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Nurses' Perceptions on the Usability of Electronic Health Records: A Scoping Review

Perceptions infirmières de l'utilisabilité des dossiers de santé électroniques : une revue de la portée

Sarah Jane Moore https://orcid.org/0009-0003-3635-795X Arthur Labatt Family School of Nursing, Western University, Ontario, Canada

Anna Garnett https://orcid.org/0000-0001-7111-8602 Arthur Labatt Family School of Nursing, Western University, Ontario, Canada

Kelly Mason Arthur Labatt Family School of Nursing, Western University, Ontario, Canada

Eunice Onigbinde Arthur Labatt Family School of Nursing, Western University, Ontario, Canada

Halyna Yurkiv https://orcid.org/0000-0003-2193-2977 Arthur Labatt Family School of Nursing, Western University, Ontario, Canada

Correspondance | Correspondence:
Anna Garnett
agarnet6@uwo.ca

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Keywords

Electronic Health Records; nurses; usability; inpatient settings

Abstract

Introduction: Electronic health records (EHRs) are designed to enhance the efficiency and quality of nursing workflows and documentation. EHR usability refers to how effectively the system supports users to accomplish their work tasks. However, the understanding of nurses' perceptions of EHRs usability in inpatient settings is limited. **Objective**: Examine the available literature on nurses' perceptions of EHRs usability in these settings. **Methods**: This scoping review was guided by the Arksey and O'Malley (2005) methodology and methodological steps of the Joana Brigs Institute (Peters et al., 2015). Search terms included combinations of synonyms for nurses, perceptions, and EHRs usability. Eligible sources of data were primary research studies published in English between January 1, 2013, and July 1, 2024, and extracted from PubMed, CINAHL, and Scopus databases. Inclusion criteria targeted Registered Nurses and Registered Practical Nurses in inpatient hospital settings in North America, Europe and Australia. Findings were presented descriptively and thematically using a narrative analysis. **Results**: Twenty studies met the inclusion criteria. The narrative synthesis generated five themes: 1) ease of information accessibility; 2) nursing workflow challenges; 3) EHR design, technical issues, interoperability; 4) impact of the EHR on the nurse-patient relationship, and 5) user training. Nurses identified factors that positively impacted EHRs usability, such as real-time access to patient information in one location, the ability to view patterns and trends in patient status, and improved interprofessional collaboration, but they shared disproportionally negative perceptions of EHRs usability. **Discussion and Conclusion**: Future research should focus on addressing these challenges to optimize EHR design, enhance training strategies, and improve system interoperability, ultimately supporting nursing workflows and enhancing patient care quality.

Mots-clés

dossiers de santé électroniques; infirmières; utilisabilité; milieux hospitaliers

Résumé

Introduction : Les dossiers de santé électroniques (DSE) sont conçus pour améliorer l'efficacité et la qualité du flux de travail et de la documentation infirmière. L'utilisabilité du DSE fait référence à l'efficacité avec laquelle le système aide les utilisateurs à accomplir leurs tâches professionnelles. Cependant, la compréhension des perceptions infirmières sur l'utilisabilité des DSE en milieu hospitalier est limitée. **Objectif** : Examiner les perceptions infirmières concernant l'utilisabilité des DSE dans ces contextes à partir des écrits disponibles. **Méthodes** : La méthodologie Arksey et O'Malley (2005) et les étapes du *Joana Brigs Institute* (Peters et al., 2015) ont guidé cette revue. Les critères d'inclusion de la recherche dans les bases de données PubMed, CINAHL et Scopus étaient les publications en anglais entre le 1er janvier 2013 et le 1er juillet 2024 concernant les infirmières autorisées et les infirmières auxiliaires autorisées en milieu hospitalier en Amérique du Nord, en Europe et en Australie, en utilisant des combinaisons de synonymes pour : infirmières, perceptions et utilisabilité des DSE. Les résultats ont été présentés de manière descriptive et thématique à l'aide d'une analyse narrative. **Résultats** : Vingt études ont été incluses. La synthèse narrative a généré cinq thèmes : 1) facilité d'accessibilité de l'information; 2) défis liés au flux de travail infirmier; 3) conception du DSE, problèmes techniques, interopérabilité; 4) impact du DSE sur la relation infirmière-patient et 5) formation des utilisateurs. Les infirmières identifiaient des facteurs ayant un impact positif, comme l'accès en temps réel aux informations sur les patients en un seul endroit, la capacité de visualiser l'évolution de l'état des patients et une meilleure collaboration interprofessionnelle. Cependant, elles avaient des perceptions disproportionnellement négatives de l'utilisabilité des DSE. **Discussion et conclusion** : La recherche future devrait permettre d'optimiser la conception des DSE, d'améliorer les stratégies de formation et l'interopérabilité des systèmes, soutenant ainsi le flux de travail infirmier et la qualité des soins aux patients.

INTRODUCTION

Electronic health records (EHRs) are digitalized versions of patient medical records that contain essential information needed for patient care, such as medical history and diagnoses, medications, treatment plans, and allergies (Jedwab et al., 2019). EHRs are intended to increase efficiency in nursing workflows (Abu Raddaha, 2018; Strudwick et al., 2018) and have rapidly replaced paper-based documentation methods (Jedwab et al.). The digitalization of patient records improves patient care outcomes by increasing the ease, accessibility, and quality of nursing documentation (Gaughan et al., 2022; Jedwab et al.; Kutney-Lee et al., 2019; Özer et al., 2020). Nurses, being the largest group of healthcare professionals, are one of the primary end users of EHRs, and have a considerable impact on their implementation (Strudwick et al.). However, nurses' perceptions that the EHR systems are challenging to use could lead to frustration and user dissatisfaction (Heponiemi et al., 2021). Prolonged frustration with EHRs use is associated with nurses' negative work experience and resultant decreased quality of patient care (Yontz et al., 2015). Understanding nurses' perceptions of EHR usability can enhance the use of this technology, ultimately improving nurses' workflows, job satisfaction, and quality of patient care (Abu Raddaha; Strudwick et al.).

Although EHRs are increasingly becoming recognized as a standardized system for patient charting across most inpatient settings, they may also complicate nurses' workflow practices (Winckler, 2021). Moreover, while EHRs can improve information accessibility, barriers to their uptake continue to exist (Manca, 2015). For example, successful adaptation to EHR use can be negatively impacted by issues related to patient data accessibility, workflow challenges, interface design flaws, technical issues, lack of interoperability, increased time spent on documenting, and poor user training (Arikan et al., 2022; Bristol et al., 2018; Dudding et al., 2018; Despins & Wakefield 2018; Gaughan et al., 2022; Graham et al., 2018; Heponiemi et al., 2021; Kutney-Lee et al., 2019; McBride et al., 2023; Özer & Santas 2020; Rogers et al., 2013; Ting et al., 2021; Tolentino et al., 2021; Topaz et al., 2016; Winckler; Wisner et al., 2021; Yontz et al., 2015).

The available body of research explored EHRs usability from the lens of financial costs, privacy issues, and procurement practices, with less attention paid to the perception of EHRs usability among nurses (Strudwick et al., 2018). Since nurses are one of the largest EHRs end users (Strudwick et al.), it is important to understand nurses' perceptions of EHRs usability to ensure EHRs seamless integration and optimal use within nursing practice (Abu Raddaha, 2018).

OBJECTIVE

The purpose of this scoping review was to examine the available literature on nurses' perception of EHRs usability within inpatient hospital settings. The insights gained from this review can inform the development of user-centered EHR enhancements that streamline nursing workflows, reduce documentation burden and ultimately enhance patient care efficiency.

METHODS

This scoping review was guided by the advanced version of Arksey and O'Malley's (2005) methodological approach for scoping reviews (Levac et al., 2010) and by the methodological steps of the Joana Brigs Institute (Peters et al., 2015). The methodological approach of Arksey and O'Malley includes five steps: 1) identifying the research question; 2) identifying relevant studies; 3) study selection; 4) charting the data, 5) collating, summarizing, and reporting the results (Arksey & O'Malley; Levac et al.). The Joana Brigs Institute methodological approach includes 11 steps: 1) title; 2) background; 3) review question/objective; 4) inclusion criteria; 5) types of participant; 6) concept; 7) context; 8) searching; 9) extracting and charting the results; 10) discussion; and, 11) conclusions and implications for research and practice (Peters et al.). This scoping review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (Sarkis-Onofre et al., 2021).

IDENTIFYING RESEARCH QUESTION

This scoping review was guided by the following research question: "What is known regarding nurses' perceptions of the electronic health records (EHRs) usability within inpatient clinical settings?" The sub-questions were: 1) What are nurses' perceptions of the ease of information accessibility?; 2) How does the EHR affect nursing workflow?; 3) Which design and technology features of the EHR influence usability?; 4) How does the time nurses spend using the EHR affect the nurse-patient relationship?; and 5) Does user training impact the usability of the EHR?

The **target population** in this study was nurses; the **concept of interest** was the usability of EHRs, the **outcome of interest** was nurses' perceptions of EHRs usability, and the **context** was inpatient hospital settings (Levac et al., 2010).

IDENTIFYING RELEVANT STUDIES

Search Strategies

The following electronic databases were queried to identify and retrieve data: PubMed, CINAHL, and Scopus. These databases contain a range of research domains aligned with nursing, health-related, and technology topics that aided in addressing our scoping review question (Peters et al., 2015). Boolean operators, MeSH terms, truncations, and wild cards were explored and used based on the unique database requirements to obtain a comprehensive search outcome (Table 1).

Inclusion and Exclusion Criteria

This review included only primary research studies with a target population of Registered Nurses (RNs) and Registered Practical Nurses (RPNs) providing direct patient care in inpatient hospital settings. Searches were limited to studies published in English. Studies with a primary focus on nurses' perceptions of EHR usability or ease-of-use were considered for inclusion. The publication date range was set from January 1, 2013, to July 1, 2024, allowing this review to uncover nuanced changes in trends of EHR adoption and implementation during this period (Atasoy et al., 2019). Studies published in North America, Europe, or Australia were included, as these geographical locations utilize similar EHR systems, enabling meaningful narrative comparisons across selected studies (Aminpour et al., 2014).

Studies on Nurse Practitioners, clinical nurse leaders, nurse managers, nursing students, physicians, and patients were excluded from this review, as these populations use EHRs differently than RNs and RPNs. For example, nurses in leadership positions utilize EHR for administrative purposes and accurate documentation oversight (Soriano et al., 2019), while nursing students may not have access to the same EHR features that nurses have (Baillie et al., 2013). On the other hand, Nurse Practitioners and physicians use additional EHRs features (e.g., diagnostic purposes, order placement) (Watson et al., 2021). Patient use of EHRs differs, as they access their health information through a portal that has a different interface and features than the EHR accessed by the healthcare team members (Dendere et al., 2019).

This review also excluded articles that discussed the usability of EHRs in settings such as Long-Term Care, walk-in clinics, and other outpatient facilities, as the usability of the EHRs in these settings significantly differs from EHRs usability in inpatient settings in terms of nursing workflows and system design (Aminpour et al., 2014; Comstock, 2018). For example, EHRs designed for inpatient settings are tailored to the needs of the hospital (Aleem, 2024) and are built for a high-stakes environment wherein healthcare providers rely on EHR for immediate decision making (e.g., vital signs, blood work) whereas in outpatient settings, care is episodic, less urgent, and the information collected may be different (e.g., patient history) (Aleem, 2023; Simbo AI, n.d.).

Selecting the Studies

The extracted data were exported to the Covidence web-based software (Veritas Health Innovation, 2023). Covidence streamlined the review process by identifying duplicates and offering additional tools for data screening and charting.

Table 1

Search Strategies

Database	Subject Headings	Search Strategy
PubMed	MeSH terms	(((Nurs*[MeSH Major Topic]) AND (perception[Text Word] OR attitude[Text Word] OR experience[Text Word] OR opinion[Text Word] OR perspective[Text Word]))) AND (electronic health record OR EHR OR electronic medical record OR EMR[MeSH Major Topic]).
CINAHL	Subject headings	(nurs*) AND (perception OR attitude OR perspective OR opinion OR experience) AND (electronic health record OR EHR OR electronic medical record OR EMR). Limiters - Published Date: 20130101-20240701 Expanders - Apply equivalent subjects Narrow by Language: - English Narrow by Subject Major: - electronic health records Search modes - Boolean/Phrase
Scopus	Key words	(nurs* OR rn OR rpn) AND (perception OR perspective OR attitude OR experience OR opinion) AND ("electronic health record" OR "electronic medical record" OR ehr OR emr) AND (LIMIT-TO (SUBJAREA, "NURS") OR LIMIT-TO (SUBJAREA, "HEAL")) AND (LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2022 OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013)) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (EXACTKEYWORD, "Electronic Health Record") OR LIMIT-TO (EXACTKEYWORD, "Electronic Health Records") OR LIMIT-TO (EXACTKEYWORD, "Electronic Medical Record")) AND (LIMIT-TO (EXACTKEYWORD,"Nurse"))

The data sources uploaded to the Covidence underwent a two-step review process. Step one involved a review of the article title and abstract according to the inclusion criteria (above mentioned). Step 2 involved a full-text reading of the included articles that passed the title and abstract screening step to validate the inclusion of the data sources for the review. A review of bias (critical appraisal) of articles was not required using a scoping review methodology (Munn et al., 2018).

COLLATING, SUMMARIZING, AND REPORTING THE RESULTS

Search Outcome

The initial search outcome across three databases (PubMed, CINAHL and Scopus) resulted in 1040 articles. After removing duplicates, 846 studies were selected for step 1 screening. Three reviewers (SJM, KM and EO) independently conducted the title and abstract screening (step 1), followed by a full-text screening (step 2). Studies were excluded based on ineligible concept, context, population, study design, or geographical location according to the inclusion and exclusion criteria. A minimum of two reviewers (SJM, KM and EO) independently screened the titles, abstracts and full texts. Any disagreements were resolved through group discussions to reach a consensus on whether to include the data source. In total, 20 articles were deemed eligible for this scoping review (Figure 1, end of document).

Charting the Data

In alignment with Arksey and O'Malley's (2005) methodology, relevant data were extracted into a data charting table embedded within Covidence software (Table 2, end of document). To ensure consistency in the extraction process, three reviewers (SJM, KM and EO) independently extracted data from the first

two studies. Subsequently, two of the three reviewers (SJM, KM and EO) extracted data from the remaining 18 articles (Table 2, end of document). The data were screened to identify common issues and benefits of the use of EHR (Table 3, end of document).

Ethical Considerations

An ethics certificate is not required for a scoping review of existing literature, as it does not involve human participants or primary data collection.

Results

Overview of the Studies' Characteristics

A total of 20 primary studies, published between January 1, 2013, and July 1, 2024, were included in this scoping review. These studies employed a variety of designs: quantitative (n=4), mixed methods (n=1), cross-sectional (n=7), and qualitative (n=8). The studies were conducted in the United States (n=16), Canada (n=1), and Europe (n=3). The inpatient clinical settings in studies included medical-surgical units, labour and delivery departments, acute care units and unspecified inpatient settings. The sample sizes ranged from 8 to 12,377 nurses.

The extracted evidence addressing nurses' perceptions of EHRs usability within inpatient hospital settings was narratively synthesized (Levac et al., 2010) and deductively organized into the following themes: 1) ease of information accessibility; 2) nursing workflow challenges; 3) EHR design, technical issues, and interoperability; 4) impact of the EHR on the nurse-patient relationship; and 5) user training (Table 3, end of document).

Theme 1 – Ease of Information Accessibility

Ease of information accessibility refers to how the EHR operates as a system to access patient information (McBride et al., 2023). This review has identified positive and negative examples of how EHR may augment diminished information access.

Positive Impact of EHR on Information Accessibility

Out of 20 reviewed, three studies reported that nurses found EHRs made patient information easily accessible, and the ease of accessibility eliminated nurses' need to search for missing data (Bristol et al., 2018; Schenk et al., 2016; Winckler, 2021). Bristol et al. found that nurses perceived EHRs as beneficial for patient care, as the consistent flow of information could be accessed by members of the allied healthcare team. Similarly, Winckler reported that nurses viewed EHRs as reflecting real-time care activities, thereby contributing to better structure and report patient care. Nurses also noted that EHRs improved communication and data sharing between interdisciplinary team members (Bristol et al.; Despins & Wakefield, 2018; Gaughan et al., 2022).

Negative Impact of EHR on Information Accessibility

Six of 20 studies expressed concerns about patient information accessibility issues, including the need to search for the required patient information in multiple locations within the EHRs (Bristol et al., 2018; Despins & Wakefield, 2018; Dudding et al., 2018; McBride et al., 2023; Schenk et al., 2016; Tolentino et al., 2021). Four studies reported increased workflow-related stress resulting from the need to examine large amounts of information to find the required patient information (Bristol et al.; McBride et al.; Schenk et al.; Winckler, 2021). Suboptimal patient information accessibility also resulted in the omission of critical cues. For instance, Despins and Wakefield found that nurses were concerned about not being able to recognize critical changes in a patient's condition due to difficulty accessing information. Bristol et al. found that slow computer systems negatively impacted EHRs usability and resulted in more stress reported by nurses.

Theme 2 – Nursing Workflow Challenges

Nursing workflow encompasses the processes nurses follow to provide care, including the sequence, type, and timing of nursing care activities (Mador & Shaw, 2009). Findings from this review indicate that nurses viewed EHR systems as tools designed to enhance their workflow (Bristol et al., 2018; Kutney-Lee et al., 2019). However, when the system did not function seamlessly, they reported care interruptions and fragmented clinical documentation (Bristol et al.; Kutney-Lee et al.; McBride et al., 2023; Tolentino et al., 2021; Topaz et al., 2016). Additionally, nurses emphasized the importance of EHR systems that aligned with and supported their existing workflow (Bristol et al.; McBride et al.).

The requirement for formulaic responses (e.g., a drop-down menu) was identified as a challenge for nursing workflow, particularly when it restricts nurses' ability to document patients' important information. In response, nurses resorted to workaround strategies, such as typing in free text boxes (Topaz et al., 2016). The reliance on structured responses may also contribute to a perceived loss of autotomy, as it limits nurses' ability to apply critical thinking while using the EHR (Tolentino et al., 2021). Furthermore, nurses expressed frustration when they had to adjust their workflows to fit the EHRs system rather than having the EHR system adapt to their established workflows (Schenk et al., 2016; Tolentino et al.).

Nurses in two studies reported that EHRs contribute to duplicate charting, reducing efficiency (Bristol et al. 2018; Wisler et al., 2021). Some also found EHRs to be of limited utility when they failed to incorporate a nursing perspective (Bristol et al.). Additionally, a large-scale survey revealed that up to 50% (n=12,377) of nurses were not consulted before the EHRs implementation (Kuteny-Lee et al., 2019). Duplicate charting not only extended the time required for documentation but also led to frustration among nurses (Bristol et al.; Tolentino et al., 2021). The repetitive nature of charting further reinforced the perception of increased documentation time (Dudding et al., 2018). Moreover, nurses spent additional time planning how to enter the information into EHRs, further contributing to documentation burdens (Winckler, 2021).

Theme 3 – EHR Design, Technical Issues, and Interoperability

The design of EHRs comprises elements such as the layout, data entry fields, and system cues reflecting how the system was developed to meet the healthcare provider's needs (i.e., documentation and patient care) (Heponiemi et al., 2021). Malfunctions in these elements can lead to various technical issues as system failures or slow loading times) (Arikan et al., 2022). In addition, a lack of integration between different EHRs platforms (i.e., EPIC and Cerner) used across departments or facilities results in poor interoperability, that is, the ability of systems to communicate, exchange and use data effectively (Graham et al., 2018). This limitation hinders continuity of care across different locations. Six studies identified nurses' concerns regarding poor interoperability (Bristol et al., 2018; Gaughan et al., 2022; Graham et al.; McBride et al., 2023; Topaz et al., 2016; Winckler, 2021). Reported challenges included a lack of standardization and communication between EHR systems within and across facilities (Gaughan et al.; Winckler). Nurses in three studies suggested a need for improving standardization of EHRs and better system interfacing between hospital departments, believing these changes would enhance EHRs usability and workflow efficiency (Bristol et al.; Graham et al.; Topaz et al.). However, some nurses also expressed that their requests for design improvements were not adequately addressed (McBride et al.).

Poor design and limited functionality were also identified as barriers to nurses effectively utilizing the information available in the EHRs (Heponiemi et al., 2021; Rogers et al., 2013). Heponiemi et al. found that malfunctioning EHRs increased nurses' stress and cognitive overload, leading to errors such as accidentally opening the wrong system or struggling to recall multiple passwords. In another study, nurses reported a lack of trust in the EHR design due to its shortcomings, which hindered effective use (Rogers et al.). Standardized data entry templates embedded in the EHRs contributed to nurses' perceived loss of autonomy in their roles (Gaughan et al., 2022; Tolentino et al., 2021; Winckler, 2021).

In addition, nurses in intensive care and medicine settings associated certain EHRs design features, such as embedded task reminders, with a reduction of critical thinking, negatively impacting their decision-making processes (Gaughan et al.; Tolentino et al.). Two studies highlighted that EHRs design often lacked comprehensiveness, preventing nurses from fully documenting their assessments (Kutney-Lee et al., 2019; Wisner et al., 2021). For example, nurses in a labour and delivery setting frequently relied on free text entry to accurately capture changes in the newborn's status (Kutney-Lee et al.).

Seven studies reported technical issues as barriers to technology acceptance, including slow or failing systems, computer malfunctions, inadequate equipment, and poorly timed automatic hardware and software updates sometimes occurring during critical nursing interventions, such as medication administration. Slow Internet connections further compound these challenges (Arikan et al., 2022; Bristol et al., 2018; Dudding et al., 2018; Tolentino et al., 2021; Topaz et al., 2016; Winckler, 2021; Yontz et al., 2015). Two studies identified shortfalls in equipment required to access the EHR as a cause of nursing frustration (Arikan et al.; Bristol et al.). Five studies reported that slow system performance not only frustrated nurses but also impeded their workflow (Bristol et al.; Dudding et al.; Tolentino et al.; Winckler; Yontz et al.).

Theme 4 – Impact of the EHR on the Nurse-Patient Relationship

Nurses interviewed by Gaughan et al. (2022) reported that EHRs enhanced their job performance, contributed to better patient outcomes, and helped prevent charting errors. In addition, nurses in three studies reported that user-friendly EHRs reduced time spent on documentation, allowing them to dedicate more time to patient care (Arikan et al., 2022; Schenk et al., 2016; Yontz et al., 2015). Nurses perceived EHRs to be user-friendly when they were considered reliable (Schenk et al.). They also found EHRs more efficient than paper charting, as they centralized all patient information in one accessible location (Arikan et al.).

Not all nurses viewed the EHR positively. A common concern across studies was the amount of time spent on documentation. In the Kurtney-Lee's (2019) study, which included a large sample size (n=12 377), 55.4% of the nurses reported that EHRs interfered with certain aspects of direct patient care. Nurses felt that EHRs documentation reduced the time available to direct patient care, hindering their ability to build therapeutic nurse-patient relationships (Graham et al., 2018; Kutney-Lee et al.; McBride et al., 2023; Ross, 2020; Wisner et al., 2021). Frustration stemmed from the increased time required for EHR documentation compared to paper charting, which nurses perceived as limiting their time for direct care (Arikan et al., 2022; Dudding et al., 2018; Graham et al.; McBride et al.; Ross; Schenk et al., 2016; Tolentino et al., 2021).

Theme 5 – User Training

Implementing and sustaining EHRs in healthcare organizations can be challenging due to the need for extensive user training. This training often requires a combination of videos, didactic sessions, availability of EHRs super-users to provide ongoing support, or other educational strategies, all of which demand additional time and resources (Heponiemi et al., 2021). Nurses have identified a need for more comprehensive EHR training, as proper preparedness is linked with increased perceived ease of use and improved nurse well-being (Heponiemi et al.; Zaman et al., 2021). However, only one study reported that nurses received adequate EHR training (Yontz et al., 2015) while five other studies found that nurses received poor or incomplete training (Bristol, 2018; Graham et al., 2018; Heponiemi et al.; Topaz et al., 2016; Zaman et al.). Insufficient training before EHR implementation led to increased reports of problems, such as difficulty focusing on patient care, which, in turn, could negatively impact the quality of care (Bristol et al.).

Despite the initial stress and frustration related to the implementation of EHR, research shows that most nurses adapted to using these systems over time (Heponiemi et al., 2021; Schenk et al., 2021). For instance, after six months, nurses in one study experienced less stress, a more favourable attitude and reduced anxiety toward EHRs (Heponiemi et al.). Interestingly, Rogers et al.

(2013) found that while many nurses initially disliked adopting EHR systems, most expressed a preference for continuing using EHRs over returning to paper charting.

DISCUSSION

This scoping review aimed to synthesize the literature on nurses' perceptions of the usability of EHRs in inpatient hospital settings. Given that nurses represent the largest group of EHR end users, understanding their perceptions of EHRs usability is crucial. The findings highlight factors that can hinder nurses' positive views on both the initial and ongoing usability of EHRs in clinical settings. Five themes emerged from this review: 1) ease of information accessibility; 2) challenges for nursing workflow; 3) EHR design, technical issues, and interoperability; 4) impact of the EHR on the nurse-patient relationship; and 5) the importance of user training. Addressing these implications for clinical practice, research, and policy is essential for gaining nurses' support for the successful implementation and continued use of EHRs.

The review findings revealed conflicting perceptions of EHRs usability among nurses, particularly regarding the ease of accessing patient information within a multidisciplinary team or across different healthcare facilities (Bristol et al., 2018; Dudding et al., 2020; Despins & Wakefield, 2018; McBride et al., 2023; Schenk et al., 2016; Tolentino et al., 2021; Ozer & Santas, 2020; Winckler, 2021). EHRs that were not fully accessible online were often viewed as frustrating, hindering nurses' ability to gain a comprehensive understanding of the full clinical picture, and increasing patient safety risks (Kutney-Lee et al., 2019; Wisner et al., 2021). Consistent with the findings of this review, Kutney-Lee et al. (2021) reported that poor EHR usability increased stress and job dissatisfaction, contributing to nurses' decision to leave their care setting. It was also reported that inadequate EHR usability was linked to negative impacts on surgical patient outcomes and increased patient mortality (Kutney-Lee et al., 2021).

Similar to the findings of this review, nurses in a previous study reported challenges with accessing and locating information, such as notes on patient records (Rathert et al., 2019). The conflicting experiences expressed by nurses in the Rathert et al. study and this scoping review suggest that perceptions regarding EHRs usability widely vary among nurses. Moy et al. (2023) found that relevant patient information could be overlooked when EHR documentation does not align with departments or nurses' workflows. Furthermore, the vast amount of information in the EHR was often perceived as more overwhelming than beneficial (Moy et al.), a concern also noted in this review. Both this review and Moy et al.'s study highlight the importance of tailoring EHRs systems to better meet the practical needs of nurses.

Weir et al. (2021) found that EHRs design needs to be improved by tailoring it to the psychological needs of healthcare workers, as these factors impact their cognition and emotional state. For instance, Weir et al. suggest that EHR should have a sense of meaning – designed to prompt healthcare workers to engage with the information presented and evaluate it. This recommendation aligns with the concerns raised by nurses in this scoping review, namely the frustration associated with the loss of critical thinking, as noted by Gaughan et al. (2022) and Tolentino et al. (2021).

In alignment with the findings of this review, Dunn et al. (2021) reported that nurses identified significant design flaws, such as multiple steps for a simple task, which contributed to the perception of an increased workload. However, in contrast to this review, Dunn et al. found that nurses did not perceive an increased workload or time burden associated with the new EHR implementation. These differing opinions may be related to the length of time the EHR has been in place. Dunn et al. found that users experienced less overall workload at the 30–32-month mark of EHR implementation. Similarly, this review found that the general sense of dread associated with the EHR decreased over time. Thus, the perceived effectiveness and positive impact of EHR usability among nurses maybe closely tied to the duration of EHR use since its implementation (Zaman et al., 2021).

A recurring concern in this review was the standardization of EHRs and its perceived impact

on nurses' autonomy, critical thinking and comprehensiveness of the documentation (Gaughan et al., 2022; Tolentino et al., 2021). Moy et al. (2023) found that, in an emergency department setting, excessive standardization hindered staff workflow, increased documentation insufficiencies and negatively affected clinicians' clinical judgment (Moy et al.) On the other hand, standardization of EHRs was seen as essential to achieving interoperability, ensuring that different EHR systems across healthcare organizations can seamlessly exchange patient information in a timely manner (Rathert et al., 2019). A scoping review by Li et al. (2022) concluded that increased EHRs interoperability positively impacts patient safety.

Another key finding of this review was the inadequate training provided to nurses on EHRs use (Bristol, 2018; Graham et al., 2018; Heponiemi et al., 2021; Topaz et al., 2016; Zaman et al., 2021). Nurses, in another study, emphasized the need for ongoing training to support EHR use (Rathert et al., 2019). They felt that adopting EHR would have been easier with more comprehensive training in general technology, both before and during implementation (Arikan et al., 2022; Rogers et al., 2013; Ross, 2020; Zaman et al.). Additionally, studies found that nurses with prior EHRs training or advanced technological skills adapted more easily to new EHRs systems and found them more effective for documentation (Arikan et al.; Zaman et al.). Thus, expanding training opportunities may enhance EHR usability among nurses. To address this need, Ting et al. (2021) suggest engaging nurses in additional safe-paced online training and providing readily accessible usability resources, including peer support from colleagues.

Future Directions

Future research directions related to EHRs usability should focus on the themes identified by this review. Further observation of nurses in each unique clinical area is needed so the EHR design is tailored to the workflow needs of the nurses working in specific inpatient settings. Issues of interoperability and patient information accessibility among providers from different healthcare organizations can be improved by investigating innovative solutions to provide a secure way to share patient information and developing data-sharing frameworks that include input from nurses. To increase the effectiveness of training for nurses, future studies can investigate: the implementation of simulation-based scenarios, the optimal way to participate in these additional trainings (on-site or remotely), best practices for education and training related to EHRs implementation (Ross, 2020), or specific changes in training needed for different inpatient units (Dudding et al., 2018).

Examining what EHR design elements impact the nurse-patient relationship could lead to EHR improvement, leading to better patient care (Wisner et al., 2021; Zaman et al., 2021). Investigating the disruptions in patient care related to the EHR and possible improvements to workflow resulting from the use of EHRs should be evaluated (Lee & McElmurry, 2010; Rogers et al., 2013). A gap identified in this study is that it is unclear if the unique interface characteristics of the EHRs used by nurses played a role in perceived usability from a nursing perspective. Future studies can focus on the comparative usability of different EHR interfaces to determine what specific design elements influence nurses' EHR usability. Additional studies are needed to determine if previous experience with digital modalities, including other EHRs, impacts nurses' ability to learn how to use the EHR.

Strengths and Limitations

A comprehensive search of three large databases with a 10-year date range increased the overall strength of this review. This review covered different inpatient clinical settings (i.e., labour and deliver, medicine, acute care and critical care), allowing a comprehensive insight into nursing perceptions on EHR use. However, findings in this scoping review should be interpreted considering some limitations. Only articles published in English were included. Searching in other scientific databases, and including more languages, may have yielded other relevant studies, offering insights not captured in this review. Additionally, differences in nursing culture (e.g., policies, leadership, working conditions) were not captured across all included studies, making it difficult to evaluate their impact on nurses' perceptions of

EHR usability. The research team also acknowledges the unintentional omission of the search term licence practical nurse (LPN) which is not used in all countries included in this review and is a synonym for the term Registered Practical Nurse (RPN). The omission of the term LPN in the initial search may have impacted our search outcomes and findings identified in this scoping review.

CONCLUSION

This scoping review explored nurses' perceptions of EHR usability in inpatient hospital settings. Findings highlighted several factors that positively influenced nurses' experiences, such as real-time access to consolidated patient information, the ability to track patterns and trends in patient status, and enhanced interprofessional collaboration. However, numerous challenges were identified, including system interoperability issues that made it difficult to retrieve the information, inadequate training, and disruptions in their workflow. Nurses also expressed concerns about prolonged documentation requirements, which reduced time for direct patient care and hindered therapeutic nurse-patient relationships. These findings provide valuable insights into the complexity of EHR usability from a nurse's perspective. Future research should focus on addressing these challenges to optimize EHR design, enhance training strategies, and improve system interoperability, ultimately supporting nursing workflow and enhancing patient care quality.

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Table 2

Data Extraction Results

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
Barriers to Adoption of Electronic Health Record Systems from the Perspective of Nurses: A Cross-sectional Study	Arikan et al., 2022	Europe	To determine the perceptions of nurses regarding the barriers to implementing fully EHR systems in hospitals.	Cross-sectional study	Survey	Nurses working in a university hospital, n = 160	Medical surgical	Unspecified
Nurses' Use of Positive Deviance When Encountering Electronic Health Records-Related Unintended Consequences	Bristol et al., 2018	United States of America	To examine nurses' perceptions of associated challenges that arise from the introduction of an EHR into nurses' workflow.	Qualitative research	Open-ended survey questions	Nurses working in a hospital setting, n = 144	All inpatient hospital departments	Epic mentioned in a quotation not by the authors.
The role of the electronic medical record in the intensive care unit nurse's detection of patient deterioration	Despins & Wakefield, 2018	United States of America	To describe the role of the EHR in intensive care units (ICU) nurses' detection of patient deterioration.	Qualitative research	Semi-structured interviews	RNs, n = 24	ICU	Unspecified
Neonatal Nurses Experience Unintended Consequences and Risks to	Dudding et al., 2018	United States of America	To describe the unintended consequences of EHR use for neonatal nurses and	Cross-sectional study	Survey	RNs, n = 40	Neonatal	Cerner and Epic reported on sample characteristics as the most

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
Patient Safety With Electronic Health Records			to explore relationships among the phenomena, neonatal nurses and EHR characteristics.					common systems. No other systems stated by name.
Nurses' Experience and Perception of Technology Use in Practice: A Qualitative Study Using an Extended Technology Acceptance Model	Gaughan et al., 2022	United States of America	To provide insight into the factors identified as benefits and drawbacks of technology use by nurses and obtain suggestions for improving technology, based on challenges identified to improve patient outcomes.	Qualitative research	Participants wrote bi-weekly journals	RNs, n = 26	ICU	Unspecified
Nurses' experience and perception of technology use in practice	Graham et al., 2018	United States of America	To explore nurses' attitudes toward bedside documentation (BD) and to gain a better understanding of the practices in BD by staff nurses.	Qualitative	Interviews using semi-structured questions and two 60–90-minute focus group sessions.	Licensed RNs with 1 or more years of experience, n = 8	Medical surgical, Gastrointestinal lab, and pre-op	Unspecified
Electronic Health Record Implementations and Insufficient Training Endanger Nurses' Well-being: Cross-	Heponiemi et al., 2021	Europe	To examine the associations of EHR-to-EHR implementations and the sufficiency of related training with perceived stress related to	Cross-sectional study	Survey	RNs, n = 3610	Unspecified	Epic reported as a commonly used system. No other systems reported by name.

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
sectional Survey Study			information systems, time pressure, and cognitive failures among registered nurses.					
Electronic Health Record Adoption and Nurse Reports of Usability and Quality of Care: The Role of Work Environment	Kutney-Lee et al., 2019	United States of America	To examine the independent and joint effects of comprehensive EHR adoption and the hospital work environment on nurse reports of EHR usability and nurse-reported quality of care and safety.	Cross-sectional study	Survey	RNs, n = 12 377	Direct patient care units	Unspecified
Electronic Health Record Maturity Matters! Texas Nurses Speak Out in Their Second Statewide Study	McBride et al., 2023	United States of America	To compare the results from 2015 to 2020 study, identify any improvements in nurses' satisfaction with EHRs over a 5-year period, and provide actionable recommendations for the next 5 years.	Cross-sectional study	Survey	Staff nurses, n = 1177 in 2015 and 1117 in 2020	Unspecified	Unspecified
Effects of electronic medical records on patient safety culture: The perspective of nurses	Özer & Santas, 2020	Europe	This study investigates the effects of nurses' views regarding electronic medical records on patient safety culture.	Quantitative (correlation and multiple regression analysis)	Survey	Nurses (unspecified), n = 645	Inpatient hospital	Unspecified

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
Use of a human factors approach to uncover informatics needs of nurses in documentation of care	Rogers et al., 2013	United States of America	To report on how a human factors approach can be used to address barriers and facilitators to the use of the nursing information system.	Qualitative research	Think aloud (verbalizing thoughts)	RNs, n = 12	Medical surgical	Unspecified
Patients Over Paperwork: Electronic Health Record Usability and Nursing Perception	Ross, 2020	United States of America	Aimed at identifying nurses' perception of the usability of the EHR and barriers to care with documentation burden in the acute care setting.	Qualitative research	Interviews	Bedside nurses (unspecified), n = 45	Acute care	Unspecified
RN Perceptions of a Newly Adopted Electronic Health Record	Schenk et al., 2016	United States of America	To understand nurses' perceptions of a newly adopted EHR.	Quantitative research	Survey	Clinical RNs, n = 285	Medical surgical and acute care	Unspecified
Four Years Later: Examining Nurse Perceptions of Electronic Documentation Over Time	Schenk et al., 2021	Canada	The purpose of this mixed-methods study was to examine nurses' perceptions of a comprehensive EHR approximately 4 years after the initial adoption of the technology.	Mixed-methods	Survey	RNs, n = 153	Unspecified	Unspecified
A Descriptive Study of Nurses' Experiences with	Tolentino et al., 2021	United States of America	The purpose of this study was to explore the unintended	Cross-sectional study	Survey	Nurses, n = 66	Unspecified	Lists Cerner as the most commonly

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
Unintended Consequences of the Electronic Health Record in Two Urban Hospitals			consequences of EHRs as experienced by nurses using the Carrington-Gephart Unintended Consequences of the EHR Questionnaire.					used EHR system. No other systems listed by name.
Nurse Informaticians Report Low Satisfaction and Multi-level Concerns with Electronic Health Records: Results from an International Survey	Topaz et al., 2016	United States of America	To present the results of two survey questions related to respondents' levels of satisfaction with, and comments relating to, the current state of EHRs used by nurses.	Cross-sectional study	Survey	Nurses, n = 469	Unspecified	Unspecified
Not another box to check! Using the UTAUT to explore nurses' psychological adaptation to electronic health record usability	Winckler, 2021	United States of America	To explore dimensions of EHR usability that may influence nurses' psychological adaptation to the use of EHRs in daily practice.	Qualitative reseach	Unspecified	Nurses, n = unspecified	Unspecified	Unspecified
Managing the tension between caring and charting: Labor and delivery nurses' experiences of	Wisner et al., 2021	United States of America	The purpose of this study was to 1) explore labor and delivery nurses' perceptions of how interaction with and use of the EHR affects	Qualitative (grounded theory methodology)	Interviews with observation	Nurses, n = 21,	Labor and delivery	Unspecified

Study Title	Authors	Continent or country of origin of data	Objective	Study design	Measurement tool	Study Population	Clinical setting	EHR system
the electronic health record			their cognitive work and 2) better understand EHR-related patient safety implications.					
Perioperative Nurses' Attitudes Toward the Electronic Health Record	Yontz et al., 2015	United States of America	The purpose of this project was to assess the attitudes of perioperative nurses toward EHR use to document patient care and identify any potential perceived barriers to the implementation of a new electronic health record for the health system.	Quantitative	Survey	RNs, n = 396	Operative services	Unspecified
The Relationship between Nurses' Training and Perceptions of Electronic Documentation Systems	Zaman et al., 2021	United States of America	The primary focus of this study is to examine how general computer skills and electronic documentation system training affect nurses' perceptions of using electronic documentation systems.	Quantitative	Survey	Nurses, n = 2248	Inpatient hospital	Unspecified

Table 3

Thematic Analysis Process

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
Arikan et al., 2022	Barriers to Adoption of Electronic Health Record Systems from the Perspective of Nurses: A Cross-sectional Study	• The most important advantages were the accessibility of test results, the availability of medical records and information, and the ability to save time. • The disadvantages included technology-related difficulties, extended time required for entering data into the system, lack of hardware (i.e., tablets for recording at the bedside) and increased workload. • The perceived barriers to implementation were the high number of patients per nurse, a limited time, insufficient knowledge and skills of EHRs, a lack of user-friendly interface and an inability to create a common language within the team, and attachment to the traditional method.	• EHR Design, Technical Issues, and Interoperability • Time Spent Documenting • User Training • Impacts on the Nurse-Patient Relationship
Bristol et al., 2018	Nurses' Use of Positive Deviance When Encountering Electronic Health Records-Related Unintended Consequences	• Slow systems and a lack of equipment necessary to support their efforts in incorporating EHR into their daily work. Lack of organizational support. Frustrations over slow equipment, lack of proper equipment, lack of training before EHR implementation. Concerns regarding the ability to access patient information. Searching in multiple locations within the EHR to find patient information. Time spent searching created extra stress. Nurses reported redundancies within the current EHR design and having to move through multiple steps to enter the areas necessary for documentation and patient care. Reported the need for standardization of EHR systems to better support nursing workflow. • Participated valued EHR systems when they addressed nurses' workflows. Frustration emerged when they perceived a lack of attention from EHR system designers. Nurses perceived a lack of nursing input into EHR design, resulting in systems poorly equipped to address nursing workflow, limiting the usefulness of the system. • Positive feelings reported about increased access to information from different members of the care team.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • User Training • Ease of Information Accessibility
Despins & Wakefield, 2018	The role of the electronic medical record in the intensive care unit nurse's detection of patient deterioration	• Discerning patterns: Electronic health medical record (EHMR) enhanced ability to recognize patterns in patients' physiological data & changes in clinical status over time. Some reported difficulty navigating trend applications, took too long for graphs to display.	• Nursing Workflow Challenges • Ease of Information Accessibility

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
		• Information silos: Like paper charts, nurses needed to go to different areas within the EHMR to obtain a comprehensive picture of the patient's clinical status. • User-friendliness: EHMR provided the ability to view information entered by other disciplines in their respective documentation sections. Issues regarding the presence of workarounds using paper.	
Dudding et al., 2018	Neonatal Nurses Experience Unintended Consequences and Risks to Patient Safety With Electronic Health Records	• Documentation took longer because of repeated data entry in multiple places. Challenges with information retrieval and slow system operations. Not being able to locate important patient information or the information was not enough to provide an accurate clinical picture. • Unable to document because computers were not working, or they had to switch computer stations to document. The need to document the same information in different places in the EHR prolonged charting. • The use of workarounds when equipment, technology, or poorly designed work processes become a barrier to patient care. Frequent interruptions, higher workload, and altered workflow as unintended consequences of EHRs. Time spent charting in the EHR may be extended due to locating an available computer and slow system responses. Slow systems take valuable time away from patient care and limit the "user-friendliness" of a system.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • Ease of Information Accessibility • Impacts on the Nurse-Patient Relationship
Gaughan et al., 2022	Nurses' Experience and Perception of Technology Use in Practice: A Qualitative Study Using an Extended Technology Acceptance Model	• Alarm fatigue as a barrier to technology acceptance, as they can be repetitive and lead to desensitization by nursing staff. • Improved communication with members of the interdisciplinary team, which is essential for better patient care. • Nurses felt that nurses' job performance was enhanced by technology, and this led to better health outcomes through the avoidance of errors and adverse events. • Heavy reliance on technology was felt to lead to a lack of practice in critical thinking and clinical reflection, which had been found in previous studies. • One of the major challenges and obstacles perceived by nurses included issues with interoperability and incongruence between hospital systems.	• EHR Design, Technical Issues, and Interoperability • Impacts on the Nurse-Patient Relationship • Ease of Information Accessibility
Graham et al., 2018	Nurses' experience and perception of technology use in practice	• Competing priorities: Bedside documentation was not acknowledged as a priority and feelings of uneasiness about documenting at the bedside. Caring: Spending time documenting at the bedside perceived to be better spent "being with" patients, less caring when focused on a computer	• EHR Design, Technical Issues, and Interoperability

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
		screen instead of the patient. Safety: Documenting at the bedside would keep nurses from other patient priorities. • Need for intentional actions to balance technology and touch: Challenges in building patient relationships and meeting BD requirements, difficulty finding balance between caring/communicating with patients and documenting at the same time. Others appreciated the ability to look something up and give patients answers right away. • Takes time and practice: The subject of access to better program interfacing between hospital departments was raised. Troubling to time was redundancy in documentation. Most nurses strongly felt the need for more training.	• Time Spent Documenting • User Training • Impacts on the Nurse-Patient Relationship
Heponiemi et al., 2021	Electronic Health Record Implementations and Insufficient Training Endanger Nurses' Well-being: Cross-sectional Survey Study	• EHR implementations have the potential to decrease the well-being of nurses and lead to cognitive failures. The highest levels of stress related to poorly functioning information systems and time pressure were experienced among those who had experienced EHR implementation within the preceding 6 months. • Implementation seems to induce stress, frustration, and feelings of incompetency, especially among those nurses who have problems with tasks requiring digital skills. • Sufficient training related to implementations appears extremely crucial for nurses and is associated with improved well-being. Fifty-three percent (53%) reported that training was insufficient.	• EHR Design, Technical Issues, and Interoperability • User Training
Kutney-Lee et al., 2019	Electronic Health Record Adoption and Nurse Reports of Usability and Quality of Care: The Role of Work Environment	• 25.1% of nurses expressed dissatisfaction with the EHR system. This percentage was lower in hospitals with comprehensive EHRs. The percentage of nurses reporting poor usability was significantly lower in hospitals with comprehensive systems. • Nearly 50% of nurses reported that they were not involved in the selection or modification of the EHR. • Over half (55.4%) of the surveyed nurses reported that EHRs interfered with patient care, while nearly one third (31.9%) reported that they were not easy to use and did not help them to do their work in an efficient way.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • Time Spent Documenting • User Training • Impacts on the Nurse-Patient Relationship • Ease of Information Accessibility

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
McBride et al., 2023	Electronic Health Record Maturity Matters! Texas Nurses Speak Out in Their Second Statewide Study	• The aspects of EHR that challenged nurses when they were providing patient care were related to workflow, communication with the patient and professionals, distress/stress, reduced time with the patient, and patient safety and quality. Nurses brought up concerns about workflow stating that "redundant design interferes with workflow and wastes time." • Documentation redundancy, the role of leadership, vendor responsibility, reimbursement/reporting requirements, and interoperability issues led to frustration for the nurses. Redundancy in documentation was repeatedly stated in the nurses' comments. • Other issues were related to the vendor's lack of clinical knowledge and education, poor interoperability, poor response to nurses' requests for changes, and design errors. In 2020, when the maturity of the EHR was considered, there was no significant satisfaction difference in any of the EHR systems reported.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • Time Spent Documenting • Ease of Information Accessibility • Impact of the EHR on the Nurse-Patient Relationship
Özer & Santas, 2020	Effects of electronic medical records on patient safety culture: The perspective of nurses	• According to the regression model, the control variables (education level, computer training, gender, age, total time working in the health sector) and all dimensions of EMRs (use of EMR, quality of EMR and user satisfaction) affect all three dimensions of patient safety culture (i.e., perceptions of safety, management support for safety, and process). • The main topics concerning nurses are whether the system provides timely accessibility to the information required, and the availability of current information in the system.	• Ease of Information Accessibility
Rogers et al., 2013	Use of a human factors approach to uncover informatics needs of nurses in documentation of care	• Nurses were not able to capitalize on the information available to them because of the lack of usability of the interface. • Lack of trust in the nurse information system led nurses not to rely on the system to manage communication within teams. • When visibility is difficult, efficiency workarounds were an expected outcome. However, none of the participants would agree to go back to using paper for clinical documentation.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability
Ross, 2020	Patients Over Paperwork: Electronic Health Record Usability and Nursing Perception	• Nurses identified they are satisfied with the EHR system over paper documentation. They perceive the system is easy to use and beneficial in supplying the information they need for decision-making purposes. • Perceived usefulness - self-efficacy in electronic documentation systems did not relate to perceived usefulness.	• Time Spent Documenting • Impact of the EHR on the Nurse-Patient Relationship

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
		• Ease of use – self-efficacy was a strong predictor for perceived ease of use. Nurses who had higher self-efficacy in using EMRs were more likely to believe that the system is easy to use. • Nurses were dissatisfied with the amount of time it takes to document into the EHR. They also identified issues with double charting.	
Schenk et al., 2016	RN Perceptions of a Newly Adopted Electronic Health Record	• Pre-EHR implementation: Ease of use – both positive and negative comments ranging from being easier to chart to having to go to many different places to find information. • Usefulness: Seems like a bigger comprehensive look at the patient; every discipline can be inputting information into the patient's chart. Also concerns about computer charting and patient care, having to figure out the computer taking away time for patient care, can't do a good job at charting in the patient's room and have the patient think they are also participating in the conversation. • Post-EHR implementation: Ease of Use – Positive; nice to have all the information in one place, more efficient because every time leaves the room charting is complete. Negative; having everything in one place is also challenging because it takes many clicks to get what you need to get to, too many steps to find data, adds stress having to do so much documentation on the computer. Information is all in one place, but complexity makes it hard to find. • Post-EHR implementation: Usefulness – Positive; provided a holistic view of the patient. Negative; patient information was fragmented and complex and created workflow challenges, frustrating having to adapt to the system rather than the system adapting to the flows we had in place that were working really well. Documentation is harder to find, not in an orderly fashion. A holistic view of the patient, but fragmentation and complexity introduce workflow challenges, taking time away from patient care when spent documenting on the computer.	• Nursing Workflow Challenges • Time Spent Documenting • Ease of Information Accessibility • Impact of the EHR on the Nurse-Patient Relationship
Schenk et al., 2021	Four Years Later: Examining Nurse Perceptions of Electronic Documentation Over Time	• Concerns with change: Scores on the domain concern about the EHR declined at each measurement, indicating less anxiety and dread over time. • For an EHR to be successful, clinicians must have confidence in the data and trust that work processes will reliably facilitate the practice of high-quality, patient-centred healthcare.	• User Training

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
		• In each domain, the nurses expressed more resolve and acceptance of the EHR at the 4-year point. This demonstrates that the nurses were more comfortable with the EHR over time.	
Tolentino et al., 2021	A Descriptive Study of Nurses' Experiences with Unintended Consequences of the Electronic Health Record in Two Urban Hospitals	• Entering the same data repeatedly in different places within the EHR as the most frequent unintended consequence of the EHR, taking too long to document, experiencing new kinds of work, changing workstations when the current station fails, system slowness, hardware and software updates, unavailability of nursing notes, documenting or entering orders on the wrong patient, difficulty retrieving or finding information in the EHR. • Nurses reported they experienced patient safety issues at least once every couple of months, particularly when receiving a patient in critical condition, when patient status changes, or when coordinating patient care while in their unit. • Nurses experienced system design, workload, and sociotechnical issues to be the most frequently occurring events. Many participants reported the burden of redundant documentation, workflow interruptions, new work, and the time it took to document in the EHR as regular events. Spending less time with their patients due to documentation demands and interruptions. Taking too long to determine where data should be documented. • Many clinicians experienced the loss of autonomy due to standardization and the perceived shift in power to information technology.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • Time Spent Documenting • Ease of Information Accessibility • Impact of the EHR on the Nurse-Patient Relationship
Topaz et al., 2016	Nurse Informaticians Report Low Satisfaction and Multi-level Concerns with Electronic Health Records: Results from an International Survey	• User issues found. Systems fail to meet nursing clinical needs: One common concern was the inability of the systems to capture the patient's story in either a narrative or structured format. • Systems are not nursing specific: EHRs do not work well for capturing, storing, and presenting nursing knowledge. • System issues found. Poor system usability as the most reported concern. Non-integrated systems and poor interoperability: Systems not integrated with clinical workflows. Lack of standards & standardization: Lack of use of documentation standards and insufficient system standardization. Limited functionality/missing components: EHRs lacked at least one key functionality.	• EHR Design, Technical Issues, and Interoperability • User Training

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
		• Environmental issues found; environments did not implement EHRs comprehensively; Lack of user training prevents full use of EHR system capabilities.	
Winckler, 2021	Not another box to check! Using the UTAUT to explore nurses' psychological adaptation to electronic health record usability	• Workarounds: When mismatches exist between workflows and EHR system design, nurses are faced with the mental challenge of overcoming disruptions in patient care using workarounds, which often lead to unreliable, unavailable, or inconsistent patient information. Workarounds involve ethical issues, threaten patient safety, and put nurses at risk if they violate organizational policies and procedures. • Ease of data entry: Duplicate charting may occur as nurses continue to use paper notes before entering data into the EHR as memory aids or if the EHR system is down at the time data entry is required. Difficulties in accurately portraying a patient's narrative when data are entered through drop-down menus or pre-populated phrases. Inappropriate data entry secondary to lack of relevant choices in standardized data entry templates, or rejecting the provided options and typing in free text. Being forced to enter data for which the nurse has little, or no knowledge, threatens the professional duty of honesty. • Ease of data retrieval: Easily accessible, provides real-time access to patient information from multiple sources through a single integrated patient record. Allows the nurse to access data without having to leave the room. Some nurses report the need to sift through information in EHRs to find relevant data due to the amount of information in the system. Locating data often requires searching through several locations in the EHR which increases workflow stress. • System Design: Lack of standardization in EHR systems. Challenges with usability included EHR systems not communicating with other systems within the same organization or between different organizations. Technical issues, such as slow Internet connections, systems going offline, or systems shutting down, can often hinder nurses' ability to complete daily tasks. Usability issues lead to inefficiency, increased frustration, reduce productivity, and threaten patient safety. Poor design of EHRs impedes nurses' ability to perform job duties, while increasing stress and cognitive burden.	• Nursing Workflow Challenges • EHR Design, Technical Issues, and Interoperability • Ease of Information Accessibility

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
Wisner et al., 2021	Managing the tension between caring and charting: Labor and delivery nurses' experiences of the electronic health record	• Nurses viewed their relationship with patients and families as integral to quality nursing care and felt that EHR use sometimes threatened this dimension of their work. • Nurses used EHRs that were not structured for perinatal patients, which required navigating screens and templates that were immaterial and often missing important aspects of care. This lack of EHR fit for perinatal conditions increased nurses' cognitive work; affected information accuracy when documentation structures made it difficult to capture the care scenario; rendered alerts and alarms ineffective, and made intended cognitive support features, such as summary or handoff screens, less useful for supporting patient overview. • Nurses were frustrated by complicated or slow change processes and barriers to advocating for EHR improvements. Being a special unit exacerbated these challenges because the hospital's main information technology support was focused on general care. Nurses often assembled information for others, such as physicians who had not learned or did not have access to the perinatal EHR. Nurses were concerned with their EHR competency and felt pressured to be efficient with documentation.	• Nursing Workflow Challenges • Impact of the EHR on the Nurse-Patient Relationship • EHR Design, Technical Issues, and Interoperability
Yontz et al., 2015	Perioperative Nurses' Attitudes Toward the Electronic Health Record	• Nurses responding to the survey were generally favourable to the use of the EHR in documenting patient care. Using the EHR will lead to improved patient care (80.8%). They had adequate time to document in the record (78.2%), had access to a computer when they needed one (83.5%), all the computers in their unit had the same functionality (70.5%), it did not take longer to document care in the computer (67.5%), and the computer did not create more work for the nurse (72.0%). • Issues found/barriers. Frequent problems with the computer were identified. The slowness of the system, slow printers, and system issues were most frequently cited as a frustration. • Staff expressed concerns about the location of computer workstations. Nurses do not like having their back to the patient to document care, nor having the computer across the room from care. • Nurses' perception of organizational support was generally positive, felt help was readily available when needed (65.3%), and the hospital provided a user-friendly environment with adequate training and backup (71.7%).	• EHR Design, Technical Issues, and Interoperability • Time Spent Documenting • User Training

Author	Study Title	Key Findings from the Original Review Process	Themes from Findings Notes
Zaman et al., 2021	The Relationship between Nurses' Training and Perceptions of Electronic Documentation Systems	• Perceived usefulness: Nurses' general computer skills were not related to the perceived usefulness of electronic documentation systems. • Ease of use: Nurses' general computer skills were related to the perceived ease of using the electronic documentation system. • Concerns with change: Scores on the domain concern about the EHR declined at each measurement, indicating less anxiety and dread over time. • Results showed that training was related to perceived ease of use in electronic documentation systems. • The results indicate that perceived ease of use largely influences electronic documentation systems' perceived usefulness because approximately 66% of the variance was explained by perceived ease of use for perceived usefulness.	• User Training

Figure 1

PRISMA Diagram from Covidence; January 1, 2013, to July 1, 2024