalaitzaki, A. E. (2020). “That which does not kill us, makes us stronger”: COVID-19 and Posttraumatic Growth. *Psychiatry Research*, 289, 113044. <https://doi.org/10.1016/j.psychres.2020.113044>
- Tedeschi, R. G., & Calhoun, L. G. (2004). Target Article: "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence". *Psychological Inquiry*, 15(1), 1–18. https://doi.org/10.1207/s15327965pli1501_01
- World Health Organization. Regional Office for Europe. (1998). Wellbeing measures in primary health care/the DepCare Project: report on a WHO meeting. Stockholm, Sweden.

ETHICAL ISSUES REGARDING THE DIGITALIZATION AND INTEROPERABILITY OF HEALTH SERVICES.

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ABSTRACT

The Covid-19 epidemic has expedited the ongoing process of digitalizing the healthcare industry. Nevertheless, there are substantial concerns surrounding the matters of personal data security and the transfer of sensitive information between systems in the digital/eHealth domain. Purpose This research aims to analyse the ethical concerns that arise from the digitalization and interoperability of health services. Methods To address this matter, a comprehensive examination of the existing body of literature is undertaken, focusing on digitization, digital applications, and emerging technologies in the healthcare industry. Additionally, the concept of interoperability and the ethical dilemmas arising from it, particularly in relation to specific patient groups, are explored. The analysis highlights significant concerns pertaining to information technology law, safeguarding personal data, maintaining the confidentiality of sensitive information, ensuring the quality and attributes of information management in the healthcare industry, and promoting access and proficiency of healthcare professionals in handling this data. These ethical quandaries hold more significance within particular patient cohorts, including as those with psychiatric disorders and impairments, unidentifiable people like refugees and immigrants, and patients hailing from disadvantaged demographics. Conclusion Given the facts provided, it is crucial to prioritise the training of healthcare workers, the creation of patient-centered safe health information systems to address cyber security concerns, and the establishment of a digital health governance framework.

Keywords: digital transformation, digitalization, health, new technologies, ethics

REFERENCES

1. European Union. Assessing the impact of digital transformation of health services. Report of the Expert Panel on effective ways of investing in Health (EXPH). 2019. https://health.ec.europa.eu/system/files/2019-11/022_digitaltransformation_en_0.pdf
2. CNN Greece. Kotsiopoulos: Digital Health Transformation - Τα βήματα που έγιναν μέσα στην πανδημία. 2022. <https://www.cnn.gr/ellada/story/223993/kotsiopoylos-o-psifiakos-metasximatismos-stin-ygeia-ta-vimata-poy-eginan-mesa-stin-pandimia>
3. Vuong K, Ivers R, Dykgraaf SH et al. Ethical considerations regarding the use of pooled data from electronic health records in general practice. AJGP. 2022. doi: 10.31128/AJGP-08-21-6140.
4. Wardhana ES, Suryono, Hernawan A, Nugroho LE. Legal Aspects of Interoperability of Electronic Medical Records in Dentistry. Saudi J Humanities Soc Sci. 2021. 10.36348/sjhss.2021.v06i09.007.
5. Zhang X, Saltman R. Impact of Electronic Health Record Interoperability on Telehealth Service Outcomes. JMIR Med Inform 2022;10(1):e31837.
6. Schallmo D, Williams CA, Boardman L. Digital transformation of business models - best practice, enablers, and roadmap. International Journal of Innovation Management. 2017;21(8):10.1142/S136391961740014X.
7. Gimpel H, Röglinger M. Digital Transformation: Changes and Chances – Insights based on an Empirical Study. Project Group Business and Information Systems Engineering (BISE) of the Fraunhofer Institute for Applied Information Technology FIT, Augsburg/Bayreuth, 2015.
8. Vail G. Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems. 2019;28(2):118-144.
9. van der Veer H, Wiles A. Achieving Technical Interoperability - the ETSI Approach. 2008. <https://www.etsi.org/images/files/ETSIWhitePapers/IOP%20whitepaper%20Edition%203%20final.pdf>
10. Rauffet P, da Cunha CM, Bernard A. Designing and managing Organizational Interoperability with organizational capabilities and roadmaps. 5th International Conference on Interoperability for Enterprise, Software and Applications (I-ESA), Apr 2009, Beijing, China.
11. Iroju O, Soriyan A, Gambo I, Olaleke J. Interoperability in Healthcare: Benefits, Challenges and Resolutions. International Journal of Innovation and Applied Studies. 2013;3:262-270.
12. Oyeyemi A, Scott P. Interoperability in health and social care: organisational issues are the biggest challenge. Journal of Innovation in Health Informatics. 2018;25(3): 196-198.
13. MedTech Europe/COSIR. Interoperability Standards in Digital Health: A White Paper from the Medical Technology Industry. 2021. https://www.cocir.org/fileadmin/Publications_2021/2021-10_COCIR_-_MTE_Interoperability_standards_in_digital_health.pdf
14. Health Information and Quality Authority. Overview of Healthcare Interoperability Standards. 2013. <https://www.hiqa.ie/sites/default/files/2017-01/Healthcare-Interoperability-Standards.pdf>

15. Brooks P. Standards and Interoperability in Healthcare Information Systems: Current Status, Problems, and Research Issues. MWAIS 2010 Proceedings. 2010;18. <http://aisel.aisnet.org/mwais2010/18>
16. Mishael SK. Data interoperability in healthcare: How we can achieve it now. 2022. http://senecaglobal.com/wp-content/uploads/2022/04/SenecaGlobal_Healthcare_Interoperability_White_Paper.pdf
17. Bielecki A, Nieszporska S. The proposal of philosophical basis of the health care system. *Medicine, Health Care and Philosophy*. 2017;20:23–35.
18. Zarif A. The ethical challenges facing the widespread adoption of digital healthcare technology. *Health Technol*. 2022;12:175-179.
19. Hanlon C, Tesfaye M, Wondimagegn D, Shibre T. Ethical and professional challenges in mental health care in low- and middle-income countries. *International Review of Psychiatry*. 2010;22(3):245-251.
20. Fields LM, Calvert JD. Informed consent procedures with cognitively impaired patients: A review of ethics and best practices. *Psychiatry Clin Neurosci*. 2015 Aug;69(8):462-71.
21. Gilbert T, Bosquet A, Thomas-Antérion C, et al. Assessing capacity to consent for research in cognitively impaired older patients. *Clin Interv Aging*. 2017;12:1553-1563.
22. Mayo AM, Wallhagen MI. Considerations of informed consent and decision-making competence in older adults with cognitive impairment. *Res Gerontol Nurs*. 2009;2(2):103-111.
23. Jeste DV, Palmer BW, Golshan S, et al. Multimedia consent for research in people with schizophrenia and normal subjects: a randomized controlled trial. *Schizophr Bull*. 2009;35(4):719-729.
24. Linder M, Lev-Ari L, Kurs R, Melamed Y. Evaluation of the capacity of inpatients with chronic schizophrenia to provide informed consent for participation in clinical trials; use of the Hebrew version of the MacArthur Competence Assessment Tool for Clinical Research (MacCAT-CR). *Isr Med Assoc J*. 2012;14(8):470-474.
25. Farkas L. Analysis and comparative review of equality data collection practices in the European Union: data collection in the field of ethnicity. 2020. <https://op.europa.eu/en/publication-detail/-/publication/1dcc2e44-4370-11ea-b81b-01aa75ed71a1/language-en>
26. WHO. Collection and integration of data on refugee and migrant health in the WHO European Region. 2020. <https://apps.who.int/iris/bitstream/handle/10665/337694/9789289055369-eng.pdf>
27. Winters N, Venkatapuram S, Geniets A, Wynne-Bannister E. Prioritarian principles for digital health in low resource settings. *J Med Ethics*. 2020;46:259-264.
28. Brall C, Schröder-Bäck P, Maeckelberghe E. Ethical aspects of digital health from a justice point of view. *Eu J Public Health*. 2019;29:18–22.

ELECTRONIC PATIENT RECORD

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ABSTRACT

The electronic patient record (EPR) is the centerpiece of digital healthcare and telematics infrastructure. Its purpose is to digitally bring together patient data that has so far been stored in various places, such as doctor's offices and hospitals.

This means that all medical information concerning a patient, such as findings, diagnoses, laboratory, imaging, therapeutic measures, treatment reports, medication plan and emergency data records can be available directly to their doctors, therapists and pharmacists.

The correct implementation of EPR will ensure that patients personalized treatments will be available at the right time, in the right place and in the best quality of healthcare delivery which will have as a result that the patients will recognize the added value of EPR. It improves information exchange between healthcare professionals, reduces duplicate testing and increases medication safety. Nevertheless there are challenges such as the risk of data leakage and reduced visual contact due to the use of technologies while providing care.

In Greece, the adoption of EPR has begun and many hospitals and clinics have started to implement electronic record systems. However, there are still important steps to be taken for full implementation and harmonization with European and international standards. The development of an integrated and interoperable EPR system can significantly contribute to improving the quality of healthcare in the country. It is a fact that it is a critical tool for the progress and upgrading of health services, offering significant benefits to patients and the health system.

An example of a successful EPR implementation is the Papageorgiou Hospital in Thessaloniki and we will show how it improves the quality of care and the efficiency of services.

In conclusion, the Electronic Patient Record (EPR) is a critical tool for the digitization of health services, significantly improving the management of medical data and the

quality of care provided. Instant access to medical information and effective treatment management contribute to patient safety and resource optimization. The EPR contributes to the direct flow of information and to the strengthening of transparency and efficiency in health services.

Key Words: electronic patient record (EPR), digital patient health data, patient files, digital access, data protection.

REFERENCES

- Abul-Husn, N. S., & Kenny, E. E. (2019). Personalized medicine and the power of electronic health records. *Cell*, 177(1), 58-69.
- Adeniyi, A. O., Arowoogun, J. O., Chidi, R., Okolo, C. A., & Babawarun, O. (2024). The impact of electronic health records on patient care and outcomes: A comprehensive review. *World Journal of Advanced Research and Reviews*, 21(2), 1446-1455.
- Anand, A. (2023). GDPR and Healthcare: Balancing Data Privacy and Access to Medical Information. *NUJS J. Regul. Stud.*, 8, 27.
- Baumann, L. A., Baker, J., & Elshaug, A. G. (2018). The impact of electronic health record systems on clinical documentation times: A systematic review. *Health policy*, 122(8), 827-836.
- Campanella, P., Lovato, E., Marone, C., Fallacara, L., Mancuso, A., Ricciardi, W., & Specchia, M. L. (2016). The impact of electronic health records on healthcare quality: a systematic review and meta-analysis. *The European Journal of Public Health*, 26(1), 60-64.
- Cowie, M. R., Blomster, J. I., Curtis, L. H., Duclaux, S., Ford, I., Fritz, F., ... & Zalewski, A. (2017). Electronic health records to facilitate clinical research. *Clinical Research in Cardiology*, 106, 1-9.
- Enahoro, Q. E., Ogugua, J. O., Anyanwu, E. C., Akomolafe, O., Odilibe, I. P., & Daraojimba, A. I. (2024). The impact of electronic health records on healthcare delivery and patient outcomes: A review. *World Journal of Advanced Research and Reviews*, 21(2), 451-460.
- Evans, R. S. (2016). Electronic health records: then, now, and in the future. *Yearbook of medical informatics*, 25(S 01), S48-S61.
- Gesulga, J. M., Berjame, A., Moquiala, K. S., & Galido, A. (2017). Barriers to electronic health record system implementation and information systems resources: a structured review. *Procedia Computer Science*, 124, 544-551.
- Huber, M. T., Highland, J. D., Krishnamoorthi, V. R., & Tang, J. W. Y. (2018). Utilizing the electronic health record to improve advance care planning: a systematic review. *American Journal of Hospice and Palliative Medicine®*, 35(3), 532-541.
- Greysen, S. R., Mendoza, Y. M., Rosenthal, J., Jacolbia, R., Rajkomar, A., Lee, H., & Auerbach, A. (2016). Using tablet computers to increase patient engagement with electronic personal health records: protocol for a prospective, randomized interventional study. *JMIR research protocols*, 5(3), e4672.
- Ministry of Finance. (2022). Decision to Incorporate the Project "National Electronic Health File" (OPS Code TA 5162372) of Action 16752 - Digital Transformation of the Health Sector. https://greece20.gov.gr/wp-content/uploads/2022/04/235.-Apofasi-entaksis-ergou_Ilektronikos-fakelos-Ygeias_16752_5162372.pdf [Accessed the 28th of August 2024, 23:35]

- Ministry of Health. (2021). National Strategy for Digital Health 2020-2025 <https://www.moh.gov.gr/articles/health/domes-kai-draseis-gia-thn-ygeia/ethnika-sxedia-drashs/8776-ethniko-sxedio-drashs-gia-th-dhmosia-ygeia-2021-2025> [Accessed the 28th of August 2024 , 21:45]
- Patel, V., & Johnson, C. (2018). Individuals’ use of online medical records and technology for health needs. *ONC Data Brief*, 40, 1-12.
- Stevenson, J. E., & Nilsson, G. (2012). Nurses’ perceptions of an electronic patient record from a patient safety perspective: a qualitative study. *Journal of advanced nursing*, 68(3), 667-676.
- Timmers, T., Janssen, L., Kool, R. B., & Kremer, J. A. (2020). Educating patients by providing timely information using smartphone and tablet apps: systematic review. *Journal of medical Internet research*, 22(4), e17342.
- Tsai, C. H., Eghdam, A., Davoody, N., Wright, G., Flowerday, S., & Koch, S. (2020). Effects of electronic health record implementation and barriers to adoption and use: a scoping review and qualitative analysis of the content. *Life*, 10(12), 327.
- Uslu, A. M., & Stausberg, J. (2008). Value of the electronic patient record: an analysis of the literature. *Journal of biomedical informatics*, 41(4), 675-682.
- Safran, C., & Goldberg, H. (2000). Electronic patient records and the impact of the Internet. *International journal of medical informatics*, 60(2), 77-83.
- Uslu, A., & Stausberg, J. (2021). Value of the electronic medical record for hospital care: update from the literature. *Journal of medical Internet research*, 23(12), e26323.
- Yadav, P., Steinbach, M., Kumar, V., & Simon, G. (2018). Mining electronic health records (EHRs) A survey. *ACM Computing Surveys (CSUR)*, 50(6), 1-40.

ELECTRONIC APPLICATIONS IN THE CONTEXT OF HEALTH SERVICES

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ABSTRACT

Introduction: Digital health and care refers to health tools and services that use electronic applications and Information Technologies to improve the prevention, diagnosis, treatment, monitoring and management of health-related issues. They are designed to improve health indicators by health users, using two-way communication tools to remotely monitor, store and forward medical data. Electronic Prescribing is described as individual elements of the Electronic Health Record, (VOUTSIDOU et al.2019), the applications and specialties of Telemedicine and Mobile Health, the Electronic Health Record, the Coding and Classification Standards of medical terms and the International Classification of Diseases.

Purpose: The purpose of this work is the study of modern Electronic Applications in health services. More specifically, a systematic review is made for their application not only in public health services but also in necessary cases that require personal or individual participation of the citizen, such as the case of teleconferencing and teleconsultation in the field of telemedicine. Secondly the article aims at the detailed approach of the benefits for each type of digital application as they work in the modern world (Menachemi and Collum,2011).

Methodology: The paper was prepared through a systematic and intensive bibliographic research and review. Articles from medical databases such as Medline, Science, Scopus, PubMed, National Library of Medicine as well as from the websites of the International Health Organizations and the Ministry of Health were used.

Results: Rapid digital and technological developments, combined with the digital maturation of the population at global and European level, have brought about significant changes in citizen’s expectations in relation to disease prevention and healthcare delivery.

Today, it has become clear that it is technologically possible to create a human-centered health care system with the patient, not the hospital, as the center of such a system, with immediate, documented and well-protected transmission of information.

Digital technologies have the potential to offer solutions to many of the challenges facing the global medical community, (Table 1), as well as increase the overall effectiveness and efficiency of the healthcare sector.

Table 1

The axes of the operating model of Electronic Health Record according to Health Level Seven (HL7)

Direct Care	DC.1	Management of care
	DC.2	Clinical decision support
	DC.3	Process management and communication
Supportive Operations	S.1	Clinical support
	S.2	Measurement, analysis, research and reporting
	S.3	Administrative and financial
Information Infrastructures	IN.1	Safety
	IN.2	Health record information and management
	IN.3	Registry and directory services
	IN.4	Standard Terminologies and Terminology Services
	IN.5	Standards-based interoperability
	IN.6	Business rules management
	IN.7	Workflow management

They can change and accelerate the technological transition, taking advantage of the impetus given to humanity by the COVID-19 pandemic (Arora et al.2021)

Conclusions: The need for the adoption of e-health solutions is internationally recognized. As the expansion of the provision of digitized health services increases and improves, the level of health of the citizens will proportionally improve and will be addressed to a larger part of the population.

Vulnerable population communities, such as the chronically ill, the elderly and citizens with mobility problems will be able to be served with equal access to health. The partnership of government departments, organizations and local bodies to connect networks, adopt and strengthen e-health activities will radically change the landscape of the current practice.

Planning to shape the digital future of Europe and all of humanity for health is a goal for global organizations and governments.

Keywords: Electronic Applications, Telemedicine, e-Health, Health Services, Covid-19 Pandemic, Electronic Health Record

REFERENCES

Arora, G., Joshi, J., Mandal, R.S., Shrivastava, N., Virmani, R., & Sethi, T. (2021). Artificial Intelligence in Surveillance, Diagnosis, Drug Discovery and Vaccine

Development against COVID-19. *Pathogens*, 10 (1048). doi:10.3390/pathogens10081048

Menachemi, & Collum, T.H. (2011). Benefits and drawbacks of electronic health record systems. *Risk Manag Healthc Policy*. 4: 47–55. doi: [10.2147/RMHP.S12985](https://doi.org/10.2147/RMHP.S12985)

VOUTSIDOU, E., MORAITIS, E., JELASTOPOULOU, A., SISSOURAS, G., & CHARALAMPOUS, G. (2019). Electronic health applications in primary medical health care: Advantages and expectations. *Archives of Hellenic Medicine*, 36(3):412–418

INVESTING IN DIGITAL INNOVATION AND DIGITAL TRANSFORMATION IN HEALTHCARE

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ABSTRACT

The global healthcare sector is undergoing a period of unprecedented change, driven by technological advances, demographic shifts and evolving patient needs. In 2024, several key trends will shape the future of healthcare (Commission services and Economic Policy Committee, 2016). Digital solutions, if well designed and implemented in a cost-effective way, have the potential to reduce health inequalities and improve the wellbeing of millions of citizens by radically changing the way health and care services are delivered to patients (European Commission, 2018). To date, the pace and scale of digital transformation in Europe has varied both within and between countries, with key challenges including complex health system structures, different funding models and multiple stakeholders with different views and expectations. This digital transformation will shape the future of healthcare.

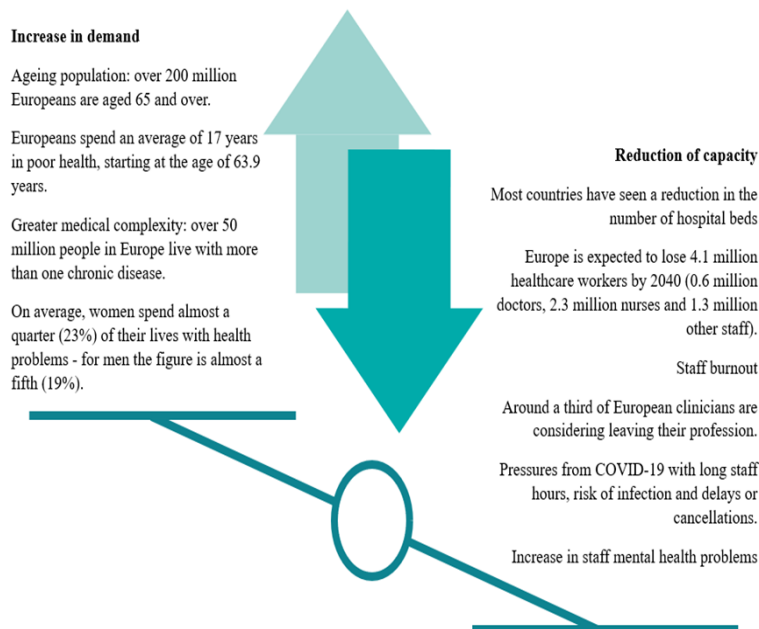


Figure 1. European health systems face increasing demands and are struggling to cope
The need for digital transformation

Healthcare systems across Europe are facing unprecedented pressures. While the quantity and quality of care has improved, the scale and complexity of needs have

increased due to an older and ageing population, growing multimorbidity and public expectations for personalised services.

While the European Union expects all citizens to have access to high quality healthcare at an affordable cost, countries differ in their capacity to provide services (e.g. number of doctors, nurses) and in the proportion of GDP spent on healthcare. Many clinicians are struggling to cope with increasing workloads and the gap between supply and demand for resources is widening.

Digital technologies can integrate care, identify and mitigate risk, predict and help manage population health needs, and improve the quality of data flow to deliver timely, effective and safe care. But digital transformation is not just about technology. It is about the management of change, enabled by technology, to improve the efficiency and effectiveness of service delivery and benefit patients and clinicians.

The European Commission noted that the uptake of digital solutions "remains slow and varies widely across Member States". It identified health data as a key enabler for digital transformation, but stressed that market fragmentation and lack of interoperability hinder an integrated approach to disease prevention, care and treatment. Its commitments included developing EU-wide data quality and security standards and giving patients access to their own interoperable electronic health record (EHR).

Benefits for patients:

- Enables patients to monitor and self-manage their health.
- Increases access to more timely and convenient care
- Improves medication management
- Improves patient experience
- Enables more proactive, and participatory care



Benefits for healthcare systems:

- Integration through greater interoperability and coordination of care channels.
- Improved economy, efficiency and effectiveness of systems and processes
- Enabling new models of care, such as value-based care and population health management

Benefits for clinicians:

- Supports clinical decision making
- Enables automation of repetitive tasks and improved classification
- Allows clinicians to work to the best of their ability
- Identifies and supports staff needs

Figure 2. Benefits of Digital Transformation

As digital technologies collect and analyse data at the patient level, privacy and security are paramount. In addition, if digital technologies are to help healthcare systems thrive, they should ideally meet the following SMART characteristics

Simple and easy to use

Measurable results

Flexible solutions

Easy to implement Simple and flexible solutions

Tailored to the needs of end users

The continued development of technologies that meet the SMART characteristics will be critical to the sustainability of health systems (Jean-Pierre Michel and Fiona Ecarnot, 2020).

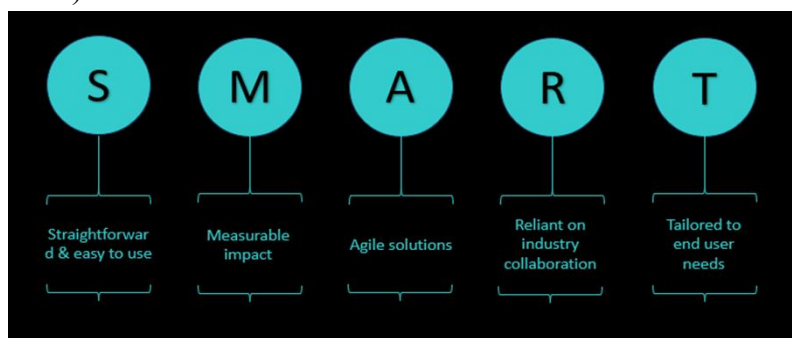


Figure 3. SMART characteristics required for the adoption of digital transformation

The future of medicine is expected to be transformed. By 2040, the way we monitor our health, seek medical advice and receive treatment will have changed dramatically (Jean-Pierre Michel and Fiona Ecarnot, 2020). . Changing the culture of organisations, especially risk-averse healthcare organisations, takes time. It is not something that takes one or three years, but a long-term change. The combination of cultural and technological changes required to drive digital healthcare means that change will not happen seamlessly or quickly (Karen Taylor, 2018). However, the imperative for today's healthcare systems struggling to adapt to a world of slowly growing budgets, rapidly increasing patient demands and data security policies creates a context and a need for change.

Key Words: healthcare, digital transformation, digital innovation

REFERENCES

- Commission services and Economic Policy Committee, (2016). Joint Report on Health Care and Long-Term Care Systems & Fiscal Sustainability. European Commission, October 07, 2016.
- European Commission, (2018). Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions.
- Jean-Pierre Michel and Fiona Ecarnot, (2020). “The shortage of skilled workers in Europe: its impact on geriatric medicine”. Springer Nature.
- Julio Torales (2020). “The outbreak of COVID-19 coronavirus and its impact on global mental health”. International Journal of Social Psychiatry - SAGE Publications.
- Karen Taylor, (2018). Medtech and the Internet of Medical Things: How connected medical devices are transforming health care. Deloitte.
- Taylor, Hinsch, and Sanghera, (2018). Time to care: Securing a future for the hospital workforce in Europe.

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HEALTH TRACKER APPS: A CASE STUDY OF USERS’ ABILITY TO SELF-MONITOR AND SELF-MANAGE THEIR PHYSICAL AND MENTAL HEALTH

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ABSTRACT

We explore new technologies everyday, which aim to improve our daily habits. Health tracker apps are a great example, since they claim to help their users keep track of their physical as well as their mental health. A number of studies have emphasized that the so-called e-health manifests itself in a variety of therapeutic domains (Sedrati et al., 2016). Applications as such are software that pertains to health knowledge and research and is utilized by patients and healthcare providers to enhance patient care and public health. Therefore, these apps turn a mobile platform into a medical one (Pires et al. 2020). It was discovered that app users engaged in more healthful behaviors and managed to become better at self-monitoring their habits and felt motivated and healthier compared to non-users (Sarcona et al., 2017). It is still under debate, with a number of studies suggesting that consumers’ engagement with digital self-monitoring is lacking, despite the rapidly growing number of health tracker apps for consumers to use for self-care (Anderson et al., 2016). There may be differences in the use of mobile technologies based on factors such as age, socioeconomic status, literacy level, and health. An individual’s motivation to adopt or continue healthy behaviors may be reflected in their use of health apps. People with chronic conditions, the elderly, and those with low health literacy should all have their needs taken into consideration by app developers and researchers (Ernsting et al. 2017). There has been an increased recognition that more attention needs to be paid to this area and to further explore whether the claims of these health tracker apps are considered beneficial and effective by their users. The main focus of this research is to investigate if these users are truly

developing an ability to self-monitor and self-manage their daily habits and specifically their physical and mental health. The methodological approach can be described as follows: Firstly, the theoretical framework is based on secondary data, scientific theories and studies. Secondly, the data for the primary research and the hypothesis testing is built on quantitative analysis (i.e. questionnaires). The survey is conducted in Thessaloniki, Greece and the questionnaire is designed in the form of closed-ended as well as multiple-choice questions, while the Likert scale was mostly used. The target group includes potential users who have experience monitoring their health habits with the help of health tracker apps. The software used for the data analysis is the SPSS program, which permits the incorporation of inferential statistical results. The findings on the above hypotheses at least hint that users of health tracker apps improve their ability to self-monitor and self-manage their daily habits and, most importantly, their physical as well as their mental health. It should be noted, that the results and conclusions of this research are still considered work in progress. Looking forward, further attempts could prove quite beneficial to the literature.

Key Words: e-health, health tracker apps, self-care, self-monitor, physical and mental health.

REFERENCES

- Anderson, K., Burford, O., & Emmerton, L. (2016). Mobile health apps to facilitate self-care: a qualitative study of user experiences. *PloS one*, 11(5), e0156164.
- Ernsting, C., Dombrowski, S. U., Oedekoven, M., Kanzler, M., Kuhlmeier, A., & Gellert, P. (2017). Using smartphones and health apps to change and manage health behaviors: a population-based survey. *Journal of medical Internet research*, 19(4), e101.
- Pires, I. M., Marques, G., Garcia, N. M., Flórez-Revuelta, F., Ponciano, V., & Oniani, S. (2020). A research on the classification and applicability of the mobile health applications. *Journal of personalized medicine*, 10(1), 11.
- Sarcona, A., Kovacs, L., Wright, J., & Williams, C. (2017). Differences in eating behavior, physical activity, and health-related lifestyle choices between users and nonusers of mobile health apps. *American Journal of Health Education*, 48(5), 298-305.
- Sedrati, H., Nejari, C., Chaqsare, S., & Ghazal, H. (2016). Mental and physical mobile health apps. *Procedia Computer Science*, 100, 900-906.

QUALITY ASSURANCE IN HEALTH UNITS

TOOLS MEASURING NURSES' COMMUNICATION SKILLS IN ONCOLOGY: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction: The benefits of effective communication in an oncology setting are multiple and include the overall well-being of patients and healthcare professionals, compliance with treatment regimens, psychological functioning and improved quality of life. Nevertheless, there are significant barriers and communication challenges reported by oncology nurses (Skär and Söderberg, 2018).

Aim: The aim of this systematic review is to document the measurement tools available in the international literature for nurses' communication skills in oncology, to evaluate their effectiveness and validity, and to identify any limitations of existing measurement tools in their application.

Methodology: This systematic review was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to search for measurement tools for nurses' communication skills using various databases such as Medline – PubMed and Scopus. The search terms are as follows: "nursing communication skills" AND "scales" OR "measurements" OR "tools" OR "inventory" AND "development" AND "validation" AND "oncology nurses". We included studies that met the following inclusion criteria (Figure 1):

- They involved nurses in oncology departments/clinics.
- They were written in English.
- There were no limitations in terms of study design and fieldwork conditions.
- Search period: from 2005 to 2024.

Figure 1

Inclusion and exclusion criteria for studies

Attribute	Inclusion criteria	Exclusion criteria
Language	English language	Other language
Time period	Studies published between January 2005 to July 2024	Studies published before January 2005 and after July 2024
Study population	Oncology nurses	Nurses in different departments, nurse students, other medical professions
Measurement tool	Tool measuring communication skills	Tool not measuring communication skills

Results: The systematic search strategy identified 10 studies that were deemed suitable for inclusion in this systematic review. Most studies were conducted in the USA (Dycus and McKeon, 2009; Banerjee et al., 2016; Wittenberg et al., 2019), while two studies were conducted in China (Liu et al., 2007; Geng et al., 2022). 1 study was conducted in Brazil (Dos Santos, Riner & Henriques, 2019), 1 in Israel (Emold et al., 2011), 1 in Korea (Soo Kim, Bae & Uhm, 2022), 1 in Japan (Mitsuyuki et al., 2024) and 1 in Egypt (Sahar and Hassan, 2018).

In this review, the included studies present Cronbach's α values of .80 to 0.98. whereas studies reporting the Correlation Coefficient had values $>.70$ (Figure 2). Therefore, their results are characterized as reliable. However, it should be noted that two studies included in the present review (Banerjee et al., 2016; Whittenberg et al., 2019), did not name the measurement tool used and did not report a reliability index. Therefore, the validity of the results of these two studies cannot be confirmed.

Figure 2

Studies included in this review and their Reliability indicators.

Authors, Year	Digital Object Identifier (DOI)	Reliability indicators
Banerjee et al. (2016)	https://doi.org/10.1016/j.nepr.2015.07.007	-
Dos Santos, Riner & Henriques (2019)	https://doi.org/10.1016/j.ijnss.2019.06.005	The Cronbach's a of the tool was 0.77. The Cronbach's a if each item was excluded ranged from 0,78 to 0,74, indicating consistency between items.
Dycus and McKeon (2009)	https://doi.org/10.1097/QMH.0b013e3181aea256	The correlation coefficient between QuISKA items was 0.839.
Emold et al. (2011)	https://doi.org/10.1016/j.ejon.2010.08.001	The subscale of emotional exhaustion was found to be efficient with a Cronbach's a of 0.86, as well as for the subscale of cynicism 0.80). However, the internal consistency of the self-realization subscale was 0.56.
Geng et al. (2022)	https://www.frontiersin.org/articles/10.3389/fsur.2022.842716	Nurses' clinical communication competence scale (NCCCS): the overall Cronbach's a coefficient was 0.978 and the Cronbach's a coefficient for each dimension was between 0.873 and 0.954. General Self-Efficacy Scale (GSES): the Cronbach's a of the scale was 0.87 and the test-retest reliability was 0.83. Questionnaire of satisfaction with nurses' communication education: Cronbach's a coefficient was 0.85 and test-retest reliability was 0.95.
Liu et al. (2007)	https://doi.org/10.1097/01.nnr.0000270030.82736.8c	The Nurses' Basic Communication Skills Scale (NBCSS):The content validity index (CVI) and reliability of the NBCSS in this study were 0.96 and 0.97, respectively. The Nurses' Self-Efficacy Ratings in Oncology Specified Scale Communication Tasks scale (NSROSCT): the CVI and reliability of the NSROSCT were 0.96 and 0.93, respectively. The Communication Outcomes Questionnaire (COQ): the reliability of the COQ was 0.97. The Nurses' Self-Perceived Support Scale (NSSS): the CVI and the reliability of the NSSS were 0.97 and 0.83, respectively.
Mitsuyuki et al. (2024)	https://doi.org/10.53044/jinr.2022-0041	Cronbach's a coefficient ($\alpha = .95$).
Sahar and Hassan (2018)	DOI: 10.9790/1959-0702017585	Checklists for communication skills = 0,966 Communication self-efficacy tool = 0,813
Soo Kim, Bae & Uhm (2022)	https://doi.org/10.1016/j.apjon.2021.12.016	Cronbach's a for the overall scale was 0.76 and the overall ICC was 0.81.
Wittenberg et al. (2019)	https://doi.org/10.1188/19.CJON.82-91	-

The results of this systematic review indicate that reliable tools exist to assess communication skills of oncology nurses. Nevertheless, however, due to the limitations observed in the studies included, it is deemed necessary to conduct studies in other oncology hospitals with a larger sample of nurses.

Conclusions: Oncology nurses face key barriers to communication in their workplace. The development, delivery and evaluation of communication skills training programs for oncology nurses is an essential requirement of modern medicine and a step towards helping nurses provide patient-centered and supportive care to patients and their families.

Key Words: communication skills, scales, tools, oncology nurses.

REFERENCES

- Banerjee, S. C., Manna, R., Coyle, N., Shen, M. J., Pehrson, C., Zaider, T., Hammonds, S., Krueger, C. A., Parker, P. A., & Bylund, C. L. (2016). Oncology nurses' communication challenges with patients and families: A qualitative study. *Nurse education in practice*, 16(1), 193–201.
- Dos Santos, F. C., Riner, M. E., & Henriques, S. H. (2019). Brazilian questionnaire of competencies of oncology nurses: Construction and test of content validation. *International journal of nursing sciences*, 6(3), 288–293.
- Dycus, P., & McKeon, L. (2009). Using QSEN to measure quality and safety knowledge, skills, and attitudes of experienced pediatric oncology nurses: an international study. *Quality management in health care*, 18(3), 202–208.
- Emold, C., Schneider, N., Meller, I., & Yagil, Y. (2011). Communication skills, working environment and burnout among oncology nurses. *European journal of oncology nursing: the official journal of European Oncology Nursing Society*, 15(4), 358–363.
- Geng, J., Liu, M., Zhang, H., Gao, J., Wang, L., Zhang, Y., Ma, F., & Liu, Y. (2022). Application of the Six-Step Standard Communication Process in the Communication Training for Newly Recruited Nurses in Cancer Specialist Hospitals. *Frontiers in surgery*, 9, 842716.
- Liu, J. E., Mok, E., Wong, T., Xue, L., & Xu, B. (2007). Evaluation of an integrated communication skills training program for nurses in cancer care in Beijing, China. *Nursing research*, 56(3), 202–209.
- Mitsuyuki, T., Ando, S., Sugimura, A., Maki, S., Sato, K. (2024). Developing a communication skills scale in the initial oncology nursing consultation after a cancer diagnosis in Japan. *JINR*, 3(1), e2022-0041.
- Sahar, M. & Hassan, M. (2018). Effectiveness of Communication Skills Training Program on Empathetic Skill and Communication Self Efficacy of Pediatric Oncology Nurses. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 7(2), 75-85.
- Skär, L., & Söderberg, S. (2018). Patients' complaints regarding healthcare encounters and communication. *Nursing open*, 5(2), 224–232.
- Soo Kim, M., Bae, E.J., Uhm, J.Y. (2022). Psychometric properties of the Korean version of ComOn coaching for oncology nurses. *Asia-Pacific Journal of Oncology Nursing*, 9 (2022), 210–216.
- Wittenberg, E., Goldsmith, J., Buller, H., Ragan, S.L., Ferrell, B.R. (2019). Communication Training: Needs Among Oncology Nurses Across the Cancer Continuum. *CJON* 2019, 23(1), 82-91.

INFORMATION NEEDS OF CANCER PATIENTS UNDERGOING RADIOTHERAPY

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ABSTRACT

Objective: Radiation therapy is one therapeutic option for cancer and it has useful aspects and impacts on health, although many patients are poorly informed of the application of radiotherapy (Jimenez et al. 2018: 2882). A lack of information and support for cancer treatment causes psychological distress to both patients and their families. The study aimed to determine cancer patients undergoing radiotherapy information needs.

Methods: We conducted a systematic search in three electronic databases (Medline, Scopus, and PubMed). We identified original studies that were published in English over the period 2017-2024. Criteria for inclusion in the study were: studies with patients with any stage or localization of histologically verified carcinoma, radiation treatment, no history of psychotic illness and/or dementia and any type of information sources. 2458 articles were retrieved and evaluated for title, abstract and full text and after eliminating duplicate and unrelated cases, and 16 studies related to the information needs of patients with breast cancer were finally reviewed.

Results: Based on these studies, the primary areas where information was most sought included diagnosis and treatment, daily activities, acceptance of the disease and self-perception, personal and family life, and sexual health (Sheikhtaheri et al. 2020: 213). The leading information needs related to diagnosis and treatment were focused on treatment outcomes and side effects. In terms of daily activities, individuals were most concerned with the disease's impact on social interactions. For disease acceptance and self-perception, key concerns included breast reconstruction, body image, and the necessity for consultation (Sheikhtaheri et al. 2020: 213). Regarding personal life, the risk of cancer for family members was a prominent need, while in the realm of sexual health, the effect of cancer on sexual attractiveness was most frequently highlighted (Sheikhtaheri et al. 2020: 213). The most commonly used information sources for cancer patients are health professionals and printed material (Savage et al., 2017: 197). Additionally, cancer patients indicated that one-on-one sessions with radiation therapists would be beneficial for receiving additional information (Savage et al. 2017:

197). However, the rise of information technology has played a significant role in disseminating shared knowledge and is a key factor driving educational reforms (Haleem et al. 2022, 276). The integration of technology-enhanced learning resources, including mobile devices, interactive whiteboards, online courses (MOOCs), tablets, laptops, simulations, dynamic visualizations, and virtual labs, has transformed education in schools and other academic settings (Haleem et al. 2022: 276).

Conclusion: Patients’ needs for information are higher before their treatment planning appointment and before starting treatment. The evidence indicates that cancer patients want to understand and be well informed about treatment in order to be part of decision-making process. Further studies should address ways to improve cancer patients' understanding of radiotherapy.

Keywords: cancer patients, radiotherapy, information needs

REFERENCES

- Haleem, A., Javaid, M., Qadri, M.A. and Suman, M. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3: 275-285.
- Jimenez, Y.A., Cumming, S., Wang, W., Stuart, K., Thwaites, D.I. and Lewis, S.J. (2018). Patient education using virtual reality increases knowledge and positive experience for breast cancer patients undergoing radiation therapy. *Supportive care in cancer: official journal of the Multinational Association of Supportive Care in Cancer*, 26(8), 2879–2888.
- Savage, K., Arif, S., Smoke, M., and Farrell, T. (2017). Preferences in Learning Styles and Modes of Information Delivery in Patients Receiving First-Day Education for Radiation Therapy. *Journal of medical imaging and radiation sciences*, 48(2), 193–198.
- Sheikhtaheri, A., Nahvijou, A. and Mashoof, E. (2020). Information Needs of Women with Breast Cancer: A Review of the Literature. *Frontiers in Health Informatics*, 9(1):213-228.

ATTITUDES AND OPINIONS OF THE THIRD AGE REGARDING MEDICAL TOURISM IN THE EPIRUS REGION.

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ABSTRACT

The following study concerns the examination of the attitudes and opinions of people of the third age regarding the medical tourism offered in a region of Greece, Epirus. The purpose of the study is the bibliographic review around the theoretical framework and the recording of primary data for the attitude and opinions of people of the third age about medical tourism in Epirus.

According to the World Tourism Organization, tourism is an industry that includes the activities of people who travel and stay in places for vacation, recreation, learning, work or other reasons (Manzoor et al. 2019). The elderly are a significant segment of the tourism industry, spending nearly \$11 billion on travel-related leisure activities, representing nearly 52% of their total annual spending (Sie et al. 2021). Tourism of third age, also known as senior tourism, refers to tourism aimed at people in their third or advanced age, usually over 65 years of age. This form of tourism has grown significantly the last decades (Dann, 2002).

Medical tourism is considered as one of the tourism dimensions and can contribute to the stable and dynamic development of a country's economy. Since it is a cost-effective industry, most developing countries have focused on it and plan to develop it (Ghanbari et al. 2014). Using marketing can help tourism businesses reach and engage with older travelers more effectively, ultimately leading to increased bookings and revenue (José et al. 2022).

An online survey was carried out in hotels of Epirus sending the questionnaires to their customers who belong to this category. The selected hotels are located in the capitals of all the Regional Units of the Epirus Region. The sample was 200 people. From the data of the research, it emerged that the tourists of the third age who took part in the research were mainly men, aged 56-60 years, married, University / ATEI graduated, who live in Central Macedonia and stay for tourism purposes in Ioannina and in Igoumenitsa. Regarding the 1st research question, the tourists claimed that they like to travel to other places mainly for the gastronomy, the sights, the culture, the natural environment. They travel for adventure, exploration and social interaction of the destination, but not for physical exercise.

Regarding the 2st research question, they have traveled a few times to the Region of Epirus to undergo complex surgeries or specialized treatments, treatments for multi-specialty problems or cancer treatments in specialized centers. However, respiratory health problems, cost, waiting time, change of environment, immediate solution to acute and/or chronic problems are factors that largely motivate them to travel to Epirus Region for medical purposes. Regarding the 3st research question, both men and women consider it necessary to have accommodation facilities for patients and their attendants, medical staff must be qualified, certified and experienced in providing medical care. There must be a clear regulatory framework regulating the medical tourism sector and protects patients and the quality of medical care. Services such as language support are crucial.

Key Words: tourism, third age, medical tourism, attitude, opinions.

REFERENCES

- Dann, G. (2002). Senior Tourism and Quality of Life. *Journal of Hospitality & Leisure Marketing*, 9 (1- 2):5-19.
- Ghanbari, A., Moradlub, K.Z. & Ramazani, M. (2014). Medical tourism. *Management Science Letters*, 4: 1651–1654.
- José, M. T., Osvaldo, S., Licínio, T., Luís, S., Ferreira Joaquim, A. & Ferreira, J. A. (2022). PERMA model of well-being applied to Portuguese senior tourists: A confirmatory factor analysis. *Sustainability*, 14(13): 7538.
- Manzoor, F., Wei, L., Asif, M., Haq, M. & Rehman, H. (2019). The Contribution of Sustainable Tourism to Economic Growth and Employment in Pakistan. *International Journal Environmental Research and Public Health*, 16(19).
- Sie, L., Pegg, S. & Phelan, K.V. (2021). Senior tourists’ self-determined motivations, tour preferences, memorable experiences and subjective well-being: An integrative hierarchical model. *Journal of Hospitality and Tourism Management*, 47.

TOWARDS SUSTAINABLE DIGITAL HEALTHCARE CRITICAL INFRASTRUCTURE: RESILIENCE AND REDUNDANCIES

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ABSTRACT

Information and Communication Technologies (ICT) play a major role in Health Management promoting not only productivity and accessibility but also quality of provided services and creating a safe environment to patients (Gomes and Romão, 2020). Due to the dynamic nature of digital transformation and the increased demands during health crisis, health sector is led to improve existing systems/subsystems and adapt new technologies into its operations, such as mHealth, telemedicine, teleconsultation, robotics, Internet of Medical Things (IoMT) and Artificial Intelligence (AI) (El-Sherif et al., 2022; Haldane et al., 2021; Shen et al., 2021; Wallis et al., 2017). The continuous assessment of digital systems' resilience is necessary to ensure ICT continuous ability to provide uninterrupted critical operations without affecting patient's life (Haldane et al., 2021). Increased degree of resilience shows a system's ability to withstand potential disruptions and to maintain or restore its functionality and performance (Aven, 2017; Haimés, 2009). Achieving sustainable digital transformation requires a high level of resilience resulting from the organizations developing transformative, adaptive, and absorbent capacities (Garcia-Perez et al., 2023). Since 2017, when 48 UK hospitals were attacked by the WannaCry cyber-attack, many digital system vulnerabilities have been identified (Boddy et al., 2017; Garcia-Perez et al., 2023). However, the diversity of information systems and the need to interoperate remain key distinguishing factors for digital healthcare systems. Developments in technologies and applications used in healthcare change the dynamic of healthcare digital environment and highlight the need to manage cybersecurity in a balanced way

to overcome every situation that can lead digital infrastructure to uncertainty (Garcia-Perez et al., 2023). As covid-19 pandemic showed up, the vulnerability of digital infrastructure constituted healthcare infrastructure as critical and gave prominence to the need for cybersecurity strategies (Mottahedi et al., 2021b). To schedule optimal system resilience management, weaknesses of digital systems and protective practices and redundancies should be identified to effectively address all emerging challenges (Mottahedi et al., 2021a).

As new technologies are continuously integrated in the context of digital transformation, this paper aims to indicate critical digital system failures and identify practices that optimize resilience and promote sustainability through (i) mapping practices and redundancies applied in public hospitals' healthcare systems and (ii) identifying the employees' abilities to acquire absorptive capacities and act appropriately to ensure the integrity and increase the reliability of the hospital's digital infrastructure. To this end and to achieve a holistic understanding of the steps done towards resilience, a qualitative research was performed. The research included experiences from 6 public hospitals. Besides, stakeholders' participation can bring out valuable knowledge and perspectives both for identifying vulnerabilities and for formulating effective solutions (de Claro, 2023). The interviews included discussion about all digital healthcare critical infrastructure whose operation should be uninterrupted to ensure that patient's life is not affected, such as (i) Hospital Information System (HIS) and Electronic Medical Record (EMR) (ii) subsystems related to the provision of healthcare and support of healthcare professionals' decision-making, which are the Laboratory Information System (LIS), the Picture Archiving and Communication System (PACS) and the Radiology Information System (RIS) and (iii) e-orders, related to clinical orders (referral for medical examinations), e-prescription and orders.

According to the interviews, public hospitals have no records of infrastructure failures and disruptions. Although several parameters can easily be estimated by experts, like the rate of client workstation failures, more complex records are not available, highlighting the difficulty of assessing resilience. Experiences emerged that a subsystem's integration into a healthcare entity poses risks to interoperability with existing systems. The organization's size is crucial for the number and size of redundancies that allow recovery in an acceptable time for patient's health. Even though the resilience culture has been adopted, the absence of records on the incidence of some failures and the lack of mapping of restorations' duration are significant problems for monitoring the degree of resilience. This can become a procedural problem in dealing with major incidents. To achieve resilience, integrating operational frameworks, periodic risk assessments, and integration plans are highly required. Finally, diversity in the functionality of critical subsystems highlighted the need for further investigation of digital healthcare systems' resilience, especially in the interoperability and integration of services.

Key Words: Critical infrastructure, healthcare IT systems, healthcare services, information technology, resilience, sustainability

REFERENCES

- Aven, T. (2017). How some types of risk assessments can support resilience analysis and management. *Reliability Engineering & System Safety*, 167:536-543.
- Boddy, A., Hurst, W., Mackay, M., and Rhalibi, A. E. (2017). A study into data analysis and visualisation to increase the cyber-resilience of healthcare infrastructures. *Proceedings of the 1st International Conference on Internet of Things and Machine Learning*, 1-7.
- de Claro, V. (2023). Reframing health systems resilience: A necessary step towards transformative action. *BMJ Global Health*, 8(7):e013233.
- El-Sherif, D. M., Abouzid, M., Elzarif, M. T., Ahmed, A. A., Albakri, A., and Alshehri, M. M. (2022). Telehealth and Artificial Intelligence Insights into Healthcare during the COVID-19 Pandemic. *Healthcare*, 10(2): 385(1-15).
- Garcia-Perez, A., Cegarra-Navarro, J. G., Sallos, M. P., Martinez-Caro, E., and Chinnaswamy, A. (2023). Resilience in healthcare systems: Cyber security and digital transformation. *Technovation*, 121:102583.
- Gomes, J., and Romão, M. (2020). Information and Communication Technologies in the Healthcare: Future Trends for Project Success. In I. R. Management Association (Ed.), *Data Analytics in Medicine* (pp. 2018–2032). IGI Global.
- Haimes, Y. Y. (2009). On the Definition of Resilience in Systems. *Risk Analysis*, 29(4):498–501.
- Haldane, V., De Foo, C., Abdalla, S. M., Jung, A.-S., Tan, M., Wu, S., Chua, A., Verma, M., Shrestha, P., Singh, S., Perez, T., Tan, S. M., Bartos, M., Mabuchi, S., Bonk, M., McNab, C., Werner, G. K., Panjabi, R., Nordström, A., and Legido-Quigley, H. (2021). Health systems resilience in managing the COVID-19 pandemic: Lessons from 28 countries. *Nature Medicine*, 27(6):964–980.
- Mottahedi, A., Sereshki, F., Ataei, M., Qarahasanlou, A. N., and Barabadi, A. (2021a). Resilience estimation of critical infrastructure systems: Application of expert judgment. *Reliability Engineering & System Safety*, 215:107849.
- Mottahedi, A., Sereshki, F., Ataei, M., Qarahasanlou, A. N., and Barabadi, A. (2021b). The Resilience of Critical Infrastructure Systems: A Systematic Literature Review. *Energies*, 14(6):1571.
- Shen, Y.-T., Chen, L., Yue, W.-W., and Xu, H.-X. (2021). Digital Technology-Based Telemedicine for the COVID-19 Pandemic. *Frontiers in Medicine*, 8: 646506.
- Wallis, L., Blessing, P., Dalwai, M., and Shin, S. D. (2017). Integrating mHealth at point of care in low- and middle-income settings: The system perspective. *Global Health Action*, 10(sup3), 1327686.

THE IMPACT OF INTERNAL AUDITS ON UPGRADING INFORMATION SYSTEMS IN GREEK PUBLIC HOSPITALS: ADDRESSING CORRUPTION AND TECHNOLOGICAL DEFICIENCIES

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ABSTRACT

Corruption and mismanagement are at the center of discussions regarding public hospitals in Greece. With the 4025/2011 Greek legislative ordinance, internal audit was instituted with the aim of minimizing these phenomena and ensuring better quality health services. The purpose of our study is to demonstrate that internal audit contributes to the maximum extent to the upgrading of the existing information systems of Greek hospitals.

For the preparation of this study, a database of results from recent internal audits (2022-2023) of a representative sample of 48 out of 131 secondary hospital structures in the country's health regions was used. Particular emphasis was placed on evaluating and auditing the processes of independent departments such as IT, accounting, and control mechanisms – security safeguards across the entire IT infrastructure of the hospital services. From the results of the survey, malfunctions and lack of security in the operation of the information systems of hospitals were found in a large part of our sample, along with insufficient use of medical and informatics technologies. Specifically, in 24.7% of the hospital structures in the sample, cases were observed where either no IT application existed or it was not adequately utilized by hospital staff. Furthermore, some other problems hospital structures identified regarding the interconnection/interoperability of the information systems were related to the inability of certain clinics to announce electronically the patient to their insurance provider, failure to adhere to electronic referrals and lack of updates to the National Insurance Capability Registry. In 19% of hospital structures, there were no safeguards for network protection and equipment, such as address security controls, nor were there access-level classifications to the internet based on the employee's position, aimed at ensuring overall process security.

The new developments in hospital administration highlight the significant role of technology, leading to a redefinition of their goals and revealing dysfunctions that

contribute to mismanagement, corruption, and resource waste. However, as the study results have shown, a large part of the studied hospital structures are at a moderate level of information system organization, not meeting the requirements expected of a modern Health Unit within the Information Society. Underfunding and poor administration of hospitals actively contribute to an unfavorable framework for the implementation of reform proposals in key areas such as information systems. Given the circumstances and the institutionalization of internal audit, the provision of services in several cases has been upgraded, enhancing the operation of information systems. In this way, appropriate guarantees are provided to hospital staff for the exercise of good governance.

Key Words: internal audit, public hospitals, health information systems, National Health System.

REFERENCES

- Antonoglou, D. & Rontos, K. (2024). Study of spatial unequal distribution of infrastructure - health services in Greece for cancer patients. *Universal Journal of Public Health*:12(3).
- Apostolakis, I. & Avouris-Kalamas, D. (2013). Information Infrastructure Management Framework in health units. *Journal of Medicine*, 102(1): 48-59.
- Aggelinos, G. & Katsikas, S.K. (2013). *The security of Information Systems in Greek Hospitals*. TrustBuss: Springer – Verlag.
- Kalafati, M.N. (2003). Attitude of health professionals towards the implementation of Hospital Information Systems: PhD thesis, Interuniversity interdepartmental P.M.P. Health informatics, Department of Nursing, National & Kapodistrian University of Athens, Athens.
- Karastamati, E. (2012). Security & Privacy in Health Information Systems: Diploma thesis, Technical and Economic Management & Security of Digital Systems (Direction: Security of Digital Systems), Department of Digital Systems, University Of Piraeus, Piraeus.
- Koutoupis, A.C. (2009). The effects of the institutional framework of Corporate Governance and Best Practices on the development of the Internal Control Systems of enterprises. The case of companies listed on the Athens Stock Exchange: PhD thesis, Department of Public Administration, Panteion University of Social & Political Sciences, Athens.
- Rodakos, H.P. (2015). Internal Audit Report: "Laiko" General Hospital of Athens (1st Y.PE. Attica). Mazars Greece: Athens, 10(11).
- Stamoulis, M.p., Cicrika, S., Chicrikas, S., Tsaklakidou, D. and Apostolakis I. (2009). Informatics in Greek public hospitals: its exploitation by hospital executives. Hellenic Statistical Institute, Athens.
- Vangelatos, A., Sarivuyukas, I. (2001). *Hospital Information System: necessary infrastructure in modern hospital*. Berlin/Heidelberg, Germany.
- Yavram, K. (March 2013). Study & implementation of remote electronic prescription application in a municipal Clinic: Diploma thesis, Department of Informatics & Telecommunications Engineering, University of Western Macedonia, Kozani.

QUALITY ASSURANCE IN HEALTH UNITS

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ABSTRACT

This dissertation is an attempt to study and investigate the quality of health services and job satisfaction rates of childbirth assistants. Literature review, quantitative research using questionnaires, research and study over related study cases aim at enlightening the beliefs and viewpoints of midwives. Through data analysis the extent of job satisfaction is explored. The connection between job satisfaction and quality of provided services has been found, according to a number of studies, to be closely related to an increase in both efficiency and productivity.

Exploring the beliefs and convictions of childbirth assistants has shown that the former are connected to their job satisfaction. 172 midwives working in both public and private obstetric/gynaecological centres in Greece, took part in the research.

Data collection was conducted using questionnaires created on Google Forms, based on the form of SERVQUAL scale. The questionnaires were distributed online and uploaded on midwives' associations and internet groups of scientific nature. 174 questionnaires were answered (2 of which were excluded since they were answered by students). Data analysis was conducted through descriptive statistical analysis.

The study of midwives' beliefs showed that Security, Tangibles and Reliability are highly rated while Empathy and Responsiveness are of lower importance.

Childbirth assistants have been found to have a positive attitude towards Reliability and Responsiveness in the first place, Equipment and Empathy following. Security was in deficit.

Therefore, there is a deficiency in terms of Security regarding the perceived quality. There is also a considerable shortage in hospital equipment which is not up-to-date and facilities which are not attractive. Also, when it comes to reliability and service provision, midwives' dissatisfaction is stated.

The lack of job satisfaction in these fields is a stimulus for both health system policy makers and managing executive members of medical institutions so that strategies which are aimed at the adequate recruitment of childbirth assistant units and the ongoing training of the personnel, are applied. The creation of a supportive network and the appointment of a “mentor” expanding the trainer's role, would be of great help.

REFERENCES

- Abby Ghobadian, Simon Speller, Matthew Jones, (1994) "Service Quality: Concepts and Models", *International Journal of Quality & Reliability Management*, Vol. 11 Issue: 9, pp.43-66, <https://doi.org/10.1108/02656719410074297>
- Alnuaimi, K., Ali, R., & Al-Younis, N. (2020). Job satisfaction, work environment and intent to stay of Jordanian midwives. *International Nursing Review*, 67(3), 403-410.
- Australia, H. (2012). *Health Workforce 2025: Doctors, Nurses, and Midwives*. Health Workforce Australia.

- Babakus, E., and Mangold, W. G. (1992). Adapting the SERVQUAL scale to hospital services: an empirical investigation. *Health services research*, 26(6), 767.
- Bekru, E. T., Cherie, A., & Anjulo, A. A. (2017). Job satisfaction and determinant factors among midwives working at health facilities in Addis Ababa city, Ethiopia. *PloS one*, 12(2), e0172397.
- Boshoff, C., & Gray, B. (2004). The relationships between service quality, customer satisfaction and buying intentions in the private hospital industry. *South African journal of business management*, 35(4), 27-37.
- Cronie, D., Perdok, H., Verhoeven, C., Jans, S., Hermus, M., De Vries, R., & Rijnders, M. (2019). Are midwives in the Netherlands satisfied with their jobs? A systematic examination of satisfaction levels among hospital and primary-care midwives in the Netherlands. *BMC health services research*, 19(1), 1-10.
- Donabedian, A. (1988). Quality assessment and assurance: unity of purpose, diversity of means. *Inquiry*, 173-192.
- Donabedian, A. (1988). The quality of care: how can it be assessed?. *Jama*, 260(12), 1743-1748.
- Dror, S. (2007). Deployment of service quality characteristics. *International Journal of Human and Social Sciences*, 1(1), 31-34.
- Eurostat. Health personnel by NUTS 2 regions : medical doctors; nurses and midwives. 2020.
- Juran, J. M. (2003). *Juran on leadership for quality*. Simon and Schuster 0.1111/jmwh.12516.
- Jarosova D, Gurkova E, Ziakova K, Nedvedova D, Palese A, Godeas G, Chan SW, Song MS, Lee J, Cordeiro R, Babiarczyk B, Frasn M. (2017) [Job Satisfaction and Subjective Well-Being Among Midwives: Analysis of a Multinational Cross-Sectional Survey](#). *J Midwifery Womens Health*. 2017 Mar;62(2):180-189. doi: 10.1111/jmwh.12516.
- Khavayet, F., Tahery, N., AlizadehAhvazi, M. & Tabnak, A. (2018) A survey of job satisfaction among Midwives working in hospitals. *Journal of Midwifery and Reproductive Health*, 6 (1), 1186-1192. <https://doi.org/10.22038/JMRH.2017.9943>.
- Kreitner R, Kinichi A, Buelens M (1999). *Organizational Behaviour*,“ McGraw-Hill, Higher Education, First European edition, p.118
- NANTSUPAWAT A., KUNAVIKTIKUL W., NANTSUPAWAT R., WICHAIKHUM O.-A., THIENTHONG H. & POGHOSYAN L. (2017) Effects of nurse work environment on job dissatisfaction, burnout, intention to leave. *International Nursing Review* 64, 91–98
- Papoutsis, D., Labiris, G., & Niakas, D. (2014). Midwives' job satisfaction and its main determinants: A survey of midwifery practice in Greece. *British Journal of Midwifery*, 22(7), 480-486.
- Parasuraman 1988 <file:///C:/Users/pante/Downloads/PZBSERVQUALJR88.pdf>
- Sato K, Adachi K (2013) Occupational stress experienced by Japanese midwives. *Br J Midwifery* 21(11): 801–6
- World Health Organization (2016) *Global Health Workforce Statistics*. Available at: <https://data.worldbank.org/indicator/SH.MED.NUMW.P3> (Accessed 2 December 2019)
- Zangaro, G. A., & Soeken, K. L. (2007). A meta-analysis of studies of nurses' job satisfaction. *Research in nursing & health*, 30(4), 445-458.

Κωσταγιόλας, Π., Καϊτελίδου, Δ., Χατζοπούλου, Μ. (2008). Βελτιώνοντας την ποιότητα στις υπηρεσίες υγείας.

<https://www.who.int/news/item/28-05-2021-update-from-the-seventy-fourth-world-health-assembly-28-may-2021>

https://www.academia.edu/1441291/A_service_quality_model_and_its_marketing_implications

THE ROLE OF DAILY CLINICAL PRACTICE INDICATORS IN HEALTHCARE QUALITY IMPROVEMENT

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ABSTRACT

Introduction In the light of the continuous technological development as well as the internationalization of markets, management systems with emphasis on quality of the services provided are becoming more and more popular in the health sector (Báo et al., 2019).

Health Quality Assessment & Quality Indicators Evaluation models must be adaptable to each healthcare unit's unique needs. Quality indicators provide the tools necessary to assess, monitor, and develop healthcare services (Quentin et al., 2019). When collected through electronic systems in daily clinical practice, these indicators enable detailed analyses across multiple areas, including patient care, staff management, and administration (Sun et al., 2020).. Their comprehensive use supports informed decision-making that leads to enhanced healthcare quality, benefiting both patients and healthcare providers (Cinaroglu & Baser, 2018).

Retrospective Cohort Study This retrospective cohort study examined 842 patients hospitalized due to COVID-19 at Kastoria General Hospital from 01/11/2020 to 31/10/2022. The sample included 54.63% males, with a median age of 72 years. Data on patient demographics, length of hospital stay, and in-hospital mortality were obtained from the hospital's Electronic COVID-19 Patient Record. The median hospital stay was 4 days, with an in-hospital mortality rate of 9.14%. A strong correlation was found between the length of hospital stay and in-hospital mortality, suggesting that longer stays were associated with higher mortality rates.

Sample Characteristics Of the 842 patients included in the study, 54.63% were male, and 45.37% were female (Chart 1).

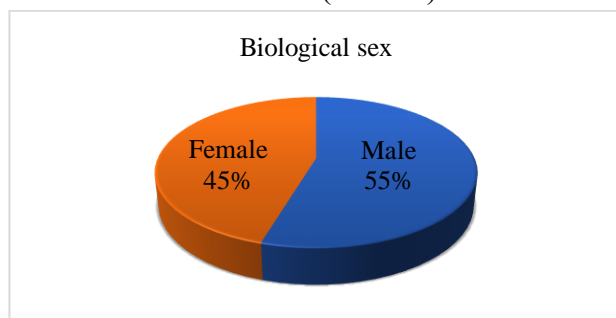


Chart 1. Sample percentages by biological sex.

Patient ages ranged from 17 to 97 years, with a median age of 72. The majority of patients (66.4%) were aged 65 or older, categorizing them as seniors according to standard age classifications. Interestingly, 3.4% of patients were aged 86, the highest proportion in any age group (Chart 2).

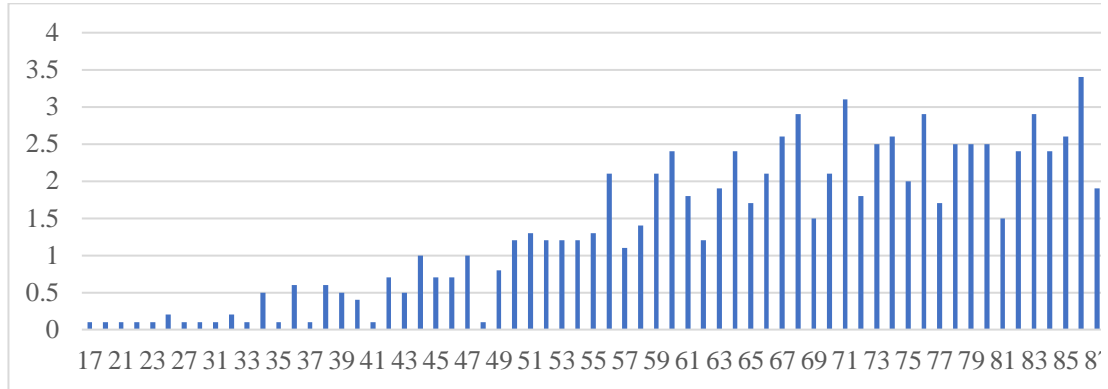


Chart 2. Percentage of patients by age

Length of Stay & In-Hospital Mortality: Hospital stays ranged from 1 to 32 days, with a median of 4 days and an average of 5.5 days. The most frequent length of stay was 4 days, reported in 21.6% of cases, followed by 3 days at 14.5% (Chart 3).

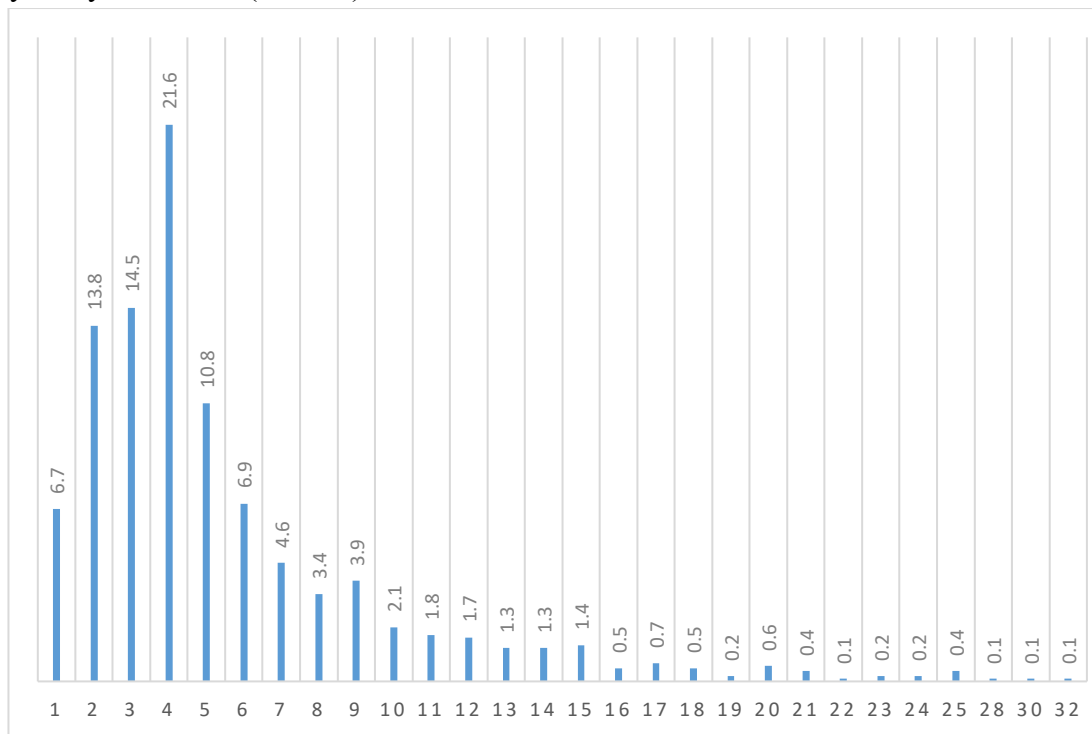


Chart 3. Percentage of patients per total number of hospitalization days until completion of hospitalization and discharge

The in-hospital mortality rate was 9.14%, representing 77 deaths (42 females and 35 males)

Notably, deaths were recorded only for those patients who passed away during their hospital stay in the COVID-19 ward, as the hospital lacked an Intensive Care Unit (ICU)

Correlations Among Variables Pearson correlation analysis identified several significant relationships between the variables. There was a positive correlation between gender and age ($r=0.109$, $p=0.002$) and between gender and days of hospitalization ($r=0.074$, $p=0.033$). Additionally, a strong positive correlation was observed between hospital days and in-hospital mortality ($r=0.289$, $p<0.01$), as well as between age and in-hospital mortality ($r=0.262$, $p<0.01$) (Chart 5).

		Gender	Death	Age	Days of hospitalization
Gender	Pearson Correlation	1	,058	,109**	,074*
	Sig. (2-tailed)		,090	,002	,033
	N	842	842	842	842
Death	Pearson Correlation	,058	1	,262**	,289**
	Sig. (2-tailed)	,090		,000	,000
	N	842	842	842	842
Age	Pearson Correlation	,109**	,262**	1	,173**
	Sig. (2-tailed)	,002	,000		,000
	N	842	842	842	842
Days of hospitalization	Pearson Correlation	,074*	,289**	,173**	1
	Sig. (2-tailed)	,033	,000	,000	
	N	842	842	842	842

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Chart 5. Chart of the correlation coefficient among the four variables. A value of 1 for the gender variable represents female gender, while a value of 1 for the in-hospital mortality variable represents deceased patients. Correlations significant at the 0.01 level are marked with a double asterisk **, while correlations significant at the 0.05 level are marked with a single asterisk *.

There are several factors regarding structure and processes that could affect the correlation between in-hospital mortality and length of stay such as nursing staff, equipment, and pharmaceutical treatments. Nosocomial infections also played a role, increasing hospital stays and mortality rates (EODY, 2019). Age was found to be a major factor in both mortality and hospital stay length, with older patients, especially those with comorbidities, showing a higher risk. Gender also influenced hospital stay, though less significantly.

Conclusions In an era of increasing demands on healthcare systems, quality indicators used in daily clinical practice serve as reliable tools for advancing patient-centered care. These indicators provide a framework for developing and implementing comprehensive, quality-focused management models tailored to the needs of individual healthcare facilities (Courtright et al., 2019). By doing so, they contribute to improved patient outcomes and the overall effectiveness of healthcare services.

Key Words: Quality of Healthcare, Clinical Indicators, Length of stay, Intrahospital mortality

REFERENCES

- Báo, A. C. P., Amestoy, S. C., Moura, G. M. S. S. de, & Trindade, L. de L. (2019). Quality indicators: Tools for the management of best practices in Health. *Revista Brasileira de Enfermagem*, 72, 360–366. <https://doi.org/10.1590/0034-7167-2018-0479>
- Cinaroglu, S., & Baser, O. (2018). Understanding the relationship between effectiveness and outcome indicators to improve quality in healthcare. *Total Quality Management & Business Excellence*, 29(11–12), 1294–1311. <https://doi.org/10.1080/14783363.2016.1253467>
- Courtright, K. R., Chivers, C., Becker, M., Regli, S. H., Pepper, L. C., Draugelis, M. E., & O'Connor, N. R. (2019). Electronic Health Record Mortality Prediction Model for 68
- EODY (2019), Nosocomial infections <https://eody.gov.gr/disease/nosokomeiakes-loimoxeis/> [Accessed the 4th of December 2022, 18:00]
- Quentin, W., Partanen, V.-M., Brownwood, I., & Klazinga, N. (2019). Measuring healthcare quality. In *Improving healthcare quality in Europe: Characteristics, effectiveness and implementation of different strategies* [Internet]. European Observatory on Health Systems and Policies. <https://www.ncbi.nlm.nih.gov/books/NBK549260/>
- Sun, L., Song, F., Shi, N., Liu, F., Li, S., Li, P., Zhang, W., Jiang, X., Zhang, Y., Sun, L., Chen, X., & Shi, Y. (2020). Combination of four clinical indicators predicts the severe/critical symptom of patients infected COVID-19. *Journal of Clinical Virology*, 128, 104431. <https://doi.org/10.1016/j.jcv.2020.104431>

TECHNOLOGICAL INNOVATIONS FOR REINFORCING THE PERSONAL HEALTH RECORDS SECURITY

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ABSTRACT

Technological innovations have influenced people’s daily lives and especially the operations of the medical services. The digital transformation has brought about alterations in the health sector and offered users a more anthropocentric approach (Stoumpos et al, 2023). The digitalization of data in health has boosted the personal health record, which can include information such as medical history, examinations, treatments, and even diagnosis. This system induces easy access, distribution of medical information, and data security to the user to improve the quality of healthcare. However, some challenges that concern the protection of private life and trustworthiness still exist (Nazi K, 2021).

This survey aims to present various technological innovations that could reinforce security issues in the health personal records. The health information consist of sensitive data that need to be protected from unauthorized actions. In this particular research, a systemic literature review was realized, making use of search engines such us Google Scholar and Consensus in order to look for reliable and recent scientific articles that have been published at journals for the last years.

The use of blockchain technology can bring about modifications in the way that data is stored and handled. By utilizing blockchain in health personal records, information can be protected from undesirable access or tampering. Moreover, the interoperability among the systems is facilitated, and more secure channels for data exchange between the health departments and data centers are established (Leeming et al, 2019). Via blockchain, users allow only authorized individuals to have access to health personal records. Finally, the traceability of health data is improved, and the accuracy of information is reassured (Mamun et al, 2022). Another technological innovation that brings upon a lot of benefits to the security of personal health records is cloud computing. With the use of this specific technology, health data is saved in credible data centers. They provide vast storage capabilities and data retrieval and as a result, easy access exists anywhere with the use of the internet. Cloud computing provides advanced security solutions such as data encryption, mechanisms for detecting invasions, and automatic software deployment information (Li et al, 2013). The biometric analysis is another technological novelty that can ensure greater security in health personal records. This method identifies users through unique physical features such as face recognition, fingerprint scanning, voice, and iris recognition. These features are unique so they cannot be easily copied. By using this method, the personal health record is protected from unauthorized access to sensitive health data. In addition,

it ensures that the information will remain secure, as there is no need for access codes that can be leaked or even lost. Since identification is based on unique attributes, it is more difficult to falsify or intercept data from each personal health record (Bhaviskar P, 2023). By using the personal health record, users are allowed to have unlimited access to their health data and to be able to manage it. These innovations create a personal health record that is reliable and secure, intending to provide protection and develop a sense of trust in healthcare so that the healthcare system can be more efficient, and the users are offered high-quality services (Negro et al , 2021)

Keywords: personal health record, security, technological innovations, cloud computing, blockchain, biometric analysis

REFERENCES

- Bhaviskar, P. (2023). Patient Identification and Healthcare System. *INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT*. <https://doi.org/10.55041/ijrem27616>.
- Leeming, G., Cunningham, J., & Ainsworth, J. (2019). A Ledger of Me: Personalizing Healthcare Using Blockchain Technology. *Frontiers in Medicine*, 6. <https://doi.org/10.3389/fmed.2019.00171>.
- Li, M., Yu, S., Zheng, Y., Ren, K., & Lou, W. (2013). Scalable and Secure Sharing of Personal Health Records in Cloud Computing Using Attribute-Based Encryption. *IEEE Transactions on Parallel and Distributed Systems*, 24, 131-143. <https://doi.org/10.1109/TPDS.2012.97>.
- Mamun, A., Azam, S., & Gritti C. (2022). Blockchain-Based Electronic Health Records Management: A Comprehensive Review and Future Research Direction. *IEEE Access*, 10, 5768-5789. <https://doi.org/10.1109/ACCESS.2022.3141079>.
- Nazi, K. (2021). The Future of Personal Health Records and Patient Portals. *Medical Research Archives*. <https://doi.org/10.18103/mra.v9i12.2641>.
- Negro-Calduch, E., Azzopardi-Muscat, N., Krishnamurthy, R., & Novillo-Ortiz, D. (2021). Technological progress in electronic health record system optimization: Systematic review of systematic literature reviews. *International Journal of Medical Informatics*, 152. <https://doi.org/10.1016/j.ijmedinf.2021.104507>.
- Stoumpos, A., Kitsios, F., & Talias, M. (2023). Digital Transformation in Healthcare: Technology Acceptance and Its Applications. *International Journal of Environmental Research and Public Health*, 20. <https://doi.org/10.3390/ijerph20043407>.

FINANCIAL PERFORMANCE IN PUBLIC HEALTHCARE: DOES GENDER MATTER?

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ABSTRACT

This study aimed at both capturing the representation of women in the upper echelons of healthcare organizations and associating gender with financial performance. The theoretical background includes that a manager is not suitable for this position, if his/her organization has poor financial performance, given that the latter is deemed a key factor towards business success. As such, men and women (should) have equal chances to hold a managerial seat in case of equal performance. Additionally, performance may vary based on the managers' gender, since their decision-making style may be different and therefore would lead to different financial results.

The total population of Greek public hospitals was included in a quantitative approach, whereby financial performance was reflected by financial ratios and female representation was reflected by the CEO and CFO gender. Both types of data were retrieved from the Greek public hospitals' financial statements of 2022 as published on the website of the Greek Ministry of Health.

Findings partially confirmed the global situation of women's under-representation, since more than 3 out of 4 public hospitals were found to appoint a male CEO, while on the other hand approximately 7 out of 10 public hospitals appointed a female CFO. Nearly half of the examined hospitals applied a diversified management scheme including a male CEO combined with two female CFOs (senior and deputy). In this context, it seems like an apparent paradox not taking advantage of this large pool of female CFOs by promoting (obviously the best of) them to CEOs. This could be attributed to stereotypes combined with policy and governance factors, which either exclude women from upper management positions or even prevent them from pursuing CEO seats. Among these factors, payroll imbalances and disruption of work-life balance are underpinned. Moreover, findings on financial performance suggest that female CEOs significantly outperformed their male counterparts as regards liquidity ratios and accounts payable turnover, while female CFOs surpassed males in terms of inventory turnover. Contrariwise, male CFOs achieved higher profitability in general. The correlation analysis also suggested absolute gender homogeneity in favor of women: organizations seeking high performance in connection with inventory turnover ratio, accounts payable turnover ratio and cash ratio should appoint only women in CEO and CFO positions. But organizations seeking profitability should apply the triumvirate scheme (all males). At this point it is worth mentioning that income statements of these specific public entities have two particularities, the state subsidies and the earnings from previous fiscal years, both of which significantly affect

profitability. As a result profitability measures are rather inconsistent and irrelevant to managers’ decision-making style.

The overall conclusion of this study is that women do not “deserve” to be out of the upper echelons of healthcare organizations, since there is no evidence that the established gender inequality transpires exactly because males produce better financial results. Actually, women focus on those components of financial performance which are better aligned to the social role of public healthcare units. This is a clear message to policy makers to be the ones who break the so called “glass ceiling”.

Key Words: women’s representation, public hospitals, financial performance

REFERENCES

- Agostino, D., Saliterer, I. & Steccolini, I. (2022). Digitalization, accounting and accountability. A literature review and reflections on future research in public services. *Financial Accountability and Management*, 38(2): 152-176.
- ALobaid, A.M., Gosling, C.M., Khasawneh, E., McKenna, L. & Williams, B. (2020). Challenges faced by female healthcare professionals in the workforce: a scoping review. *Journal of Multidisciplinary Healthcare*, 13: 681-691.
- Belaounia, S., Tao, R. & Zhao, H. (2020). Gender equality's impact on female directors' efficacy: A multi-country study. *International Business Review*, 29(5): 101737.
- Boylan, J., Dacre, J. & Gordon, H. (2019). Addressing women's under-representation in medical leadership. *Lancet*, 393(10171): e14.
- Brahma, S., Nwafor, C. & Boateng, A. (2021). Board gender diversity and firm performance: the UK evidence. *International Journal of Finance & Economics*, 26(4): 5704–5719.
- Christopher, A.N., Nembhard, I.M., Wu, L., Yee, S., Sebastian, A., Charan, N. & Betchen, S. (2022). Association of women leaders in the C-suite with hospital performance. *BMJ Leader*, 6(4): 271-277.
- García, C. J. & Herrero, B. (2021). Female directors, capital structure, and financial distress. *Journal of Business Research*, 136: 592-601.
- Hu, Q., Bhuiyan, Md.B.U. & Houqe, M.N. (2024). CFO demographics and working capital management in China. *Journal of Emerging Market Finance*, 23(1): 56-82.
- Kalaitzi, S., Cheung, K.L., Hiligsmann, M., Babich, S. & Czabanowska, K. (2019). Exploring women healthcare leaders' perceptions on barriers to leadership in Greek context. *Frontiers in Public Health*, 7(68): 1-9.
- Karakolias, S. & Polyos, N. (2015). Application and assessment of a financial distress projection model in private general clinics. *Archives of Hellenic Medicine*, 32(4): 475-483.
- Mose, J.N. (2021). Representation of women in top executive positions in general medical-surgical hospitals in the United States. *Women’s Health Reports*, 2(1): 124-132.
- Nguyen, T.T.C., Le, A.T.H. & Nguyen, C.V. (2023). Internal factors affecting the financial performance of an organization’s business processes. *Business Process Management Journal*, 29(5): 1408-1435.
- OECD (2023). *Health at a Glance 2023: OECD Indicators*, OECD Publishing, Paris. <https://www.oecd.org/health/health-at-a-glance/> [Accessed the 29th of April 2024, 13:28]

- Saleh, M.W.A., Zaid, M.A.A., Shurafa, R., Maigoshi, Z.S., Mansour, M. & Zaid, A. (2021). Does board gender enhance Palestinian firm performance? The moderating role of corporate social responsibility. *Corporate Governance*, 21(4): 685-701.
- Schopohl, L., Urquhart, A. & Zhang, H. (2021). Female CFOs, leverage and the moderating role of board diversity and CEO power. *Journal of Corporate Finance*, 71(101858): 1-53.
- Shahzad, F., Hussain Baig, M., Rehman, I.U., Latif, F. & Sergi, B.S. (2020). What drives the impact of women directors on firm performance? Evidence from intellectual capital efficiency of US listed firms. *Journal of Intellectual Capital*, 21(4): 513-530.
- Zeng, S. & Wang, L. (2015). CEO gender and corporate cash holdings. Are female CEOs more conservative? *Asia-Pacific Journal of Accounting & Economics*, 22(4): 449-474.

PREPARATION AND MONITORING OF THE PUBLIC HOSPITAL BUDGET DURING THE FISCAL YEAR

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ABSTRACT

The budgets of public hospitals operating in Greece are designed and monitored under the supervision of the responsible departments of the Ministry of Health (MoH), based on its organizational chart. The purpose of this study was to report all the concepts and procedures involved until the final approval and monitoring of the specific administrative act. Data used for the preparation of this study mainly consist of the legislated Laws of the Greek state, the Presidential Decrees, Circulars of the Ministries of the General Government as well as their decisions, mainly during the last decade, as they have been posted on “Diavgeia”. The method used is the literature review of Jurisprudence mentioned above. First, the notion of the State Budget was developed, as it is the primary administrative act of an economic character of the general government, affecting the preparation of the budgets of all its entities. The concept of the Medium-term Fiscal Strategy Program (M.P.D.S.) is also analyzed, the compliance of which is binding within the framework of the country’s obligations as a member of the European Union. We also described the monitoring process undertaken by the financial department of a public hospital regarding its approved budget during the fiscal year, the reasons for which there is a need to reform it, and the steps that must be implemented to approve the amendment from the responsible department of the MoH. The overall result of our research was, on the one hand, the highlighting of the interaction between the state budget and a hospital budget of the National Health System (E.S.Y.) and on the other hand, the identification of the problems faced by the executives of the financial services, regarding the monitoring of the relevant budgets of the tertiary health sector. In conclusion, it is assumed from this research, that ethical dilemmas arise from the holders of positions of responsibility in the financial departments of the public hospitals, with regard to recommendations for decision-making by administrative bodies, with a view to the safety of patients, in the context of the correct observance of the budget. Moving towards comprehensive budgeting needs universal adoption of contemporary accounting standards and development of relevant expertise within

public health units. Additionally, the personnel provision of the financial services, in combination with the strengthening of the cognitive object to deal with the modern requirements in terms of information requested by the health authorities of the Central Government, is a condition for the general upgrading of the National Health system.

Key Words: Budgeting, Public accounting standards, Public hospitals, Reporting

REFERENCES

- Christiaens, J., Vanhee, C., Manes-Rossi, F., Aversano, N., & van Cauwenberge, P. (2015). The effect of IPSAS on reforming governmental financial reporting: an international comparison. *International Review of Administrative Sciences*, 81(1): 158-177.
- Columbano, C., Biondi, L. & Bracci, E. (2023). Properties of accrual accounts in public sector entities: Evidence from the Italian National Health Service. *Journal of Public Budgeting, Accounting & Financial Management*, 35(6): 240-261.
- Kane, N.M. & Magnus, S.A. (2001). The Medicare Cost Report and the limits of hospital accountability: Improving financial accounting data. *Journal of Health Politics, Policy and Law*, 26(1): 81-105.
- Lindaas, N.A., Anthun, K.S. & Magnussen, J. (2023). Budgeting in public hospital trusts: Surplus, optimism, and accuracy. *Financial Accountability & Management*, 39: 514-533.
- Απόφαση αρ. οικ. 2/84027/ΔΠΓΚ : «Αναμόρφωση των εγκεκριμένων αναλυτικών προϋπολογισμών των λοιπών φορέων Γενικής Κυβέρνησης, συμπεριλαμβανομένων και των ΑΔΑ που δεν ανήκουν στην Κεντρική Διοίκηση ως ειδικοί φορείς, πλην ΟΤΑ και φορέων του Κεφαλαίου Α' του ν.3429/2005. (ΦΕΚ Β' 5171/16.11.2018)
- Απόφαση 6056/08-02-2023, 4ης Υγειονομικής Περιφέρειας Μακεδονίας - Θράκης, «Κατανομή Ορίων Πιστώσεων Εσόδων - Εξόδων Προϋπολογισμού έτους 2023, Νοσοκομείων αρμοδιότητας της 4ης Υ.Π.Ε. Μακεδονίας και Θράκης», Α.Δ.Α: 9ΥΑΘΟΡ1Ο-75Β (Διαύγεια) .
- Εγκύκλιος Υπ. Οικονομικών 2/47972/0026/15-06-2018, «Οδηγίες για την τήρηση του Μητρώου Δεσμεύσεων».
- Εγκύκλιος Υπ. Οικονομικών 2/90725/0026/10-12-2018, «Προληπτικός έλεγχος δαπανών ΟΤΑ Α' βαθμού και ΝΠΙΔ από το Ελεγκτικό Συνέδριο».
- Ν.2362/1995, «Περί Δημοσίου Λογιστικού, ελέγχου των δαπανών του Κράτους και άλλες διατάξεις», (ΦΕΚ Α' 247/23.11.1995)
- Ν.3329/2005, «Εθνικό Σύστημα Υγείας και Κοινωνικής Αλληλεγγύης και λοιπές διατάξεις», (ΦΕΚ Α' 81/04.04.2005).
- Ν.4129/2013, «Κύρωση του Κώδικα Νόμων για το Ελεγκτικό Συνέδριο», (ΦΕΚ Α 52/28.2.2013)
- Ν.4052/2012, «Νόμος αρμοδιότητας Υπουργείων Υγείας και Κοινωνικής Αλληλεγγύης και Εργασίας και Κοινωνικής Ασφάλισης για εφαρμογή του νόμου «Έγκριση των Σχεδίων Συμβάσεων Χρηματοδοτικής Διευκόλυνσης μεταξύ του Ευρωπαϊκού Ταμείου Χρηματοπιστωτικής Σταθερότητας (Ε.Τ.Χ.Σ.), της Ελληνικής Δημοκρατίας και της Τράπεζας της Ελλάδος, του Σχεδίου του Μνημονίου Συνεννόησης μεταξύ της Ελληνικής Δημοκρατίας, της Ευρωπαϊκής Επιτροπής και της Τράπεζας της Ελλάδος και άλλες επείγουσες διατάξεις για τη μείωση του δημοσίου χρέους και τη διάσωση της εθνικής οικονομίας» και άλλες διατάξεις. (ΦΕΚ Α' 41/01.04.2012).

- N.4152/2013, «Επείγοντα μέτρα εφαρμογής των νόμων 4046/2012, 4093/2012 και 4127/2013» (ΦΕΚ Α'107/9.5.2013).
- N.4270/2014, «Αρχές δημοσιονομικής διαχείρισης και εποπτείας (ενσωμάτωση της Οδηγίας 2011/85/ΕΕ) - δημόσιο λογιστικό και άλλες διατάξεις» (ΦΕΚ Α' 143/28-6-2014)
- N.4771/2021, «Κύρωση: α) της από 11.12.2020 Σύμβασης Δωρεάς μεταξύ του Ελληνικού Δημοσίου, του Κοινωφελούς Ιδρύματος με την επωνυμία «Κοινωφελές Ίδρυμα Ιωάννη Σ. Λάτση (John S. Latsis Public Benefit Foundation)» και του Ν.Π.Δ.Δ. με την επωνυμία «Γενικό Νοσοκομείο Αθηνών “Γ. ΓΕΝΝΗΜΑΤΑΣ”» και β) της από 9.12.2020 Σύμβασης Δωρεάς μεταξύ του Ελληνικού Δημοσίου, της 4ης Υ.Πε. Μακεδονίας και Θράκης, του Αντικαρκινικού Νοσοκομείου Θεσσαλονίκης «Θεαγένειο», της Άννας Μαρίας Λουίζας Ιωάννη Λάτση και της Ελληνικής Αντικαρκινικής Εταιρείας και λοιπές διατάξεις του Υπουργείου Υγείας. (ΦΕΚ Α'16/01.02.2021)
- Π.Δ 80/2016, «Ανάληψη υποχρεώσεων από τους διατάκτες».(ΦΕΚ Α'145/05.08.2016)
- Π.Δ 146/2003, «Περί ορισμού του περιεχομένου και του χρόνου ενάρξεως της εφαρμογής του Κλαδικού Λογιστικού Σχεδίου Δημοσίων Μονάδων Υγείας». (ΦΕΚ Α'122/21.05.2003)
- Π.Δ 121/2017, «Οργανισμός του Υπουργείου Υγείας» (ΦΕΚ Α' 148/09.10.2017)

HUMAN RESOURCES AND HEALTHCARE: FLIPPED TEACHING PRACTICES FOCUSED ON SOCIALIZATION OF WORKERS IN HEALTHCARE UNITS

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ABSTRACT

This article examines the implementation of flipped learning in healthcare and its impact on employee socialization. The need for innovative training strategies becomes imperative due to the ever-changing demands in healthcare. Flipped learning, especially through online tools, is presented as an important change that improves the educational processes and professional development of employees.

Socialization of employees in healthcare facilities remains a critical factor in their professional development and organizational success. Transitioning to flipped learning models requires an understanding of the impact of this practice, both on interprofessional collaboration and on the quality of patient care. Employees report in initial clinical interviews that knowledge sharing through flipped learning improves collaboration and improves HRM (Human Resource Management) services.

The literature highlights the importance of flipped learning for the socialization of healthcare workers (McLaughlin et al., 2014). According to Zhang (2023), the use of online tools is drastically changing health education and providing opportunities to develop critical thinking and problem-solving skills (Zhang et al., 2023). Alshebami & Seraj (2022) also emphasize that the flipped classroom arouses interest because it can promote collaborative learning environments (Alshebami & Seraj, 2022).

The purpose of the study was to examine the impact of flipped learning on the process of socialization and professional development of employees in health units. In particular, the focus was on how this educational approach improves collaboration and knowledge management in healthcare (Shahmoradi et al., 2017) according to the SECI model. The knowledge creation model known as SECI (socialization, externalization, combination and internalization) was developed by Nonaka and Takeuchi (1995).

Research Questions:

How does flipped learning impact employee socialization?

What impact does flipped learning have on professional development and critical thinking skills?

How does flipped learning help improve collaboration and knowledge management between employees?

The study was conducted in a provincial health center in semi-mountainous Crete using repertory grid tools and George Kelly's decision-making methodology (Wheatley et al., 2020). The sample consisted of 22 employees who voluntarily participated in the flipped learning process. The research adopted this mixed approach to analyze

participants' experiences qualitatively and quantitatively. Employees participated in online sessions and flip-learning activities where they were asked to apply their knowledge to real-world problems. Data were collected through interviews and quantitative RGT questionnaires, highlighting participants' personal perceptions and experiences. This method was used to assess the impact of the intervention on collaboration, skill development and professional behavior.

Results showed that flipped learning significantly improved employee socialization and promoted a sense of community and collaboration. Additionally, participants reported an improvement in critical thinking and problem-solving skills, as well as a better understanding of the need for professional development and awareness. Knowledge management and organizational effectiveness also showed significant improvements and contributed to the overall quality of patient care.

Flipped learning is an effective tool for improving the exchange of experiential knowledge and promoting the professional development of employees. Applying these practices can usher in a new era of professional development and provide meaningful tools and strategies to address the challenges of today's HRM world.

Key Words: Flipped Classroom, SECI Model, HRM, Health Units

REFERENCES

- Alshebami, A. S., & Seraj, A. H. A. (2022). Investigating the Impact of Institutions on Small Business Creation Among Saudi Entrepreneurs. *Frontiers in Psychology*, 13, 897787. <https://doi.org/10.3389/fpsyg.2022.897787>
- McLaughlin, J. E., Roth, M. T., Glatt, D. M., Gharkholonarehe, N., Davidson, C. A., Griffin, L. M., Esserman, D. A., & Mumper, R. J. (2014). The flipped classroom: a course redesign to foster learning and engagement in a health professions school. *Academic Medicine: Journal of the Association of American Medical Colleges*, 89(2), 236–243. <https://doi.org/10.1097/ACM.000000000000086>
- Shahmoradi, L., Safadari, R., & Jimma, W. (2017). Knowledge Management Implementation and the Tools Utilized in Healthcare for Evidence-Based Decision Making: A Systematic Review. *Ethiopian Journal of Health Sciences*, 27(5), 541–558. <https://doi.org/10.4314/ejhs.v27i5.13>
- Wheatley, R., Winder, B., & Kuss, D. J. (2020). Using a visually adapted repertory grid technique (VARGT) with people who stalk. *Journal of Forensic Practice*, 22(2), 109–121. <https://doi.org/10.1108/jfp-10-2019-0048>
- Zhang, P., Li, X., Pan, Y., Zhai, H., & Li, T. (2023). Global trends and future directions in online learning for medical students during and after the COVID-19 pandemic: A bibliometric and visualization analysis. *Medicine*, 102(50), e35377. <https://doi.org/10.1097/MD.00000000000035377>

LEVERAGING E-HEALTH POLICIES TO COMBAT VACCINE HESITANCY: ENHANCING COMMUNICATION AND TRUST IN HEALTH KNOWLEDGE DISSEMINATION

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ABSTRACT

Vaccine hesitancy, identified by the World Health Organization (WHO) as one of the top ten global health threats, presents significant challenges to public health initiatives worldwide (Larson et al., 2011; Sabahelzain et al., 2020). The Internet serves as a network that disseminates both accurate and inaccurate information about vaccines, leading some parents to refuse or delay vaccinations based on what they find online (Garett & Young, 2021; Gori et al., 2023; Neff et al., 2021). The advent of digital health technologies offers novel opportunities to address these challenges through improved communication and dissemination of health knowledge (Turon et al., 2023). E-health policies, which encompass a wide range of digital tools and strategies, have the potential to enhance public trust and increase vaccine acceptance (Cacciatore, 2021). This review explores the impact of e-health policies on vaccine hesitancy and examines how these policies can be leveraged to improve health communication and knowledge dissemination.

This review aims to assess the effectiveness of e-health policies in mitigating vaccine hesitancy and to identify best practices for using digital health communication tools to enhance trust and knowledge dissemination among the public.

We conducted a bibliographic review of relevant articles published during the last five years in the English language. Sources were identified through the electronic databases of PubMed, Google Scholar, and Scopus, focusing on studies related to e-health policies, digital health communication, and vaccine hesitancy. 29 articles were included in this review. Key themes and findings were synthesized to provide insights into the current landscape and best practices for leveraging e-health tools to combat vaccine hesitancy. The review included examining various e-health platforms implemented in Greece, such as the Electronic Health Record (EHR) system, the myHealth app, and the electronic prescription system, to assess their impact on public health communication and vaccination rates.

The review of the literature revealed a consensus that comprehensive e-health policies, including mobile health applications, telemedicine consultations, and social media campaigns, significantly contribute to increasing vaccination rates. The studies reviewed indicated that e-health tools improve accessibility to accurate health information and facilitate personalized communication between healthcare providers and patients. Trust in vaccination information disseminated through digital channels endorsed by health authorities was found to be higher among the public. Key factors contributing to this trust included the credibility of the source, clarity of the information, and the interactive nature of the communication platforms.

The findings suggest that e-health policies play a crucial role in reducing vaccine hesitancy by enhancing the dissemination of trustworthy health information and facilitating effective communication between healthcare providers and the public (Fitzpatrick, 2023). The presence of e-health platforms in Greece, such as the Electronic Health Record (EHR) system, the myHealth app, and the electronic prescription system, exemplifies how digital health infrastructure can support public health goals (Voutsidou, 2021). To maximize the impact of these policies, it is essential to integrate them into broader public health strategies, ensuring that digital health tools are accessible, user-friendly, and culturally sensitive. Future research should focus on longitudinal studies to further assess the long-term effects of e-health interventions on vaccine uptake and public health outcomes. By leveraging the strengths of digital health technologies, policymakers, and health professionals can significantly improve public trust in vaccines and contribute to the overall success of vaccination programs.

Key Words: E-Health Policies, Vaccine Hesitancy, Health Communication, Trust, Digital Health, Public Health

REFERENCES:

- Cacciatore, M. A. (2021). Misinformation and public opinion of science and health: Approaches, findings, and future directions. *Proceedings of the National Academy of Sciences of the United States of America*, 118(15).
- Fitzpatrick, P. J. (2023). Improving health literacy using the power of digital communications to achieve better health outcomes for patients and practitioners. *Frontiers in Digital Health*, 5: 1–13.

- Garett, R., & Young, S. D. (2021). Online misinformation and vaccine hesitancy. *Translational Behavioral Medicine*, 11(12): 2194–2199.
- Gori, D., Capodici, A., La Fauci, G., Montalti, M., Salussolia, A., Soldà, G., Di Valerio, Z., Scognamiglio, F., Fantini, M. P., Leask, J., Larson, H. J., Profeti, S., Toth, F., & Lenzi, J. (2023). COVID-19 Vaccine Refusal and Delay among Adults in Italy: Evidence from the OBVIOUS Project, a National Survey in Italy. *Vaccines*, 11(4): 839.
- Larson, H. J., Cooper, L. Z., Eskola, J., Katz, S. L., & Ratzan, S. (2011). Addressing the vaccine confidence gap. *The Lancet*, 378(9790): 526–535.
- Neff, T., Kaiser, J., Pasquetto, I., Jemielniak, D., Dimitrakopoulou, D., Grayson, S., Gyenes, N., Ricaurte, P., Ruiz-Soler, J., & Zhang, A. (2021). Vaccine hesitancy in online spaces: A scoping review of the research literature, 2000-2020. *Harvard Kennedy School (HKS) Misinformation Review*, 2(5).
- Sabahelzain, M. M., Dube, E., Moukhyer, M., Larson, H. J., Van Den Borne, B., & Bosma, H. (2020). Psychometric properties of the adapted measles vaccine hesitancy scale in Sudan. *PLoS ONE*, 15(18): 1–12.
- Turon, H., Wolfenden, L., Finch, M., Mccrabb, S., Naughton, S., & Connor, S. R. O. (2023). Dissemination of public health research to prevent non-communicable diseases: a scoping review, 23(1): 1–15.
- Voutsidou, S. (2021). E-Health Applications for Smart and Pervasive Healthcare in Greece. What Can We Expect? In Sharma, U. (Ed.), *Smart and Pervasive Healthcare*.

E-HEALTH POLICIES

THE NEED TO IMPLEMENT THE DIGITAL HEALTH SYSTEM IN THE PENITENTIARY SYSTEM IN ALBANIA: A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background: The introduction of telemedicine services in prisons offers a notable opportunity to enhance healthcare access for prisoners, thereby improving the realization of their right to health (Tian et al., 2021; Gunn et al., 2020; Mateo et al., 2019; Kinner et al., 2018; Oh et al., 2005). The healthcare system in Albania, as part of the National Strategy and Development 2030, is currently experiencing significant transformations and process reengineering in response to rising patient expectations and increasingly complex challenges concerning health, cost containment, and the enhancement of care quality. In Albania, the healthcare landscape is characterized by a multitude of changes, particularly those associated with technological advancement and digitalization, as well as the fortification of human resources. Key elements driving these changes include healthcare policies, financial reforms, and innovations within the healthcare framework.

Objective: The objective of this study is to offer a thorough examination of e-health interventions in the penitentiary system in Albania.

Methodology: This research employs a qualitative, cross-sectional approach through a literature review and a comparison of e-health implementation in Albanian prisons and at the European Union level. The tools employed to accomplish this aim consist of a questionnaire designed for penitentiary professionals, alongside a comparative analysis of relevant literature and political strategies pertaining to the digital implementation within the prison system. This questionnaire was specifically developed by the author for this research and was directed towards the heads of five correctional facilities in Albania. The questionnaire metric properties underscore its reliability, with this study revealing Cronbach's alpha and McDonald's Omega values of $\alpha = 0.871$ and $\omega = 0.80$, respectively.

Results: The cross-sectional results indicate that while the legal framework is well-established, justice stakeholders encounter challenges in implementing it in prisons for three primary reasons. Firstly, establishing and maintaining e-health services incur high costs. Secondly, utilizing telehealth to link inmates with healthcare providers hinders the traditional human evaluation and treatment process. Thirdly, while telehealth can

alleviate the strain of recruiting on-site healthcare professionals, they require extensive training and support for technical infrastructure, which is currently lacking in Albania. Conclusions: In conclusion, despite the presence of remote healthcare initiatives in the Medical and Juridical Masterplans, the interest in adopting telemedicine in Albania and the Western Balkans remains limited (Qosaj et al.,2024; Tresa et al.,2022; De Oliviera et al.,2021; Mehta& Pandit,2018; Mackenbach et al.,2013). Moreover, the efforts in this field lack sufficient backing, presenting a significant barrier to their incorporation into standard healthcare protocols.

Keywords: telemedicine, legal reform, prisons, advancement, human rights

REFERENCES

- De Oliveira Andrade, A., Soares, A. B., De Andrade Palis, A., Cabral, A. M., Barreto, C. G. L., De Souza, D. B., De Paula Silva, F., Santos, F. P., Silva, G. L., Guimarães, J. F. V., De Araújo, L. a. S., Nóbrega, L. R., Mendes, L. C., Luiz, L. M. D., Brandão, M. R., Milagre, S. T., De Lima Gonçalves, V., De Freitas Morales, V. H., Da Conceição Lima, V., & Pereira, A. A. (2021). On the use of telemedicine in the context of COVID-19: legal aspects and a systematic review of technology. *Research on Biomedical Engineering*, 38(1), 209–227. <https://doi.org/10.1007/s42600-021-00133-8>
- Fuchs, V. R. (2009). Health reform: Getting the essentials right. *Health Affairs*, 28(Supplement 1), w180–w183. <https://doi.org/10.1377/hlthaff.28.2.w180>
- Gunn, J., Taylor, P. J., Forrester, A., Parrott, J., & Grounds, A. (2020). Telemedicine in prisons: A Crime in Mind perspective. *Criminal Behaviour and Mental Health/CBMH*. *Criminal Behaviour and Mental Health*, 30(2–3), 65–67. <https://doi.org/10.1002/cbm.2160>
- Kinner, S. A., & Young, J. T. (2018). Understanding and improving the health of people who experience Incarceration: An Overview and synthesis. *Epidemiologic Reviews*, 40(1), 4–11. <https://doi.org/10.1093/epirev/mxx018>
- Mackenbach, J. P., & McKee, M. (2013). A comparative analysis of health policy performance in 43 European countries. *European Journal of Public Health*, 23(2), 195–201. <https://doi.org/10.1093/eurpub/cks192>
- Mateo, M., Álvarez, R., Cobo, C., Pallas, J., López, A., & Gaite, L. (2019). Telemedicine: contributions, difficulties, and key factors for implementation in a prison setting. *Revista Española De Sanidad Penitenciaria*, 21(2), 95–105. <https://doi.org/10.4321/s1575-06202019000200005>
- Mehta, N., & Pandit, A. (2018). Concurrence of big data analytics and healthcare: A systematic review. *International Journal of Medical Informatics*, 114, 57–65. <https://doi.org/10.1016/j.ijmedinf.2018.03.013>
- Oh, H. Y., Rizo, C., Enkin, M., & Jadad, A. R. (2005). What is eHealth (3): A Systematic review of published definitions. *JMIR. Journal of Medical Internet Research/Journal of Medical Internet Research*, 7(1). <https://doi.org/10.2196/jmir.7.1.e1>
- Qosaj, F. A., & Bourdeaux, M. (2024). Health policy developments in the Western Balkan Countries 2000–19: towards European Health and Health Care Policies. *European Journal of Public Health*, 34(3), 460–466. <https://doi.org/10.1093/eurpub/ckae045>

- Tian, E. J., Venugopalan, S., Kumar, S., & Beard, M. (2021). The impacts of and outcomes from telehealth delivered in prisons: A systematic review. *PloS One*, 16(5), e0251840. <https://doi.org/10.1371/journal.pone.0251840>
- Tresa, E., Czabanowska, K., Clemens, T., Brand, H., Babich, S. M., Bjegovic-Mikanovic, V., & Burazeri, G. (2022). Europeanization of health policy in post-communist European societies: Comparison of six Western Balkan countries. *Health Policy*, 126(8), 816–823. <https://doi.org/10.1016/j.healthpol.2022.05.015>

EVALUATION OF THE PERFORMANCE LEVELS OF NURSES WORKING IN EMERGENCY AND INTENSIVE CARE UNITS REGARDING ADVANCED CARDIAC LIFE SUPPORT

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ABSTRACT

The low survival rates following cardiac arrest indicate the ongoing need for the development and maintenance of advanced life support skills during Cardiopulmonary Resuscitation (CPR) training. Emergency department and intensive care nurses are crucial healthcare professionals responsible for rapidly and effectively intervening in critical situations within hospital settings, with critical roles in advanced life support practices. Simulation-based training is widely used for CPR trainings of healthcare providers. This study aimed to compare the performance of nurses who received "Cardiopulmonary Resuscitation Training" within the scope of in-service training according to their departments.

A retrospective and descriptive research design was conducted with 1543 nurses who received CPR training at the CASE Simulation Center between April 2014 and March 2021. A pretest, scenario based performance exam, and a posttest were conducted." Data were collected using the "Advanced Life Support (ALS) Scenario Control Form" and an Observation-Based Performance Evaluation checklist. Analyses were performed using the MedCalc Statistical Software version 12.7.7 (MedCalc Software bvba, Ostend, Belgium; <http://www.medcalc.org>; 2013) program”.

Participants consisted of 39% nurses working in Inpatient Wards, 35.5% in Intensive Care Units, 13.7% in Emergency Departments, and 11.9% in other outpatient units,

with no significant differences found between groups in pre-test results. Statistically significant differences were observed between simulation pre-test and post-test results in all groups, with higher post-test averages across all groups. At the end of the training, no statistically significant difference was observed between groups in the scenario based performance exam scores.

Simulation-based advanced life support training has been found effective in enhancing nurses' knowledge and skill levels. Conducting more frequent and updated training sessions for nurses working in intensive care units and emergency departments will lead to improved clinical performance.

Anahtar Kelimeler: Nurse, Simulation Training, Cardiopulmonary Resuscitation

REFERENCES

- Anderson, M., Secret, K., Krein L., Schildhouse R., Guetterman T., Harrod M., Kronick S., Chan P. (2021) Best Practices for Education and Training of Resuscitation Teams for In-Hospital Cardiac Arrest. *Circulation: Cardiovascular Quality and Outcomes* Volume 14, Issue 2, December 2021
- Davis, L. E., Storjohann, T. D., Spiegel, J. J., Beiber, K. M., & Barletta, J. F. (2013). High-fidelity simulation for advanced cardiac life support training. *American journal of pharmaceutical education*, 77(3), 59. <https://doi.org/10.5688/ajpe77359>.
- Güven D., Karabulut N. (2018) Kardiyopulmoner Resusitasyon Eğitiminin Hemşirelerin Bilgi Düzeyine Etkisi. *HSP* 2018;5 (2):161-168 161. DOI: 10.17681/hsp.333950
- Santos, E. C. A. dos ., Fontes, C. J. F., D'Artibale, E. F., Miravete, J. de C., Ferreira, G. E., & Ribeiro, M. R. R.. (2021). Simulation for teaching cardiorespiratory resuscitation by teams: setting and performance assessment . *Revista Latino-americana De Enfermagem*, 29, e3406. <https://doi.org/10.1590/1518-8345.3932.3406>
- Türker E., Tanrikulu Y. (2020). Kardiyopulmoner Resüsitasyonda Haptik Simülasyon Kullanımı *PASHİD* 1(2):65-72 *Paramedik ve Acil Sağlık Hizmetleri Dergisi* Derleme Makalesi

THE ECONOMICS OF E-HEALTH: A COMPARATIVE VIEW OF THE MACRO-ECONOMICS AND POLICIES OF TELEMEDICINE AND DIGITAL HEALTH IN ALBANIA.

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ABSTRACT

Background: The development of mobile technologies (such as digital services, mobile health, telemedicine, and the Internet of Things), the widespread access to the internet, and the abundance of information available have prompted businesses to undergo novel relationship and management encounters (Gosh et al.,2022; Ceiperk et al.,2021; Keesara et al.,2020; Jordanova & Lievens,2011). The onset of the third industrial revolution, denoting the shift from an industrial society to a digital one, where the focus lies not solely on goods production but also significantly on knowledge, system and information management, and the enhancement of intangible resources (Biancuzzi et al.,2023; Gentili et al.,2022; Sanyal et al.,2018; AIDossary et al.,2017; Schweitzer & Synowiev, 2012; van Germent-Pijnen et al.,2011).

Objective: The aim of this research is to investigate whether eHealth could serve as the primary catalyst for change in enhancing the efficiency and effectiveness of healthcare services in Albania, and to ascertain the potential role of digital innovation in enhancing the healthcare system itself in the country.

Method: The present paper provides a comprehensive and comparative analysis through qualitative methodology concerning the stages that have marked the implementation of e-health initiatives in Albania, up to the most recent developments, incorporating the Digital Health Pact within the Health Pact.

Results: The outcomes of the macro- and micro-economic and political examination have affirmed that, thus far in our nation, digital innovation in healthcare has been predominantly sporadic and incomplete, lacking an overarching strategic scheme capable of harmonizing the actions of the central government with those of the regional authorities. Beyond the strictly financial dimension, which is undeniably critical, there arises the necessity for a holistic approach. The current scenario reveals that e-Health signifies an opportunity to enhance administrative and clinical-healthcare procedures, furnish citizens/patients with superior services, particularly concerning planning and access to acute phases, and engage them in their own healthcare journey.

Conclusions: In conclusion, the sustainability of the system hinges on its capacity to embrace change, address immediate challenges, and devise strategies for long-term development and innovation.

REFERENCES

- AlDossary, S., Martin-Khan, M. G., Bradford, N. K., & Smith, A. C. (2017). A systematic review of the methodologies used to evaluate telemedicine service initiatives in hospital facilities. *International Journal of Medical Informatics*, 97, 171–194. <https://doi.org/10.1016/j.ijmedinf.2016.10.012>
- Biancuzzi, H., Mas, F. D., Bidoli, C., Pegoraro, V., Zantedeschi, M., Negro, P. A., Campostrini, S., & Cobianchi, L. (2023). Economic and Performance Evaluation of E-Health before and after the Pandemic Era: A Literature Review and Future Perspectives. *International Journal of Environmental Research and Public Health/International Journal of Environmental Research and Public Health*, 20(5), 4038. <https://doi.org/10.3390/ijerph20054038>
- Ceipek, R., Hautz, J., Petruzzelli, A. M., De Massis, A., & Matzler, K. (2021). A motivation and ability perspective on engagement in emerging digital technologies: The case of Internet of Things solutions. *Long Range Planning*, 54(5), 101991. <https://doi.org/10.1016/j.lrp.2020.101991>
- Gentili, A., Failla, G., Melnyk, A., Puleo, V., Di Tanna, G. L., Ricciardi, W., & Cascini, F. (2022). The cost-effectiveness of digital health interventions: A systematic review of the literature. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.787135>
- Ghosh, S., Hughes, M., Hodgkinson, I., & Hughes, P. (2022). Digital transformation of industrial businesses: A dynamic capability approach. *Technovation*, 113, 102414. <https://doi.org/10.1016/j.technovation.2021.102414>
- Jordanova, M., & Lievens, F. (2011). Global Telemedicine and eHealth (A synopsis). *E-Health and Bioengineering Conference*, 1–6. <https://ieeexplore.ieee.org/abstract/document/6150373>
- Keesara, S., Jonas, A., & Schulman, K. (2020). COVID-19 and health care’s digital revolution. *New England Journal of Medicine/the New England Journal of Medicine*, 382(23), e82. <https://doi.org/10.1056/nejmp2005835>
- Sanyal, C., Stolee, P., Juzwishin, D., & Husereau, D. (2018). Economic evaluations of eHealth technologies: A systematic review. *PloS One*, 13(6), e0198112. <https://doi.org/10.1371/journal.pone.0198112>
- Schweitzer, J., & Synowiec, C. (2012). The economics of eHealth and mHealth. *Journal of Health Communication*, 17(sup1), 73–81. <https://doi.org/10.1080/10810730.2011.649158>
- Van Gemert-Pijnen, J. E. W. C., Nijland, N., Van Limburg, M., Ossebaard, H. C., Kelders, S. M., Eysenbach, G., & Seydel, E. R. (2011). A holistic framework to improve the uptake and impact of eHealth technologies. *JMIR. Journal of Medical Internet Research/Journal of Medical Internet Research*, 13(4), e111. <https://doi.org/10.2196/jmir.1672>

EVALUATION OF POST-GRADUATE ORIENTATION PROGRAM FOR SURGICAL NURSING SIMULATION BASED LEARNING EXAMPLE

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ABSTRACT

Objective: The aim of the study was to evaluate the simulation based orientation program in post-graduate surgical nursing.

Methods: The study was performed in a descriptive retrospective design. The data were maintained within the nursing education and development department of a private health group in Turkey between 2017-2019. Totally 1615 nurses who were new at a health institution were included in the study. Orientation program includes 64 hours of theoretical education and 27 hours of simulation based learning. Partial task trainer, medium and high fidelity human patient simulators were used during simulation.

Results: It was determined that nurses mostly worked in the surgical inpatient service (22.3%; n=360) and intensive care units (15.9%; n=257). The nurses' orientation program knowledge level pre-test mean score was 63.8 ± 13.7 , and post-test mean score was 81.7 ± 11.6 . A statistically significant difference was found between pre-test and post-test scores ($p < 0.001$). When the skill point averages of the nurses were evaluated, it was determined that the highest skill level in the basic-advanced life support scenario was in the "Material Management" sub-dimension (95.75%), and the lowest skill level was in the "Patient safety" sub-dimension (74.77%).

Conclusion: Clinical orientation program based on simulation based learning can increase the knowledge level of nurses and can be an effective method in developing competence. Health institutions should use simulation based learning methods in clinical orientation program in accordance with their own conditions and using different simulation techniques. It is recommended that post-graduate orientation program can be enriched with different scenario and used in the development of nurses' competencies.

Anahtar Kelimeler: Simulation Based Learning, Surgical Nursing, Orientation Program, Postgraduate Education

REFERENCES

- Serbest Ş, Ulupınar S. Özel bir hastane grubunda çalışan hemşirelerin kurumdaki hizmet içi eğitim uygulamalarına ilişkin görüşleri. *Florence Nightingale Journal of Nursing*. 2010;18(2):98-105.
- Savcı C, Şerbetçi G, Hacer Ö. Hemşire ve Ebelerin Hizmet İçi Eğitim Uygulamalarına Yönelik Görüş ve Beklentilerinin Belirlenmesi. *Sağlık Bilimleri Üniversitesi Hemşirelik Dergisi*. 2021;3(2):77-82.
- Fey MK, Miltner RS. A Competency-Based Orientation Program for New Graduate Nurses. *JONA: The Journal of Nursing Administration*. 2000;30(3):126-132.
- Strauss E, Ovnat C, Gonen A, Lev-Ari L, Mizrahi A. Do orientation programs help new graduates? *Nurse Education Today*. 2016;36:422-426.
- Baxter PE. Providing orientation programs to new graduate nurses: Points to consider. *Journal for Nurses in Professional Development*. 2010;26(4):E12-E17.
- Park M, Jones CB. A retention strategy for newly graduated nurses: An integrative review of orientation programs. *Journal for Nurses in Professional Development*. 2010;26(4):142-149.
- Terzioğlu F, Kapucu S, Özdemir L, et al. Simülasyon yöntemine ilişkin hemşirelik öğrencilerinin görüşleri. *Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi*. 2012;19(1):16-23.
- Gaba D. The future vision of simulation in healthcare. *Simulation in Healthcare*. 2007;2(2):126-135.
- Wilford A, Doyle T. Integrating simulation training into the nursing curriculum. *British Journal of Nursing*. 2006;15(17):926-931.
- Göriş S, Bilgi N, Bayındır S. Hemşirelik eğitiminde simülasyon kullanımı. *Düzce Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi*. 2014;1(2):25-29.

HEALTH MANAGEMENT AND BUSINESS INTELLIGENCE

CASE STUDY OF HEALTH CARE IN PRIMARY AND SECONDARY EDUCATION: FINANCIAL AND ORGANIZATIONAL ANALYSIS.

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ABSTRACT

The topic that this study examines is the case study of a school community, both primary and secondary education, for the health care of its students. School is undoubtedly a very important field of action for the promotion of children's health. During the COVID-19 pandemic, the lack of educational systems to ensure and strengthen children's health came to the surface. It is therefore imperative that schools adapt based on two very important axes around child health. First, schools should have the structures to take care of the health of male and female students and cover all their medical needs. In this way, the children's families will be supported by the health specialists who will be in the schools, as well as the health systems, as primary health will be strengthened in the schools. Then, the second axis should be the education of children from an early age about good health, proper nutrition, the importance of exercise and shaping future citizens with good physical and mental health.

In this context, the aim of this study was to examine how a certain educational institution is organized and managed in order to promote the concept of health to its students and how to ensure it with the benefits it offers them. The mode of operation of the school clinic is investigated as well as the responsibilities and the job position of the school nurse, also analyzing the economic dimension that arises for the school community. The research was conducted through personal interviews and the data collected was qualitative.

The main result was that the field of health care and especially the one of mental health is not particularly developed in the school environment and several proposals are shaped for the formation of a school community that adds value to ensuring the health

of its students. Strengthening and promoting good physical and mental health appears to be necessary not only for children but also for the whole society in the short term (e.g. limiting and combating cases of viruses and infections) and in the long term (reducing cases of patients with psychiatric disorders). Therefore, health care in the school community is connected and interacts directly with the health care of each state as it lays the foundations for disease prevention and early diagnosis. It equips the children, i.e. the future adults, with knowledge about ways to deal with the disease.

As regards the Greek case, deficiencies are observed regarding health care in primary and secondary education. On the other hand, the majority of European countries have already implemented school education and health promotion programs, which are carried out with the aim of children understanding the concept of health from an early age and learning to take care of themselves. Thus, it would be of great importance to investigate health care practices of other private institutions, in different areas of the Greek territory, and also initiatives undertaken by public schools, in order to draw more informed conclusions about this topic.

Key Words: Health, school health, health promotion, school nurse, school psychologist

REFERENCES

- World Health Organization & World Organization of Family Doctors. (2008). Integrating mental health into primary care : a global perspective. World Health Organization.
- Fernando, Suman. Mental health, race and culture. Bloomsbury Publishing, 2010.
- Stiefel, M. C., Straszewski, T., Taylor, J. C., Huang, C., An, J., Wilson-Anumudu, F. J., & Cheadle, A. (2020). Using the County Health Rankings Framework to Create National Percentile Scores for Health Outcomes and Health Factors. *The Permanente journal*, 25, 1.
- Centers for Disease Control and Prevention, Leading Health Indicators, Available at https://www.cdc.gov/nchs/healthy_people/hp2020/hp2020_indicators.htm, accessed on April 19, 2023
- Shi L, Singh D.A. Delivering health care in America: a systems approach. ed 5. Boston: Jones & Bartlett; 2012.
- Cantrell, M. A. (2007). Health-related quality of life in childhood cancer: State of the science. *Oncology Nursing Forum*, 34, 103–111.
- DiPietro, L. et al. (2020). Advancing the global physical activity agenda: recommendations for future research by the 2020 WHO physical activity and sedentary behavior guidelines development group. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 1-11.
- Ottawa charter for health promotion, Available at <https://www.who.int/publications/i/item/WH-1987>. accessed on May 2, 2023.
- Patja, K. et al. (2022). Health promotion and disease prevention in the education of health professionals: a mapping of European educational programmes from 2019. *BMC medical education*, 22(1), 778.
- Trilk J, Nelson L, Briggs A, Muscato D. Including lifestyle medicine in medical education: rationale for American College of Preventive Medicine/American Medical Association resolution 959. *Am J Prev Med*. 2019

- López, V., Cárdenas, K., & González, L. (2021). The Effect of School Psychologists and Social Workers on School Achievement and Failure: A National Multilevel Study in Chile. *Frontiers in psychology*, 12, 639089.
- Schmitz, S. L., Clopton, K. L., Skaar, N. R., Dredge, S., & VanHorn, D. (2022). Increasing School-Based Mental Health Services with a "Grow Your Own" School Psychology Program. *Contemporary school psychology*, 26(1), 22–33
- Beletsioti, C., & Niakas, D. (2022). Health services utilization and its determinants in the context of recession: evidence from Greece. *Journal of public health (Oxford, England)*, 44(2), 332–341.
- Bada, Electra & Darlington, Emily & Masson, Julien & Santos, Rute. (2019). European Standards and Indicators for Health Promoting Schools., Available at https://www.schoolsforhealth.org/sites/default/files/editor/Teachers%20resources/european_standards_and_indicators_on_hps_en.pdf
- Ανάπτυξη - υλοποίηση από το Υπουργείο Υγείας δράσεων και παρεμβάσεων ευαισθητοποίησης και ενημέρωσης του μαθητικού πληθυσμού στο πλαίσιο της Αγωγής Υγείας σε Εθνικό Επίπεδο, για το σχολικό έτος 2022 – 2023, διαθέσιμο στην διεύθυνση <https://www.moh.gov.gr/articles/health/dieythynsh-prwtobathmias-frontidas-ygeias/draseis-kai-programmata-agwghs-ygeias/agwgh-ygeias/draseis-kai-parembaseis-eyaisthhtopoihshs-kai-enhmerwshs-toy-mathhtikoy-plhthysmoy/enhmerwsh-drasewn-ana-sxoliko-etos/10951-anapyksh-ylopoihs-apo-to-ypourgeio-ygeias-drasewn-kai-parembasewn-eyaisthhtopoihshs-kai-enhmerwshs-toy-mathhtikoy-plhthysmoy-sto-plaisio-ths-agwghs-ygeias-se-ethniko-epipedo-gia-to-sxoliko-etos-2022-2023>
- Beletsioti, C., & Niakas, D. (2022). Health services utilization and its determinants in the context of recession: evidence from Greece. *Journal of public health (Oxford, England)*, 44(2), 332–341.

UTILIZING NON-VERBAL COMMUNICATION IN EFFECTIVE MANAGEMENT IN HEALTHCARE SETTINGS

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ABSTRACT

This study aims to investigate the understanding and use of non-verbal communication within healthcare settings, focusing on the perspectives of both frontline healthcare workers and administrative staff. The research explores the extent to which non-verbal communication is recognized as a critical skill in professional interactions, as well as its potential integration into daily healthcare practices. Additionally, the study examines whether verbal communication, along with its various components, is actively utilized or could be developed as a formalized skill in healthcare environments.

The specific objectives of this research include assessing the level of knowledge regarding non-verbal communication within organizational frameworks, its promotion, and application in such settings, and whether it has been systematically adopted by healthcare management. The sample comprises ten participants, including doctors, nurses, and other health professionals, as well as healthcare executives, all of whom are employed in frontline roles. To facilitate an in-depth exploration of their experiences and perceptions, semi-structured interviews were conducted, providing participants with the freedom to express their views. The data were analyzed using a qualitative methodology, specifically through thematic analysis.

Although the sample size is small, the study provides valuable insights into the participants' personal experiences and perceptions regarding non-verbal communication in healthcare. The findings indicate a notable gap in knowledge among healthcare professionals concerning non-verbal communication, as well as limited implementation of such practices in the workplace. Participants expressed a clear need for greater training and the promotion of non-verbal communication skills within the organizational culture.

This study contributes to the growing body of research on healthcare communication by highlighting the attitudes and perceptions of healthcare professionals toward non-verbal communication. It underscores the importance of fostering a culture that values

and integrates non-verbal communication skills as part of comprehensive healthcare training. Future research should focus on larger, more diverse samples to further explore how non-verbal communication can enhance patient care and improve organizational outcomes in the healthcare sector.

Keywords: Non-verbal Communication, Paralinguistics, Interpersonal Communication, Healthcare Communication, Thematic Analysis

REFERENCES

- Ang, W. C., Swain, N., & Gale, C. (2013). Evaluating communication in healthcare: Systematic review and analysis of suitable communication scales. *Journal of Communication in Healthcare*, 6(4), 216-222.
- Avdimiotis, S. (2019). Emotional intelligence and tacit knowledge management in hospitality. *Journal of Tourism, Heritage & Services Marketing (JTHSM)*, 5(2), 3-10.
- Bechtoldt, M. N., Beersma, B., Rohrmann, S., & Sanchez-Burks, J. (2013). A gift that takes its toll: Emotion recognition and conflict appraisal. *European Journal of Work and Organizational Psychology*, 22(1), 56-66.
- Chichirez, C. M., & Purcărea, V. L. (2018). Interpersonal communication in healthcare. *Journal of medicine and life*, 11(2), 119.
- Foronda, C. L., Walsh, H., Budhathoki, C., & Bauman, E. (2019). Evaluating nurse–physician communication with a rubric: A pilot study. *The Journal of Continuing Education in Nursing*, 50(4), 163-169.
- Gheorghîța, N. (2012). The role of the nonverbal communication in interpersonal relations. *Procedia-Social and Behavioral Sciences*, 47, 552-556.
- Kar, A. K., & Kar, A. K. (2017). How to walk your talk: effective use of body language for business professionals. *IUP Journal of Soft Skills*, 11(1), 16
- Riess, H., & Kraft-Todd, G. (2014). EMPATHY: a tool to enhance nonverbal communication between clinicians and their patients. *Academic Medicine*, 89(8), 1108-1112.
- Tskhay, K. O., Xu, H., & Rule, N. O. (2014). Perceptions of leadership success from nonverbal cues communicated by orchestra conductors. *The Leadership Quarterly*, 25: 901-911.
- Van Kleef, G. A. (2014). Understanding the positive and negative effects of emotional expressions in organizations: EASI does it. *Human Relations*, 67: 1145-1164.
- Velentzas, J. O. H. N., & Broni, G. (2014). Communication cycle: Definition, process, models and examples. *Recent advances in financial planning and product development*, 117-131.
- Weller, J., Boyd, M., & Cumin, D. (2014). Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgraduate medical journal*, 90(1061), 149-154.
- Zamfir, C. M. (2021). Workplace Orientation: Norms, Rules, Roles and Values as Principles of Ethical Behaviour and Effective Communication. *Ovidius University Annals, Economic Sciences Series*, 21(1), 439-447.

EVALUATION OF THE FINANCIAL LITERACY AND LEADERSHIP SKILLS IN HEALTHCARE PROFESSIONALS IN GREECE

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ABSTRACT

Financial literacy is the possession of skills, knowledge, and attitudes to make informed money decisions. Recently, the importance of financial literacy among healthcare providers has been underscored; however, evidence regarding the financial literacy and the leadership skills in healthcare providers is limited. Our aim was to assess the financial literacy of healthcare professionals and their leadership skills, in Greece.

A prospective multicenter questionnaire study was conducted during 2023-2024. Participants' financial literacy was assessed using the OECD/INFE Toolkit for Measuring Financial Literacy and Financial Inclusion 2022. The participants' leadership skills were assessed using the Leadership Skills questionnaire. A multivariate correlation of financial literacy scores with leadership scores was performed, adjusted for the type of duties (administrative versus non-administrative), type of education (university versus technical), status (medical versus nursing), sex, and age.

300 healthcare professionals, 120(40%) men and 180(60%) women were included, with a median age of 48(27-59) years. Of them, 205(69%) held a university degree and 95(31%) technical education. 171(57%) were doctors and 129(43%) nurses, while 162(54%) professionals reported that they performed administrative duties and 138(46%) that they did not. The overall financial literacy score for all healthcare professionals was

13.83±2.65 (adjusted 69.14±13.25%), and the digital financial literacy score was 5.4±1.7 (adjusted 53.97±17.07%). Leadership scores are depicted in Table 1.

Table 1. Leadership score of all respondents.

Leadership score	Management skills	Interpersonal	Conceptual

		skills		skills	
Average score		22.89±2.84	19.6±2.13	23.17±2.74	
1.	Very high	60 (20%)	-	56 (19%)	
2.	High	179 (59.5%)	103 (34%)	193 (64%)	
3.	Moderate	60 (20%)	190 (64%)	51 (17%)	
4.	Low	1 (0.5%)	7 (2%)	-	
5.	Very low	-	-	-	

University-educated professionals had a significantly higher overall financial literacy score of

14.23±2.69 (adjusted 71.13±13.49%), versus technical education professionals of 12.97±2.33 (adjusted 64.84±11.66), ($p<0.001$). Also, professionals with administrative duties had a significantly higher overall financial literacy score of 14.14±2.48 (adjusted 70.68±12.40%), compared to non-administrative professionals of 13.47±2.80 (adjusted 67.34±14.01), ($p=0.029$). Moreover, physicians had a significantly higher overall financial literacy score of 14.37±2.67 (adjusted 71.87±13.39%), versus nurses 13.10±2.44 (adjusted 65.52±12.19), ($p<0.001$). Finally, men had a significantly higher overall financial literacy score of 15.20±2.60 (adjusted 76.02±13.01%), compared to women of 12.91±2.26 (adjusted 64.56±11.30), ($p<0.001$).

Regarding leadership skills, professionals with administrative duties scored higher than professionals without administrative tasks in all areas. University-educated professionals had similar scores to technical education professionals in the management skills area, but significantly lower scores in the interpersonal skills areas and conceptual skills. Physicians scored significantly lower than nurses in management, interpersonal, and conceptual skills. Men scored significantly higher than women in all areas of leadership skills.

In multivariate analysis, the overall financial literacy score was strongly positively correlated with management skills score, conceptual skills score, university education and negative with female sex. Also, overall digital financial literacy score was strongly positively correlated with interpersonal skills score, conceptual skills score and negatively with female sex (Table 2).

Table 2. Multivariate linear regression analysis of overall and digital financial literacy scores with leadership scores, adjusted for the type of duties, education, status, sex, and age.

	b	95% CI	p
Overall financial literacy score			
Management skills score	.215	.053, .378	.010
Conceptual skills score	.197	.032, .361	.020
Level of education (University)	1.956	1.150, 2.762	.000
Sex (Female)	-.938	-1.540, -.337	.002
Digital financial literacy score			
Interpersonal skills score	.106	.001, .212	.049

Conceptual skills score	.116	.004, .228	.042
Sex (Female)	-.495	-.904, -.086	.018

In conclusion, we found that the overall financial literacy score for healthcare professionals was higher than the average for Greece. Leadership skills, university education, and sex have strong impact on the overall financial literacy score. Further studies are warranted to evaluate the potential approaches in education that could improve financial literacy in healthcare professionals in Greece.

Key Words: financial literacy, leadership, healthcare professionals

INTEGRATING GENETIC ALGORITHMS WITH DATA ENVELOPMENT ANALYSIS: ENHANCING HOSPITAL EFFICIENCY DURING HEALTH CRISES

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ABSTRACT

The aim of this research is to develop a novel Genetic Algorithm (GA)-enhanced approach to Data Envelopment Analysis (DEA), specifically designed to assess and optimize hospital efficiency during acute health crises such as COVID-19. This research incorporates GA to dynamically adjust input and output weights in a DEA model, with the aim of improving the accuracy of efficiency assessments while offering a method capable of adapting to changing hospital service conditions, thus responding directly to the challenges posed by the pandemic. In this context, the application of Genetic Algorithms (GA) in healthcare settings has shown promising results, notably in optimizing the allocation of medical resources to improve patient satisfaction and equipment utilization (Amindoust et al., 2021; Yan et al., 2022). However, little research has attempted to integrate GA with DEA to optimize hospital efficiency in times of health crisis (Du et al., 2017).

The methodology employed includes establishing the most important inputs and outputs of a hospital by collecting information from a sample of 50 persons employed in various managerial positions of the public hospitals in Greece. This process led to the identification of 7 inputs and outputs or weights followed by the collection of quantitative data regarding each weight for each of these 38 hospitals, representing Decision Making Units (DMUs), with the intention to research the optimization of the efficiency of these organizations during the COVID-19 outbreak (2020) using the GA-enhanced DEA approach developed herein.

A Python code, based on detailed mathematical modeling, was developed to study the effectiveness of the selected organizations.

The results of this research highlight the robust convergence of the genetic algorithm, reaching a fitness value close to 0.8 as early as the first ten generations, and then stabilizing around this value in subsequent generations. This rapid stabilization suggests that the algorithm rapidly reached near-optimal weights, subsequently refining solutions around this performance peak. This efficiency is illustrated by the steady growth in average fitness, accompanied by reduced variability, underlining the

algorithm's effectiveness in maintaining consistently high solution quality. The analysis of optimal weights reveals relevant insights into the configuration of weights that maximize the efficiency of the decision units examined. In particular, the weights for inputs such as number of beds and medical supplies indicate a significantly greater emphasis on hospital

Capacity than on the availability of medical resources, a finding aligned with the urgent challenges imposed by the health crisis. Furthermore, the variations observed in the distribution of weights for the other variables suggest a fluctuating and contextual role in the assessment of effectiveness, reflecting specific operational strategies or institutional responses to the health crisis. The optimized weights yielded by the genetic algorithm demonstrate significant priorities in hospital management during the COVID-19 pandemic. The greater importance attributed to the number of developed beds (weight 1) emphasizes the priority given by hospitals to maximizing their reception capacity, which is essential in the context of a health emergency (Alsaqqa, 2023). Conversely, the lower weights attributed to medical supplies (weight 3) could indicate optimized management or less dependence on these resources, despite their crucial importance in patient treatment (Porada et al., 2022). Optimized weight analysis suggests that the Greek hospitals had to balance resources between immediate capacity and the quality of care provided, reflecting the operational challenges specific to the pandemic (Rosenbäck&Svensson, 2023). The proposed integration of GA and DEA enables overcoming the constraints of classical DEA models and exploiting the flexibility of GA to dynamically adjust evaluation criteria to changing pandemic contexts. This research advances current understanding and application of evaluative methods capable of responding effectively to public health emergencies, suggesting that hospital administrators should prioritize improving bed infrastructure and optimizing medical resource utilization to

improve efficiency in the organizations studied.

Key Words: Data Envelopment Analysis (DEA), Genetic Algorithms (GA), Hospital Efficiency, COVID-19 Pandemic, Genetic Algorithm (GA)-enhanced DEA

REFERENCES

- Alsaqqa, H. H. (2023). Healthcare Organizations Management: Analyzing Characteristics, Features and Factors, to Identify Gaps "Scoping Review." *Health Services Insights.*, 16, 117863292311681. <https://doi.org/10.1177/11786329231168130>
- Amindoust, A., Asadpour, M., & Shirmohammadi, S. (2021). A Hybrid Genetic Algorithm for Nurse Scheduling Problem considering the Fatigue Factor. *Journal of Healthcare Engineering*, 2021, 1–11. <https://doi.org/10.1155/2021/5563651>
- Du, G., Liang, X., & Sun, C. (2017). Scheduling Optimization of Home Health Care Service Considering Patients' Priorities and Time Windows. *Sustainability*, 9(2), 253. <https://doi.org/10.3390/su9020253>
- Porada, S., Sygit, K., Hejda, G., & Nagórska, M. (2022). Optimization of the Use of Hospital Beds as an Example of Improving the Functioning of Hospitals in Poland on the Basis of the Provincial Clinical Hospital No. 1 in Rzeszow.

International Journal of Environmental Research and Public Health/International Journal of Environmental Research and Public Health, 19(9), 5349. <https://doi.org/10.3390/ijerph19095349>

- Rosenbäck, R. G., & Svensson, A. (2023). Resilience in keeping the balance between demand and capacity in the COVID-19 pandemic, a case study at a Swedish middle-sized hospital. *BMC Health Services Research*, 23(1). <https://doi.org/10.1186/s12913-023-09182-4>
- Yan, C., McClure, N., Dukelow, S. P., Mann, B., & Round, J. (2022). Optimal Planning of Health Services through Genetic Algorithm and Discrete Event Simulation: A Proposed Model and Its Application to

THE ROLE OF HEALTHCARE PROFESSIONALS' SELF-REGULATION IN AN EMERGENCY DEPARTMENT IN DEALING WITH PATIENT DEATH

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ABSTRACT

The healthcare professional, in addition to his constant contribution to his daily work, is forced to face very difficult situations, such as the death of his patient. In emergency departments, the conditions for dealing with patients are different from those in long-term hospitalization, due to the urgency. So the question arises: how do health professionals in emergency departments deal with the death of patients?

The international literature is quite "poor" in investigating this question. In this article we will focus on investigating the treatment of patient death by healthcare professionals in emergency departments. What specifically, the research question is asked: does the level of self-regulation of health professionals in emergency departments affect or not the way they deal with the death of their patients?

Since the research of Albert Bandura, considered the founder of social cognitive theory and social learning theory, in the mid-1970s, it has been accepted that "people are able to control their behavior through a process known as self-regulation".

In the field research, which was carried out among health professionals in the emergency departments of 29 hospitals from all over Greece, 3 pairs of independent variables were defined that are included in the field of self-regulation, and three pairs of dependent variables, which are included in the possible consequences of the death of patients for health professionals.

The independent variables of self-regulation include: the pairs of skills of dealing with work difficulties, work reactions (Simon and, Bush 2009) and appropriate dealing with "others" (Baumeister, 1996).

The dependent variables include the 3 already dependent pairs regarding the consequences of the patients' death on the health professionals: mental and cognitive manifestations, "resistance manifestations" (Ordog, and Wassergberger, 1986), and fear manifestations (Cai, et al., 2017).

The results of the statistical analyses, performed using MANOVA, show that some variables influence some of the ways in which emergency department health professionals deal with patient death and other ways of dealing with patient death do not affect them.

More specifically, of the two independent variables that make up the coping with work difficulties, one, "appropriate work behavior" affects the dependent variable "mental and cognitive manifestations" while the other independent variable, "keeping calm" does not affect this specific dependent variable. The dependent variable "mental and

cognitive manifestations" is not affected by any other independent variable of self-regulation used for this research.

Regarding the dependent variable "manifestations of resistance", the research showed that it is influenced by both the independent variable of "keeping calm" and the independent variable of "appropriate work behavior" that belong to the field of self-regulation.

Finally, the dependent variable of "manifestation of fear" is influenced by the independent variable "keeping calm" while it is not influenced by the independent variable "appropriate work behavior"

More specialized statistical analyzes demonstrate significant dependencies of the variables that make up the consequences of patient death on emergency department health professionals but also a lack of dependence on independent variables of self-regulation.

These results highlight the "delicate" relationships that develop between self-regulation variables and patient death outcome variables.

The article concludes with a discussion of the results of this research.

LEADERSHIP IN THE CONTEXT OF DIGITAL HEALTH SERVICES

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ABSTRACT

Digital transformation affects the way people work, interact and think (Hai et al., 2021). Traditional leadership mindset approaches are inadequate in an era of highly uncertain and rapidly changing business arrangements (Kane et al., 2019). Leaders need to adapt the way they work in the digital environment to achieve effective, long-term performance (Contreras et al., 2020). In addition, organisations need to be aware of the key leadership competencies that managers need to be successful in this environment (Cortellazzo et al., 2019). The characteristics related to leadership in the study were identified and categorised as behaviours, roles and attributes.

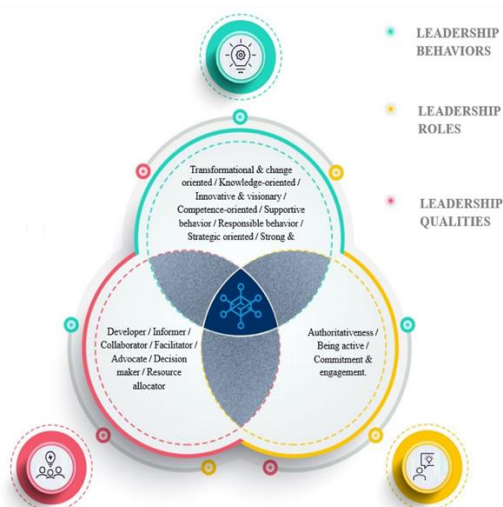


Figure 1. Leadership characteristics in the context of digital health services

The digitisation of services and the rapid development of artificial intelligence (AI) in healthcare offer potential solutions to some of the challenges facing healthcare systems around the world. It is therefore essential for healthcare leaders to understand the state of the art and how these technologies can be used to improve the efficiency, safety and access to healthcare services and achieve value-based care (Bolden and Regan et al., 2016).

Effective leadership is critical to the implementation of necessary healthcare reforms. Therefore, it is essential to ensure the necessary capacity development of digital leaders. Traditionally, healthcare leaders have been expected to ensure competence in clinical

services and good management. Now, however, they must have sufficient knowledge of digital technologies related to health information and become agents of change and innovation.

Here are the key points for healthcare leaders to consider:

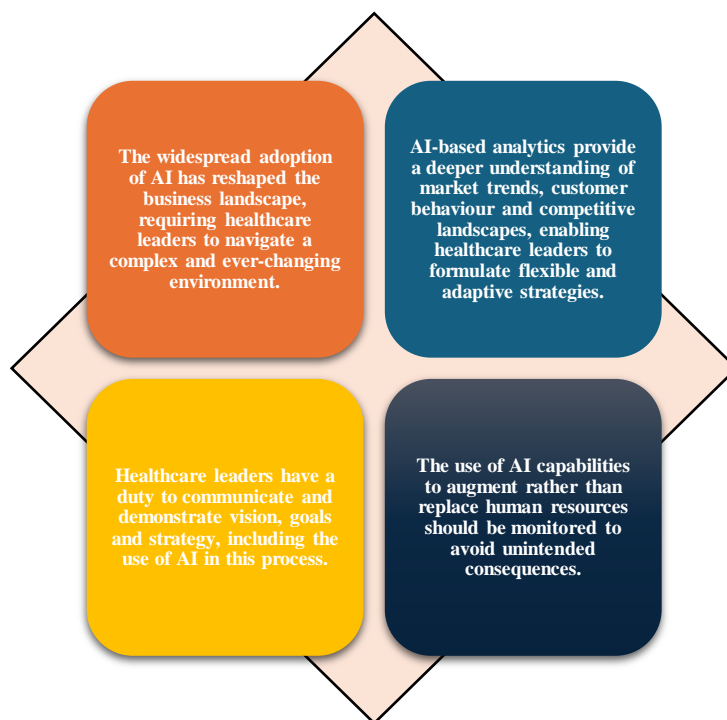


Figure 2. Executive Leadership Key Points

But what does AI and digitalisation mean for healthcare leaders, and what are the key points to consider?

Artificial intelligence generally refers to a computer system (hardware or software) that has the ability to perform tasks or reasoning that we usually associate with human intelligence (Pinto JK and Mantel SJ et al., 1990) Therefore, AI is not a single type of technology, but many different types in different application areas, such as diagnosis and treatment, patient engagement and compliance, and administrative activities (John Wiley and Sons et al., 2000). However, when applying AI technology in practice, certain problems and challenges may require optimisation of the method in combination with the specific setting. Therefore, we can define AI as a complex socio-technical intervention, as its success in a clinical healthcare setting depends on more than technical performance (Gomes J and Romão M. et al., 2015).

The main areas of AI application in the health sector are reportedly:

Machine learning (ML): the use and development of computer systems that can learn and adapt without explicit instruction, using algorithms and statistical models to analyse and draw conclusions from patterns in data.

Natural Language Processing (NLP): the application of computational techniques to the analysis and synthesis of natural language and speech.

According to the Cambridge Dictionary (n.d., 23 May), digitisation is defined as 'a form that can be stored and read by computers'. Few authors provide a formal definition of leadership or closely related terms in the context of digital health services.

E-leadership - "E-leadership is defined as a social influence process mediated by AIT to induce changes in attitudes, emotions, thinking, behaviour and/or performance in individuals, groups and/or organisations". (Avolio, Sosik, J. J. , Kahai, S. S. and Baker et al., 2014).

Virtual Leadership - "When a person leads a team that they do not see in person, leads a team that is geographically dispersed, or works in a team that is partially remote, they are part of the virtual workplace" (Dinnocenzo et al., 2006, p. 14).

Westerman G et al, highlighting the role of a leader in executing digital transformation, stated that a digital leader is an individual who motivates the organisation by creating appropriate digital awareness and who has the power to influence people (Westerman G, Bonnet D, McAfee A. Brighton et al., 2014 .

In conclusion, digital leaders should envision an ambitious and bold future for their organisations with innovative solutions within their capabilities and connect these innovations to healthcare to improve quality of care or cost reduction goals. They need to step out of their comfort zone to understand the rapidly evolving scenario where exceptional leadership skills are essential to create a strong foundation for the adoption of modern, efficient and customised digital technologies in the rapidly growing healthcare sector.

Key Words: healthcare, leadership, artificial intelligence, digital, health services

REFERENCES

- Avolio, B. J. , Sosik, J. J. , Kahai, S. S. and Baker, B. (2014). E-leadership: Re-examining transformations in leadership source and transmission. *The Leadership Quarterly*, 25(1), 105–131.
- Bolden R and Regan NO (2016). Digital disruption and the future of leadership: an interview with Rick Haythornthwaite, chairman of Centrica and MasterCard. *J Manag Inq* 25:438-446.
- Cambridge University (n.d.). Cambridge Advanced Learner's Dictionary & Thesaurus.
- Contreras F, Baykal E, Abid G (2020). E-leadership and teleworking in times of COVID-19 and beyond: What we know and where do we go. *Front Psychol* 11:590271.
- Cortellazzo L, Bruni E, Zampieri R (2019). The role of leadership in a digitalized world: a review. *Front Psychol* 10:1938.
- Dinnocenzo, D. (2006). How to lead from a distance. *The Walk the Talk Company*.
- Gomes J and Romão M. (2015). The success of IS/IT projects in the healthcare sector: stakeholders' perceptions. *IEEE*.10:1-7
- Hai TN, Van QN, Tuyet MNT (2021). Digital transformation: opportunities and challenges for leaders in the emerging countries in response to covid-19 pandemic. *Emerg Sci J* 5:21-36.
- John Wiley & Sons (2000). *Software Project Management Practices and Techniques. On Time Within Budget: 3rd Edition*.
- Kane GC, Phillips AN, Copulsky J, Andrus G (2019). How digital leadership is(n't) different. *MIT Sloan Manag Rev* 60:34-39.

Pinto JK, Mantel SJ (1990). The causes of project failure. IEEE Trans Eng Manag 37:269-276.

Westerman G, Bonnet D, McAfee A. Brighton (2014). Leading Digital: Turning Technology into Business Transformation. MA: Harvard Business Publishing.

HEALTH SERVICES MANAGEMENT: INCLUSIVE LEADERSHIP, ADAPTIVE PERFORMANCE AND WORK ENGAGEMENT IN THE DIGITAL ERA

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ABSTRACT

The services management of health care is very complex (Aubry, Richer and Lavoie-Tremblay, 2014). It involves examining the management of health care units in the new era of digitalization. Issues include care process re-organisation, information technology, human resource competency development and change management (Richer et al., 2013). Furthermore, organisational changes have substantial impacts in the management of health care workers (Kuokkanen et al., 2007; Bernstrøm and Kjekshus, 2015).

Inclusive leadership is a democratic style of leadership, with no exclusions and its main characteristic is the participation of employees in decision making (Carmeli, A., Reiter-Palmon, R. and Ziv, E., 2010; Yu, 2020; Pitt et al., 2021). The effect of inclusive leadership in the digital era (Randel et al., 2018), in adaptive performance (Shoss et al., 2012; Krijgsheld, Tummers, L. G. and Scheepers, F. E., 2022) and work engagement (Bakker, A.B. and Demerouti, E., 2008; Bakker, 2011; Bakker, A.B. and Demerouti, E., 2017) of health professionals is very important for the services management of health units (Tan, R. and Antonio, F., 2022).

The purpose of the present research is to investigate the effect of inclusive leadership style on the adaptive performance and the work engagement of health professionals. Weighted and structured close-ended self-report questionnaires were distributed to health professionals in electronic and paper form. The results of the research show that the implementation of inclusive leadership has a positive effect on both on the adaptive performance and work engagement of employees.

The managers of the departments consider that they have an inclusive leadership style to a high degree. Also, it was found that the more accessible managers were those of

the public sector. Moreover, the women healthcare professionals manage emergency situations better than the men and they are more willing to learn. Furthermore, both doctors and the nursing staff report greater adaptive capacity.

The employees who have a higher level of academic qualifications can manage their stress in emergency situations better, are more willing to learn and are more able to handle emergency situations. In addition, the older and more experienced employees are more capable and ready to adjust in difficult situations. Moreover, doctors, employees who have a position of responsibility and older employees have a higher degree of work engagement. On the opposite, the more years an employee works in the same position, the less engaged he/she is to it.

More than 85% of the participants have a strong desire to take part in decision making and they mostly belong to the medical staff, they hold academic degrees (Master’s degree or PhD), they already have a responsible position, they are characterized by a high adaptive performance, they are discerned for their ability to handle emergency situations and they declare to be more engaged to their work. Thus, it can be said that inclusive leadership has a positive effect in the adaptive performance and work engagement of healthcare professionals.

Key Words: Inclusive leadership, adaptive performance, work engagement, digital era, services management

REFERENCES

- Aubry, M., Richer, M. C., & Lavoie-Tremblay, M. (2014). Governance performance in complex environment: The case of a major transformation in a university hospital. *International Journal of Project Management*, 32(8), 1333–1345.
- Bakker, A. B. (2011). An evidence-based model of work engagement. *Current directions in psychological science*, 20(4), 265-269.
- Bakker, A. B., & Demerouti, E. (2008). Towards a model of work engagement. *Career development international*, 13(3), 209-223. <https://doi.org/10.1108/13620430810870476>.
- Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of occupational health psychology*, 22(3), 273.
- Bernstrøm, V. H., & Kjekshus, L. E. (2015). Effect of organisational change type and frequency on long-term sickness absence in hospitals. *Journal of Nursing Management*, 23(6), 813–822.
- Carmeli, A., Reiter-Palmon, R., & Ziv, E. (2010). Inclusive leadership and employee involvement in creative tasks in the workplace: The mediating role of psychological safety. *Creativity Research Journal*, 22(3), 250-260.
- Krijgsheld, M., Tummers, L. G., & Scheepers, F. E. (2022). Job performance in healthcare: a systematic review. *BMC Health Services Research*, 22(1), 149.
- Kuokkanen, L., Suominen, T., Rankinen, S., Kukkurainen, M. L., Savikko, N., & Doran, D. (2007). Organizational change and work-related empowerment. *Journal of Nursing Management*, 15(5), 500–507.
- Pitt, C., Doyle, K.E., Mpofu, E., Saunders, P., Doyle, R.W., Zarb, L.P. (2021). Leadership for Sustainable Organizational Health and Well-Being: Indigenous Community Perspectives. In: Di Fabio, A. (eds) *Cross-cultural Perspectives on*

Well-Being and Sustainability in Organizations. Springer, Cham.
https://doi.org/10.1007/978-3-030-86709-6_8.

- Randel, A. E., Galvin, B. M., Shore, L. M., Ehrhart, K. H., Chung, B. G., Dean, M. A., & Kedharnath, U. (2018). Inclusive leadership: Realizing positive outcomes through belongingness and being valued for uniqueness. *Human Resource Management Review*, 28(2), 190-203.
- Richer, M. C., Marchionni, C., Lavoie-Tremblay, M., & Aubry, M. (2013). The project management office: Transforming healthcare in the context of a hospital redevelopment project. *Healthcare Management Forum*, 26(3), 150–156.
- Shoss, M. K., Witt, L. A., & Vera, D. (2012). When does adaptive performance lead to higher task performance?. *Journal of organizational behavior*, 33(7), 910-924.
- Tan, R., & Antonio, F. (2022). New insights on employee adaptive performance during the COVID-19 pandemic: Empirical evidence from Indonesia.
- Yu, Y. (2020). Impact of inclusive leadership on employees' adaptive performance. In 2019 International Conference on Education Science and Economic Development (ICESD 2019) (pp. 6-9). Atlantis Press.

QUALITY ASSURANCE IN HEALTH UNITS

THE GREEN PSYCHOLOGY AND CLIMATE CHANGE MANAGEMENT IN PUBLIC HEALTH

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ABSTRACT

Background: The indispensable role of Ecopsychology lies in addressing subjective distress, managing crises and diseases, and fostering a profound collective contemplation on the diverse ongoing cues from our planet (Berry et al.,2009; Huang et al.,2013; Hayes et al.,2018; Van Valkengoed & Steg, 2019; Cianconi et al.,2020; Thoma et al.,2021; Walinski et al.,2023). The current paper aims to investigate, using a qualitative transversal methodology, the Eco-Psychological perspective concerning the interplay between humanity and nature and the determinants influencing the emergence or suppression of proactive attitudes towards environmental occurrences as a method to promote community mental well-being.

Methodology: The current paper was conducted within the qualitative, analytical, and descriptive bibliometric research framework. The process involved the collection, research, analysis, and discussion of chosen bibliographic materials, consisting of four main stages: information focusing from various sources such as journals, articles, books, theses, and academic works, selection of these sources, analysis of academic literature, and interpretation of the information contained from the literature of the last 20 years.

Results: Literature review results revealed that occurrences like climate-induced migrations such as air pollution and noise increase the incidence of emotional distress, solastalgia, climate grief, and anxiety; floods and storms impact on the emergence of anxiety disorders while heat, heatwaves, and wildfires increase the incidence of PTSD, trauma and suicide in the last 20 years (McLaughlin et al.,2011; Nahar et al.,2014; Bromet et al.,2016; Hayes et al.,2018; Dumencic et al.,2019; Bozick,2021; Lester et al.,2021; Rocque et al.,2021; Crane et al.,2022; Massazza, 2022; Clayton et al.,2023).

Conclusion: The conclusion will offer suggestions for promoting the active involvement of individuals as integral components of the social framework, their harmonious interaction with nature, and the enhancement of social and psychological welfare as a protective measure in Public Health.

Keywords: Eco-Psychology, Climate Change, Management, Assertiveness, Public Health

REFERENCES

- Berry, H. L., Bowen, K., & Kjellstrom, T. (2009). Climate change and mental health: a causal pathways framework. *International Journal of Public Health*, 55(2), 123–132. <https://doi.org/10.1007/s00038-009-0112-0>
- Bozick, R. (2021). The effects of Hurricane Harvey on the physical and mental health of adults in Houston. *Health & Place*, 72, 102697. <https://doi.org/10.1016/j.healthplace.2021.102697>
- Bromet, E. J., Atwoli, L., Kawakami, N., Navarro-Mateu, F., Piotrowski, P., King, A. J., Aguilar-Gaxiola, S., Alonso, J., Bunting, B., Demyttenaere, K., Florescu, S., De Girolamo, G., Gluzman, S., Haro, J. M., De Jonge, P., Karam, E. G., Lee, S., Kovess-Masfety, V., Medina-Mora, M. E., . . . Kessler, R. C. (2016). Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. *Psychological Medicine*, 47(2), 227–241. <https://doi.org/10.1017/s0033291716002026>
- Cianconi, P., Betrò, S., & Janiri, L. (2020). The Impact of Climate Change on Mental Health: A Systematic Descriptive review. *Frontiers in Psychiatry*, 11. <https://doi.org/10.3389/fpsy.2020.00074>
- Clayton, S., Manning, C., Hill, A. N., & Speiser, M. (2023). Mental Health and Our Changing Climate: Children and Youth Report 2023 [Dataset]. In *PsycEXTRA Dataset*. <https://doi.org/10.1037/e504642023-001>
- Crane, K., Li, L., Subramanian, P., Rovit, E., & Liu, J. (2022). Climate Change and Mental Health: A review of empirical evidence, mechanisms and implications. *Atmosphere*, 13(12), 2096. <https://doi.org/10.3390/atmos13122096>
- Dumencic, B., Rajc, J., Marjanović, K., Požgain, I., & Pavokovic, D. (2019). IMPACT OF METEOROLOGICAL FACTORS ON SUICIDE ATTEMPTS AND COMPLETED SUICIDES IN CROATIA, OSIJEK-BARANJA COUNTY. *Psychiatria Danubina*, 31(4), 405–412. <https://doi.org/10.24869/psyd.2019.405>
- Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018). Climate change and mental health: risks, impacts and priority actions. *International Journal of Mental Health Systems*, 12(1). <https://doi.org/10.1186/s13033-018-0210-6>
- Huang, C., Barnett, A. G., Xu, Z., Chu, C., Wang, X., Turner, L. R., & Tong, S. (2013). Managing the health effects of temperature in response to climate change: Challenges ahead. *Environmental Health Perspectives*, 121(4), 415–419. <https://doi.org/10.1289/ehp.1206025>
- Lester, D. (2021). The Environment and Suicide – Why suicidologists should support climate change policies. *Crisis*, 42(2), 89–91. <https://doi.org/10.1027/0227-5910/a000752>
- Massazza, A., Ardino, V., & Fioravanzo, R. E. (2022). Climate change, trauma and mental health in Italy: a scoping review. *European Journal of Psychotraumatology*, 13(1). <https://doi.org/10.1080/20008198.2022.2046374>
- McLaughlin, K. A., Berglund, P., Gruber, M. J., Kessler, R. C., Sampson, N. A., & Zaslavsky, A. M. (2011). Recovery from PTSD following Hurricane Katrina. *Depression and Anxiety*, 28(6), 439–446. <https://doi.org/10.1002/da.20790>
- Nahar, N., Blomstedt, Y., Wu, B., Kandarina, I., Trisnantoro, L., & Kinsman, J. (2014). Increasing the provision of mental health care for vulnerable, disaster-affected

- people in Bangladesh. *BMC Public Health*, 14(1). <https://doi.org/10.1186/1471-2458-14-708>
- Rocque, R. J., Beaudoin, C., Ndjaboue, R., Cameron, L., Poirier-Bergeron, L., Poulin-Rheault, R., Fallon, C., Tricco, A. C., & Witteman, H. O. (2021). Health effects of climate change: an overview of systematic reviews. *BMJ Open*, 11(6), e046333. <https://doi.org/10.1136/bmjopen-2020-046333>
- Thoma, M. V., Rohleder, N., & Rohner, S. L. (2021). Clinical Ecopsychology: the mental health impacts and underlying pathways of the climate and environmental crisis. *Frontiers in Psychiatry*, 12. <https://doi.org/10.3389/fpsy.2021.675936>
- Walinski, A., Sander, J., Gerlinger, G., Clemens, V., Meyer-Lindenberg, A., & Heinz, A. (2023). The effects of climate change on mental health. *Deutsches Ärzteblatt International*. <https://doi.org/10.3238/arztebl.m2022.0403>
- Van Valkengoed, A., & Steg, L. (2019). The Psychology of Climate Change adaptation. <https://doi.org/10.1017/9781108595438>

THE RELATIONSHIP BETWEEN CARING BEHAVIORS AND PERIOPERATIVE INDIVIDUAL-CENTERED CARE AMONG SURGICAL NURSES

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ABSTRACT

The role of perioperative nurses is to provide effective perioperative care and advocate for patients (Van Wicklin, 2020). Nurses must possess adequate knowledge during the perioperative process, deliver optimal individualized patient care, and maintain effective communication with patients (Rauta et al., 2013). The Perioperative Patient-Centered Model, dating back to the 2000s, provides the conceptual framework for perioperative nursing practices (Rothorck & Smith, 2000; Van Wicklin, 2020). This model emphasizes making patient care "visible" among all other variables in the surgical environment by prioritizing it (Rothorck & Smith, 2000). The patient-centered model is also outcome-oriented, highlighting that the care provided by perioperative nurses is aimed at achieving high-quality patient outcomes (Van Wicklin, 2020). However, due to the stressful and anxiety-inducing nature of the surgical process for patients and their families, as well as advancements in surgical technologies, it is believed that perioperative nurses may become distanced from patient care (Shin & Kang, 2019). There is no existing literature in Turkey that evaluates perioperative patient-centered care and examines the levels of care behaviors among nurses. This study examines the relationship between the caring behaviors of nurses working in surgical units and perioperative person-centered care.

This descriptive, cross-sectional correlational study was conducted with 119 nurses working in surgical units. The data were collected using the Descriptive Information Form, Person Centered Perioperative Nursing Scale (Yılmaz Esenboğa & Yurt, 2023), and Caring Behaviors Inventory-24 (Kursun & Kanan, 2012). The data were analyzed using the licensed SPSS 27 package. Cronbach's alpha test statistics, t and ANOVA tests, Tukey test, Pearson correlation tests were used. Results were interpreted with a significance level of $p < 0.05$.

Among the nurses who participated, 93.28% were female, 53.78% were single, 78.99% had a bachelor's degree, and the mean age was 35.01 ± 7.86 years (range: 20-55). Most nurses had not received training in perioperative patient preparation (82.35%) or person-centered care (90.76%). The mean score on the Person-Centered Perioperative Scale was 85.19 ± 9.05 (range: 64.00-100.00), and the mean score on the Caring Behaviors Inventory-24 was 5.43 ± 0.59 (range: 3.00-6.00). A statistically significant, moderate positive relationship was found between the Person-Centered Perioperative Scale scores and the Caring Behaviors Inventory-24 scores ($p < 0.05$, $r = 0.728$).

Most nurses in surgical units had not received training on perioperative patient preparation and person-centered care. It was found that as nurses' Person-Centered Perioperative Nursing Scale scores increased, their Caring Behaviors Inventory-24 scores also increased. It is recommended that in-service training on perioperative patient preparation and person-centered care be planned for nurses.

Keywords: Surgical nursing, caring behaviors, individual-centered care

REFERENCES

- Kursun S & Kanan N. (2012). Validity and Reliability Study of the Turkish Version of Caring Behaviors Inventory-24. *Anatolian Journal of Nursing and Health Sciences*, 15 (4): 229-235.
- Van Wicklin S A. (2020). The Perioperative Patient Focused Model: A literature review. *Perioperative Care and Operating Room Management*, 18, 100083.
- Rauta S, Salanterä, S, Nivalainen J & Junttila K. (2013). Validation of the core elements of perioperative nursing. *Journal of Clinical Nursing*, 22(9-10), 1391-1399.
- Rothorck J C & Smith D A. (2000). Selecting the perioperative patient focused model. *AORN journal*, 71(5), 1030-1037.
- Shin S & Kang J. (2019). Development and validation of a person-centered perioperative nursing scale. *Asian Nursing Research*, 13(3), 221-227.
- Yılmaz Esenboğa N & Yurt S. (2023). Person Centered Perioperative Nursing Scale: The Study of Adaptation to Turkish, Validity and Reliability. *JEUNF*, 30(1), 21-33. <https://doi.org/10.53490/egehemsire.1107227>

MAPPING TECHNOSTRESS RESEARCH IN NURSING: A BIBLIOMETRIC STUDY FROM 2009 TO 2024

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ABSTRACT

Objective: This study aimed to conduct a bibliometric analysis of research on technostress in nursing, focusing on publications indexed in the Web of Science (WoS) database. The goal was to provide a comprehensive overview of the trends, key contributors, and research themes in this emerging field, and to highlight gaps that need to be addressed in future studies.

Methods: An advanced search was performed in the Web of Science database using the keywords "nursing," "nurse," and "technostress." The bibliographic data of the retrieved articles were analyzed using the R studio program, which facilitated an in-depth bibliometric evaluation of publication trends, citation metrics, authorship patterns, and thematic focus areas.

Results: The search identified a total of 17 articles published on technostress in nursing between 2009 and 2024. The earliest publications appeared between 2009 and 2014, with just two articles, indicating limited initial exploration of the topic. The number remained the same between 2015 and 2019, with two articles published. Notably, the field experienced significant growth between 2020 and 2024, during which 13 articles were published, reflecting an annual growth rate of 7.6%. The average number of citations per article was 16.33, suggesting a growing recognition and impact of the research within the academic community.

A total of 63 authors contributed to the 17 articles, with foreign authors comprising 16.67% of the contributors, highlighting some international collaboration but also indicating that the field is still relatively concentrated. On average, each article featured four co-authors, although three articles were single-author studies, underscoring the collaborative nature of research in this area. The studies utilized 78 unique keywords, with the most common being "impact," "stress," "consequences," "technology" and "technostress." These keywords reflect the multifaceted nature of technostress, encompassing its causes, effects, and broader implications for nursing practice.

The most frequent journal of publication was "BMC Nursing," which featured two articles on the topic. Prominent sources referenced in these studies included "MIS Quarterly" (42 articles), "Information Systems Research" (23 articles), "Computers in Human Behavior" (17 articles), "Journal of Advanced Nursing" (16 articles), and "Journal of Applied Social Psychology" (16 articles), indicating a multidisciplinary interest in technostress. Notably, 27.77% of the published articles were affiliated with Comilla University, followed by Bern University of Applied Sciences and Western Washington University, each contributing 22.22% of the research output. The most cited study was "The Bright and Dark Sides of Technostress: A Mixed-Methods Study Involving Healthcare IT" by B. Califf et al., which garnered 157 citations, highlighting the pivotal role of mixed-methods research in understanding the dual impacts of technostress.

The countries leading in technostress research in nursing were China, the United States, Bangladesh, Switzerland, and Portugal, reflecting a global interest in the topic but also suggesting opportunities for broader international engagement.

Conclusion: Technostress is an increasingly recognized issue that significantly impacts nurses' job performance, job satisfaction, patient care quality, and overall healthcare services. Despite the growing body of research, there is a notable lack of intervention studies that evaluate coping strategies and offer actionable recommendations for healthcare organizations. To address this gap, future research should aim to develop conceptual frameworks and evidence-based interventions that can help nurses manage technostress effectively. Expanding the scope of research to include diverse healthcare settings and populations will also be crucial in understanding the full extent of technostress and its implications for nursing practice.

Key Words: bibliometric analysis, healthcare IT, job satisfaction, informatics, nursing, technostress.

REFERENCES

- Alshammari, M.H., Alenezi, A. (2023). Nursing workforce competencies and job satisfaction: the role of technology integration, self-efficacy, social support, and prior experience. *BMC Nurs* 22, 308. <https://doi.org/10.1186/s12912-023-01474-8>
- Bail, C., Marquardt, B., Harth, V. et al. (2024). Technostresserleben in der stationären medizinischen Versorgung in deutschen und schweizerischen Kliniken: aktueller Forschungsstand. *Zbl Arbeitsmed.* <https://doi.org/10.1007/s40664-024-00542-3>
- Burke M. S. (2009). The incidence of technological stress among baccalaureate nurse educators using technology during course preparation and delivery. *Nurse Education Today*, 29(1), 57–64. <https://doi.org/10.1016/j.nedt.2008.06.008>
- Califf, C.B. (2022). Stressing affordances: Towards an appraisal theory of technostress through a case study of hospital nurses' use of electronic medical record systems. *Information and Organization*, Volume 32, Issue 4, 100431. <https://doi.org/10.1016/j.infoandorg.2022.100431>

- Califf, C.B., Sarker, S., & Sarker, S. (2020). The Bright and Dark Sides of Technostress: A Mixed-Methods Study Involving Healthcare IT. *MIS Q.*, 44. <https://doi.org/10.25300/misq/2020/14818>
- Deng, W., Yang, T., Deng, J., Liu, R., Sun, X., Li, G., Wen, X. (2023). Investigating Factors Influencing Medical Practitioners' Resistance to and Adoption of Internet Hospitals in China: Mixed Methods Study. *J Med Internet Res.* 2023;25:e46621. <https://doi.org/10.2196/46621>
- Golz, C., Peter, K. A., Müller, T. J., Mutschler, J., Zwakhalen, S. M. G., & Hahn, S. (2021). Technostress and Digital Competence Among Health Professionals in Swiss Psychiatric Hospitals: Cross-sectional Study. *JMIR Mental Health*, 8(11), e31408. <https://doi.org/10.2196/31408>
- Golz, C., Peter, K. A., Zwakhalen, S. M. G., & Hahn, S. (2021). Technostress Among Health Professionals – A Multilevel Model and Group Comparisons between Settings and Professions. *Informatics for Health and Social Care*, 46(2), 137–149. <https://doi.org/10.1080/17538157.2021.1872579>
- Kasemy, Z. A., Sharif, A. F., Barakat, A. M., Abdelmohsen, S. R., Hassan, N. H., Hegazy, N. N., Sharfeldin, A. Y., El-Ma'doul, A. S., Alsawy, K. A., Abo Shereda, H. M., & Abdelwanees, S. (2022). Technostress Creators and Outcomes Among Egyptian Medical Staff and Students: A Multicenter Cross-Sectional Study of Remote Working Environment During COVID-19 Pandemic. *Frontiers In Public Health*, 10, 796321. <https://doi.org/10.3389/fpubh.2022.796321>
- Khuntia, J., Tanniru, M., & Weiner, J. (2015). Juggling digitization and technostress: The case of alert fatigues in the patient care system implementation. *Health Policy and Technology*, 4(4), 364–377. <https://doi.org/10.1016/j.hlpt.2015.08.005>
- Kräfte, J., Wirth, T., Harth, V. et al. (2024). Digital stress perception among German hospital nurses and associations with health-oriented leadership, emotional exhaustion and work-privacy conflict: a cross-sectional study. *BMC Nurs.* 23, 213. <https://doi.org/10.1186/s12912-024-01825-z>
- Lucena, J. C., Carvalho, C., Santos-Costa, P., Mónico, L., & Parreira, P. (2021). Nurses' Strategies to Prevent and/or Decrease Work-Related Technostress: A Scoping Review. *Computers, informatics, nursing: CIN*, 39(12), 916–920. <https://doi.org/10.1097/CIN.0000000000000771>
- Siddiqi, K.O. (2024). Impact of technostress and work-family conflict on turnover intention among nurses in Bangladesh: a moderation effect of perceived supervisor support. *Journal of Computational Social Science*. <https://doi.org/10.1007/s42001-024-00296-1>
- Siddiqi, K.O., Hashim, R.A., Mahmood, R., Rahman, H. (2023). Does supervisory and co-worker support reduce work-family conflict among nurses in bangladesh? the moderating effect of technostress. *Employee Responsibilities and Rights Journal*. <https://doi.org/10.1007/s10672-023-09466-1>
- Silva, M., Queiros, C., Cameira, M. (2016). Health in the workplace: technostress and burnout in nurses. *International Journal On Working Conditions*, 12 .
- Su, C. Y., & Chao, C. M. (2022). Investigating Factors Influencing Nurses' Behavioral Intention to Use Mobile Learning: Using a Modified Unified Theory of Acceptance and Use of Technology Model. *Frontiers In Psychology*, 13, 673350. <https://doi.org/10.3389/fpsyg.2022.673350>
- Ungku Ahmad, U. N., Mohamad Amin, S., & Wan Ismail, W. K. (2014). Moderating Effect of Technostress Inhibitors on the Relationship between Technostress

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Creators and Organisational Commitment. Jurnal Teknologi, 67(1).
<https://doi.org/10.11113/jt.v67.1932>

DIGITALIZATION IN ROUTINE DENTAL CARE IN INDIA – A SURVEY ON UTILIZATION, PREFERENCES AND PERCEIVED POTENTIALS

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ABSTRACT

Digitalization is considered as an ongoing revolution in healthcare, too. Digital dentistry is structured into two main fields: “Dental Informatics“ and “Digital Dental Technologies”, both differentiated in multiple, individual technologies and purposes (Alotaibi et al. 2023). The objective of this study is to elucidate the implementation, the preferences, the awareness and the potentials of digitalization in routine dental care practice in India from the perspective of dentists as well as of patients. The main focus was put on practice management software and digital radiography.

Cross-sectional online surveys for dentists and dental patients from India over the last quarter of 2023 were performed using specially designed and tested standardized questionnaires.

Dentists were approached through professional networks, dental associations, and alumni networks. Patients were recruited in dental clinics. Overall, questionnaires from 131 dentists and 92 dental patients were included in the analyses. Information regarding age, professional experience of dentists and location of dental practice (urban/rural) were included in the questionnaires.

Dental Practice Management:

67.6% of practitioners use software for appointment scheduling, while 44.1% find it helpful in managing billing processes. 76.5% leverage software for patient record management.

Among software users, 52.9% emphasize a notable enhancement in efficiency, while 91.2% observe improvements in educating and communicating with patients. 58.1% expressed a lack of complete confidence in manual data security. On the patient side, 53.3% report a lack of awareness of their dentist regarding software usage, and 43.3% of see a significant positive impact of digital technology on their dental experiences.

In contrast to surveys more than a decade ago (e.g. Brian et al. 2007) all responding dentists declared to use digital radiography, about two third of them for longer than three years. 61% of the dentists indicated that the implementation of digital radiology has strongly influenced their clinical practice routine. The main benefits reported were improved diagnostic capabilities (53%), cost savings on the long run (17%), workflow efficiency (14%) and patient preferences. The higher initial implementation costs of digital radiography were compensated by advantages such as increased efficiency (53%), increased patient outcomes and higher patient satisfaction (17% each).

Our study gives a current update on the use of digital technologies in dental care in India. The sample size and the nature of the data could give hints but no statistically significant results concerning age, gender, specialization and urban respectively rural settings. The study highlights disparities in awareness levels across different age groups and geographic regions, indicating a need for targeted educational campaigns for dentists and patients.

Patients in dental care in India are aware and expect digital technologies to be used for data management and treatment processes. The use of digital radiography is fully adapted in dental care whereas the implementation of digital data management was surprisingly low.

Overall, the study underscores the transformative potential of dental practice management software and digital radiography in enhancing efficiency, communication, and patient satisfaction.

Key Words: Dental Care, India, Radiography, Patient data management

REFERENCES

- Alotaibi K. F., Kassim A. M. (2023) Digitization in Dentistry: A Conceptual Framework for Digital Dental Technologies and Dental Informatics in Dental Practice. *International Journal of Intelligent Systems and Applications in Engineering* 11(3), 965–974
- Brian J.N., Williamson G.F. (2007) Digital radiography in dentistry: A survey of Indiana dentists. *Dentomaxillofacial Radiology* 36(1):18-23

DIGITAL THERAPEUTICS AS AN EFFECTIVE MEANS TO ADDRESS PSYCHOEDUCATION AND HEALTH SERVICES

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ABSTRACT

Digital Therapeutics, referred to as "Digital Therapeutics" (or "DTx" in the abbreviation), can be characterized as technological innovations that "deliver therapeutic interventions facilitated by high-quality software applications, grounded in scientific evidence derived from methodologically rigorous and confirmatory clinical trials, aimed at the prevention, management, or treatment of a wide array of physical, mental, and behavioral health conditions."(Hu et al.,2024; Chung,2019; Kraft et al.,2008) Digital Therapies are not merely health-related applications, nor are they telemonitoring interventions, nor systems provided by pharmaceutical enterprises designed to assist patients in the management of their medical conditions, particularly from the perspective of adherence to pharmacological treatment (termed Patient Support Program) (Bochicchio et al.,2021). Occasionally, they may also be mistakenly equated with what are identified as "digital medicines" ("Digital Medicines"), which refers to pharmaceuticals embedded with an integrated sensor that activates in the gastrointestinal tract upon ingestion (Nomura,2023).Digital Therapies can operate in two different ways, either independently of a drug (therefore without the parallel use of a "classic" drug) or in combination with it.The present research seeks to validate the current advancements by conducting an analysis of the literature pertaining to digital therapies utilizingPubMeddatabase a resource internationally recognized by the U.S. and European agencies (Landers et al.,2023). Commencing with an advanced search employing the term "Digital Therapies", authors addressed a series of keywords that served as the foundation for the currentstudy. The search encompassed clinical trials associated with the keyword array "digital therapeutics" or "digital therapeutics" or "digital therapies" or "digital therapy" that were documented on the website.Selected articles featured any element of information and communication technology, which includes mobile phones, cell phones, smartphones; computer-assisted interventions and apparatus; the Internet, online platforms, and mobile applications; blogs and social

media components; and email, text messages, and texts. We further refined our search parameters by also querying these terms within the “intervention” and “title” fields. Analyses were executed using SPSS version 29 and encompassed frequency distributions (for categorical variables) and means (for continuous variables). An additional analytical component involved examining the distribution of technologies employed by digital therapies across each disease category considered, with the objective of identifying potential clusters of tools associated with specific diseases (Nwosu et al.,2023). The study was based on the analysis of 135 randomized clinical trials within the domain of digital health and therapies. The medical conditions wherein these digital tools are predominantly utilized are those in which cognitive behavioral therapies (CBT) and lifestyle modifications have already been integrated into conventional treatment paradigms, notably within the fields of mental health, chronic diseases, and addictions (Biskupiak et al.,2024; Orsolini et al.,2023). These digital interventions, by fostering a more proactive role for the patient in engaging with the therapy, enhance its implementation and adherence (Fürstenau et al.,2023). Moreover, it has been observed that certain digital tools are more effective for specific pathologies, exemplified by the usage of video games predominantly within mental health. In conclusion, we advocate for an increased dissemination and comprehension of these matters among physicians, researchers, and developers, and, importantly, a heightened utilization of randomized clinical trials, which stand as the most robust methodology available for the scientific validation of these therapies.

Keywords: Digital therapies, digital intervention, non-pharmacological treatment, cognitive-behavioral therapies, mental-health

REFERENCES

- Biskupiak, Z., Ha, V. V., Rohaj, A., & Bulaj, G. (2024). Digital Therapeutics for improving Effectiveness of pharmaceutical drugs and biological products: Preclinical and clinical studies supporting development of drug + digital combination therapies for chronic diseases. *Journal of Clinical Medicine*, 13(2), 403. <https://doi.org/10.3390/jcm13020403>
- Bochicchio, M. A., Vaira, L., Mortara, A., & De Maria, R. (2021). Which usability assessment for digital therapeutics and patient support programs? In 2021 IEEE International Conference on Digital Health (ICDH). IEEE USA. <https://doi.org/10.1109/icdh52753.2021.00051>
- Chung, J. (2019). Digital therapeutics and clinical pharmacology. *Translational and Clinical Pharmacology*, 27(1), 6. <https://doi.org/10.12793/tcp.2019.27.1.6>
- Fürstenau, D., Gersch, M., & Schreiter, S. (2023). Digital Therapeutics (DTX). *Business & Information Systems Engineering*, 65(3), 349–360. <https://doi.org/10.1007/s12599-023-00804-z>
- Hu, P., Hu, L., Wang, F., & Mei, J. (2024). Editorial: Computing and artificial intelligence in digital therapeutics. *Frontiers in Medicine*, 10. <https://doi.org/10.3389/fmed.2023.1330686>
- Kraft, P., Drozd, F., & Olsen, E. (2008). Digital Therapy: Addressing willpower as part of the Cognitive-Affective Processing System in the service of Habit change. In *Lecture notes in computer science* (pp. 177–188). https://doi.org/10.1007/978-3-540-68504-3_16

- Landers, C., Wies, B., & Ienca, M. (2023). Ethical considerations of digital therapeutics for mental health. In Elsevier eBooks (pp. 205–217). <https://doi.org/10.1016/b978-0-323-90045-4.00007-1>
- Nomura, A. (2023). Digital health, digital medicine, and digital therapeutics in cardiology: current evidence and future perspective in Japan. *Hypertension Research*, 46(9), 2126–2134. <https://doi.org/10.1038/s41440-023-01317-8>
- Nwosu, A., Boardman, S., Husain, M. M., & Doraiswamy, P. M. (2022). Digital therapeutics for mental health: Is attrition the Achilles heel? *Frontiers in Psychiatry*, 13. <https://doi.org/10.3389/fpsyt.2022.900615>
- Orsolini, L., Longo, G., & Volpe, U. (2023). Practical application of digital therapeutics in people with mood disorders. *Current Opinion in Psychiatry*, 37(1), 9–17. <https://doi.org/10.1097/ycp.0000000000000906>

UTILIZING BLOCKCHAIN TECHNOLOGY IN BLOOD DONATION SYSTEMS

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ABSTRACT

Blood donation is one of the most important aspects of the health system worldwide. However, it is commonly affected by inefficiencies, a lack of transparency, and subsequent contamination and mismanagement. Due to those problems, delays, errors, and even life-threatening situations may arise. Blockchain technology offers a promising solution for such issues because it is decentralized, immutable, and transparent. The following abstract discusses ways in which blockchain technology would potentially enhance traceability, transparency, and trust among stakeholders, always respecting the blood donation process.

This study aims to explore the application of blockchain that improves donor tracking and blood supply chain management and ensures traceability, accountability, and integrity in blood donation records. A comprehensive bibliographic review was conducted utilizing the electronic databases Pubmed, Scopus, and Cinahl. We ended up with 11 articles. Keywords: Blockchain, Blood Donation, Supply Chain, Traceability, Data Security, Healthcare, Transparency, Donor Engagement, Decentralized Systems, Medical Data

Results:

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Increased Transparency:

The blockchain-based system provided a clear and immutable record of each blood donation, ensuring that all transactions could be traced from donor to recipient. This enhanced trust among all stakeholders, including donors, healthcare professionals, and patients.

Enhanced Data Security:

The decentralized nature of blockchain technology ensured that sensitive donor information was protected from unauthorized access or tampering. The immutability of the blockchain ledger prevented fraudulent data manipulation, thus ensuring data integrity throughout the process.

Efficient Supply Chain Management:

The blockchain system allowed for real-time blood tracking from donation to transfusion. This improved the overall efficiency of the supply chain by reducing errors and preventing the loss or mishandling of blood products.

Improved Accountability:

The application of blockchain technology ensured that each stakeholder in the blood donation process was accountable for their role, from collection to delivery. This accountability reduced the risk of contamination, mismanagement, or fraud in blood donation systems.

Automated Processes Using Smart Contracts:

Smart contracts were successfully used to automate donor eligibility checks, donation scheduling, and communication between healthcare facilities. This reduced the administrative burden and sped up routine processes in the blood donation system.

Conclusion

The study demonstrates that blockchain technology can significantly improve blood donation systems' efficiency, transparency, and security. By creating a decentralized and immutable ledger, blockchain ensures that every donation is tracked, verified, and accounted for, reducing the risk of errors, fraud, and data breaches. The integration of smart contracts further automates critical processes, streamlining the donation lifecycle from donor registration to transfusion. In addition to improving operational efficiency, blockchain also enhances donor trust by providing transparency and accountability in the system. Future work could focus on scaling this solution for wider adoption, addressing potential challenges such as scalability and integration with existing healthcare infrastructures.

REFERENCES

- Dajim, L. A., Al-Farras, S. A., Al-Shahrani, B. S., Al-Zuraib, A. A., & Mathew, R. M. (2019, May). Organ donation decentralized application using blockchain technology. In 2019 2nd International Conference on Computer Applications & Information Security (ICCAIS) (pp. 1-4). IEEE.
- Kuberkar, S., & Singhal, T. K. (2021). Factors influencing the adoption intention of blockchain and internet-of-things technologies for sustainable blood bank management. *International Journal of Healthcare Information Systems and Informatics (IJHISI)*, 16(4), 1-21.

- Kim, S., Kim, J., & Kim, D. (2020). Implementation of a blood cold chain system using blockchain technology. *Applied Sciences*, 10(9), 3330
- Lakshminarayanan, S., Kumar, P. N., & Dhanya, N. M. (2020, February). Implementation of blockchain-based blood donation framework. In 3rd International Conference on Computational Intelligence in Data Science (ICCIDS) (pp. 276-290).
- Nazir, T., Ahmed, R. H., Hussain, M., & Zahid, S. (2023). Transforming blood donation processes with blockchain and IoT integration: An augmented approach to secure and efficient healthcare practices. 2023 International Conference on IT and Industrial Technologies (ICIT), Chiniot, Pakistan, 1-8.
- Sadri, S., Shahzad, A., & Zhang, K. (2021, February). Blockchain traceability in healthcare: Blood donation supply chain. In 2021 23rd International Conference on Advanced Communication Technology (ICACT) (pp. 119-126). IEEE.
- Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2017, June). An overview of blockchain technology: Architecture, consensus, and future trends. In 2017 IEEE International Congress on Big Data (BigData Congress) (pp. 557-564). IEEE.