
Implementation of Electronic Medical Records (EMR) in Improving the Quality and Efficiency of Health Services: Literature Review

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Abstract

Digital transformation in Indonesia's health sector, driven by the Industry 4.0 era and mandated by Minister of Health Regulation No. 24 of 2022, requires a transition from manual to Electronic Medical Records (EMR). While promising efficiency, its implementation still faces various practical challenges. Objective: This study aims to analyze the success of EMR implementation, evaluate its impact on work efficiency and service quality, and identify the main obstacles encountered by healthcare facilities. This study employed a literature review method, analyzing ten scientific articles published between 2022 and 2025. Data were gathered from Google Scholar and national health journal portals, followed by a narrative synthesis. The findings indicate that EMR significantly improves service quality through rapid data integration, reduction of medical errors, faster waiting times, and cost efficiency (paperless system). However, success is heavily influenced by infrastructure stability (internet and power) and human resource readiness. Major obstacles include resistance to work culture changes among senior staff, limited digital literacy, and less user-friendly system interfaces. EMR implementation has a substantial positive impact on patient service management and patient safety. For sustainable optimization, management commitment is required in providing adequate infrastructure, continuous technical training for staff, and developing systems that are more adaptive to user needs.

Keywords: Electronic Medical Records (EMR), HIMS, Service Quality, Operational Efficiency, Healthcare Facilities.

INTRODUCTION

The development of information technology in the era of industry 4.0 has brought about major transformations in various sectors, including the health sector. Hospitals and community health centers, as health care facilities, are required to adapt to digital innovations in order to improve service quality and operational efficiency (Koten et al., 2022). One of the main pillars of this transformation is the transition from manual recording systems to Electronic Medical Records (EMR). The implementation of EMR is no longer just an option, but an obligation for all health facilities in Indonesia in accordance with the mandate of Minister of Health Regulation (PMK) Number 24 of 2022 (Gabriella et al., 2023; Ikawati & Ilmawati, 2025).

Functionally, RME is a computerized health information system that stores integrated clinical, administrative, and demographic patient data (Ariani, 2023). The use of this system aims to overcome various weaknesses of manual systems, such as the risk of document loss, data duplication, and limited accessibility of information, which often hinders rapid clinical decision-making (Alkaf et al., 2024; Rusdi et al., 2024). With the RME, medical personnel can access patient health records in real time, which ultimately supports patient safety through the reduction of medical errors or clinical errors (Nurhayati et al., 2023).

However, in practice, the implementation of RME and Hospital Management Information Systems (SIMRS) still faces significant challenges. Several studies have shown obstacles in aspects of infrastructure, such as internet network disruptions and power stability, as well as aspects of human resources related to technical competence readiness and staff resistance to system changes (Andriani et al., 2022; Farhiyah et al., 2025). In addition, the suitability of the system interface (user interface) is also an important consideration so that the applications used can support, rather than hinder, the productivity of staff in the field (Agustiany et al., 2024).

This literature review was compiled to provide information from various previous studies on the use of EMR as a form of computer-based technological advancement in various health facilities in order to analyze the success of EMR implementation, evaluate its impact on improving work efficiency and service quality, and identify the main obstacles encountered as recommendations for optimizing health information systems in the future.

RESEARCH METHODS

This study used a literature review method by conducting a systematic search of various relevant scientific articles on the implementation of Electronic Medical Records (EMR) and Hospital Management Information Systems (SIMRS). The literature search strategy was conducted through electronic databases such as Google Scholar and other national health journal portals using specific keywords including electronic medical records, EMR implementation, HIMS, quality of health services, and electronic medical records.

The selection of articles was based on several inclusion criteria, namely articles published between 2022 and 2025, research focusing on the effectiveness, obstacles, and impact of implementing electronic systems in health care facilities, both community health centers and hospitals, as well as articles available in full text. From the search results, ten main articles were selected and then analyzed in depth by extracting important data such as author names, year of publication, research methods used, and the main findings of each study. The collected data was then synthesized narratively to provide a comprehensive overview of the phenomenon of computer-based technology implementation in healthcare in Indonesia as a basis for drawing conclusions and recommendations for future system development.

RESULTS AND DISCUSSION

Results

Tabel 1.1 Tabel Research Results Overview

No.	Tittle	Researcher	Result
1.	Improving the Quality and Efficiency of Health Services through the Implementation of Electronic Medical Records (RME) at Hasta Husada Hospital	Achmad Jaelani Rusdi, Fendi Kurniawan, Amir Muhammad Rifqi	The results of the study show that RME provides significant benefits, including fast and accurate access to patient data, increased work efficiency, and a reduction in medical errors. Although most users feel comfortable using RME after training, there are still complaints about the system interface that needs to be simplified. User attitudes are generally positive towards RME after seeing the tangible benefits, despite initial resistance. The implementation of the Hospital Management Information System (SIMRS) has shown mixed results, with some units having fully switched to RME and others still in the transition phase.

No.	Title	Researcher	Result
2.	Improving the Quality and Efficiency of Health Services Through the Implementation of Electronic Medical Records in Hospitals	Asti Nurhayati, Ummu Muti'ah, Yuniarti	The implementation of RME significantly improves service quality through data integration that facilitates clinical decision-making, as well as creating operational and cost efficiencies (paperless) that ensure service continuity, with the caveat that its success is highly dependent on the readiness of technological infrastructure and human resource competencies. However, its effectiveness is still hampered by limitations in technological infrastructure and the readiness of human resource technical competencies.
3.	Review Of The Implementation Of Electronic Medical Records For Outpatient Care At The Jabung Community Health Center In Malang Regency	Fita Rusdian Ikawati, Sindi Adita Ilmawati	The results of the study show that the implementation of RME faces problems such as internet disruptions, system errors, application bugs, power outages, and resistance or rejection of the new system by staff. The limited features of e-Pus also mean that some data is still managed manually. Even so, RME provides many benefits, such as speeding up services, facilitating access to patient data, and making work more efficient. Patients also experience faster and more practical services. The implementation of RME at the Jabung Community Health Center faces challenges in the form of internet disruptions, application bugs, and staff resistance to the new system. The limited features of the e-Pus application also necessitate the use of a hybrid system. Nevertheless, RME improves service efficiency, speeds up work processes, and facilitates access to patient data, resulting in faster and more organized services.
4.	Implementation of Hospital	Nur Laili Farhiyah, Hashifah Faizah, Budi	The results of the study show that the implementation of SIMRS has

No.	Title	Researcher	Result
	Management Information System (SIMRS) in Health Service Provision	Hartono, Alfani Ghutsa Daud	had a significant positive impact on several aspects of service. SIMRS has proven successful in reducing patient waiting times, improving the accuracy and integration of patient data through Electronic Medical Records (EMR), and strengthening coordination between units. However, the implementation process also faced challenges, including resistance from users, particularly senior staff, high investment costs, and the need to adapt to a digital-based work culture. Factors supporting its success included strong commitment from top management and comprehensive user training.
5.	The effectiveness of electronic medical records in efforts to improve productivity and patient safety management: A qualitative study at Mutiara Putri Mother and Child Hospital (RSIA), Bandar Lampung	Indri Agustiany, Rian Andriani, Achmad Dheni Suwardhani	The implementation of RME at Mutiara Putri Hospital has been proven to increase productivity, accuracy, and efficiency of services through an integrated management approach in terms of human resources, budget, methods, infrastructure, and materials. This system significantly strengthens patient safety management, but its success is highly dependent on strong infrastructure support, integrated system improvements, and the urgency of implementing continuous training for staff to ensure the quality of medical data entry.
6.	Electronic Medical Records as a Support for Management of Patient Services at Gadjah Mada University Hospital	Rika Andriani, Dewi Septiana Wulandari, Rizka Siwi Margianti	The implementation of Electronic Medical Records (EMR) at Gadjah Mada University Hospital has proven to be effective as a key support in patient service management, particularly in facilitating care coordination, continuous monitoring of patient progress, and assisting patient service managers in identifying and intervening in a timely

No.	Title	Researcher	Result
			manner, although the usability of the system still needs to be improved based on user feedback.
7.	Analysis of Successful Implementation of Electronic Medical Records at Universitas Gadjah Mada Hospital	Ali Reza Alkaf, Anang Dwi Permana, Dita Anggraini, Dramora Nepy Asmara, Wisnu Prasetianto, Vip Paramarta	Analysis of the successful implementation of RME at UGM Hospital shows that system quality and information quality have a significant effect on user satisfaction and net benefits. This system has succeeded in improving the accuracy of medical documentation, reducing clinical errors, and accelerating access to patient data, although organizational support and ongoing training remain determining factors in maintaining consistent use of the system by medical personnel.
8.	Analysis of the Impact of Hospital Electronic Medical Records on Improvements in Quality and Patient Safety at Permata Sarana Husada Hospital in 2023	Tasha Gabriella, Windiyaningsih Cicilia, Trigono Ahdun	Research at Permata Sarana Husada Hospital shows that the implementation of RME has a significant effect on improving service quality (92.5%), system quality (99.16%), and patient safety (95.5%). This success is supported by the respondents' knowledge level reaching 100% through intensive training; however, the study still recommends the need for routine monitoring of the application to reduce technical disruptions and the development of remote data access features for medical personnel.
9.	Analysis Of The Successful Implementation Of Electronic Medical Records In Improving The Efficiency And Quality Of Services	Suci Ariani	The implementation of RME has been proven to significantly improve work effectiveness and quality of healthcare services through case management optimization, reduced waiting times, and increased collaboration among healthcare professionals. However, the long-term success of this system requires serious attention to obstacles such as resource constraints, data security,

No.	Title	Researcher	Result
			interoperability, and resistance to organizational cultural change.
10.	Healthcare Digitalization In Improving The Quality Of Healthcare Services	Ade Amallia	Research shows that health digitization, particularly through the implementation of electronic medical records (EMR), plays a positive role in improving accessibility, patient data accuracy, and clinical decision-making to support equitable service quality. However, its success is highly dependent on the competence of health workers, adequate infrastructure, and optimal assistance strategies to overcome user resistance and digital divides in remote areas.

Discussion

Based on an analysis of ten reviewed literature, the implementation of Electronic Medical Records (EMR) in various health facilities has shown a significant impact on operational efficiency and service quality. Findings from studies by Ariani (2023) and Nurhayati et al. (2023) confirm that the transition to a digital system effectively reduces administrative workload and creates cost efficiencies through a paperless system. This is in line with the results of a literature study by Koten et al. (2022), which states that EMR optimizes service time and facilitates more integrated collaboration between healthcare professionals (PPA).

In the context of patient safety, the use of RME has been proven to minimize medical errors. Research by Gabriella et al. (2023) and Agustiany et al. (2024) highlights that accurate patient identification features and the ease of reading electronic prescriptions drastically reduce the risk of procedural errors. Alkaf et al. (2024) added that good system and information quality are key to reducing clinical errors and increasing user satisfaction in hospitals. These benefits are supported by data integration that enables continuous monitoring of patient conditions (Andriani et al., 2022).

However, despite its advantages, the implementation process still faces substantial and consistent challenges in several regions. Primary infrastructure constraints such as internet network stability and power outages are reported to be major obstacles, especially at the community health center (Puskesmas) level (Ikawati & Ilmawati, 2025). In addition to technical aspects, human resources also play a crucial role. Resistance to changes in work culture and digital literacy gaps among medical staff require special attention through continuous training (Farhiyah et al., 2025; Rusdi et al., 2024).

Systematically, the success of RME implementation depends not only on technological sophistication, but also on management readiness in managing human resource transitions and ensuring infrastructure sustainability. Synchronization between government policy (Minister of Health Regulation No. 24 of 2022) and the readiness of health facilities in the field is a key determinant in realizing equitable and high-quality health digitization in Indonesia.

CONCLUSIONS

Based on a literature review of ten research articles, it can be concluded that the implementation of Electronic Medical Records (EMR) and Hospital Management Information Systems (HMIS) has a significant positive impact on the quality of healthcare services. The use of EMR has been proven to improve operational efficiency by reducing administrative workload, speeding up waiting times, and increasing cost efficiency through a paperless system. In addition, the digitization of medical records plays a crucial role in improving patient safety through better data accuracy, reduction of medical errors in prescription reading, and support for more accurate clinical decision-making for medical personnel.

However, the success of RME implementation is highly dependent on the readiness of technological infrastructure and human resource competencies. Technical obstacles such as internet instability, power outages, limited digital literacy, and resistance from staff to changes in manual work systems remain major challenges, especially in primary health facilities. Therefore, strong managerial support is needed through the provision of adequate infrastructure, ongoing technical training for staff, and the development of more user-friendly application interfaces to ensure the success of sustainable digital health transformation in Indonesia.

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