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The Nurses' Mental Burden in Utilizing Electronic Medical Records in Hospitals

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Abstract

Electronic Medical Record (EMR) revolutionize patient information management in healthcare but pose challenges for nurses, who play a crucial role in their utilization. Despite perceived benefits, nurses face significant mental burdens navigating these systems, requiring tailored strategies for successful integration. This article explores nurses' challenges with EMRs and proposes solutions to alleviate their burden while ensuring efficient patient care. This study employed a systematic literature review following the PRISMA method. Conducting searches across databases Scopus and PubMed using keywords "electronic medical record" and "nurse". Total of 22 selected articles show that Nurses' cognitive challenges with EMRs in hospitals stem from design complexities, impacting workflow and decision-making, exacerbated by factors like experience levels and external events like the COVID-19 pandemic, while usability, system quality, and participatory design approaches can mitigate stressors and enhance nurses' engagement and efficiency. Nurses' EMR experiences impact their well-being and patient care. Addressing these challenges requires optimizing design, usability, training, and support. Supporting nurses in EMR use enhances patient care and well-being, necessitating ongoing research and collaboration for improvement.

Introduction

In the digital age of healthcare, Electronic Medical Records (EMRs) have revolutionized the way patient information is stored, accessed, and managed within hospital settings. EMRs can enhance patient safety, improve the quality of care provided, streamline workflow processes, and increase access to critical health information (Lee & Lee, 2021). Electronic Medical Records also contribute to reducing medication errors, decreasing workload, and improving the availability of medical information among nurses (Naamneh & Bodas, 2024). Despite these advantages, the implementation of EMRs can also introduce challenges such as complex workflows, system inflexibility, and usability issues (Lee & Lee, 2021). While these technological advancements promise greater efficiency and accuracy in healthcare delivery, they also introduce a unique set of challenges for frontline healthcare providers, particularly nurses. As the primary users and custodians of EMRs, nurses bear a significant mental burden in navigating and utilizing these complex systems amidst their demanding clinical responsibilities.

Nurses play a crucial role in the successful implementation and utilization of EMRs in healthcare settings. Studies have highlighted that nurses perceive EMRs as tools that reduce their workload, enhance documentation quality, improve patient safety, and positively impact patient care (Jaber et al., 2021). Furthermore, the involvement of nurses in the participatory

design of EMRs, especially in specialized areas like pediatric palliative care, has been shown to improve documentation practices and the overall quality of care provided (Kernebeck et al., 2021; Kernebeck et al., 2022). Nurses' experiences post-EMR implementation have been mixed, with reports indicating both positive and negative impacts on clinicians (Jedwab et al., 2022). The use of EMRs in nurse education has also been explored, with studies focusing on how academic electronic medical records can enhance learning and prepare future nurses for the digital healthcare environment (Raghunathan et al., 2021). However, barriers to the acceptance of EMRs among healthcare professionals, including physicians and nurses, have been identified, emphasizing the importance of addressing challenges to ensure successful EHR implementation (Jimma & Enyew, 2022).

This article explores the nuanced dimensions of the mental burden experienced by nurses when interfacing with EMRs in hospital environments. It delves into the psychological stressors, cognitive challenges, and emotional implications that arise from the integration of technology into their daily workflow. This article assesed what the specific cognitive challenges and psychological stressors experienced by nurses when utilizing Electronic Medical Records (EMRs) in hospital settings, how the design and usability of EMR systems impact the mental burden of nurses, and what features or improvements could alleviate their cognitive load, and what strategies and support mechanisms can be implemented to mitigate the mental burden of nurses when interfacing with EMRs, while still ensuring efficient and accurate patient care delivery.

Methods

This study utilized a systematic literature review approach guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method and protocol (Page et al., 2021). Database searches were conducted using multiple sources, such as Scopus and Pubmed. The keywords searched were "electronic medical record" AND “nurse". Table 1 displays the criteria for inclusion and exclusion.

Table 1. Inclusion and Exclusion Article Criteria

Inclusion Criteria	Exclusion Criteria
Articles that discuss about the mental burden of nurses in utilizing electronic medical records in hospitals	Articles not related to the mental burden of nurses in utilizing electronic medical records in hospitals
Scholar and research article English documents Published year 2019-2024 Available in full text Open access	Non scholar and research article Documents not in English Published outside 2019-2024 Not available full text Non-open access
Quantitative, qualitative, experimental research methods, and other methods	Systematic review method, literature review, or non-research methods

Search Strategy

A systematic search strategy was established in April 2024 utilizing terms pertaining to electronic medical record and nurse. The electronic searches were conducted using the final keywords "electronic medical record" and “nurse” combined with the logical operator "AND." The literature search was performed in April 2024. The data sources used were Scopus and Pubmed.

Selection of the Study

The outcomes obtained from the preceding phase were gathered and stored in a database to assist the author in scrutinizing the titles and abstracts to ascertain eligible articles. The

qualified articles were further reevaluated to eliminate any duplicates that were identified. Afterward, the remaining qualified articles were carefully reviewed to confirm that they met the inclusion requirements. Several research titles and abstracts have been removed from the study since its objective is to investigate about the mental burden of nurses in utilizing electronic medical records in hospitals

Data Extraction

Afterwards, data was gathered from the eligible papers to be included in the study findings. This data encompassed information such as the authors and publication year, research aims, data collection instrument, research technique, and outcomes. The extracted data were shown in a descriptive manner without any accompanying analyses. Information was obtained from 22 papers that satisfied the criteria for inclusion.

Result and Discussion

Based on the search results utilizing predetermined keywords and inclusion criteria, a total of 111 potential articles were initially retrieved from two prominent databases: Scopus (N = 89) and PubMed (N = 22). Subsequent to the title screening process, the number of articles with relevant titles is 100. Following the removal of duplicate articles (n=11), as well as those not published between 2020 and 2024 (n=9), those lacking open access availability (n=5). A total of 75 articles were retained for further analysis. A subsequent screening of abstracts led to the evaluation of 75 articles, with 22 found to have abstracts not meeting the predetermined criteria. A subsequent assessment involving full-text examination was then conducted to ascertain eligibility, resulting in the inclusion of 22 articles for the study.

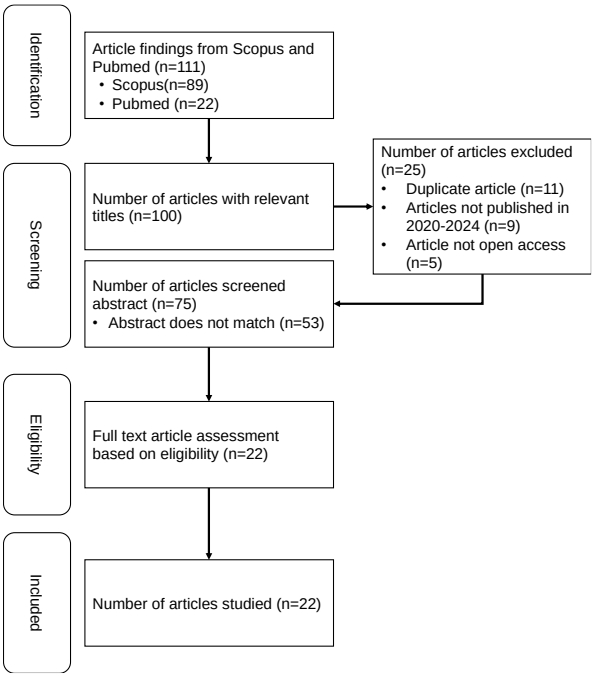

Figure 1. Flow diagram of systematic literature review

Table 2. Summary of burden of nurses in utilizing electronic medical records in hospitals articles

Title, Author, Year	Aims	Sample Size	Methods	Result
Usability Study of an Electronic Medical Record From the Nurse	The aim of the study was to evaluate the usability of an	The study involved five Nurse Practitioners as	The study used the "think-aloud technique" to observe five Nurse	The study revealed that the EMR system used by Nurse

Title, Author, Year	Aims	Sample Size	Methods	Result
Practitioners' Practice: A Qualitative Study Using the Think-Aloud Technique (Alshehri & Alanazi, 2023)	Electronic Medical Record system from the perspective of Nurse Practitioners using the "think-aloud technique."	participants, following the "5-use rule" to identify usability issues in the EMR system.	Practitioners completing tasks on the EMR, aiming to identify usability issues.	Practitioners posed challenges such as high cognitive workload, limited functionality, and technical issues.
Developing a nurse-driven vascular access device order set using the electronic medical record (Bechdel et al., 2022)	Develop an electronic order set for vascular access device utilization based on evidence-based guidelines, with a focus on reducing unnecessary catheter placements and improving patient safety.	Data from a 36-month period (January 2017 to December 2019) was used in this investigation at a Level 1 trauma center in southeastern Pennsylvania to assess the impact of the nurse-driven vascular access device order set on patient outcomes.	The study utilized evidence-based guidelines from The Michigan Appropriateness Guide for Intravenous Catheters and recommendations from the Infusion Therapy Standards of Practice to develop a nurse-driven vascular access device order set.	The results showed a significant decrease in unnecessary peripherally inserted central catheter placements and an increase in appropriately placed peripheral intravenous catheters, demonstrating the effectiveness of the nurse-driven vascular access device order set.
How Nurse Experience Influences The Patterns Of Electronic Medical Record Documentation In An Intensive Care Unit (Guo et al., 2019)	The aim of the study was to investigate how nurse experience influences electronic medical record (EMR) documentation patterns in an intensive care unit, highlighting significant differences in workflow between high- and low-experienced nurses.	The study involved 10 ICU nurses from the University of Missouri hospital, with data collected using the Real-Time Measurement System (RTMS) to analyze nurse work patterns in EMR documentation	The study had 11 data points for high experienced nurses and 23 data points for low experienced nurses, suggesting the need for more data in future research to support the findings.	The results showed that ICU nurses spent most of their time on EMR documentation at the bedside, with differences in mouse clicks between high- and low-experienced nurses for tasks like accessing lab results and adding patient information.
Nurses' Views on the Use, Quality, and Satisfaction with Electronic Medical Record in the Outpatient Department at a	This study explores nurses' perspectives on the use, quality, and satisfaction with Electronic Medical Record systems in an	A minimum of 141 participants were needed for this study on nurses' views of Electronic Medical Record systems in	Nurses from the Outpatient Department at a tertiary hospital were surveyed between December 2019 and March 2020 to	The study had a response rate of 77.2%, with the majority of participants being female nurses above 30 years old,

Title, Author, Year	Aims	Sample Size	Methods	Result
Tertiary Hospital (Jaber, 2021)	outpatient setting at a tertiary hospital	outpatient settings.	assess their views on Electronic Medical Record use, quality, and satisfaction.	holding a bachelor's degree, and working as staff nurses in the Outpatient Department. Most participants had over 5 years of nursing experience and had been using a computer and EMR for more than 1 year.
Nurse motivation, engagement and well-being before an electronic medical record system implementation: A mixed methods study (Jedwab et al., 2021)	This study aims to investigate nurse motivation, engagement, and well-being before the implementation of an electronic medical record system.	The study involved a sample size of 120 nurses who participated in surveys and focus group interviews.	The study used a mixed methods approach, including surveys and focus group interviews, to explore nurse motivation, engagement, and well-being before the implementation of an electronic medical record system.	The study found that nurses were generally positive about the EMR implementation, but some showed signs of low well-being and burnout, indicating potential vulnerabilities to the impact of the change.
Change in nurses' psychosocial characteristics pre- and post-electronic medical record system implementation coinciding with the SARS-CoV-2 pandemic: pre- and post-cross-sectional surveys (Jedwab et al., 2022)	The aim of the study was to investigate the impact of implementing an electronic medical record system on nurses' well-being, work engagement, burnout, work satisfaction, intention to stay, and motivation to use technology, both before and after implementation, coinciding with the SARS-CoV-2 pandemic.	A total of 942 surveys were analyzed, with 550 collected before the electronic medical record implementation and 392 collected after the implementation, representing response rates of 15.52% and 9.50%, respectively.	The study analyzed survey data from 942 nurses before and after the implementation of an electronic medical record system, assessing various psychosocial factors using statistical analysis in IBM SPSS Statistics. The study compared demographic characteristics, conducted reliability tests on survey tools, and used non-parametric tests	Statistically significant changes were observed post-implementation of the electronic medical record system, impacting nurses' well-being, burnout levels, and work engagement. However, some components such as absorption and psychological safety showed no significant change.

Title, Author, Year	Aims	Sample Size	Methods	Result
			due to non-normal data distribution.	
Nurses' Experiences After Implementation of an Organization-Wide Electronic Medical Record: Qualitative Descriptive Study (Jedwab et al., 2022)	The aim of this study was to explore nurses' experiences following the implementation of an organization-wide electronic medical record system.	A total of 158 nurses participated in this study, with data collected through focus group and individual interviews, as well as open-ended survey responses.	Data collection for this study occurred between November 2020 and June 2021, with a total of 158 nurses participating through focus group and individual interviews, as well as open-ended survey responses.	A total of 158 nurses participated in the study, with findings highlighting the impact of the electronic medical record system on nursing practices and patient care.
Understanding nurses' perceptions of barriers and enablers to use of a new electronic medical record system in Australia (Jedwab et al., 2022)	The aim of the study was to understand nurses' perceptions of barriers and enablers to using a new electronic medical record system in an acute hospital environment in Australia.	Sixty-three nurses from five hospital sites participated in 12 focus group interviews for data collection in this study on nurses' perceptions of barriers and enablers to using a new electronic medical record system in Australia.	Data were collected through 12 focus group interviews with 63 nurses from five hospital sites in Victoria, Australia, just before the implementation of a new electronic medical record system. The transcripts were analyzed using the Theoretical Domains Framework to identify barriers and enablers to system use.	The coded data from the study mapped to 13 out of 14 domains, with nurse motivation emerging as a key theme among both barriers and enablers. Nurses identified emotions and environmental context as common barriers, while social influences and reinforcement were common enablers to using the new electronic medical record system.
The Impact Of Covid-19 Pandemic On Nurses' Behavior For Updating Assessment Results By Using The Electronic Medical Record Log Data In A Non-Covid	The aim of the study was to investigate the impact of the COVID-19 pandemic on nurses' behavior in updating assessment results using electronic medical record log data in a non-	The study involved nine ICU nurses before the pandemic and eleven ICU nurses during the pandemic, with varying years of experience, to analyze the impact of	The study conducted time & motion observations on ICU nurses before and during the pandemic to analyze the impact of COVID-19 on updating assessment results in EMRs.	The study found that during the pandemic, ICU nurses spent less time on updating assessment results in EMRs but accessed these pages more frequently compared to before the pandemic.

Title, Author, Year	Aims	Sample Size	Methods	Result
Intensive Care Unit (Kasaie, 2021)	COVID intensive care unit.	COVID-19 on updating assessment results in EMRs.		
Participatory design of an electronic medical record for paediatric palliative care: A think-aloud study with nurses and physicians (Kernebeck et al., 2021)	The aim of the study was to involve nurses and physicians in a think-aloud study to enhance the design of an electronic medical record system for paediatric palliative care.	The study included 16 paediatric palliative care professionals, consisting of 10 nurses and 6 physicians, who participated in the think-aloud sessions.	The study utilized a qualitative observational approach with 16 paediatric palliative care professionals, involving concurrent think-aloud sessions and semi-structured interviews to evaluate the acceptance of a novel patient chart module in an electronic medical record system.	The analysis of the think-aloud sessions with 16 paediatric palliative care professionals resulted in four main categories and 42 subcategories, providing valuable insights into the usability and functionality of the electronic medical record system.
Evaluation of an Electronic Medical Record Module for Nursing Documentation in Paediatric Palliative Care: Involvement of Nurses with a Think-Aloud Approach (Kernebeck et al., 2022)	The aim of the study was to evaluate an Electronic Medical Record Module for Nursing Documentation in Paediatric Palliative Care through the involvement of nurses using a Think-Aloud approach.	11 Nurses from a Paediatric Palliative Care unit in Germany participated in the study evaluating the Electronic Medical Record Module for Nursing Documentation.	The study used a qualitative observational approach combined with the Think-Aloud method to evaluate the Electronic Medical Record Module for Nursing Documentation in Paediatric Palliative Care.	The study provided valuable insights into the usability and effectiveness of the Electronic Medical Record Module for Nursing Documentation in Paediatric Palliative Care, highlighting areas for improvement in nursing documentation practices.
Participatory Design of a Medication Module in an Electronic Medical Record for Paediatric Palliative Care: A Think-Aloud Approach with Nurses and Physicians (Kernebeck et al., 2022)	The aim of the study was to explore user acceptance factors related to the design of a medication module in an electronic medical record for paediatric palliative care, focusing on performance	The study involved 10 nurses and four physicians in evaluating the medication module for paediatric palliative care	The study used a concurrent think-aloud protocol and semi-structured qualitative interviews with nurses and physicians to evaluate the medication module in an electronic medical record for	The study identified key factors influencing user acceptance, focusing on performance expectancy and effort expectancy, providing insights for further module

Title, Author, Year	Aims	Sample Size	Methods	Result
	expectancy and effort expectancy		paediatric palliative care	development and evaluation
Nurses' Electronic Medical Record Workarounds in Mental Healthcare Settings (Kweon, 2021)	The study aimed to explore nurses' workarounds in using Electronic Medical Records (EMR) in mental healthcare settings, identifying common practices, consequences, and suggestions for improving EMR implementation	Out of 52 invited nurses, 50 (96.1%) completed the survey on EMR workarounds in mental healthcare settings, providing valuable insights for the study	The study analyzed data from 50 nurses using descriptive statistics and Pearson's correlation coefficients to examine EMR workarounds in mental healthcare settings, identifying common practices and suggestions for improvement	Nurses showed significant involvement in EMR workarounds, with scores above 3.0 on all items. Common workarounds included using physicians' login accounts for medication access and assisting colleagues unfamiliar with EMR use. The study highlighted problems, consequences, and suggestions for EMR implementation in psychiatric patient care
Nurses' electronic medical record workarounds in a tertiary teaching hospital (Lee, 2021)	The study aimed to identify nurses' workarounds related to electronic medical records in a tertiary teaching hospital, focusing on understanding the reasons, frequency, and impact of these workarounds on patient care and workflow efficiency.	106 nurses (84.8%) using electronic medical records in a tertiary teaching hospital completed questionnaires and provided written responses to identify workarounds related to electronic medical record use.	The study analyzed data from 106 nurses who completed questionnaires and provided written responses to identify workarounds related to electronic medical record use in a tertiary teaching hospital.	The study found that nurses reported frequent workflow delays and the use of workarounds related to electronic medical records, with common categories including electronic documentation, difficulty accessing records, medication administration, and communication issues.
Effect of Electronic Medical Record Quality on	This study examined how the quality of electronic medical	This study involved 278 nurses from four hospitals who	This study analyzed data from 278 nurses in four hospitals	The study found that system, information, and service quality of

Title, Author, Year	Aims	Sample Size	Methods	Result
Nurses' Perceived Usefulness and Ease of Use (Lee & Lee, 2022)	records, including system, information, and service quality, influences nurses' perceived usefulness and ease of use. The results showed that these qualities significantly predict nurses' perceptions, highlighting the importance of stakeholder collaboration in improving electronic medical record quality for better implementation.	completed a questionnaire to assess the impact of electronic medical record quality on their perceived usefulness and ease of use.	using a self-administered questionnaire to investigate the effect of electronic medical record quality on perceived usefulness and ease of use.	electronic medical records explained a significant portion of the variance in nurses' perceived usefulness and ease of use, emphasizing the importance of these qualities in predicting user perceptions.
The effect of electronic medical records on medication errors, workload, and medical information availability among qualified nurses in Israel–a cross sectional study (Naamneh, 2024)	The aim of the study was to investigate the impact of Electronic Medical Records (EMRs) on medication errors, workload, and medical information availability among qualified nurses in Israel.	A total of 591 registered nurses working in government hospitals in Israel participated in the study, with 148 men (25%) and 443 women (75%).	The study utilized a questionnaire with closed and open-ended questions to assess the perceptions of qualified nurses in Israel regarding Electronic Medical Records (EMRs) and their impact on medication errors, workload, and medical information availability.	Nurses perceived that Electronic Medical Records (EMRs) reduced medication errors and workload by approximately 30% each. However, they also reported that EMRs required longer documentation time and may impair medical information availability by about 10%.
Perioperative Nurses' Perceptions Pre-Implementation of an Electronic Medical Record System (Njane, 2021)	This study aims to explore perioperative nurses' perceptions of an Electronic Medical Record (EMR) system pre-implementation to identify facilitators, understand the impact on workflow and	The study involved 27 perioperative nurses in Melbourne, Australia, across three hospital sites to gather data on their perceptions of an Electronic Medical Record (EMR) system	The study used a qualitative exploratory descriptive design with five focus groups to collect data from 27 perioperative nurses across three hospital sites in Melbourne, Australia. Data collection involved audio-	The results revealed three main themes with eight sub-themes, highlighting perioperative nurses' anticipation and expectations regarding the implementation of an Electronic Medical Record

Title, Author, Year	Aims	Sample Size	Methods	Result
	patient care, and provide recommendations for successful EMR adoption in perioperative settings.	pre-implementation.	recorded focus groups, verbatim transcription, thematic analysis, and mapping to the Theoretical Domains Framework to identify facilitators and barriers for EMR implementation.	(EMR) system in their workplace.
Facilitators and Barriers to the Adoption of an Electronic Medical Record System by Intensive Care Nurses (Osajiuba, 2021)	This study aims to investigate the facilitators and barriers influencing the adoption of an Electronic Medical Record System by Intensive Care Nurses, focusing on their perceptions, psychological factors, and implementation challenges.	The study involved 292 ICU nurses from a large public health service in Melbourne, Australia, who participated in a cross-sectional survey and subsequent focus groups to gather data on their perceptions of EMR adoption.	The study used a mixed-method approach involving a survey and focus groups with ICU nurses in Melbourne, Australia, to explore factors influencing their adoption of an Electronic Medical Record System.	ICU nurses expressed optimism about the new EMR system, hoping it would enhance their work practices. They identified facilitators and barriers to EMR adoption, suggesting strategies to improve implementation in an Australian healthcare setting.
Effects of electronic medical records on patient safety culture: The perspective of nurses (Özer, 2020)	This study aims to investigate the impact of nurses' perceptions of electronic medical records on patient safety culture.	The study involved 398 nurses working in seven state hospitals in the Burdur province of Turkey.	The study used correlation and multiple regression analyses to examine the relationships between nurses' views on electronic medical records and patient safety culture	The results showed that both control variables and dimensions of electronic medical records influenced all aspects of patient safety culture, explaining a significant portion of the variance.
Ensuring effective care transition communication: Implementation of an electronic medical record–based tool for improved cancer treatment	The aim of the project was to develop and implement a standardized handoff process using an electronic medical record-based tool to improve	The study involved a total of 27 nurses who participated in pre- and post-intervention surveys to evaluate the effectiveness of	A multidisciplinary team developed and implemented a standardized handoff process using an EMR-based tool, following Plan-Do-Study-Act	The intervention led to a reduction in medication errors from 60% to 32%, increased tool utilization to 85% of patient visits, and improved nurse

Title, Author, Year	Aims	Sample Size	Methods	Result
handoffs between clinic and infusion nurses (Pandya, 2019)	communication and reduce medication errors for patients undergoing cancer treatment.	the patient handoff tool	methodology. The study evaluated outcomes before and after the intervention over a 1-year period.	satisfaction with the handoff process.
An Electronic Medical Record Training Conversion for Onboarding Inpatient Nurses (Smailes et al., 2019)	The aim of the study was to evaluate the impact of transitioning from instructor-led training to electronic learning for inpatient nurse electronic medical record training, focusing on usability, satisfaction, and return on investment.	The study collected evaluations from 75 newly hired inpatient nurses to assess the usability and effectiveness of electronic medical record electronic learning training compared to instructor-led training.	The study involved converting inpatient nurse training from instructor-led to electronic learning, with evaluations conducted using Likert scales and qualitative feedback. Data analysis included descriptive and inferential statistics using SAS software.	The results showed that electronic learning was effective and efficient for inpatient nurse training, with high user satisfaction and a significant reduction in training time compared to instructor-led training.
Nurses' and midwives' experiences of the first phase of the implementation of an electronic medical records system (Wynter, 2022)	The aim of the study was to describe nurses' and midwives' experiences following the initial phase of implementing an electronic medical record system at a public health service in Melbourne, Australia.	The study included 39 participants, with 25 being nurses, 12 midwives, and two not providing this information.	Four focus groups were conducted 8-10 months post-implementation of the EMR, with thematic analysis used to analyze the transcripts.	The study identified three main themes: effects on workflow, effects on patient care and communication, and negative effects on nurses' and midwives' well-being.

The Cognitive Challenges and Psychological Stressors Experienced by Nurses When Utilizing EMRs in Hospital

Nurses encounter various cognitive challenges when utilizing Electronic Medical Records (EMRs) in hospital. Cognitive challenges in Electronic Medical Record (EMR) systems refer to the mental difficulties and complexities that nurses encounter when using these systems. These challenges can arise from various factors such as the design of the EMR interface, the amount of information presented, the navigation process, and the cognitive load imposed on nurses when interacting with the system (Osajiuba et al., 2021).

Research has shown that poor usability of EMRs can lead to cognitive challenges for nurses, including stress, frustration, cognitive failure, alert fatigue, and high cognitive workload (Kernebeck et al., 2021). The cognitive load imposed by EMRs is influenced by the complexity of the system, the amount of information that needs to be processed, and the efficiency of the user interface (Kernebeck et al., 2021). Nurses may experience cognitive challenges when they

have to use multiple systems simultaneously, deal with system outages, or face extra work associated with EMR usage (Wynter et al., 2021). Moreover, cognitive challenges in EMRs can impact nurses' workflow and decision-making processes. Workarounds in EMRs, such as difficulties in accessing information, medication administration issues, and communication barriers, can contribute to cognitive challenges for nurses (Kweon & Lee, 2021). The cognitive demands of using EMRs can also vary based on nurses' experience levels and the specific context in which they are working (Guo et al., 2019). During the COVID-19 pandemic, the cognitive challenges associated with EMRs may be exacerbated as nurses face increased workloads, rapidly changing patient conditions, and the need for timely and accurate documentation (Shala et al., 2021). Understanding and addressing cognitive challenges in EMRs are essential to support nurses in delivering safe and effective patient care while minimizing mental burden and cognitive strain.

The implementation of EMRs can significantly impact nurses' work motivation, engagement, satisfaction, and well-being (Jedwab et al., 2021). Nurses often resort to workarounds when using EMRs, which can introduce inefficiencies in documentation processes (Lee & Lee, 2021). While many nurses perceive that EMRs reduce workload, improve documentation quality, and enhance patient care, the actual experience may vary, leading to challenges in adapting to these systems (Jaber et al., 2021). The use of EMRs in hospital settings can also influence nurses' psychosocial characteristics, especially during significant events like the implementation of new systems coinciding with external factors such as the COVID-19 pandemic (Jedwab et al., 2022). Understanding nurses' perceptions of barriers and enablers to EMR use is crucial in addressing cognitive challenges associated with these systems (Jedwab et al., 2021).

Psychological stressors experienced by nurses when utilizing Electronic Medical Records (EMRs) in hospitals can be multifaceted and impactful on their well-being. The implementation of EMRs can lead to increased workload, documentation challenges, and concerns about patient safety, contributing to psychological stress among nurses (Jedwab et al., 2021). Nurses may face psychosocial stressors in complex healthcare environments, dealing with clinical complexities, patient safety concerns, and the pressure to adapt to new technologies like EMRs (Jedwab et al., 2021). The introduction of EMRs can also coincide with external factors such as the COVID-19 pandemic, further exacerbating stress levels among nurses (Jedwab et al., 2022). Burnout, which can develop from sustained physical and psychological stress, has been identified as a significant consequence of EMR implementation, affecting nurses' physical and psychological health as well as the quality of patient care (Jedwab et al., 2022). The negative effects of EMRs on nurses' personal well-being, including frustration, stress, and exhaustion, have been reported, highlighting the psychological toll of using these systems (Wynter et al., 2021). Moreover, the dissatisfaction with EMR use can impact healthcare professionals like nurses, potentially leading to burnout, fatigue, stress, and time pressure (Kernebeck et al., 2021). Nurses' experiences post-EMR implementation may vary, with some reporting improved communication with patients and reduced medication errors, while others note negative effects on patient care and communication, contributing to psychological stress (Wynter et al., 2021). Understanding nurses' perceptions of barriers and enablers to EMR use is crucial in addressing the psychological stressors associated with these systems (Kernebeck et al., 2021).

In summary, nurses face significant cognitive challenges and psychological stressors when utilizing Electronic Medical Records (EMRs) in hospitals. While EMRs offer potential benefits such as reduced workload and improved documentation quality, nurses often encounter obstacles like inefficiencies in documentation and concerns about patient safety. These stressors, compounded by external factors like the COVID-19 pandemic, contribute to burnout and dissatisfaction among nurses. Understanding nurses' perceptions of EMR use is crucial for

addressing these challenges effectively and supporting their well-being. Efforts to mitigate cognitive load and psychological stressors must be tailored to nurses' needs, with a focus on promoting engagement, motivation, and overall well-being. Further research is needed to ensure that EMRs enhance rather than detract from patient care delivery and safety.

The Design and Usability of EMR Systems Impact the Mental Burden of Nurses

The design of Electronic Medical Record (EMR) systems can significantly impact the mental burden of nurses. The design of Electronic Medical Record (EMR) systems encompasses the structure, layout, features, and functionalities of digital platforms used to store, manage, and retrieve patient health information electronically. Effective EMR system design should prioritize user-centered principles to ensure that the platform is intuitive, easy to navigate, and supports the specific needs of nurses in their daily tasks (Lee & Lee, 2021). Nurses' experiences with EMRs can be influenced by various design elements, such as the organization of information, data accessibility, and integration with clinical workflows (Murphy & Carter-Templeton, 2023). A well-designed EMR system can enhance nurses' ease of use, streamline documentation processes, and improve the quality of care provided to patients (Murphy & Carter-Templeton, 2023). Furthermore, the design of EMR systems can directly impact nurses' mental burden and well-being. Poorly designed systems that are challenging to use, slow, or lack interoperability with other tools can lead to frustration, stress, and exhaustion among nurses (Wynter et al., 2021). Conversely, EMR systems designed with input from nurses through participatory design processes can help alleviate these negative effects and enhance user satisfaction (Kernebeck et al., 2021).

Studies have shown that the implementation of EMR systems is a significant workplace event for nurses, affecting their motivation, engagement, satisfaction, and well-being (Jedwab et al., 2021). Nurses often resort to workarounds when using EMRs, which can add to their cognitive load and stress levels (Lee & Lee, 2021). The impact of EMR system implementation on nurses' work motivation, engagement, and satisfaction underscores the importance of considering design elements that can alleviate mental burden and enhance user experience (Jedwab et al., 2021). Furthermore, the mixed experiences of nurses post-EMR implementation highlight the need to address the potential stressors associated with these systems (Jedwab et al., 2021). The concept of technostress, as explored in the context of hospital nurses' use of EMR systems, emphasizes the importance of understanding how system design can either alleviate or exacerbate mental burden and stress among healthcare professionals (Califf, 2022).

The usability of Electronic Medical Record (EMR) systems significantly impacts the mental burden of nurses. The usability of Electronic Medical Record (EMR) systems refers to the extent to which these systems are user-friendly, efficient, and effective in supporting healthcare professionals, particularly nurses, in their daily tasks. Usability encompasses factors such as ease of navigation, data input, information retrieval, system responsiveness, and overall user satisfaction with the EMR interface (Alshehri & Alanazi, 2023). Studies have shown that the usability of EMR systems significantly impacts nurses' experiences, work efficiency, and well-being (Jaber et al., 2021). Effective EMR usability can enhance workflow by providing easy access to real-time patient data, improving communication with patients, and reducing medication errors (Jaber et al., 2021). On the contrary, poor usability, characterized by slow system performance, difficult navigation, and lack of interoperability, can disrupt workflow, increase stress, frustration, and exhaustion among nurses (Jaber et al., 2021). Nurses' perceptions of EMR usability are crucial as they directly influence the quality of care delivery and patient outcomes (Jedwab et al., 2021).

Several studies have highlighted the relationship between EMR usability and its effects on nurses' well-being. Poor usability of EMRs has been associated with negative consequences such as stress, frustration, cognitive failure, burnout, fatigue, and time pressure (Kernebeck et

al., 2021; Kernebeck et al., 2022). Nurses play a crucial role in the adoption and implementation of EMR systems, with motivation being a key driver for their acceptance of these systems (Jedwab et al., 2022). The perceived importance of EMR systems in reducing medication errors and relieving workload has been emphasized in research (Jaber et al., 2021). However, the impact of EMR system implementation on nurses' work motivation, engagement, satisfaction, and well-being is not yet fully understood (Jedwab et al., 2022). Studies have shown that EMR systems can have both positive and negative effects on nurses. While some nurses reported that EMRs facilitated easier access to patient data and improved communication with patients, others found them slow, difficult to navigate, and disruptive to workflow (Wynter et al., 2021). The introduction of new technology like EMRs can contribute to nurses' stress and have negative consequences for patient safety (Osajiuba et al., 2021). The use of EMR systems by nurses is transforming healthcare delivery, with implications for patient care and communication (Njane et al., 2021). Studies have shown changes in nurses' psychosocial characteristics coinciding with EMR system implementation during the pandemic (Jedwab et al., 2022). The use of EMR systems by nurses to document vital signs and patient conditions has been crucial in managing patient care, especially in intensive care units (Kasaie, 2021). However, challenges exist in ensuring effective care transition communication using EMRs, highlighting the need for optimized tools and processes (Pandya et al., 2019). Barriers to the acceptance of EMRs by nurses have been identified, emphasizing the importance of understanding nurses' perceptions and experiences with these systems (Jimma & Enyew, 2022). Usability studies have been conducted to evaluate EMR systems from the perspective of nurse practitioners, highlighting the need for user-friendly interfaces (Alshehri & Alanazi, 2023). Additionally, the role of nurse practitioners in EMR implementation has been explored to understand their involvement in transitioning to electronic documentation systems (Larson, 2021).

Strategies and Support Mechanisms to Mitigate the Mental Burden of Nurses When Interfacing with EMRs

To alleviate the mental burden experienced by nurses when interacting with Electronic Medical Record (EMR) systems, various strategies and support mechanisms can be implemented based on research findings. One crucial strategy involves identifying and addressing nurses' key concerns and perceptions regarding EMR systems to optimize implementation and ongoing support strategies (Jedwab et al., 2021). Providing continuous training and technical assistance to nurse's post-implementation is essential for ensuring their confidence and competence in using the system (Jimma & Enyew, 2022). Additionally, involving nurses in the participatory design of EMR systems can enhance usability and user satisfaction, thereby reducing the mental burden associated with system interaction (Kernebeck et al., 2021; Kernebeck et al., 2022). Research indicates that the quality of EMRs significantly influences nurses' experiences and ease of use (Lee, 2022) Therefore, enhancing EMR quality through stakeholder collaboration and continuous assessment can improve user satisfaction and reduce the mental burden on nurses (Lee, 2022). Ensuring that EMRs are user-friendly and efficient can positively impact nurses' work engagement and motivation (Jedwab et al., 2022). Moreover, implementing support mechanisms such as nurse-driven order sets within the EMR, task lists, and documentation aids can help nurses manage their workload and streamline care delivery processes (Bechdel et al., 2022). Tools within the EMR that facilitate communication and care coordination, especially during patient handoffs, can enhance efficiency and reduce cognitive load on nurses (Ghosh et al., 2022). During the COVID-19 pandemic, leveraging EMRs for efficient data documentation and communication can help alleviate the mental burden on nurses (Shala et al., 2021). Promoting a positive patient safety culture through EMR use and training can enhance nurses' confidence in system utilization and reduce errors (Özer & Şantaş, 2020).

Conclusion

The utilization of Electronic Medical Records (EMRs) in hospitals presents significant cognitive challenges and psychological stressors for nurses. These challenges stem from various factors including system design, usability, and external pressures such as the COVID-19 pandemic. Nurses' experiences with EMRs can impact their work motivation, engagement, satisfaction, and well-being, with potential consequences for patient care. Addressing these challenges requires a multifaceted approach, including optimizing system design, enhancing usability, providing adequate training and support, and fostering a positive patient safety culture. By implementing strategies to mitigate the mental burden associated with EMR use, healthcare organizations can support nurses in delivering safe and effective patient care while promoting their overall well-being. Further research and collaboration are essential to continually improve EMR systems and ensure they enhance rather than detract from healthcare professionals' experiences and patient outcomes.

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