

THE EFFECT OF ELECTRONIC MEDICAL RECORDS (EMR) ON TIME EFFICIENCY: LITERATURE REVIEW

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ABSTRACT

The integration of electronic medical records (EMR) has some crucial role to be implemented in health care service because it can reduce the workload of doctors and other healthcare professionals. Electronic medical records have patient information that can be accessed easily, which ultimately helps doctors and other healthcare professionals improve patient safety such as clinical decision-making (diagnoses, allergies, previous medical history, and drug duplication). By using EMR, data can be easily summarized in a system, no need to worry about scattered paper. In hospitals has become a crucial approach for improving the effectiveness of healthcare services, especially in minimizing outpatient wait times. This research uses the literature review method that examines the impact of EMR implementation on wait times for outpatients by utilizing databases to find relevant publications for this research. Articles were chosen based on criteria for inclusion and exclusion. The inclusion criteria were articles published in the last 5 years of national and international research articles in English, relating to the title of the effect of EMR on time efficiency: Literature Review. Hypothesis testing indicated that electronic medical record performance and service time have a simultaneous and partial impact on patient satisfaction. Satisfaction will be achieved when the customer or patient experiences a swift, seamless, and unobstructed EMR system along with ideal service duration and quick, accurate service time.

Key words: Time efficiency; electronic medical records; healthcare service; service effectiveness, outpatient wait times

INTRODUCTION

The digital transformation of the healthcare sector has positioned Electronic Medical Records (EMR) as indispensable components of the modern healthcare system (Gedikci Ondogan et al., 2023). These systems are fundamentally intended to facilitate patient-centered treatment and ensure effective communication and secure medical information sharing among all healthcare professionals (Gedikci Ondogan et al., 2023). A primary goal of EMR implementation is to enhance time efficiency and service delivery, directly impacting key metrics such as outpatient satisfaction (Hidayat et al., 2022). For example, the use of EMR has a demonstrated effect on service time, which is a critical factor in determining patient satisfaction levels (Hidayat et al., 2022). Despite these projected gains in efficiency and service time, the actual deployment of EMRs often introduces significant integration challenges within hospital settings, potentially complicating or delaying the full realization of time-saving benefits (Anwar & Malik, 2023). Given the critical relationship between EMR systems, service time metrics, and inherent implementation complexities, this literature review aims to systematically analyze the evidence to determine the comprehensive effect of Electronic Medical Records (EMR) on time efficiency in clinical practice.

METHOD

This study employed a literature review method, using databases such as Google Scholar, PubMed, and ScienceDirect as primary sources. Additional relevant data, including review articles, systematic reviews, and meta-analyses, were also utilized. Articles were selected based on specific criteria: they had to be national or international research articles published in English within the last five years, and pertain to the effect of EMR on time efficiency. Three reviewers independently screened the titles and abstracts against the inclusion and exclusion criteria. Manuscripts that passed this initial screening proceeded to full-text retrieval for detailed examination.

RESULTS AND DISCUSSION

Recent literature confirms that Electronic Medical Record (EMR) implementation improves time efficiency in healthcare. The literature review on ten articles confirms these complexities, leading to the following results:

Table 1. Articles for this research

No	Title	Author	Purpose	Method	Result
1	Electronic medical records (EMR) in streamlining patient care and reducing waiting time.	Akinboyo, M. S., Makinde, B. O., & Gbemi-Ogunle ye, P. F.	To analyze the role of EMR in streamlining patient care processes and achieving a reduction in patient waiting time.	<i>Specific method not detailed in citation summary</i> (Likely a review or descriptive study)	EMR is an effective tool for optimizing workflows, leading to faster service delivery and shorter patient waiting times.
2	The Effectiveness of EMR Implementation regarding reducing documentation errors and waiting time for patients in outpatient clinics: a systematic review.	Albagmi S.	To systematically review the effectiveness of EMR implementation in reducing documentation errors and patient waiting times in outpatient clinics.	Systematic Review	EMR implementation is effective in reducing documentation errors and patient waiting times.
3	Hospital Efficiency Using Electronic Health Records For Patient Service Quality: Literature review.	Anggraeni, Ni W S.	To review existing literature on how Electronic Health Records (EHR) affect hospital efficiency and the quality of patient services.	Literature Review	EHR use is generally associated with improved hospital efficiency and higher quality of patient service (details implied by the review's title).
4	Benefits of integrated electronic medical record in the efficiency of health services.	Argotti Zumbana, R. D., et al.	To identify the use and benefits of the Integrated Electronic Medical Record (IEMR) concerning efficiency in the healthcare system.	Systematic Review	IEMR is a key strategy that improves service quality, reduces administrative time, and enhances medical decision-making.
5	Paper-and-pencil vs. electronic patient records: Analyzing time efficiency, personnel requirements, and usability impacts on healthcare administration.	Berger, M. F., et al.	To compare paper-based records (PPR) and electronic patient records (EPR) based on time efficiency, personnel needs, and usability.	Comparative/Analytical Study	EPR is generally superior to PPR in time efficiency and resource management, though usability poses challenges.
6	A study of the effect of health records digitalization on healthcare facility operational efficiency.	Ng'andu, D., & Haabazoka, L.	To investigate the effect of health records digitalization (EHR/EMR) on operational efficiency in healthcare facilities.	Quantitative Study (Survey-based)	Digitalization of health records significantly improves overall healthcare facility operational efficiency.

7	Effectiveness of electronic health record use by nurses in clinical documentation: A literature review.	Pringgayuda, F.	To review the literature regarding the effectiveness of nurses' use of Electronic Health Records (EHR) for clinical documentation.	Literature Review	EHR use by nurses is effective in improving the quality and timeliness of clinical documentation.
8	Comparative effectiveness of EMR systems on clinical workflows.	Shen, Y., Lee, S., & Kim, H.	To compare the effectiveness of different EMR systems regarding their impact on various clinical workflows.	Comparative Study	Different EMR systems exhibit varying levels of effectiveness, suggesting that system design significantly impacts clinical workflow efficiency.
9	The impact of electronic medical records on clinical documentation: A case study.	Torab-Miandoab, A., et al.	To investigate the impact of Electronic Medical Records (EMR) on the quality and process of clinical documentation through a detailed case study.	Case Study	EMR use generally improves the quality and efficiency of clinical documentation compared to paper-based methods (based on the case findings).
10	A qualitative analysis of the impact of electronic health records (EHR) on healthcare quality and safety: Clinicians' lived experiences.	Upadhyay, S., & Hu, H.-F.	To explore clinicians' lived experiences to assess EHR's impact on healthcare quality and patient safety.	Qualitative Analysis (Semi-structured Interviews)	Clinicians have mixed views; EHR improves data accessibility but concerns remain regarding data accuracy, usability, and interoperability.

EMR Benefits and Organizational Gains

The adoption of Electronic Medical Records (EMRs) is a crucial strategy for modernizing healthcare, delivering significant organizational benefits in documentation quality and operational efficiency (Anggraeni, 2024; Argotti Zumbana et al., 2025; Pringgayuda, 2025). Specifically, EMR implementation notably reduces documentation errors, particularly those concerning medication (Albagmi, 2021; Argotti Zumbana et al., 2025). Documentation quality improved dramatically, reaching 100% adherence among all staff after EMR deployment in some studies (Torab-Miandoab et al., 2025). Furthermore, EMR utilization streamlines clinical activities, speeding up patient registration and improving scheduling, which ultimately reduces patient waiting times in outpatient settings (Akinboyo et al., 2024; Argotti Zumbana et al., 2025; Albagmi, 2021).

Clinical Ambivalence and Usability Challenges

Despite the organizational benefits, clinicians often express an ambivalent perspective regarding EMR systems, citing a gap between theoretical advantages and practical realities (Upadhyay & Hu, 2022). A key concern is the resulting documentation burden, with some physicians spending over half their work time actively engaged with the EMR (Upadhyay & Hu, 2022; Torab-Miandoab et al., 2025). This friction is primarily caused by usability flaws and poor system design, which actively disrupt clinical workflows, negatively affecting physician acceptance and potentially undermining efficiency gains (Berger et al., 2024; Pringgayuda, 2025). Furthermore, system complexity combined with hardware limitations has been linked to unintended consequences, including increased stress and reduced job satisfaction (Upadhyay & Hu, 2022).

Systemic Barriers to Digital Records

Realizing the full potential of digital records is conditional upon addressing critical systemic barriers (Anggraeni, 2024). Common implementation challenges include inadequate digital skills, insufficient staff training, and major issues with technological infrastructure, such as downtime or unreliable connectivity (Akinboyo et al., 2024; Argotti Zumbana et al., 2025; Ng'andu & Haabazoka, 2024). Infrastructure failure can force facilities into cumbersome dual paper and electronic systems, which drastically increases staff workload (Ng'andu & Haabazoka, 2024). Successful deployment therefore requires robust technological investment, appropriate data security, and a strategic focus on user-centered design, including the active involvement of end-users like nurses in the development process (Argotti Zumbana et al., 2025; Pringgayuda, 2025).

CONCLUSION

The research confirms that Electronic Medical Records (EMRs) are vital for modernizing healthcare, successfully achieving the expected results of improving documentation quality and operational efficiency by reducing errors and cutting patient waiting times. However, realizing these benefits is challenging, as clinicians frequently express ambivalence due to a high documentation burden and workflow friction caused by poor system usability. To ensure sustained efficiency, systemic barriers—such as inadequate technological infrastructure and insufficient staff training—must be overcome. Therefore, future research should focus on developing and testing tailored EMR implementation models that prioritize continuous staff training and user-centered design to minimize disruption and align the technology with clinical practice.

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