

Review of Electronic Medical Record Usage and Its Impact on Outpatient Service Effectiveness at Kadatua Community Health Center

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A B S T R A C T

The development of information technology in healthcare has accelerated digital transformation through the implementation of Electronic Medical Record (EMR) to improve the effectiveness of healthcare services, particularly outpatient care. However, implementing EMRs in primary healthcare centers still faces challenges, including limited infrastructure, unstable internet connectivity, and inadequate human resource readiness. This study **aimed** to examine the use of Electronic Medical Records in improving the effectiveness of outpatient services at Kadatua Community Health Center based on four aspects: tasks and functions, plans and programs, regulations and policies, and goals and ideal conditions. This study employed a descriptive qualitative **method** with a case study design. Data were collected through interviews, observations, and document reviews. The research was conducted at Kadatua Community Health Center, South Buton Regency, from March to May 2026. The **findings** showed that EMR effectively supported patient registration, patient data recording, retrieval of medical histories, and preparation of healthcare service reports. Their implementation was supported through collaboration with the system vendor by providing technical guidance on the use of the E-Puskesmas application. However, the health center had not established a specific Standard Operating Procedure for EMR implementation. EMR also improved the efficiency and effectiveness of outpatient services. Nevertheless, implementation has not been fully optimized because of unstable internet connectivity, limited computer facilities, and occasional power outages, requiring some services to return to manual procedures. **In conclusion**, EMR at Kadatua Community Health Center effectively supported outpatient services. However, improvements in infrastructure, network stability, and human resource capacity remain necessary to achieve optimal implementation.

PENDAHULUAN

The Community Health Center is a primary healthcare facility that plays a strategic role in delivering both public health and individual health services. According to the Ministry of Health of the Republic of Indonesia specifically under Minister of Health Regulation Number 19 of 2024 concerning Community Health Centers is defined as a healthcare facility that provides primary-level public and individual health services, prioritizing promotive and preventive measures to achieve the highest possible level of public health within its service area. This regulation underscores that the Puskesmas functions not merely as a treatment center but also as a frontline entity in enhancing the quality of healthcare services ensuring they are effective, efficient, and sustainable (Permenkes No. 19, 2024)

Advancements in information technology have driven a digital transformation in healthcare, notably through the implementation of Electronic Medical Records (EMR). According to the Minister of Health Regulation No. 24 of 2022 concerning Medical Records, an EMR is a medical record system that utilizes electronic platforms to support the digital recording, storage, management, and utilization of patient data; this is expected to enhance the quality, speed, accuracy, and continuity of healthcare services. EMR implementation also offers operational benefits, such as streamlining administrative processes, improving data accuracy, reducing paper usage, and boosting the work efficiency of healthcare professionals (Permenkes No. 24, 2022). The availability of accurate medical record data or information is a crucial factor in determining the quality of healthcare services. In the context of primary healthcare, Community Health Centers as first-level healthcare facilities are required to deliver effective, efficient, high-quality, and continuous services, in accordance with the Minister of Health Regulation No. 19 of 2024 concerning Community Health Centers.

The use of electronic medical records holds great potential for enhancing the effectiveness of outpatient services, as the processes of recording and retrieving patient data can be performed more quickly and accurately than with manual systems. Furthermore, robust data integrity enables healthcare professionals to make clinical decisions more rapidly, thereby improving service quality, reducing patient wait times, and minimizing documentation errors.

Although Electronic Medical Records (EMR) offer various benefits in healthcare services, their implementation across many healthcare facilities remains suboptimal due to limitations regarding infrastructure, internet connectivity, technological equipment, and human resource readiness. These constraints result in EMRs being used alongside manual medical records, preventing the full realization of the benefits of digitalization (Mandasari, 2024).

A preliminary study conducted on February 2, 2026, at the Kadatua Community Health Center revealed that the Electronic Medical Record (EMR) system has been in use since August 2024, approximately 60% of services have adopted the EMR, while the remaining 40% still rely on manual medical records. Although the implementation of the EMR facilitates faster patient registration, documentation, and data retrieval and reduces the consumption of paper and writing supplies it faces challenges such as unstable internet connectivity, power outages, and a shortage of computers and laptops, all of which could potentially hinder patient registration, documentation, and data entry processes.

Several previous studies indicate that the implementation of Electronic Medical Records (RME) contributes to enhancing service effectiveness, despite the various obstacles encountered during the process. Research by Agustina and Mahmudin (2024), demonstrates that RME implementation at the Sumur Bandung Community Health Center has been effective when evaluated against aspects such as tasks or functions, plans or programs, regulations and rules, and goals or ideal conditions, although challenges regarding infrastructure and human resources persist. Similarly, a study by Mandasari (2024), shows that RME usage supports the effectiveness of outpatient services at the Siulak Mukai Community Health Center however, instances of incomplete data entry remain, driven by network disruptions, the heavy workload of healthcare workers, and a lack of accountability in the RME documentation process. Furthermore, Latipah *et al.* (2021), explain that the effectiveness of RME in outpatient services can be assessed through four dimensions: tasks or functions, plans or programs, regulations and rules, and goals or ideal conditions. Based on these studies, there remains a need to examine the effectiveness of RME usage in light of the specific conditions and characteristics of individual healthcare facilities particularly the Kadatua Community Health Center, which faces infrastructure limitations and is located in an archipelagic region.

Based on the foregoing, this study was conducted to examine the use of Electronic Medical Records (RME) in relation to the effectiveness of outpatient services at the Kadatua Community Health Center (Puskesmas). The assessment covers four aspects tasks or functions, plans or programs, regulations or rules, and objectives or ideal conditions while taking into account the current hybrid implementation of RME, which utilizes both electronic and manual systems. This study is significant because the effectiveness of RME depends not only on system availability but also on the system's capacity to support service delivery, its alignment with established plans and programs, compliance with applicable regulations, and the achievement of desired service outcomes. Fundamentally, the implementation of RME aims to enhance service quality, ensure data security and availability, and support the management of digitally integrated medical records (Permenkes No. 24, 2022). Therefore, this study aims to evaluate the effectiveness of RME usage in outpatient services at Puskesmas Kadatua based on these four aspects, with the expectation that the findings will serve as a basis for evaluation and provide recommendations to the health center for optimizing RME implementation and improving the effectiveness of outpatient services.

METHOD

This study employs a qualitative descriptive method with a case study design to gain an in-depth understanding of how the use of Electronic Medical Records (EMR) affects the effectiveness of outpatient services at the Kadatua Community Health Center. The study utilizes qualitative data obtained through interviews, observations, and document analysis. The research was conducted at the Kadatua Community Health Center, South Buton Regency, between March and May 2026. The research focuses on the effectiveness of EMR implementation. The study involved eight informants: a medical records unit head, a medical records officer, a nurse, an outpatient registration officer, a general clinic officer, a dental clinic officer, an MCH (Maternal and Child Health) clinic officer, and

an IT officer. Informants were selected qualitatively based on information adequacy until data saturation was reached. The object of the study is the impact of EMR usage on the effectiveness of outpatient services

Data were collected through interviews, direct observation, and document analysis, utilizing interview guides, observation sheets, voice recorders, writing instruments, and cameras. Data validity was verified through source and technique triangulation by comparing information across informants and cross-referencing findings from interviews, observations, and documentation. Analysis was conducted using a descriptive qualitative approach involving data reduction, data presentation in narrative form, and conclusion drawing and verification.

Data validity was verified through source triangulation and technique triangulation. Source triangulation involved comparing information from various informants and confirming details with the head of the medical records unit, while technique triangulation entailed comparing data obtained through interviews, observations, and document analysis. Data analysis was conducted using a descriptive qualitative approach comprising three stages: data reduction, data presentation, and conclusion drawing. Data gathered from interviews, observations, and documentation were sorted according to the research focus, presented as narrative descriptions, tables, or matrices, and subsequently interpreted to draw conclusions regarding the use of Electronic Medical Records (EMR) and the effectiveness of outpatient services at the Kadatua Community Health Center.

RESULTS & DISCUSSION

The research results indicate that the use of Electronic Medical Records (EMR) via the E-Puskesmas application at the Kadatua Community Health Center has been implemented since 2024 and has enhanced the effectiveness of outpatient services. The findings were analyzed based on four aspects of effectiveness: tasks/functions, plans/programs, regulations/rules, and goals/ideal conditions.

Task/Function Aspect

The implementation of the Electronic Medical Record (EMR) system assists staff in handling registration, documentation, patient history retrieval, and the compilation of service reports. Electronically stored patient data can be accessed more quickly, eliminating the need for manual file searches. This demonstrates that the use of the EMR system supports staff in performing their duties and enhances work efficiency. These findings align with Latipah *et al.* (2021), who state that organizational effectiveness is reflected in the ability to execute tasks and functions in accordance with established goals.

In line with this, a study by Diastri and Kurniawan (2025), examined the implementation of Electronic Medical Records (EMR) in outpatient services. The results indicated that the use of EMR facilitated staff workflows by allowing patient data to be accessed via the system and making the documentation process more practical. These conditions supported smooth service delivery and demonstrated that electronic systems can help improve operational efficiency. These findings align with research conducted at the Kadatua Community Health Center, where EMR enabled staff to easily access patient histories, maintain records, and carry out service procedures. Meanwhile, a study by Mandasari (2024), showed that EMR implementation benefited the service process, particularly by making it easier for staff to access and manage patient data and by accelerating task execution. These results demonstrate that electronic systems offer greater ease in information management compared to manual record-keeping. This finding is consistent with the situation at the Kadatua Community Health Center, as EMR helps staff locate patient data and history more quickly, thereby increasing the efficiency of service delivery.

However, the use of Electronic Medical Records (EMR) at the Kadatua Community Health Center remains suboptimal due to a hybrid implementation approach that combines EMR with manual medical records. This situation is driven by several challenges, such as unstable internet connections, power outages, a limited supply of computers or laptops, and the lack of adequate Wi-Fi facilities. Furthermore, some staff members still use personal mobile phones to access the EMR system. Operating both systems simultaneously results in duplicate record-keeping, thereby increasing the staff's workload and diminishing the efficiency gains expected from using EMR.

These results align with research by Handayani (2019), which indicates that the use of E-Puskesmas has not yet fully succeeded in replacing manual medical records. Electronic systems are still utilized alongside manual record-keeping due to limitations in the supporting facilities required for service delivery. This demonstrates that the availability of adequate facilities and infrastructure is a

crucial factor in supporting the optimal implementation of electronic systems. Similar findings were reported by Agustina and Mahmudin (2024), who noted that the implementation of Electronic Medical Records (RME) still faces obstacles specifically, limited facilities and supporting resources preventing the system from being fully utilized to support healthcare services. Thus, prior research reinforces the findings at Puskesmas Kadatua, confirming that adequate infrastructure, facilities, and resources are essential to optimize RME usage and reduce reliance on manual medical record-keeping.

Plan/Program Aspect

Regarding the planning and programming aspect, the implementation of the Electronic Medical Record (RME) system at the Kadatua Community Health Center (Puskesmas) was carried out through collaboration between the Health Office and the E-Puskesmas vendor. Prior to the system's implementation, staff received technical guidance and orientation on using the RME and were issued accounts tailored to their respective duties and authority. The RME system has been implemented across all stages, from patient registration to the documentation of services provided in the clinics. These conditions indicate that the planning and execution of the RME program have proceeded effectively. According to Latipah *et al.* (2021), a program is considered effective if the formulated plan is executed in alignment with established objectives. Furthermore, the implementation of RME systems is a mandatory requirement for healthcare facilities, as stipulated in the Minister of Health Regulation No. 24 of 2022 concerning Medical Records.

However, the implementation of the Electronic Medical Record (RME) program at the Kadatua Community Health Center is not yet fully optimal, as it remains constrained by limitations regarding internet connectivity, electricity, and supporting infrastructure. These conditions prevent the electronic system from operating smoothly at all times; consequently, manual medical records are still maintained to support service delivery.

These findings align with research Khasanah and Budiyantri (2023), indicating that while E-Puskesmas has been utilized as part of the implementation of health information systems, its execution has not yet been fully optimal. The study results demonstrate that readiness for Electronic Medical Record (EMR) implementation requires support across various aspects to ensure the system can be utilized to its full potential in service delivery. This situation reinforces findings from the Kadatua Community Health Center, where the use of the electronic system remains suboptimal due to ongoing implementation challenges. At Community Health Center Kadatua, these challenges are evident in the continued use of a hybrid EMR approach, as well as limitations regarding internet connectivity, electricity, and supporting infrastructure. Consequently, the presence of an electronic system must be accompanied by adequate readiness and support to ensure optimal EMR implementation.

These results are also supported by research Alfian and Basra (2020), which indicates that the implementation of E-Puskesmas is influenced by several components, including system performance, human resources, facilities and infrastructure, as well as monitoring and evaluation activities. The study shows that limitations in these supporting components can hinder the optimization of the system's use in service delivery. Thus, findings from previous research reinforce the results of the study at Community Health Center, demonstrating that the successful implementation of the Electronic Medical Record (RME) system depends not only on the availability of the application itself but also requires support regarding network connectivity, electricity, facilities and infrastructure, human resources, and continuous monitoring and evaluation.

Regulatory/Procedural Aspect

The regulatory aspects regarding the implementation of the Electronic Medical Record (RME) system at the Kadatua Community Health Center are not yet fully optimal, as there is no specific Standard Operating Procedure (SOP) governing its use. In practice, staff still rely on the SOP for manual medical records as a service guideline. A Standard Operating Procedure (SOP) is a guideline containing standard operational procedures used by an organization to ensure that every choice made, action taken, and processing facility utilized by individuals within the organization is carried out efficiently, reliably, in accordance with standards, and systematically (Wahyuni and Budiati, 2021).

This situation indicates that the absence of specific guidelines means the use of Electronic Medical Records (EMR) lacks operational standards specifically governing the processes of utilization, management, and electronic data security. These findings align with Wikansari *et al.* (2024), who identified the lack of Standard Operating Procedures (SOPs) and an implementation

roadmap as organizational obstacles to EMR readiness. That study demonstrated that, in addition to issues regarding SOPs and roadmaps, implementation readiness is also influenced by limitations in human resources, funding, and infrastructure such as hardware and internet access speeds. These results highlight that the availability of guidelines and organizational support is crucial for preparing for EMR implementation, ensuring it is carried out in a structured and optimal manner.

Although specific Standard Operating Procedures (SOPs) for patient data security and confidentiality regarding the use of Electronic Medical Records (EMR) have not yet been established, implementation has been quite effective. Each staff member is assigned a username, password, and access rights tailored to their specific duties and authority. Passwords are also updated periodically to safeguard patient data. No breaches of patient data security or confidentiality were observed during the study, although minor technical errors occurred during data entry. This implementation aligns with Minister of Health Regulation No. 24 of 2022, which mandates that EMR systems ensure the security, confidentiality, integrity, availability, and accountability of patient data. These findings are consistent with the study by Pramesti *et al.* (2024), whose systematic review emphasizes that medical data security and confidentiality are critical aspects of EMR implementation. Their study highlights the confidential nature of patient medical data, necessitating data protection measures to mitigate the risk of information leaks when using electronic systems. Thus, the implementation of access controls comprising usernames, passwords, and specific access rights at the Kadatua Community Health Center has supported efforts to maintain patient data security and confidentiality, even though specific guidelines governing EMR security at an operational level are still required.

Thus, the regulatory and procedural aspects of implementing the Electronic Medical Record (RME) system at the Kadatua Community Health Center cannot yet be considered fully effective. This is primarily due to the absence of a specific Standard Operating Procedure (SOP) for the RME, even though data security and confidentiality mechanisms such as account management, passwords, and access rights have been implemented quite effectively. Therefore, the development of a specific RME SOP is necessary to ensure that the usage, management, security, and protection of patient data are guided by clear and consistent protocols for all staff members.

Goal/Ideal Condition Aspect

The Electronic Medical Record (EMR) system has positively impacted the effectiveness of outpatient services, particularly regarding registration speed, patient data retrieval, record completeness, and access to service history. The use of Mobile JKN also supports the registration process, enabling patients to reduce waiting times. These findings indicate that the operational benefits of the EMR system are beginning to be realized at the levels of service delivery and data management. This aligns with the findings of Dewi Nashrulloh (2024), which state that the implementation of electronic health information systems can enhance service efficiency, accelerate patient administrative processes, and support improvements in the quality of healthcare services. These results mirror the situation at Puskesmas Kadatua, where the use of the EMR system helps expedite patient registration, facilitates the retrieval of medical record data, and improves the quality of service data management, thereby making outpatient service delivery more effective.

Although the implementation of the Electronic Medical Record (EMR) system has benefited service delivery, the ideal state at the Kadatua Community Health Center has not yet been fully realized, as the EMR is still being used alongside manual medical records. This situation is influenced by several constraints, including unstable internet connectivity, a shortage of computers and laptops, power outages, a lack of adequate Wi-Fi facilities, and the need for integration with the BPJS web service. These obstacles have prevented the full and continuous utilization of the EMR system across the entire outpatient service process. Consequently, the study findings indicate that the mere existence of an EMR system does not automatically result in optimal service effectiveness; successful implementation also depends on infrastructure readiness, the availability of supporting facilities, operational policies, and organizational support.

These findings align with Latipah *et al.* (2021), who discussed the effectiveness of implementing information systems in supporting work execution and the achievement of organizational goals. That study explained that effectiveness is determined not merely by the existence of a system or program, but also by the system's capacity to support task execution and the attainment of established objectives. The research results indicate that achieving effectiveness is linked to the performance of tasks and functions, the execution of plans or programs, compliance with applicable regulations, and the realization of expected goals or conditions. These results are relevant to the

situation at Puskesmas Kadatua; while the Electronic Medical Record (RME) system has aided staff in performing their duties and accelerated certain service processes, its effectiveness has not been maximized due to the persistence of manual record-keeping and limited supporting facilities. Therefore, optimizing the RME system requires not only the use of electronic technology but also adequate infrastructure, policies, and organizational support to ensure the implementation goals are fully realized.

Thus, research indicates that the Electronic Medical Record (RME) system has been reasonably effective in supporting outpatient services at the Kadatua Community Health Center, though its performance is not yet optimal. The RME facilitates task execution, accelerates access to patient information, aids in reporting, supports faster service delivery, and enhances patient satisfaction. Key obstacles include the use of a hybrid system; limitations regarding infrastructure, network connectivity, and electricity supply; and the absence of specific Standard Operating Procedures (SOPs) for the RME. Therefore, optimizing the RME requires strengthening network and electrical infrastructure, providing computer hardware, developing integration with BPJS services, and formulating RME-specific SOPs to ensure implementation is effective, standardized, secure, and compliant with applicable regulations.

CONCLUSION

Based on the research findings regarding the use of Electronic Medical Records (EMR) to support the effectiveness of outpatient services at the Kadatua Community Health Center, it can be concluded that the implementation of EMR has been sufficiently effective in supporting outpatient service delivery. This conclusion is drawn from an assessment of tasks and functions, plans and programs, regulations and rules, as well as objectives and ideal conditions. Regarding tasks and functions, EMR facilitates staff in registration, data recording, patient history retrieval, and the compilation of service reports. In terms of plans and programs, the implementation of EMR has received support from the Health Office and the vendor through technical guidance and the utilization of the E-Puskesmas application. Regarding regulations and rules, patient data security has been implemented through the assignment of usernames and passwords based on individual staff access rights, although the Kadatua Community Health Center does not yet have a specific Standard Operating Procedure (SOP) governing EMR usage. Finally, concerning objectives and ideal conditions, the use of EMR has contributed to improved service efficiency, such as by accelerating the registration process and facilitating the retrieval of patient data.

However, its implementation is not yet fully optimal, as Community Health Center Kadatua still employs a hybrid system using the Electronic Medical Record (EMR) alongside manual medical records. This situation is influenced by unstable internet connectivity, power outages, and limited supporting facilities such as computers, laptops, and Wi-Fi. Therefore, although the EMR has supported the effectiveness of outpatient services, improvements to infrastructure, the development of specific Standard Operating Procedures (SOPs), and the optimization of the electronic system are required to maximize the EMR's implementation.

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