

# Strategy to Overcome Barriers to Implementing Electronic Medical Records in Inpatient Care at Mandor Health Center, West Kalimantan

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## ABSTRACT

Community Health Centers (Puskesmas) function as the main provider of public health services while encouraging community participation. As an institution that handles a large amount of data, Puskesmas requires an accurate and efficient data management system to support structured reporting. The purpose of this study was to analyze strategies in overcoming obstacles in the implementation of medical records in inpatient services at the Mandor Puskesmas. This study was conducted at the Mandor Puskesmas, located in Landak Regency, West Kalimantan Province. This study used a qualitative approach with an instrumental case study method. In this study, the researcher involved five main subjects who had important roles in the implementation of Electronic Medical Records in the inpatient unit of the Mandor Puskesmas. The data analysis process consisted of several stages, namely data reduction, data presentation, and drawing conclusions. Based on the results of the study, there were several factors that hindered the implementation of Electronic Medical Records (EMR) in Inpatient Services at the Mandor Puskesmas, West Kalimantan. These factors include *Man; Machine; Method; Material*; as well as *Money*. Some of the proposed strategies are the addition of medical and IT personnel who have competence in the field of RMIK and health information technology, routine training for medical personnel, improving the quality of internet networks and server maintenance, procuring new computers that meet specifications, and preparing clear and detailed SOPs regarding the implementation of RME.

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## 1. INTRODUCTION

Community Health Centers (Puskesmas) serve as the primary provider of public health services while encouraging community participation. In addition to providing integrated and comprehensive health services in designated areas, Puskesmas also run essential public health programs. They are responsible for maintaining the health of the community in their service area while ensuring the quality of individual health services is maintained. (Dinata, 2018).

In accordance with the Regulation of the Minister of Health of the Republic of Indonesia No. 43 of 2019, a community health center is a health service facility that provides public health services and first-level individual health services with an emphasis on promotive and preventive efforts. Community health centers were established to provide comprehensive health services to all residents in their working areas. The programs and initiatives run by the Community Health Center

are fundamental programs that must be implemented by the government to improve community welfare (Ministry of Health of the Republic of Indonesia, 2019).

As an institution that handles a large amount of data, the Health Center requires an accurate and efficient data management system to support structured reporting. Management Information System (MIS) is an important tool in supporting effective and efficient health services, especially in patient data management, administration, and fast and accurate data-based clinical decision making. (Harikatang et al., 2024; Sofia et al., 2024). The patient's personal information and medical history are stored in documents known as medical records. (Handiwidjojo, 2009; Rusdiana et al., 2024).

Medical records contain important patient data, including identity, examinations, medical actions, and other health services received at health facilities. Good medical record management is essential to improve the quality of health services, ensure legal certainty in medical documentation, maintain the confidentiality and security of patient data, and support the transition to an integrated digital system (Ministry of Health of the Republic of Indonesia, 2022). The importance of medical records emphasizes the need for careful data storage and protection. (Pribadi et al., 2018; Sholkhan, 2024).

Technological advances now allow for electronic document storage and management. Information technology has changed the landscape across all fields, creating challenges such as technology adaptation and dynamic needs. (Rubini et al., 2024). The implementation of electronic medical records (EMR) is a global trend that allows health workers to record patient conditions and medical history digitally through an information system. EMR increases efficiency by allowing faster and more practical access to patient data. (Yoga et al., 2021).

In Indonesia, EMR is increasingly being adopted as part of the health information system. The implementation of EMR contributes to improving the overall quality of health services and plays an important role in patient safety. In addition, EMR improves the accuracy, integrity, and accessibility of data, as well as improving the quality of services at Puskesmas. (Pribadi et al., 2018).

Research conducted by the Center for Indonesia's Strategic Development Initiatives (CISDI) found that of the 9,831 Community Health Centers in Indonesia, 4,807 had not implemented RME. (Babo et al., 2023). Based on data from the Samarinda City Health Office, 26 Community Health Centers in Samarinda are ready to implement RME. However, in East Kalimantan, which consists of seven districts and three cities, there has been no survey conducted to determine the number of Community Health Centers that have adopted RME. (Risnawati et al., 2024).

The Ministry of Health requires all health service facilities to use electronic medical records integrated with SATUSEHAT no later than December 31, 2023, in accordance with the provisions stipulated in Law Number 24 of 2022. The Minister of Health issued a circular letter NUMBER HK.02.01/MENKES/1030/2023 which confirms the imposition of administrative sanctions on health facilities that do not implement electronic medical records. These sanctions can include written warnings to revocation of permits.

With the issuance of the Minister of Health Regulation No. 24 of 2022, all health service facilities, including Community Health Centers, are required to implement electronic medical records. The Ministry of Health has set a deadline of December 31, 2023 for all health facilities to switch from a manual medical record system to a digital system (Ministry of Health of the Republic of Indonesia, 2022).

Previous studies have shown that many health facilities are still not fully ready to implement RME. Several aspects such as managerial capacity, financial and budget support, operational readiness, technological infrastructure, and organizational structure still need to be improved. (Yoga et al., 2021). Research at the Susoh Health Center, Southwest Aceh District, shows that adequate information technology infrastructure increases the chances of readiness for implementing RME up to 20 times. (Fitriyandina et al., 2024). However, other studies have shown that the implementation of RME is generally going well. However, there are still some challenges, such as the absence of a standard operating procedure (SOP) for RME in Puskesmas and the need for additional training to improve the competence of medical records personnel. (Risnawati & Purwaningsih, 2024; Yulis et al., 2021).

Medical record services at the Mandor Health Center have not fully used electronic medical records, there are still several service units that still use traditional or manual medical records, one of the service units that still uses manual medical records is inpatient services.

Based on observations and preliminary surveys conducted by researchers in September 2024, in health services at the Mandor Health Center, especially in inpatient services, which still use Conventional Medical Records, which are a writing/note/documentation that chronologically and systematically describes and explains a person's medical history. The fact that electronic medical records have not been used in inpatient services at the Mandor Health Center is apparently influenced by several inhibiting factors so that the use of electronic medical records required by Law Number 24 of 2022 cannot be implemented.

Mandor Health Center currently still uses a manual recording system, which can be seen from the use of physical folders and filing cabinets in storing medical records. Initial studies through interviews with medical record officers showed that Mandor Health Center is in the process of switching to an EMR system in accordance with the Minister of Health Regulation No. 24 of 2022. However, the transition from conventional to digital medical records is still ongoing, and the level of readiness for implementation cannot be ascertained. Interviews with medical record officers showed that Mandor Health Center is in the process of transitioning to an EMR system in accordance with the regulation. Given the various challenges that exist, this study aims to assess the readiness of Mandor Health Center in adopting EMR. The success of implementation is highly dependent on thorough preparation to ensure smooth operations and prevent potential obstacles in the future.(Pratama & Darnoto, 2017).

Research at the Samigaluh I Health Center shows that the readiness of health facilities to switch from paper-based medical records to EMR is influenced by technological infrastructure and human resource readiness.(Widayanti et al., 2023). In addition, research at Baki Health Center emphasized the importance of readiness analysis before implementing RME to replace manual medical records.(Wati et al., 2024). Evaluation of the readiness of health professionals in adopting RME also showed that adequate preparation and training are needed to ensure successful implementation.(Wahyuni & Oktavia, 2024).

Research shows that the implementation of RME in Indonesia still faces various challenges, including limited human resources who have the ability to operate the RME system, lack of technological infrastructure readiness, and inadequate financial support. These factors affect the readiness and success of Puskesmas in adopting RME.(Siswati et al., 2024). In addition, other studies have shown that the implementation of RME generally runs well. However, there are still several challenges, such as the absence of a standard operating procedure (SOP) for RME in Puskesmas and the need for additional training to improve the competence of medical records personnel.(Muchlis, 2024).

By understanding the factors that hinder the implementation of electronic medical records at the Mandor Health Center, it is hoped that this study can provide appropriate recommendations to support the acceleration of digitalization of health services. This study also aims to identify the main challenges and formulate strategies that can be applied to improve the readiness and effectiveness of the implementation of electronic medical records in first-level health care facilities. From the results of the description above, the researcher is interested in analyzing the inhibiting factors for the non-implementation of electronic medical records in the Inpatient Services of the Mandor Health Center.

## **2. RESEARCH METHODS**

This study uses a qualitative approach with an instrumental case study method to explore strategies in overcoming barriers to the implementation of Electronic Medical Records (EMR) in inpatient services at the Mandor Health Center, West Kalimantan. This approach was chosen because it allows for in-depth exploration of complex, contextual, and unique phenomena, and is suitable for uncovering experiences, perceptions, and strategies used in the context of implementing health digitalization policies. The instrumental case study method is used to understand one case in detail in order to gain an understanding that can be used in a broader context. By focusing on the implementation of EMR as the main phenomenon, this study seeks to explore various inhibiting

factors and strategies for resolving them by referring to the 5M model (Man, Machine, Method, Material, Money).

The study was conducted at the Mandor Health Center located in Landak Regency, West Kalimantan. This location was chosen because it is in a transition period from a manual medical record system to an electronic system, as mandated by the Regulation of the Minister of Health of the Republic of Indonesia No. 24 of 2022. The research was conducted in December 2024. During this period, researchers conducted a series of field activities including interviews, direct observation of the inpatient service process, and documentation of policies and infrastructure related to EMR. The selection of the research time also took into account the readiness of the Health Center in providing data and the availability of key informants.

The research subjects were selected using purposive sampling technique, namely by selecting informants who were considered to have relevant experience and understanding of the implementation of RME in inpatient units. There were five main informants in this study, namely the Head of the Medical Records Unit, the Health Center Information System Staff, a General Practitioner, a Nurse, and IT Staff. These five informants have direct responsibility in the implementation, management, and technical support of RME, so that their perspectives reflect the entire process from administrative, clinical, to technical aspects. This technique allows researchers to obtain in-depth and contextual data based on the real experiences of implementers in the field.

Data collection techniques in this study include in-depth interviews, participant observation, and documentation studies. Interviews were conducted with semi-structured guidelines that were adjusted to the position and role of each informant. Observations were conducted to directly observe service activities and the use of RME, including user interaction with the system, as well as the available supporting infrastructure. Meanwhile, documentation studies include analysis of documents such as internal policies, standard operating procedures (SOPs), budget plans, and visual documentation and other technical reports. The data obtained from these three techniques complement each other and provide a comprehensive picture of the actual conditions of RME implementation at the Mandor Health Center.

To ensure the validity and credibility of the data, this study used triangulation techniques of sources and methods. Data from interviews were verified with observation results and written documents to avoid bias or incorrect interpretation. In addition, the validation process was carried out by re-checking the information obtained from informants, as well as clarifying things that were considered unclear or ambiguous. The data analysis process followed the stages of Miles and Huberman, namely data reduction (selecting and simplifying important information), presenting data in narrative form, and drawing conclusions and verification to obtain valid and meaningful findings. The analysis was carried out thematically to group inhibiting factors and formulate strategies based on empirical data.

The entire research process was conducted by upholding the principles of research ethics. The researcher ensured that each informant was given a complete explanation of the objectives, benefits, and procedures of the research, and obtained written consent through an informed consent form. Participation in the research was voluntary, without pressure or coercion, and the informant's identity was kept confidential to protect privacy. Ethical principles such as respect for persons, beneficence, and justice were used as the main reference in the implementation of this research, so that all activities were carried out with full responsibility and integrity. This research is expected to provide a real contribution to the development of a better RME implementation strategy in primary health care facilities in Indonesia.

### **3. RESULTS AND DISCUSSION**

This study reveals five main factors that hinder the implementation of Electronic Medical Records (EMR) in inpatient services at Mandor Health Center, which are studied using the fishbone approach (5M): Man (human resources), Machine (equipment and technology), Method (standard operating procedures), Material (supporting documents), and Money (budget). Each factor plays an important role in determining the success or failure of the transition from a manual system to an electronic system. Based on in-depth interviews, field observations, and documentation studies, these

obstacles are clearly identified and can be grouped according to the main themes that influence the digitalization process of the medical record system.

### **Human Resources Factor (Man)**

One of the most prominent obstacles was found in the human resources aspect. Some health workers, especially those over 40 years old, had difficulty adapting to the digital system. They tended to be more accustomed to manual recording and showed limitations in the use of computers. In addition, the number of Information Technology (IT) officers at the Health Center was still very limited and there were no special personnel who handled RME fully. This condition resulted in a slow response to technical obstacles that arose. These results are in line with research by Magfiroh et al. (2023), which stated that the perception, ability, and willingness of health workers towards technology greatly influenced the success of RME implementation.

### **Technology and Equipment Factors (Machine)**

The next obstacle lies in the inadequate infrastructure and technological devices. The computers used are more than five years old and do not support the required RME system specifications. In addition, unstable internet connections often stop the electronic recording process, so officers return to using manual methods. These technical disruptions cause services to be slow and inefficient. These results reinforce the findings of Pohan et al. (2022), which states that hardware and network quality are key factors in the success of a health information system.

### **Procedure and Method Factors**

The absence of a specific Standard Operating Procedure (SOP) related to the implementation of RME is another significant obstacle. Although the Mandor Health Center has a Decree for the Implementation of RME and an SOP for handling system disruptions (downtime), there is no written guide that regulates the flow of RME implementation from start to finish. This causes confusion among officers in running the system and reduces efficiency. As stated by Putri et al. (2023), clear SOPs are needed so that the system runs consistently and minimizes procedural errors.

### **Document and Supporting Material Factors**

Problems were also found in the document aspect, where not all service forms are available in digital format. Several important forms such as informed consent and general consent still have to be printed and signed manually because there has been no implementation of electronic signatures (TTE). This slows down the documentation process and makes the data not fully digitized. In fact, according to WHO (2021), the success of EMR is highly dependent on full digitization and interoperability of documents between service units.

### **Budget and Funding Factors (Money)**

The last factor that hampers implementation is budget constraints. Although the Health Center has submitted funds for system development, there has been no special budget allocation from the local government to support the procurement of devices, training, and maintenance of the RME system. As a result, improvement efforts are slow and depend on the availability of the general budget. This finding is in line with the study by Ali & Arifin (2018), which states that digital transformation in the health system requires planned and sustainable financial support.

Budget constraints at the Mandor Health Center are a major challenge in supporting the sustainability of RME implementation. Based on the interview results, it was found that there was no special budget allocated for RME development from either the central or regional government. Efforts to procure hardware, train health workers, and maintain the system were carried out by utilizing general operational funds which were limited and not specific for digitalization activities. As a result, many plans to strengthen the health information system were delayed or did not run optimally.

This condition shows that the implementation of RME requires not only technical readiness, but also mature financial planning and policy support from local governments. Without a long-term funding commitment, digital transformation will be slow and inconsistent. As stated by Muchlis (2024), the success of the health service digitalization program in primary facilities is highly

dependent on adequate budget support to ensure system continuity, technology updates, and continuous improvement of human resource capacity.

In this context, it is important for the management of the Mandor Health Center to advocate to the Health Office and related stakeholders to integrate digitalization needs into regional budget planning. It is also necessary to prepare procurement proposals based on real needs and priority-based financing mapping. Partnership strategies with external institutions, such as universities, NGOs, or the private sector engaged in health technology, can also be an alternative medium-term solution.

Thus, the solution to budget constraints depends not only on the availability of funds, but also on managerial skills in managing resources, building cross-sector collaboration, and integrating digitalization programs into the regional health planning system. Changing the mindset from simply waiting for assistance to being proactive in ensuring the sustainability of digital programs is the main key to the success of the overall implementation of RME.

#### 4. CONCLUSION

This study aims to identify barriers and formulate strategies to overcome obstacles in the implementation of Electronic Medical Records (EMR) in inpatient services at the Mandor Health Center, West Kalimantan. As stated in the Introduction Chapter, the success of digitalization of the primary health care system is highly dependent on the readiness of resources, infrastructure, procedures, and policy support. Through a qualitative approach with an instrumental case study, the results of this study indicate that barriers to EMR implementation can be categorized into five main factors based on the fishbone model, namely Man (HR), Machine (technology devices), Method (SOP), Material (documents), and Money (budget). These five factors are interrelated and contribute directly to the low effectiveness of RME implementation at the Mandor Health Center. The biggest obstacles come from limited human resource capabilities in using technology, outdated hardware, the absence of a special SOP for RME implementation, incomplete digital documents, and minimal special and sustainable budget support. However, this study also succeeded in proposing various concrete strategies to overcome these obstacles, including adding RMIK and IT personnel, conducting periodic training, improving network and hardware quality, compiling SOPs for RME implementation, and advocating for a budget based on digitalization needs. The relationship between the research objectives and the discussion results shows a strong match between the formulation of the problem, objectives, and field findings. Thus, this study has succeeded in answering the main question regarding managerial strategies that can be used to overcome obstacles to the implementation of RME practically and applicatively. These findings provide an important contribution to the development of health information systems in first-level service facilities, especially in encouraging the acceleration of digital transformation that is more efficient, structured, and oriented towards improving the quality of health services. The prospect of developing the results of this study can be directed at the preparation of an RME implementation model based on facility readiness and risk management at the Puskesmas level. In addition, the results of this study can be a reference for further studies to evaluate the effectiveness of the strategies that have been implemented, as well as to examine their impact on service quality, patient satisfaction, and administrative efficiency. The application of the research results is also very possible to be replicated in other Puskesmas with similar characteristics, so that it can become a national RME implementation model that is adaptive and sustainable.

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