



The Consequences of Employing Electronic Health Records in Daily Nursing Practice: An Integrative Literature Review

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Abstract. Background: Electronic Health Record (EHR) systems are digital versions of patient health records that are stored and managed in a computerized format. EHR systems have transformed the way healthcare professionals manage patient data and deliver care. The implementation of EHRs has become increasingly widespread in recent years, and with it, an abundance of literature has emerged exploring various aspects of EHRs.

Purpose: This study sought to explore the consequences of using EHRs in daily nursing practices.

Methods: An integrative literature review was conducted using articles, discussion papers, and peer-reviewed publications published in English between 2012 and 2023 on PubMed, Google Scholar, EBSCO, MEDLINE, and CINAHL using specific search terms. Data was extracted on six areas, including authors, purpose of study, sample size, research design, and main findings. The data was analyzed and synthesized through narrative review, comparing studies that reported on the same concept.

Results: This study reviewed ten articles on the impact of electronic health records (EHR) on nursing practices, including seven quantitative and three qualitative studies. Two significant themes emerged: the benefit of EHR in documentation and the impact of EHR on nursing efficiency.

Conclusion: Overall, this review noted that the use of EHR significantly helps to improve daily nursing practices, especially in reducing time spent on various activities and the reduction in clinical errors and speed of nursing care service delivery. The review also showed that EHR systems improve the care of some health conditions.

Keywords: electronic health records · nursing practices · documentation · efficiency

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1 Introduction

Electronic health records (EHR) are computer-based records of a patient's medical and clinical history within a healthcare organization, designed for use by healthcare providers [1]. The adoption of health informatics has been on the rise globally, both in developed and developing countries [2]. For instance, the prevalence of EHR systems has grown significantly in recent years, with countries like the Kingdom of Saudi Arabia initiating plans to expand the application of health informatics in government hospitals since 2008 [3]. This trend highlights the importance of health informatics in enhancing patient care services.

Before discussing the impact of EHRs on nursing practice, it is essential to understand their development. The evolution of EHRs began in the late 20th century, with the increasing use of computer technology in healthcare. Over the years, EHR systems have advanced in functionality, security, and interoperability, enabling seamless integration into healthcare organizations [7]. Consequently, EHR adoption rates have risen, contributing to more efficient and effective patient care [8].

Numerous benefits of EHRs in nursing and medical practice have been reported, such as time-saving [4] and improving patient care efficiency by reducing time spent on various healthcare activities [5]. Additionally, EHRs contribute to promoting nursing and clinical research for practice improvement and enhancing the quality of patient admission notes [6]. Despite the evidence supporting EHR use in patient care, there is notable inconsistency in the results regarding its influence on nurses' daily practices. Therefore, this review aimed to identify the consequences of employing electronic health records on daily nursing practices, specifically focusing on the following research objectives:

- To explore the impact of employing electronic health records on the efficiency of nursing practices.
- To explore the benefits of employing electronic health records on nurses' documentation.

2 Methods

2.1 Articles Selection Process

The literature search was performed systematically, using a conventional protocol-driven literature search approach as described by Dekkers and Langhorne [7]. The search was guided by the research question: what are the consequences of employing EHRs in nursing daily practice? Based on this question, the literature search focused on articles, discussion papers, and peer-reviewed publications that addressed both negative and positive consequences of using EHR in nursing practices. Articles were sought from five online database sources: PubMed, Google Scholar, EBSCO, MEDLINE, and CINAHL using the following key terms separated by search operators; 'nurse' OR 'nursing staff' AND 'electronic health records,' OR 'computerized provider order entry' OR 'health information systems' OR 'nursing informatics' AND 'time efficiency' (Fig. 1).

Inclusion criteria comprised non-review articles, discussion papers, and peer-reviewed publications published between 2012 and 2023 in English. The quality of the articles was assessed by the researchers, focusing on the consistencies between the

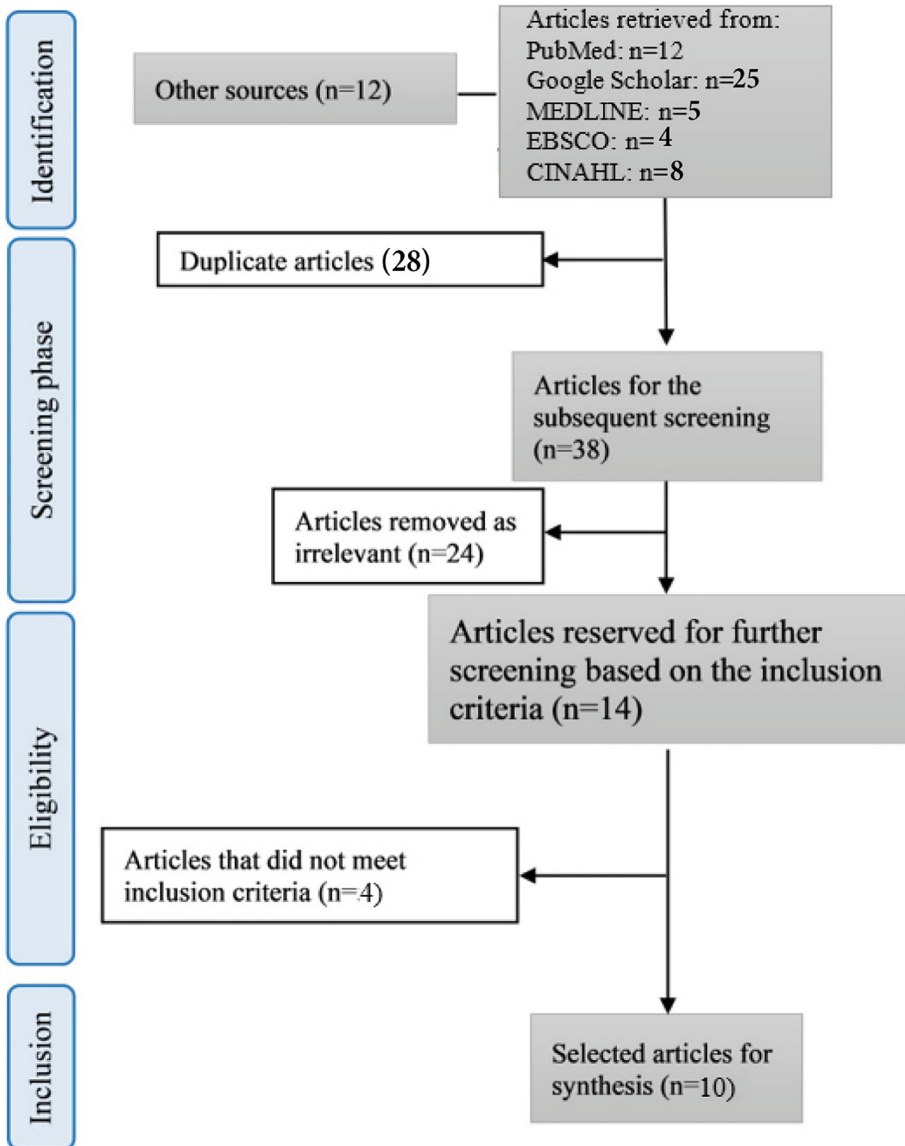


Fig. 1. PRISMA diagram of articles identification, inclusion, exclusion.

study aim, methods, and results. Articles with noticeable inconsistencies in their aim, methods, and results were excluded from the review.

2.2 Data Summary, Analysis and Management

Data extraction focused on six areas, including authors and year of publication, purpose of the study, sample size, research design, and summary of the main findings.

The PROGRESS (“place of the study, race, occupation, gender, religion, education, socioeconomic status”) checklist by Marx et al. [8] was also used to document some information from the articles. Data and information of interest were tabulated for assessment of reporting biases and the subsequent synthesis. During the extraction process, the number of quantitative and qualitative articles was also noted.

2.3 Data Analysis and Synthesis

Narrative review was the principal approach used for data analysis and synthesis. The narrative review focused on describing the study interventions, if any, and the outcomes in relation to the research objectives. Accordingly, the synthesis concentrated on the various ways in which the application of EHR influences the daily practices of clinical nurses as reported in the selected studies. The narrative analysis aimed to identify relevant themes from the selected study articles, including quantitative and qualitative studies, and then describe them in relation to the study objectives to determine what the researchers observed. The analysis was also done in a comparative way, focusing on all the studies that reported on the same concept.

3 Results

A total of ten articles were reviewed and considered in this article (Appendix I). For each included article, the authors’ data, year of publication, the purpose of the study, sample size, design, and main findings were extracted and presented.

3.1 Studies’ Characteristics

All of the ten articles addressed the benefits of EHR in nursing daily practices applied the quantitative methodology. However, different designs were applied. Two studies applied the time series analysis [4, 9], three studies used the prospective longitudinal cohort design [10–12], one study used national survey [13], one study interrupted time series analysis [14], three studies used observational quantitative designs [15, 16, 24]. The sample participants greatly varied, with the minimum being 8 and the biggest being 3607.

From the analysis of the study outcomes, two significant themes were noted:

3.2 Benefit of EHR in Documentation

The use of EHR helps to reduce time spent in documenting the clinical information records and data. Three research articles indicated that the use of the electronic health system was effective in reducing time spent by clinical nurses in documenting patients’ clinical information [4, 11, 12]. The changes in documentation time were thus noted to improve with time. The improvements in the documentation time were also reported among the nurses working in another single ophthalmology unit by Read-Brown et al. [4]. However, the trends in time changes were slightly different. According to Read-Brown et al. [4], the documentation time reduced somewhat during the late implementation

phase but was not steady. Moreover, these researchers noted that “there was no decrease in operating room turnover time or surgical volume after implementation” (p. 4548). Munyisia, Yu, and Hailey [11] also reported that documentation time fluctuated significantly throughout implementation from the third month to two years.

3.3 Benefit of EHR in Improving the Efficiency of Daily Nursing Practices

Ten studies confirmed the significance of the EHR in enhancing clinical nurses' operations and the efficiency of care practices. For instance, Cho et al. [15] noted a high-efficiency score (94.2%) and pointed out that applying the EHRs improved nurses' operations alongside enhanced usability. According to Westbrook et al. [9], there was a significant improvement in the nurses' operations based on the time spent sharing information with the doctors. According to Vatnoy, T., et al. (2014). The findings from the study positive impact in regarding the system's usability than the observations from the laboratory tests.

Moreover, the introduction of electronic health systems improved the access and usability of the clinical data and patients' information [10, 15]. Karp et al. [10] found that the EHR system improved nurses' efficacy and use of significant clinical and patient information processing by 24%. Similarly, Cho et al. [15] indicated that the adoption of electronic nursing records improved nurses' competency and proficiency by 59.5% and 60.6%, respectively.

Health record systems improve the care for specific diseases and efficiency among nurses [13, 14, 16]. One of the studies reported that the introduction of EHR associated with significant improvements in the care for patients with hospital-acquired pressure ulcers by 13% [14]. Schenk et al. [16] also noted that the introduction of comprehensive EHRs saved the time spent by nurses in different intervention units in the hospital. In the same line, Vehko et al. [13] reported that the absence or lower applications of the electronic-care competencies increase the level of psychological distress among clinical nurses.

4 Discussion

This study found out that EHR has significant benefits on documentation activities of the daily nursing practices. Documentation of patients' information is of the routine practices in nursing that takes nurses' time when done manually. At the same time, the passing the manually documented information to the other healthcare professionals takes more time that would otherwise be spend on beneficial duties of patients' care [17]. Many other previous studies have also noted that the use of electronic methods help to reduce time wastage among nurses when documenting clinical information [18, 19].

The ability to reduce time wastage using the EHR systems among the clinical nurses is beneficial and applicable in many nursing environments. One of the apparent benefits is reducing time wastage since nurses are mostly burdened with workload. Heavy workload is one of the factors that snatch nurses the time to have enough rest and sleep [20]. Therefore, coming up with means to speed up the daily nursing practices would be beneficial to the healthcare organization as well as the healthcare service providers.

Moreover, this review also noted that the EHR is significant in improving efficiency of daily nursing practices. Various concepts were noted to improve in regards to the daily nursing practices when the EHR was implemented. For instance, there was an observed reduction in the clinical errors and speed of nursing care service delivery. This benefit was noted in diverse geographical areas and using different samples. Other benefits include the efficiency, proficiency, and available functions of the daily nursing practices [15]. These findings concur with the outcomes noted in the previous studies, such as Rathert et al. [21] who reported the benefit of EHR in improving communication between nurses and doctors.

The introduction of electronic health systems improves access and usability of the clinical data and patients' information, as well as nurses' competency and proficiency. The ability to save clinical information in the readily accessible format helps to ensure faster delivery of healthcare services. As a result, nurses' practices of providing care to patients is significantly enhanced as noted in the previous studies [22, 23]. The review also showed that the EHR systems improve the care of some health conditions, such as pressure ulcers or other disease conditions that need long-term monitoring [16].

5 Conclusion

This literature review identified the various ways in which Electronic Health Record (EHR) systems can be utilized to improve nurses' duties and patient care activities. It is clear from the findings that there are a number of potential benefits associated with the adoption of EHR systems, especially in terms of enhancing healthcare operations, though there is a missing consensus about the role of these systems in improving the time-efficiency of nurses. Varying outcomes of studies looking at the effect of adoption of EHR on time-efficiency in nursing suggest that the impact of these systems may be strongly influenced by organizational factors such as organizational structure, culture, and leadership style. Hence the (EHR) enhance the ability of clinical nurses to perform their clinical duties better, thereby improving the overall delivery of care.

6 Implications

- Further studies are necessary to evaluate the impact of electronic health systems on time efficiency in nursing, given the significant variations in time efficiency assessments of EHR usage in daily nursing practices.
- The success of EHR adoption in daily nursing practices is dependent on organizational factors, including organizational structure, culture, and leadership style. These factors are crucial because they also affect time efficiency, along with technology adoption.
- When evaluating the efficiency of EHR, it is essential to consider the impact of EHR on time efficiency, as the implication of EHR in daily nursing practices can affect electronic health system efficiency indicators.

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