

Implementation of Electronic Medical Records and its Implications for the Effectiveness of Health Services in Indonesia: Narrative Review

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ABSTRACT

Digitizing the health system through the implementation of Electronic Medical Records (RME) is one of the strategic steps in improving the effectiveness of health services in Indonesia. RME enables digital recording, management, and access of patient medical data, replacing manual systems that are less efficient and error-prone. This article aims to narratively review the literature that discusses the implementation of RME and its impact on the effectiveness of health services in Indonesia. The study was conducted through a narrative review approach utilizing data from various scientific articles obtained through databases such as Google Scholar and Scopus. Article selection was carried out based on certain inclusion and exclusion criteria, with a publication range of 2020–2025. The results of the review of six articles show that RME contributes positively to improving operational efficiency, documentation quality, interprofessional coordination, and patient safety. RME speeds up the service process, minimizes medical errors, and supports more accurate clinical decision-making. However, the implementation of RME also faces challenges such as limited technology infrastructure, data security issues, and the readiness of human resources that still varies. The implementation of RME in Indonesia has a significant impact on the effectiveness of health services. To maximize its benefits, strong regulatory support, ongoing training, and the development of an integrated and user-friendly system are needed.

Keywords: Electronic Medical Records, Healthcare, Service Effectiveness, Hospitals, Digitization

INTRODUCTION

The development of information technology has brought very significant changes to various sectors of life, including the health sector (Paul et al., 2023; Ratta et al., 2021; Stoumpos et al., 2023). Digitizing the health system is one of the important efforts to improve the quality and accessibility of health services in this modern era. One of the key innovations in digital health transformation is the implementation of Electronic Medical Records (EMR) (Handiwidjojo, 2015). RME is a system that allows for the digital storage, management, and access of patient medical data, replacing the manual recording system that has been used previously. With RME, it is hoped that the medical service process can become more efficient, accurate, and integrated, thereby improving the quality of services in health facilities (Tiorentap, 2020).

In Indonesia, the implementation of RME has begun to be gradually adopted in various types of healthcare facilities, ranging from hospitals and clinics to health centers in various regions. The government, through the Ministry of Health and various supporting regulations such as the Regulation of the Minister of Health, has encouraged the acceleration of RME usage as part of the national digital transformation program in the health sector (Indonesia, Kementerian Kesehatan, 2022). In addition, various initiatives and technical support are provided to facilitate the integration of health information systems so that they can operate optimally. However, the implementation of RME in the field faces various complex obstacles. The challenges faced in RME implementation include uneven technological infrastructure aspects, including limited data storage facilities and adequate security systems to maintain the confidentiality of patient information (Putri, 2023). Furthermore, the readiness of human resources, especially healthcare

workers who must be able to operate this system properly, remains problematic. The varying digital competencies of healthcare workers necessitate continuous training. No less important, resistance to changes in the work system that has long been implemented manually represents an organizational cultural obstacle that needs to be overcome for the transition to an electronic system to run smoothly (Amin et al., 2021).

Despite these challenges, empirical studies show that the use of RME provides significant benefits. RME has been shown to reduce the risk of medical record errors, speed up the patient service process, and improve inter-unit coordination and communication between healthcare workers within a single facility (Asih & Indrayadi, 2023). Healthcare effectiveness can also be improved through easy access to real-time patient data, which facilitates faster and more informed clinical decision-making. Furthermore, the implementation of RME allows for a more transparent and accountable system for monitoring and evaluating service quality (Siswati et al., 2024).

Two previous studies provide important context for the implementation of Electronic Medical Records (EMR) in Indonesia, but they also leave significant gaps. First, the meta-analysis by Campanella et al. showed that EMR correlates with improved healthcare quality—such as reduced mortality and complications—but the findings are dominated by hospitals in developed countries, with high heterogeneity in study design and quality indicators, making generalization to developing-country healthcare systems still limited. Second, an Indonesian study by Sinaga & Sumartini assessed the effectiveness of EMR from the perspective of nurses and found improvements in patient safety dimensions. However, its focus was facility-specific and more process-oriented (compliance and speed of documentation) rather than measuring clinical outcomes across units, and it did not fully examine organizational prerequisites such as infrastructure readiness and digital competencies in a quantitative manner. Filling this gap, the present review links the evidence of EMR's benefits to the Indonesian context by comparing service quality dimensions (safety, accuracy, continuity) and adoption determinants (infrastructure, human resources, governance) in an integrated way, thus addressing not only "whether EMR is beneficial" but also "under what conditions those benefits are consistent" across different types of facilities.

Therefore, it is very important to conduct an in-depth narrative review of various literature related to the implementation of RME, particularly in the context of healthcare in Indonesia. This review aims to summarize the available scientific evidence and provide a comprehensive picture of the real impact of RME usage on the effectiveness and quality of health services in Indonesia. The results of this review are expected to serve as useful references for policymakers, health facility managers, and researchers in optimizing the use of RME to support a more advanced and responsive national health system.

RESEARCH METHOD

This study used a narrative review approach to review and analyze the literature that discusses the implementation of Electronic Medical Records (*RME*) and its impact on the effectiveness of health services in Indonesia. The literature search process was carried out systematically through several scientific journal databases such as Google Scholar and Scopus.

The search strategy used a combination of the following keywords: ("electronic medical record" OR "electronic health record" OR EMR OR EHR) AND ("hospital service" OR "healthcare service" OR "patient care") AND (implementation OR adoption OR impact).

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Table 1. PICO Framework

PICO	Definition
<i>Population</i>	Healthcare providers in healthcare facilities in Indonesia.
<i>Intervention</i>	Implementation of electronic medical records.
<i>Comparison</i>	Electronic medical records compared to conventional/manual medical records.
<i>Outcomes</i>	The effectiveness of hospital services or health facilities.

Inclusive Criteria:

1. Articles that discuss the implementation of electronic medical records (EMR) and its impact on the effectiveness of healthcare services.
2. Studies conducted in health care facilities such as hospitals, clinics, or health centers.
3. Articles published in Indonesian.
4. Articles published in the last five-year time span (2020–2025).

Exclusion Criteria:

1. Articles that do not specifically address electronic medical records (e.g. focus only on manual medical records).
2. Studies that only highlight the technical aspects of EMR development without examining its impact on health services.
3. Articles written in languages other than Indonesian.
4. Studies conducted outside the context of a healthcare facility (e.g. animal hospital or non-clinical laboratory).

RESULTS AND DISCUSSION

From the literature search process carried out through several scientific journal databases such as Google Scholar and Scopus, a number of articles were found that discussed the implementation of Electronic Medical Records (RME) in health care facilities in Indonesia. After a selection based on the inclusion and exclusion criteria that have been set, as many as 6 articles were obtained that were considered relevant for further analysis. The articles contain information about the methods used, the focus of the discussion, and the main findings related to the impact of RME on the effectiveness of health services.

The following table presents a summary of the characteristics of each article that has been reviewed, including information about the author, year of publication, article title, and the main results or conclusions of each study.

Table 2. Article Search Results

Writer	Year	Heading	Purpose	Result
Yohanes Wahyu Nugroho, Fadma Aji Pramudita	2024	The Role of Electronic Medical Records in Improving Efficiency, Quality of Healthcare, and Patient Care Safety: A <i>Systematic Literature Review Analysis</i>	Analyze the role of Electronic Medical Records in improving the efficiency, quality of healthcare services, and safety of patient care	The implementation of EMR makes a significant contribution to improving operational efficiency, standardization of medication management, and transparency of information. In the context of healthcare quality, EMRs play a role in improving care coordination

Writer	Year	Heading	Purpose	Result
				and minimizing the risk of medical errors. On the other hand, The safety aspect of patient care is strengthened by features such as drug interaction alerts and accurate medication management
Sofia Arditya Kustiyanti, Anhari Achadi	2024	Implementation of Electronic Medical Records in Emergency Installations: <i>Literature Review</i>	Know how to implement electronic medical records in emergency departments.	The use of Electronic Medical Records (RME) provides various significant benefits in health services, especially in the Emergency Unit. One of its main benefits is lowering the rate of medical errors and improving patient safety. In addition, RME also improves the quality of medical documentation, where electronic records such as tablet-based resuscitation records have been proven to produce more complete documentation than paper records. On the other hand, systems such as My Health Record are considered to provide better efficiency by medical personnel, especially in handling patients with complex conditions. These findings suggest that the implementation of RME can support safer, more efficient, and well-documented services.
Cahyani Yunisa, Erix Gunawan	2024	The Effect of the Implementation of Electronic Medical Records on the Quality of Outpatient Services at Hospital X	To determine the effect of the implementation of electronic medical records on the quality of outpatient services.	The implementation of electronic medical records has an influence on the quality of outpatient services, but the percentage is not too significant because electronic medical records are only one of the factors in the assessment of service quality.
Fita Rusdian Ikawati	2024	The Effectiveness of the Use of Electronic Medical Records on Improving the Quality of Patient Services in Hospitals	Exploring the benefits and challenges of implementing RME and its implications for medical practice and healthcare services in Indonesia.	The implementation of electronic medical records (RME) in hospitals in Indonesia has great potential in improving the efficiency, accuracy, and quality of health services, although there are still various obstacles that need to be overcome.

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Writer	Year	Heading	Purpose	Result
Yuana Wangsa Putri, Tini Rezeki Saragih, Sri Hajijah Purba	2024	Implementation and Impact of the Use of Electronic Medical Record System (RME) in Health Services	Determine the impact of EMR implementation on healthcare including the challenges faced during its implementation	RME plays an important role in improving the quality of health services, patient satisfaction, reducing medical errors, and improving coordination between healthcare professionals.
Henry Adrian, Cahya Tri Purnami, Antono Suryoputro	2023	Analysis of Electronic Medical Record Documentation in Health Care Facilities: <i>Literature Review</i>	Knowing the potential benefits, problems, and solutions for the implementation of electronic medical record documentation in healthcare facilities	The completeness of electronic medical record documentation improves patient safety and continuity of health services.

The implementation of Electronic Medical Records (RME) in various healthcare facilities in Indonesia has become one of the main strategies in supporting the digital transformation of the health sector. Based on the results of the analysis of the six articles reviewed, RME shows a significant contribution in improving the effectiveness of health services, both in terms of operational efficiency, service quality improvement, and patient safety. However, its implementation cannot be separated from various technical and non-technical challenges that require special attention.

One of the main dimensions influenced by RME is the efficiency of health services. Studies by Nugroho and Pramudita (2024) and Yunisa and Gunawan (2024) consistently confirm that digitizing medical records is able to accelerate access to patient data, reduce the administrative workload of health workers, and accelerate service flows, especially in outpatient settings. This is in line with the findings of Adrian et al. (2023), where most patients stated that RME speeds up waiting times and makes the work process of medical personnel more efficient. The presence of automated templates and features in the RME system also smooths medical documentation and shortens recording time, so that medical personnel can be more focused on clinical actions. In addition to efficiency, improving the quality of health services is also an important implication of the implementation of RME. RME provides quick and comprehensive access to patients' medical histories, examination results, and treatment plans, supporting more accurate and data-driven medical decision-making.

This is elaborated in depth by Putri et al. (2024), who mention that RME allows for more integrated care between units because the data can be accessed in real-time and across departments. In fact, the features of the RME system also allow for early detection of certain conditions, such as hypertension, which reinforces the role of RME in promotive and preventive efforts. Research by Ikawati (2024) added that collaboration between medical personnel from various specialties is also easier to do because of the integration of medical information. This aspect is important in the handling of complex cases that require continuous monitoring and multidisciplinary involvement. Good medical documentation also improves transparency, accountability, and standardization of healthcare services, as highlighted by Nugroho and Pramudita (2024) and Kustiyanti and Achadi (2024), who highlight the role of RME in improving the quality of documentation, especially in emergency situations. In terms of patient safety,

various studies have shown that RME plays a role in reducing the risk of medical errors, such as medication administration errors, diagnosis recording, and medical procedures. This is due to a neat data structure and an automatic alert system that prevents medical action inconsistencies. A study by Kustiyanti and Achadi (2024) shows that RME in the Emergency Unit (ER) is very helpful in critical situations because it speeds up recording and supports decision-making in emergency situations. The integration of information also allows patient care to be more targeted and less risky.

Although the potential of RME is huge, its implementation in Indonesia is still faced with a number of challenges. Technical challenges such as limited information technology infrastructure, especially in remote areas, are major obstacles. The availability of adequate hardware and software as well as stable internet connectivity greatly determines the success of the RME system. In addition, the issue of patient data security is a major concern. Medical data is sensitive information that must be protected with a reliable security system to prevent leaks or unauthorized access. Several studies reveal concerns about cyberattacks and data protection that are not optimal, as conveyed by Yunisa and Gunawan (2024) and Ikawati (2024). In terms of human resources, adaptation to digital technology is still a big challenge. Many healthcare workers who are used to manual systems find it difficult to use RME, especially if the training provided is not appropriate for the context of daily work. This is proven in the study of Kustiyanti and Achadi (2024), where non-contextual training and user fatigue are factors inhibiting the effectiveness of RME in the field. Therefore, it is important to provide relevant, ongoing, and actively involve healthcare workers in the development of the system for optimal use. In addition, high documentation workloads and data-filled time that consume interaction time with patients are also issues that need to be considered. If it is not balanced with a strategy to reduce administrative burden or more practical system integration, then the potential for RME can actually interfere with the quality of service interpersonally. Therefore, the development of a user-friendly, flexible, and integrated system is needed so that RME not only functions as a recording tool, but actually supports an effective clinical process.

Overall, the results of analysis from various sources show that the implementation of RME in Indonesia has a wide positive impact on the effectiveness of health services. RME accelerates the service process, improves the quality of documentation and coordination between professions, and strengthens patient safety. However, successful implementation is highly dependent on infrastructure readiness, supporting policies, user competencies, and a structured change management system. Government support, whether in the form of regulations, financing, and training, will be a key factor in accelerating the adoption and optimization of RME in all healthcare facilities in Indonesia.

CONCLUSION

The implementation of Electronic Medical Records (*RME*) in Indonesia has been proven to contribute positively to the effectiveness of health services, especially in improving operational efficiency, service quality, and patient safety. *RME* accelerates data access, supports information-driven decision-making, and reduces medical errors. However, challenges such as limited infrastructure, data security, and human resources readiness remain obstacles. To optimize the benefits of *RME*, regulatory support, relevant training, and the development of an integrated, easy-to-use system are needed.

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