JHeS (Journal of Health Studies)
Vol. 10, No. 2 (2026), pp.1-16
e-ISSN 2549-3353
p-ISSN 2549-3345
https://doi.org/10.31101/jhes.4576

Literature Review

Technostress among nurses during electronic medical record implementation: a systematic literature review

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Submitted: November 4, 2025 Revised: February 28, 2026 Accepted: March 3, 2026

Abstract
The rapid implementation of Electronic Medical Records (EMR) has transformed healthcare documentation but has also introduced new psychological challenges among nurses. This study aims to identify and analyze the relationship between EMR implementation, technostress, and their impacts on nurses' performance and service quality. Using the PRISMA approach, a systematic literature review was conducted through PubMed and Scopus databases, focusing on studies published between 2020 and 2024. Eight relevant articles met the inclusion criteria, encompassing quantitative, qualitative, and mixed-method designs. The synthesis revealed that EMR systems enhance documentation accuracy and patient safety but simultaneously increase administrative burden, workload, and digital complexity, leading to technostress symptoms such as fatigue, frustration, and decreased focus. These stressors contribute to reduced work efficiency, lower job satisfaction, and potential risks to patient care quality. The review also found that adequate training, organizational support, and user-friendly system design are critical to mitigating technostress and improving adaptation. This study highlights that digital transformation in healthcare requires balanced attention to both technological innovation and human well-being.

Keywords: administrative burden; digital transformation; electronic medical record; nurses; service quality

1. Introduction

Digital transformation has become one of the key pillars in the global reform of healthcare systems. The integration of digital technologies has not only changed how hospitals manage information but also reshaped the paradigms of service delivery, decision-making, and organizational governance (Kraus et al., 2021). In this context, digital transformation is understood as the process of integrating technology across all operational and cultural aspects of an organization to create new value and enhance efficiency (Iyamu et al., 2021). In the healthcare sector, this transformation is reflected through the adoption of various innovations such as telemedicine, big data analytics, artificial intelligence, the Internet of Medical Things, and particularly the Electronic Medical Record (EMR) as the core of hospital information systems (Yun et al., 2024). The implementation of EMR enables patient data to be stored and accessed electronically, thereby accelerating documentation processes and improving the accuracy and security of clinical information (Koebe & Bohnet-Joschko, 2023).

Cross country studies indicate that hospital digitalization is driven not only by external factors such as government policy and efficiency pressure but also results in tangible changes in hospital governance and workflow processes. Digital transformation has been shown to improve data management effectiveness, service efficiency, and the speed of clinical decision making (Raimo et al., 2023). Moreover, digital approaches help hospitals optimize interdepartmental coordination, reduce administrative errors, and strengthen quality monitoring systems, which in turn enhance service quality and patient satisfaction (Baihaqy & Subriadi, 2025). In many public hospitals, digital initiatives have

also improved the patient experience by promoting greater transparency, faster access to care, and stronger trust in healthcare systems (Huaytan et al., 2024). In Indonesia, hospital digital transformation has been accelerated by the national Digital Health Transformation initiative led by the Ministry of Health. Several studies reveal that hospital digitalization contributes to improved service efficiency, reduced administrative time, and smoother coordination among healthcare professionals (Nurfaidah et al., 2025; Saputra, 2025). Beyond efficiency, digitalization also facilitates more transparent and accountable data management. However, the effectiveness of these initiatives remains highly dependent on infrastructure readiness, organizational support, and the ability of human resources to adapt to technological change (Baihaqy & Subriadi, 2025). Overall, digitalization in healthcare represents not merely the adoption of technology but a deep organizational transformation that reshapes workflows, management structures, and interprofessional interactions within hospitals. While this transformation offers significant strategic benefits in terms of efficiency and service quality, it simultaneously introduces new challenges, particularly in the form of adaptation pressure and psychological strain among healthcare workers, especially nurses who are the primary users of EMR systems (Koebe & Bohnet-Joschko, 2023).

Although the implementation of Electronic Medical Records (EMR) has great potential to improve the quality of healthcare services, the process still faces various complex challenges at structural, organizational, and human resource levels. The adoption of this system requires major changes in hospital workflows, data management systems, and patterns of clinical communication among healthcare professionals (Gatiti et al., 2021). These changes, while intended to enhance efficiency, often create friction in practice, especially among nurses who are at the frontline of care and must adapt to new documentation and coordination routines. Several studies have shown that the success of EMR implementation is strongly influenced by institutional readiness and leadership commitment (Jimma & Enyew, 2022). Hospitals with adequate digital infrastructure, clear operational procedures, and continuous training tend to experience smoother transitions. In contrast, hospitals with limited technological capacity or weak administrative support often face resistance, low adoption rates, and incomplete data entry. In many developing countries, including Indonesia, gaps in infrastructure and human resources further complicate the process of digital transformation (Rasyid et al., 2025).

In the Indonesian context, EMR implementation is regulated by the Ministry of Health Regulation Number 24 of 2022, which emphasizes the importance of electronic-based management to ensure efficiency, accuracy, and accountability. However, several studies indicate that many hospitals still face technical challenges such as unstable systems, limited integration across service units, and insufficient user training (Farid & Maharani, 2025). These barriers often result in fragmented data systems and duplication of manual documentation, reducing the overall effectiveness of EMR. At the organizational level, EMR implementation frequently disrupts long-established clinical routines and increases the workload of nurses who must enter detailed patient information while maintaining direct patient care (Rusdiana et al., 2024). This situation creates tension between administrative and clinical duties, requiring nurses to balance technological demands with their primary caregiving roles. Such workflow disruptions not only reduce time efficiency but also increase cognitive burden, which can ultimately lead to the emergence of technological stress or technostress.

Globally, similar patterns of challenges have been reported in developed countries. Janett & Yeracaris (2020), found that in the early stages of EMR implementation in the United States, healthcare workers encountered usability problems, inconsistent data entry standards, and frustration due to the steep learning curve. Over time, continuous user feedback mechanisms and system refinements have proven essential in reducing resistance and improving acceptance of EMR technology. Evidence from Indonesian hospitals also supports this global pattern. Ikawati & Haris (2024), found that although EMR implementation can enhance patient service quality and data accuracy, its success largely depends on

staff motivation, the intensity of training, and management support. Farid & Maharani (2025), further observed that resistance to EMR often arises from perceptions that the system increases workload, extends documentation time, and reduces interaction with patients. Overall, the challenges of EMR implementation are multidimensional, encompassing technological, managerial, and psychological aspects. Technical problems such as system errors and unstable connectivity interact with organizational factors like limited training and weak managerial involvement. These combined factors influence individual responses among healthcare workers, particularly nurses, who often experience technostress, emotional fatigue, and decreased job satisfaction. Therefore, the success of digital transformation in hospitals is determined not only by technological readiness but also by adaptive leadership, user-centered system design, and continuous professional support to ensure that digitalization truly improves healthcare service quality.

The implementation of electronic medical records (EMR) has improved efficiency in healthcare delivery but has also introduced new psychological challenges known as technostress. This pressure arises when healthcare workers are required to adapt to complex technologies and rapid changes in workflow. Vehko et al. (2019), found that limited IT competence and poor system usability contribute to time pressure and work-related stress, which in turn reduce service effectiveness. Provenzano et al. (2024), emphasized that EMR adoption is often associated with increased workplace stress and reduced staff well-being, particularly when organizational and technical support are insufficient. Such conditions disrupt team communication and delay clinical decision-making processes.

Furthermore, Shaban et al. (2025), revealed that technostress can lead to emotional exhaustion and burnout among nurses, especially in critical care units. Emotional intelligence plays a mediating role in mitigating these negative outcomes and sustaining performance. Kopuz et al. (2025), also noted that technostress exerts a dual influence: it may foster digital adaptability on one hand, but on the other, it can decrease job performance if not accompanied by adequate psychosocial and technological support. Muhlizardy et al. (2025), highlighted that high workload and technological demands reduce nurse satisfaction in EMR use, consequently affecting patient service quality. To address this, Lucena et al. (2021), proposed stress management strategies centered on team support, continuous technological training, and workplace well-being initiatives to maintain optimal performance and consistent care quality.

Although research on digital transformation in healthcare has been growing, most studies still focus on the technological and organizational efficiency aspects without adequately addressing the psychological and social impacts on healthcare workers, particularly nurses who are the primary users of Electronic Medical Records (EMR). Previous studies have reported mixed findings regarding the relationship between EMR use, workload, stress, and job satisfaction, yet there has been no systematic synthesis that comprehensively integrates these outcomes. Moreover, most existing evidence originates from developed countries, while research in developing contexts such as Indonesia remains limited and fails to fully capture nurses' experiences of technostress during EMR implementation. The novelty of this study lies in its systematic synthesis of empirical evidence on technostress among nurses during EMR implementation, highlighting its antecedents, impacts on performance and service quality, and possible mitigation strategies. Unlike prior reviews that emphasize technological success factors, this study adopts a human-centered analytical approach, positioning nurses' psychological and organizational experiences as integral dimensions of hospital digital transformation. Accordingly, this study aims to identify and analyze systematically the factors causing technostress among nurses during EMR implementation and its impacts on nurse performance and healthcare service quality. The findings are expected to provide a conceptual foundation and practical recommendations for hospital managers and policymakers in designing digital transformation strategies that are more adaptive, human-oriented, and conducive to sustainable quality improvement in healthcare services during EMR implementation.

2. Research Methods

2.1.Type of Research

This study adopts a Systematic Literature Review (SLR) design as the main research approach. The SLR is a structured and transparent method used to identify, evaluate, and synthesize existing studies to answer a specific research question (Pati & Lorusso, 2017). Unlike traditional narrative reviews, the SLR follows a well-defined and replicable process that ensures methodological rigor in each step from formulating search strategies to analyzing and reporting findings (Lame, 2019). The systematic procedure enables researchers to organize large bodies of literature objectively and avoid bias in evidence interpretation (Mengist et al., 2020). By integrating diverse empirical findings, the SLR approach helps uncover knowledge gaps and develop conceptual insights that support future research and practice (Snyder, 2019). Accordingly, this study applies the SLR method to comprehensively examine technostress among nurses during the implementation of Electronic Medical Records (EMR), aiming to generate a structured synthesis of factors, impacts, and mitigation strategies within the broader context of digital transformation in healthcare.

2.2.Data Source and Search Strategy

This study employed a systematic search approach using two major scientific databases using PubMed and Scopus to ensure both disciplinary specificity and cross-disciplinary comprehensiveness in identifying relevant literature on technostress among nurses during the implementation of Electronic Medical Records (EMRs). Following established guidelines for systematic review methodology (Snyder, 2019), these databases were selected for their quality, coverage, and accessibility to peer-reviewed journals in health, nursing, and organizational research (Mongeon & Paul-Hus, 2016). PubMed is a leading biomedical and health sciences database that provides access to studies focusing on clinical practice, nursing, and health informatics, making it ideal for capturing research on nurses' psychological responses and work-related stress in healthcare technology contexts (Lame, 2019). Scopus, on the other hand, is a multidisciplinary citation database encompassing fields such as digital transformation, healthcare management, and behavioral science supporting the identification of broader contextual and organizational aspects of technostress during EMR implementation (Zhu & Liu, 2020). The search strategy used a Boolean approach combining four conceptual clusters: technostress, target population, electronic medical record system, and implementation context (Lowe et al., 2020). Logical operators OR and AND were applied to link these clusters: OR broadened the search by including synonymous or related terms, while AND connected distinct concepts to narrow the results to studies addressing all aspects of the research topic.

Table 1. Boolean Search Formula and Term Functions

Concept	Search Items	Purpose of Use
Technostress	"technostress" OR "technology stress" OR "digital stress" OR "stress" OR "workplace stress"	To identify literature discussing psychological or occupational stress due to digital technologies.
Target Population	"nurse" OR "nursing" OR "healthcare worker" OR "medical staff"	To focus on nurses and closely related healthcare professionals.
Electronic Medical Record (EMR)	"electronic medical record" OR "EMR" OR "electronic health record" OR "EHR"	To specify the digital information system under study.
Implementation Context	"implementation" OR "adoption" OR "integration" OR "deployment"	To capture studies focusing on system introduction, adaptation, or operational integration.

Based on **Table 1**, the Boolean search formula integrates the four conceptual domains that structure the scope of this review. By combining the terms with logical connectors OR for inclusivity of synonyms and AND for specificity the query ensures comprehensive yet focused retrieval of studies addressing technostress experienced by nurses during EMR implementation. This systematic approach enables the identification of empirical and theoretical works that contribute to understanding both the psychological effects and operational challenges associated with digital transformation in healthcare. The final Boolean string used for both PubMed and Scopus see on **Table 2**.

Table 2. Data Source and Query Strings

Database	Formula Boolean
Scopus PubMed	(“technostress” OR “technology stress” OR “digital stress” OR “stress” OR “workplace str1```ess”) AND (“nurse” OR “nursing” OR “healthcare worker” OR “medical staff”) AND (“electronic medical record” OR “EMR” OR “electronic health record” OR “EHR”) AND (“implementation” OR “adoption” OR “integration” OR “deployment”)

2.3.Search Criteria Restrictions

In conducting a systematic literature review, the use of inclusion and exclusion criteria is essential to ensure that the selection of studies is both relevant and methodologically consistent with the research objectives (van Dinter et al., 2021). These criteria serve as a structured framework that guides researchers in determining which studies are eligible for analysis and which should be excluded due to limited alignment with the topic or methodological weaknesses. Inclusion criteria are established to capture studies that directly address the phenomenon under investigation, in this case, the occurrence of technostress among nurses during Electronic Medical Record (EMR) implementation. Such criteria help ensure that the review focuses on empirical evidence that contributes meaningfully to understanding the relationship between digital transformation, psychological well-being, and healthcare performance. Conversely, exclusion criteria are applied to eliminate articles that may introduce conceptual noise or bias, such as those unrelated to the nursing profession, non-empirical studies, or papers outside the scope of EMR implementation. By applying these restrictions, the review achieves a balance between breadth and precision, ensuring that the final set of studies reflects both depth of insight and reliability of evidence (Lame, 2019).

Table 3. Inclusion and Exclusion Criteria

Aspects	Inclusion Criteria	Exclusion Criteria
Publication Period	January 2020 - December 2024	except January 2020 - December 2024
Publication Type	Empirical article	Editorials, commentaries, opinions, case reports, proceedings, article reviews, notes, books, book chapters. etc
Language	In English	other than in English
Access	open access	restricted access
Research Design	Quantitative, qualitative, mixed-methods studies	literature review
Main Topic	Discussing the investigated technostress among nurses within the context of Electronic Medical Record (EMR) implementation	Articles that do not explicitly mention technostress among nurses within the context of Electronic Medical Record (EMR) implementation

2.4.Selection and Screening Process

The selection and screening process in this review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which provides a transparent and structured approach for identifying, screening, and including relevant studies. This process ensures that the literature selection is systematic, traceable, and free from subjective bias (Haddaway et al., 2022a). Initially, all retrieved records from PubMed and Scopus were compiled and exported into a reference management tool to facilitate duplication checking. Duplicate records were identified and removed to prevent redundancy in the data set. The remaining studies were then screened in two sequential phases: title–abstract screening and full-text eligibility assessment. During the title and abstract screening, studies were evaluated for their alignment with the key themes of this review, namely technostress, nurses, and Electronic Medical Record (EMR) implementation. Articles that met the inclusion criteria were retained for full-text review, where each study was examined in greater depth to assess methodological rigor, data relevance, and contextual fit with the research objectives (Schreiber & Cramer, 2024). At the final stage, only studies that provided empirical evidence or systematic insights into the relationship between EMR implementation and technostress among nurses were included in the synthesis. The complete selection pathway including identification, screening, eligibility, and inclusion stages is visually summarized in **Figure 1** (PRISMA Flow Diagram) to illustrate the filtering and decision-making process used throughout the review.

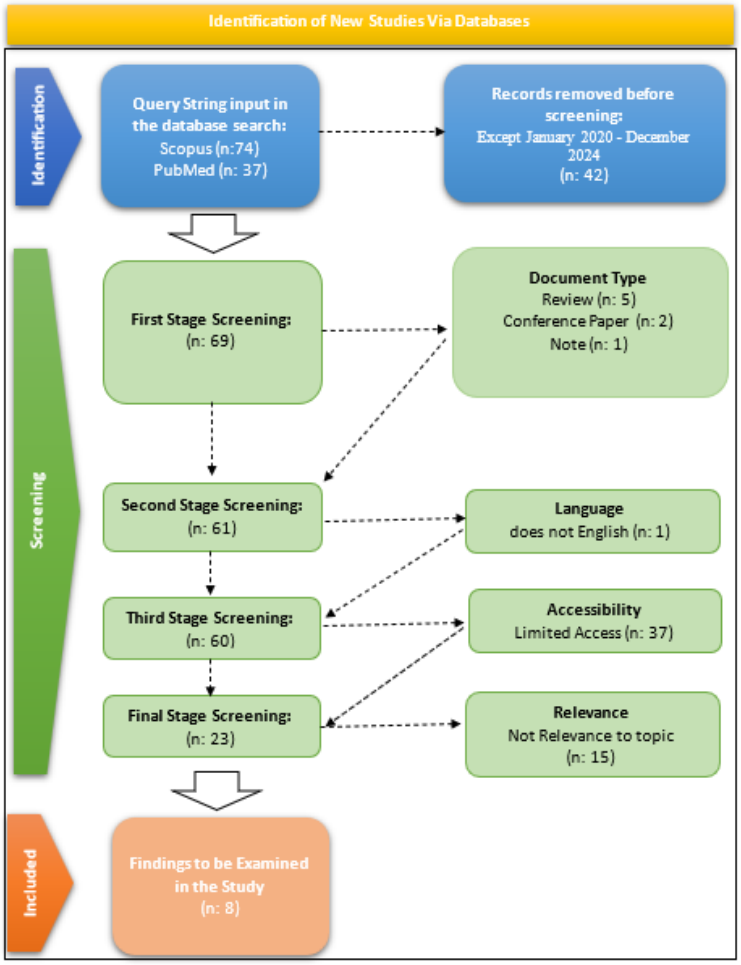

Figure 1. PRISMA – ScR Flow Chart
Source: (Haddaway et al., 2022b)

2.5.Data Extraction and Quality Appraisal

After identifying and selecting the eligible studies, the data extraction process was systematically conducted to gather key information relevant to the study objectives. This stage aimed to ensure transparency, accuracy, and comparability among all included studies (Chetwynd, 2022). Extracted data included bibliographic details (author, year, and country), study design, population characteristics, context of EMR implementation, type of technostress measured, and the main findings or outcomes reported. A standardized extraction matrix was used to maintain consistency, and data were entered into a spreadsheet for organized documentation. Each article was independently reviewed and coded by reviewers based on thematic relevance, with discrepancies resolved through discussion to minimize subjective bias (Pati & Lorusso, 2017). Following extraction, quality appraisal was performed to assess the methodological rigor and internal validity of each study. This process aimed to ensure that only studies meeting a minimum quality threshold contributed to the synthesis (Munn et al., 2019). The Joanna Briggs Institute (JBI) Critical Appraisal Checklist was employed as a guide to evaluate various study designs, including quantitative, qualitative, and mixed-methods research (Santos et al., 2018). Key appraisal indicators included clarity of objectives, adequacy of sample size, transparency of data collection methods, and appropriateness of analytical techniques.

2.6.Data Analysis and Presentation of Results

After completing the data extraction and quality appraisal process, the next stage involved data analysis, which aimed to identify key patterns, thematic relationships, and research gaps related to technostress among nurses in the context of Electronic Medical Record (EMR) implementation. The analysis followed a descriptive and thematic approach, as recommended by Snyder (2019), to achieve a comprehensive understanding of diverse methodological and contextual findings across studies. A thematic synthesis approach was employed to trace major themes within the reviewed studies, including the causes of technostress, organizational and technological determinants, nurses' coping strategies, and the impact of technostress on job performance and satisfaction. Each theme was developed through processes of coding, categorization, and interpretation of study results, allowing heterogeneous data to be grouped into meaningful analytical units (Torres-Carrión et al., 2018). Additionally, a basic descriptive quantitative analysis was performed to summarize publication characteristics such as year, country, and research design distribution. This approach helped illustrate publication trends and emerging research focuses in technostress and healthcare digitalization (Kitchenham et al., 2015).

The findings were presented through tables and figures, which summarize study characteristics, thematic distributions, and relationships among key variables. Furthermore, a narrative synthesis was used to explain the connections between empirical findings and the theoretical framework guiding this review. To ensure systematic and transparent reporting, the study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines developed (Haddaway et al., 2022b). The PRISMA flow diagram was employed to depict the selection process from identification and screening to eligibility assessment and inclusion of the final set of studies. Through this analytical framework, the review not only maps the current state of research on technostress among nurses during EMR implementation, but also establishes a conceptual foundation for understanding how technology-induced stress emerges, interacts with organizational contexts, and influences work quality and patient safety outcomes.

3. Results and Discussion

Based on a literature review conducted through the PubMed and Scopus databases, eight articles were found to be relevant to the research objective regarding the relationship between the

implementation of Electronic Medical Records (EMR), technostress, and the well-being of nursing staff. These articles were selected because they met the inclusion criteria that highlighted the experiences, challenges, and impacts of EMR implementation on nurses' workload, work stress, and professional adaptation in the healthcare environment. This review confirms that the use of EMR has two sides: on the one hand, it can improve the efficiency and accuracy of services, but on the other hand, it can cause psychological pressure related to system complexity, administrative demands, and lack of adequate training. These findings reinforce the findings which Sartika et al. (2024) and Tasbihah & Yunengsih (2024), show that EMR provides optimal accuracy in medical treatment and improved patient care. The results of the analysis of these eight articles are then synthesized in **Table 4**, which summarizes the research methods, main findings, and their relevance to the research focus.

Table 4. Literature Review Results

Title	Author (s), Year	Methods & Design	Key Findings	Relevance to Study
The effect of electronic medical records on medication errors, workload, and medical information availability among qualified nurses in Israel – a cross-sectional study	(Naamneh & Bodas, 2024)	Quantitative, Cross-sectional survey	EMR reduced medication errors but increased nurses' workload and stress due to information overload.	Highlights dual impact of EMR: safety benefits vs. technostress; aligns with nurse workload and cognitive strain dimensions.
Electronic health record adoption and its effects on healthcare staff: a qualitative study of well-being and workplace stress	(Provenzano et al., 2024)	Qualitative, semi-structured interviews	Identified emotional fatigue, workload escalation, and adaptation challenges after EHR adoption.	Provides qualitative evidence of EHR-induced stress and well-being reduction among healthcare staff.
'One size does not fit all': Nurses' and midwives' opinions about using electronic medical records	(Smyth et al., 2024)	Qualitative, focus group study	Found perception gaps and usability concerns; EMR seen as both beneficial and burdensome.	Shows subjective perception and variability of technostress depending on digital literacy and workflow.
Stressors, resources, and strain associated with digitization processes of medical staff working in neurosurgical and vascular surgical hospital wards: a multimethod study	(Tell et al., 2023)	Mixed-methods (survey + interview)	Reported increased strain and time pressure due to digital documentation; coping resources mitigated effects.	Links digital transformation with stress; emphasizes moderating role of support and communication
Electronic health record	(Heponiemi et al., 2021)	Quantitative, cross-sectional	Lack of EHR training associated with burnout,	Reinforces importance of training and

Title	Author (s), Year	Methods & Design	Key Findings	Relevance to Study
implementations and insufficient training endanger nurses' well-being: cross-sectional survey study			frustration, and decreased job satisfaction among nurses.	organizational support in preventing technostress.
Identification of factors influencing the adoption of health information technology by nurses who are digitally lagging: in-depth interview study	(De Leeuw et al., 2020)	Qualitative, in-depth interviews	Found digital resistance among older nurses due to lack of confidence and perceived complexity of HIT	Addresses adoption barriers that trigger technostress and resistance to EMR integration.
The impact of time spent on the electronic health record after work and of clerical work on burnout among clinical faculty	(Peccoralo et al., 2021)	Quantitative, observational study	Excessive after-hours EHR use ("pajama time") strongly linked to burnout and emotional exhaustion.	Illustrates temporal dimension of technostress and its psychological toll.
Rethinking the electronic health record through the quadruple aim: time to align its value with the health system	(Alami et al., 2020)	Conceptual and reflective analysis	Advocates redesigning EHR to align efficiency with clinician well-being and patient outcomes.	Provides strategic lens for balancing digital efficiency with health worker well-being.

The synthesis of eight relevant articles as presented in **Table 4,** shows that the implementation of Electronic Medical Records (EMR) is closely related to the emergence of technostress symptoms among nursing staff. All studies confirm that the workload has increased due to more complex digital documentation requirements and changes in workflows that demand rapid adaptation to the new system. Several studies highlight that a lack of training and limited technical support exacerbate the work stress experienced by healthcare workers. On the other hand, some findings indicate that the well-planned implementation of EMR, accompanied by ongoing training, can actually improve efficiency, communication, and patient safety. Thus, it can be concluded that technostress arises not solely because of technology, but because of the manner of implementation, organizational support, and the readiness of human resources, which differ in each healthcare context.

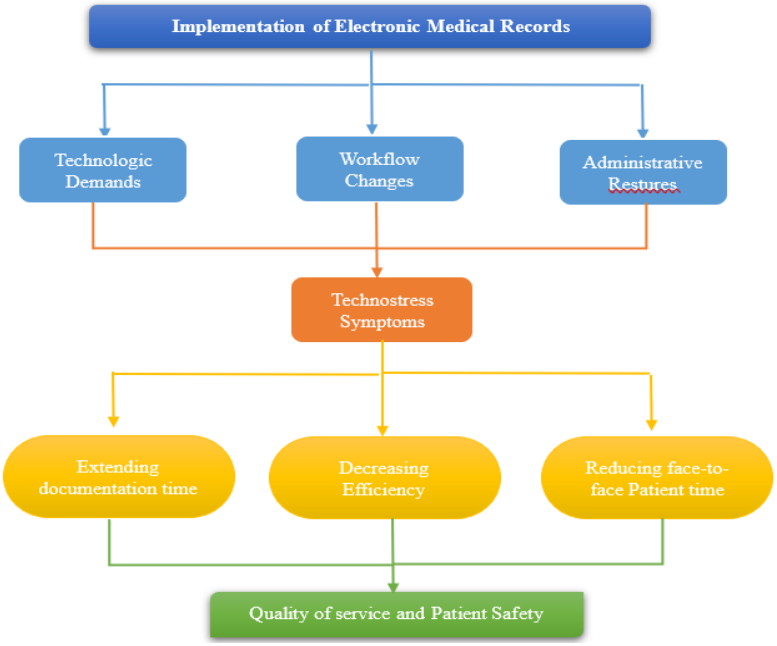

Figure 2. Flowchart of findings synthesis

Figure 2, illustrates the conceptual relationship between the implementation of Electronic Medical Records and its impact on technostress and its implications for service quality and patient safety. The implementation of EMR gives rise to three main sources of stress, namely technological demands, changes in workflow, and additional administrative burdens. All three contribute to the emergence of technostress symptoms such as increased documentation time, decreased work efficiency, and reduced direct interaction time between healthcare workers and patients. **Figure 2**, illustrates the conceptual relationship between the implementation of Electronic Medical Records and its impact on technostress and its implications for service quality and patient safety. The implementation of EMR gives rise to three main sources of stress, namely technological demands, changes in workflow, and additional administrative burdens. All three contribute to the emergence of technostress symptoms such as increased documentation time, decreased work efficiency, and reduced direct interaction time between healthcare workers and patients.

The results of the study show that the implementation of electronic medical record systems has had consequences that are not only technological, but also administrative and psychological for healthcare workers. The complexity of digital systems has led to a significant increase in administrative burdens, particularly in terms of documentation requirements and changes in workflows. These findings are in line with the study by Storseth et al. (2025), which highlights how digital systems often prolong administrative processes and reduce the face-to-face time between medical personnel and patients. Woelert (2023), adds that digitization that is not balanced with adaptive managerial policies tends to create task fragmentation and reduce professional autonomy, which ultimately disrupts the smooth running of services. Conceptually, Mikkelsen et al (2024), emphasize that administrative burden has cognitive, procedural, and emotional dimensions that affect work efficiency, while Mikkelsen et al. (2024), show that high administrative pressure is positively correlated with increased work stress among frontline staff and decreased patient satisfaction. Meanwhile, Madsen et al (2022), explain that digitization designed without considering user readiness can create new administrative burdens that are counterproductive to efficiency goals.

This condition encourages the emergence of technostress symptoms, which are psychological pressures resulting from intense interaction with digital technology in the work environment. These symptoms are evident in increased digital fatigue, frustration with complex systems, and decreased focus on completing clinical tasks. These findings are in line with the research by Olakotan et al (2025), which found that technology-based care redesign can add to the mental burden on healthcare workers if it is not accompanied by proportional adjustments to their workload. LaBoone & Marques (2024), further reinforce these findings by showing that innovations such as wearables and AI-based decision support systems have the potential to increase service efficiency, but without mature integration into clinical workflows, they actually cause excessive technological pressure. Thus, technostress is not solely the result of the existence of technology, but rather a reflection of the imbalance between digital demands and the adaptive capacity of the organization.

These findings can be further understood through the Transactional Model of Stress and Coping, which explains how individuals appraise and respond to technological demands. In the context of EMR implementation, high digital complexity and administrative pressure act as stressors, while training, managerial support, and digital literacy serve as coping resources. Similarly, the Job Demands Resources (JD-R) framework suggests that EMR-induced technostress occurs when job demands outweigh available resources, highlighting the critical role of organizational interventions to maintain well-being and performance.

The implications of the two phenomena above are clear in terms of service quality and patient safety. The results of the study show that increased administrative burdens and symptoms of technostress have a direct impact on reduced work efficiency, increased documentation time, and decreased face-to-face time with patients. As a result, the dimensions of speed, empathy, and reliability, which are at the core of healthcare quality, have deteriorated. Ali et al (2024), emphasize that service quality is greatly influenced by the effectiveness of human interaction between medical personnel and patients, which will weaken if professionals' time and energy are consumed by administrative work. Research by Zehra et al. (2025), also shows that patient experience plays an important role as a mediator between the service process and health outcomes, so that an increase in digital workload can interfere with patients' perceptions of service quality. This is reinforced by Alibrandi et al (2023), who highlight the relationship between patient satisfaction and perceptions of hospital quality, and by Çakmak & Uğurluoğlu (2024), who find that patient-centered communication can mitigate the negative effects of technostress by strengthening interpersonal relationships and emotional engagement in the care process.

From these findings and supporting literature, a thematic chain of relationships emerges between three main concepts: administrative burden, technostress, and service quality. The digitization of health information systems, initially designed to improve efficiency, has the potential to create high administrative pressure. This pressure develops into technostress when individuals and organizations are unable to adapt to rapid technological changes and workflows. As a result, service quality and patient safety decline, both due to reduced work efficiency among healthcare workers and decreased quality of interaction between medical staff and patients. In this context, the success of digital transformation in healthcare is not only determined by technological advances, but also by the organization's ability to balance innovation with the psychological well-being of workers and the effectiveness of collaborative work systems.

The review highlights that successful EMR implementation requires balancing digital transformation with psychological and organizational readiness. Hospitals should prioritize user-centered design, continuous training, and stress management initiatives. Leadership support and participatory approaches are essential to enhance nurses' adaptation and reduce technostress. Moreover, integrating real-time feedback mechanisms and simplifying documentation interfaces can prevent excessive workload and sustain service quality.

Furthermore, this review does not include gray literature or non-English studies, which might offer additional insights into the diversity of nurses' experiences. Future research should consider comparative analyses across different healthcare systems and cultures. Employing longitudinal mixed-method approaches could also reveal how technostress evolves over time and how institutional resilience and leadership styles influence adaptation. Such empirical evidence would deepen the understanding of sustainable digital transformation in healthcare

4. Conclusion

The results of this study indicate that the implementation of Electronic Medical Records (EMR) has a dual impact on nursing staff. On the one hand, EMR improves efficiency, documentation accuracy, and patient safety. However, on the other hand, this digitization process creates new administrative burdens and psychological stress known as technostress. Eight articles that were systematically reviewed show that the main triggers of technostress include system complexity, increased workload, changes in workflow, and lack of training and organizational support. The impact of these conditions not only reduces nurses' job satisfaction and emotional well-being, but also has the potential to reduce service quality and the effectiveness of interactions with patients. Thematic synthesis shows that the phenomenon of technostress is closely related to administrative burden and service quality. The increase in administrative tasks due to digitization causes high cognitive and emotional pressure. When the adaptive capacity of organizations and individuals is not balanced with technological demands, this pressure develops into technostress, which ultimately has a negative impact on key dimensions of service quality such as speed, empathy, and reliability.

The limitations of this study lie in the scope of the data, which only uses English-language open access articles from 2020–2024, so that relevant literature outside these criteria has not been accommodated. In addition, most of the findings come from the context of hospitals in developed countries, which may have different infrastructure and organizational culture conditions than developing countries such as Indonesia. For further research, it is recommended that empirical studies with a mixed-method approach be conducted to explore nurses' experiences in greater depth in the context of Indonesia or other developing countries. Further research could also examine the effectiveness of technostress mitigation strategies, such as more user-friendly system design, continuous training interventions, and stress management policies based on social and technological support.

References

Alami, H., Lehoux, P., Gagnon, M. P., Fortin, J. P., Fleet, R., & Ag Ahmed, M. A. (2020). Rethinking the electronic health record through the quadruple aim: Time to align its value with the health system. *BMC Medical Informatics and Decision Making*, *20*(1), 1–5. https://doi.org/10.1186/s12911-020-1048-9

Ali, J., Jusoh, A., Idris, N., & Nor, K. M. (2024). Healthcare service quality and patient satisfaction: a conceptual framework. *International Journal of Quality and Reliability Management*, *41*(2), 608–627. https://doi.org/10.1108/IJQRM-04-2022-0136

Alibrandi, A., Gitto, L., Limosani, M., & Mustica, P. F. (2023). Patient satisfaction and quality of hospital care. *Evaluation and Program Planning*, *97*(September 2022), 102251. https://doi.org/10.1016/j.evalprogplan.2023.102251

Baihaqy, A., & Subriadi, A. P. (2025). Development of digital transformation model in hospital. *Technological Sustainability*, *4*(1), 1–29. https://doi.org/10.1108/TECHS-04-2024-0028

Çakmak, C., & Uğurluoğlu, Ö. (2024). The Effects of Patient-Centered Communication on Patient

Engagement, Health-Related Quality of Life, Service Quality Perception and Patient Satisfaction in Patients with Cancer: A Cross-Sectional Study in Türkiye. *Cancer Control*, *31*, 1–15. https://doi.org/10.1177/10732748241236327

Chetwynd, Ellen. (2022). Critical Analysis of Reliability and Validity in Literature Reviews. *Journal of Human Lactation*, *38*(3), 392–396. https://doi.org/10.1177/08903344221100201

De Leeuw, J. A., Woltjer, H., & Kool, R. B. (2020). Identification of factors influencing the adoption of health information technology by nurses who are digitally lagging: In-depth interview study. *Journal of Medical Internet Research*, *22*(8). https://doi.org/10.2196/15630

Farid, A., & Maharani, S. (2025). Implementasi Electronic Medical Record Di Rumah Sakit X Kabupaten Kudus. *Journal of Administrative and Social Science*, *6*(2), 17–21. https://doi.org/10.55606/jass.v6i2.1865

Gatiti, P., Ndirangu, E., Mwangi, J., Mwanzu, A., & Ramadhani, T. (2021). Enhancing Healthcare Quality in Hospitals through Electronic Health Records: A Systematic Review. *Journal of Health Informatics in Developing Countries*, *15*(2), 1–25. https://www.jhidc.org/index.php/jhidc/article/view/330

Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022a). Campbell Systematic Reviews - 2022 - Haddaway - PRISMA2020 An R package and Shiny app for producing PRISMA 2020-compliant.pdf. In *Open Synthesis Campbell Systematic Reviews* (Vol. 18, Issue e1230, pp. 1–14). https://doi.org/10.1002/cl2.1230

Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022b). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. *Campbell Systematic Reviews*, *18*(2), e1230. https://doi.org/10.1002/cl2.1230

Heponiemi, T., Gluschkoff, K., Vehko, T., Kaihlanen, A. M., Saranto, K., Nissinen, S., Nadav, J., & Kujala, S. (2021). Electronic Health Record Implementations and Insufficient Training Endanger Nurses' Well-being: Cross-sectional Survey Study. *Journal of Medical Internet Research*, *23*(12). https://doi.org/10.2196/27096

Huaytan, J. V. P., Rojas, G. G. R., Ruiz-Balvin, M. C., Roldan, F. A. G., Leiva, N. A. D., Gordillo-Flores, R. E., Melly, J. L. I., & Tapia-Silguera, R. D. (2024). Digital Transformation in Public Hospital Management: Improving the Patient Experience. *Revista de Gestao Social e Ambiental*, *18*(4), 1–7. https://doi.org/10.24857/rgsa.v18n4-046

Ikawati, F. R., & Haris, M. S. (2024). Challenges in Implementing Digital Medical Records in Indonesian Hospitals: Perspectives on Technology, Regulation, and Data Security. *Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health*, *4*(2), 01–25. https://doi.org/10.62951/icistech.v4i2.70

Iyamu, I., Xu, A. X. T., Gómez-Ramírez, O., Ablona, A., Chang, H. J., Mckee, G., & Gilbert, M. (2021). Defining digital public health and the role of digitization, digitalization, and digital transformation: Scoping review. *JMIR Public Health and Surveillance*, *7*(11), 1–14. https://doi.org/10.2196/30399

Janett, R. S., & Yeracaris, P. P. (2020). Electronic medical records in the american health system: Challenges and lessons learned. *Ciencia e Saude Coletiva*, *25*(4), 1293–1304. https://doi.org/10.1590/1413-81232020254.28922019

Jimma, B. L., & Enyew, D. B. (2022). Barriers to the acceptance of electronic medical records from the perspective of physicians and nurses:A scoping review. *Informatics in Medicine Unlocked*, *31*(May), 100991. https://doi.org/10.1016/j.imu.2022.100991

Kitchenham, B. A., Budgen, D., & Brereton, P. (2015). *Evidence-based software engineering and systematic reviews*. CRC press.

Koebe, P., & Bohnet-Joschko, S. (2023). The Impact of Digital Transformation on Inpatient Care: Mixed Methods Study. *JMIR Public Health and Surveillance*, *9*. https://doi.org/10.2196/40622

Kopuz, K., Turgut, M., & Aydın, G. (2025). Technostress among nurses: boon or bane? The moderated mediation model. *BMC Nursing*, *24*(1). https://doi.org/10.1186/s12912-025-03721-6

Kraus, S., Schiavone, F., Pluzhnikova, A., & Invernizzi, A. C. (2021). Digital transformation in healthcare: Analyzing the current state-of-research. *Journal of Business Research*, *123*, 557–567. https://doi.org/10.1016/j.jbusres.2020.10.030

LaBoone, P. A., & Marques, O. (2024). Overview of the future impact of wearables and artificial intelligence in healthcare workflows and technology. *International Journal of Information Management Data Insights*, *4*(2), 100294. https://doi.org/10.1016/j.jjimei.2024.100294

Lame, G. (2019). Systematic literature reviews: An introduction. *Proceedings of the Design Society: International Conference on Engineering Design*, *2019-Augus*(August), 1633–1642. https://doi.org/10.1017/dsi.2019.169

Lowe, M. S., Stone, S. M., Maxson, B. K., Snajdr, E., & Miller, W. (2020). Boolean redux: Performance of advanced versus simple boolean searches and implications for upper-level instruction. *Journal of Academic Librarianship*, *46*(6), 102234. https://doi.org/10.1016/j.acalib.2020.102234

Lucena, J. C.-R., Carvalho, C., Santos-Costa, P., Mónico, L., & Parreira, P. (2021). Nurses' Strategies to Prevent and/or Decrease Work-Related Technostress: A Scoping Review. *CIN: Computers, Informatics, Nursing*, *39*(12). https://journals.lww.com/cinjournal/fulltext/2021/12000/nurses__strategies_to_prevent_and_or_decrease.12.aspx

Madsen, C. Ø., Lindgren, I., & Melin, U. (2022). The accidental caseworker – How digital self-service influences citizens' administrative burden. *Government Information Quarterly*, *39*(1). https://doi.org/10.1016/j.giq.2021.101653

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, *7*, 100777. https://doi.org/10.1016/j.mex.2019.100777

Mikkelsen, K. S., Madsen, J. K., & Baekgaard, M. (2024). Is stress among street-level bureaucrats associated with experiences of administrative burden among clients? A multilevel study of the Danish unemployment sector. *Public Administration Review*, *84*(2), 248–260. https://doi.org/10.1111/puar.13673

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: a comparative analysis. *Scientometrics*, *106*(1), 213–228. https://doi.org/10.1007/s11192-015-1765-5

Muhlizardy, M., Nurhayati, A., Isnaini, L., & Zahrani, N. (2025). ANALISIS BEBAN KERJA TERHADAP KEPUASAN PERAWAT DALAM PENGGUNAAN REKAM MEDIS ELEKTRONIK (RME) DI UNIT RAWAT JALAN. *Jurnal Penelitian Perawat Profesional*, *7*(3), 593–600. https://doi.org/http://jurnal.globalhealthsciencegroup.com/index.php/JPPP

Munn, Z., Barker, T. H., Moola, S., Tufanaru, C., Stern, C., McArthur, A., Stephenson, M., & Aromataris, E. (2019). Methodological quality of case series studies: An introduction to the JBI critical appraisal tool. *JBI Database of Systematic Reviews and Implementation Reports*, 2127–2133. https://doi.org/10.11124/JBISRIR-D-19-00099

Naamneh, R., & Bodas, M. (2024). The effect of electronic medical records on medication errors, workload, and medical information availability among qualified nurses in Israel– a cross sectional study. *BMC Nursing*, *23*(1), 1–10. https://doi.org/10.1186/s12912-024-01936-7

Nurfaidah, Muhammad Aqil, & Chaerunnisa Rumianti. (2025). Digitalisasi Pelayanan dan Transformasi Digital Terhadap Kualitas Pelayanan RSUD Provinsi Sulawesi Barat. *Jurnal E-*

Bussiness Institut Teknologi Dan Bisnis Muhammadiyah Polewali Mandar, *4*(2), 28–38. https://doi.org/10.59903/ebussiness.v4i2.119

Olakotan, O., Samuriwo, R., Ismaila, H., & Atiku, S. (2025). Usability Challenges in Electronic Health Records: Impact on Documentation Burden and Clinical Workflow: A Scoping Review. *Journal of Evaluation in Clinical Practice*, *31*(4), 1–16. https://doi.org/10.1111/jep.70189

Pati, Debajyoti, & Lorusso, Lesa N. (2017). How to Write a Systematic Review of the Literature. *HERD: Health Environments Research & Design Journal*, *11*(1), 15–30. https://doi.org/10.1177/1937586717747384

Peccoralo, L. A., Kaplan, C. A., Pietrzak, R. H., Charney, D. S., & Ripp, J. A. (2021). The impact of time spent on the electronic health record after work and of clerical work on burnout among clinical faculty. *Journal of the American Medical Informatics Association*, *28*(5), 938–947. https://doi.org/10.1093/jamia/ocaa349

Provenzano, M., Cillara, N., Curcio, F., Pisu, M. O., González, C. I. A., & Jiménez-Herrera, M. F. (2024). Electronic Health Record Adoption and Its Effects on Healthcare Staff: A Qualitative Study of Well-Being and Workplace Stress. *International Journal of Environmental Research and Public Health*, *21*(11). https://doi.org/10.3390/ijerph21111430

Raimo, N., De Turi, I., Albergo, F., & Vitolla, F. (2023). The drivers of the digital transformation in the healthcare industry: An empirical analysis in Italian hospitals. *Technovation*, *121*(May 2022), 102558. https://doi.org/10.1016/j.technovation.2022.102558

Rasyid, M. J., Aqid, B. M., Salsabila, A. P., & Nurfiyanti, K. (2025). Implementation of EMR System in Indonesian Health Facilities: Benefits and Constraints. *Journal of Indonesian Health Policy and Administration*, *10*(1), 31–38. https://doi.org/10.7454/ihpa.v10i1.1140

Rusdiana, E., Sanjaya, Y., & Guardian. (2024). Penerapan Konsep Layanan Prima Dan Strategi Komunikasi ,Etika Di Rumah Sakit. *Jurnal Manajemen Pelayanan Kesehatan (The Indonesian Journal of Health Service Management)*, *27*(3), 103–109.

Santos, W. M. Dos, Secoli, S. R., & Püschel, V. A. de A. (2018). The Joanna Briggs Institute approach for systematic reviews. *Revista Latino-Americana de Enfermagem*, *26*, e3074. https://doi.org/10.1590/1518-8345.2885.3074

Saputra, W. (2025). Dampak Digitalisasi Manajemen Rumah Sakit terhadap Efisiensi Pelayanan : Literature Review. *Jurnal Ilmu Kesehatan Masyarakat*, *14*(3), 245–254. https://doi.org/10.33221/jikm.v14i03.3834

Sartika, L. D., Syaodih, E., & Widjaja, Y. R. (2024). Evaluation of the Implementation of Electronic Medical Records in the Intensive Care Unit of Sunan Kudus Islamic Hospital. *(IJP) Indonesia Jurnal Perawat*, *9*(2), 64–75. https://doi.org/10.26751/ijp.v9i2.2617

Schreiber, F., & Cramer, C. (2024). Towards a conceptual systematic review: proposing a methodological framework. *Educational Review*, *76*(6), 1458–1479. https://doi.org/10.1080/00131911.2022.2116561

Shaban, M., Ezzelregal Abdelgawad, M., Mohamed Elsayed, S., & Mohamed Abdallah, H. M. (2025). The mediating role of emotional intelligence in the relationship between technostress and burnout prevention among critical care nurses a structural equation modelling approach. *BMC Nursing*, *24*(1). https://doi.org/10.1186/s12912-025-02852-0

Smyth, W., Bogiatzis, M., Irving, L., Morton, J., Holland, S., & Nagle, C. (2024). 'One size does not fit all': Nurses' and midwives' opinions about using electronic medical records. *Australian Journal of Advanced Nursing*, *41*(4), 4–13. https://doi.org/10.37464/2024.414.1205

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*(August), 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Storseth, O., McNeil, K., Grudniewicz, A., Correia, R. H., Gallant, F., Thelen, R., & Lavergne, M. R.

(2025). Administrative burden in primary care Critical review. *Canadian Family Physician*, *71*(6), 417–423. https://doi.org/10.46747/cfp.7106417

Tasbihah, F., & Yunengsih, Y. (2024). Penerapan Rekam Medis Elektronik dalam Menunjang Efektivitas Kerja Perekam Medis di Rumah Sakit Hasna Medika Cirebon. *Jurnal Indonesia : Manajemen Informatika Dan Komunikasi*, *5*(3), 2761–2767. https://doi.org/10.35870/jimik.v5i3.946

Tell, A., Westenhöfer, J., Harth, V., & Mache, S. (2023). Stressors, Resources, and Strain Associated with Digitization Processes of Medical Staff Working in Neurosurgical and Vascular Surgical Hospital Wards: A Multimethod Study. *Healthcare (Switzerland)*, *11*(14). https://doi.org/10.3390/healthcare11141988

Torres-Carrión, P. V, González-González, C. S., Aciar, S., & Rodríguez-Morales, G. (2018). Methodology for systematic literature review applied to engineering and education. *2018 IEEE Global Engineering Education Conference (EDUCON)*, 1364–1373. https://doi.org/10.1109/EDUCON.2018.8363388

van Dinter, R., Tekinerdogan, B., & Catal, C. (2021). Automation of systematic literature reviews: A systematic literature review. *Information and Software Technology*, *136*(April), 106589. https://doi.org/10.1016/j.infsof.2021.106589

Vehko, T., Hyppönen, H., Puttonen, S., Kujala, S., Ketola, E., Tuukkanen, J., Aalto, A. M., & Heponiemi, T. (2019). Experienced time pressure and stress: Electronic health records usability and information technology competence play a role. *BMC Medical Informatics and Decision Making*, *19*(1), 1–9. https://doi.org/10.1186/s12911-019-0891-z

Woelert, P. (2023). Administrative burden in higher education institutions: a conceptualisation and a research agenda. *Journal of Higher Education Policy and Management*, *45*(4), 409–422. https://doi.org/10.1080/1360080X.2023.2190967

Yun, J. H. J., Zhao, X., & Liu, Z. (2024). Regulation architecture of open innovation under digital transformation: Case study on telemedicine and for-profit-hospital. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1), 100252. https://doi.org/10.1016/j.joitmc.2024.100252

Zehra, S., Ranjan, J., & Shukla, M. (2025). Service quality in healthcare: understanding the relationship between patient experience and healthcare outcomes. *International Journal of Health Care Quality Assurance*, 1–18. https://doi.org/10.1108/IJHCQA-09-2024-0090

Zhu, J., & Liu, W. (2020). A tale of two databases: the use of Web of Science and Scopus in academic papers. *Scientometrics*, *123*(1), 321–335. https://doi.org/10.1007/s11192-020-03387-8