



The Impact of Implementing Electronic Medical Records (EMR) on Outpatient Services at Toto Kabila Regional General Hospital, Bone Bolango Regency, Gorontalo Province

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Article Info

Article history:

Received 26 May, 2026

Revised 08 July, 2026

Accepted 25 July, 2026

Keywords:

Electronic Medical Records;
EMR Implementation;
Outpatient Services; Service
Efficiency; Data Quality

ABSTRACT

The implementation of Electronic Medical Records (EMR) represents an important component of digital transformation in healthcare, particularly in outpatient services that require rapid, accurate, and accessible patient information. This study aimed to analyze the impact of EMR implementation on outpatient services at Toto Kabila Regional General Hospital, Bone Bolango Regency, Gorontalo Province. A descriptive qualitative design with a phenomenological approach was employed. Five informants were selected purposively, comprising the head of the medical records unit, a medical records officer, an outpatient registration officer, a nurse, and an information technology staff member. Data were collected through in-depth interviews, observation, and documentation and analyzed through data reduction, data presentation, and conclusion drawing. The findings indicate that EMR implementation improves outpatient service efficiency by accelerating patient registration, patient-data retrieval, and service documentation while reducing dependence on paper records and physical storage. EMR also improves the completeness, accuracy, accessibility, and security of medical record data through electronic storage and user-based access controls. Health workers generally perceive EMR positively because it facilitates their work and access to patient information. Nevertheless, implementation remains constrained by unstable internet connectivity, system errors, limited supporting devices, incomplete integration with BPJS, and the need for continuous improvement of user competencies. The study concludes that EMR has contributed positively to outpatient service quality at Toto Kabila Regional General Hospital, although system optimization, infrastructure strengthening, continuous training, technical support, and periodic evaluation remain necessary.

INTRODUCTION

Information technology has transformed healthcare delivery, including the management and use of patient medical records. Electronic Medical Records (EMR) provide a digital mechanism for recording, storing, retrieving, and managing patient health information and are intended to support more efficient, accurate, integrated, and continuous healthcare services. In Indonesia, the implementation of electronic medical records is supported by Minister of Health Regulation No. 24 of 2022 on Medical Records, which requires healthcare facilities to organize electronic medical records. The document reviewed for this article identifies EMR as an important element of digital transformation aimed at improving service efficiency, medical-record data quality, and patient care quality (Asrin et al., 2024).

Outpatient services require rapid access to accurate information because they involve substantial patient flows and multiple stages of registration, examination, treatment, and documentation. Compared with paper-based records, EMR can reduce the time required to locate patient information, reduce paper use and physical storage needs, and facilitate coordination among healthcare personnel. The source study also reports that EMR can improve the efficiency of registration, patient-data retrieval, and access to medical-record information (Purwanti & Aditya, 2025).

However, EMR implementation does not automatically eliminate operational problems. The study background identifies network disruptions, slow systems, application errors, incomplete integration among service units, and the need for healthcare workers to adapt to new workflows as continuing challenges. At Toto Kabila Regional

General Hospital, the outpatient service had already adopted EMR, but the system was not fully integrated with the BPJS system, requiring staff to access or enter information into different systems in some stages of service. These conditions could reduce the efficiency gained from digitalization.

Previous studies cited in the source document have examined EMR implementation, service quality, waiting time, implementation barriers, and patient safety. Nevertheless, the study argues that a broader examination of outpatient services is still needed, particularly one that brings together service efficiency, medical-record data quality and accuracy, healthcare workers' perceptions, implementation barriers, and responses to those barriers. Accordingly, this study aimed to analyze the impact of EMR implementation on outpatient services at Toto Kabila Regional General Hospital, Bone Bolango Regency.

METHODS

This study used a descriptive qualitative design with a phenomenological approach. The approach was selected to understand the experiences and perceptions of personnel involved in the use of EMR in outpatient services. The study was conducted at Toto Kabila Regional General Hospital, Bone Bolango Regency, Gorontalo Province, during March–June 2026.

Five informants were selected using purposive sampling: the head of the medical records unit, one medical records officer, one outpatient registration officer, one nurse, and one information technology staff member. These informants were considered relevant because they directly interacted with EMR in different stages of outpatient service delivery.

Data were obtained through in-depth interviews, direct observation, and documentation. The interview topics covered the effect of EMR on service efficiency, medical-record data quality and accuracy, healthcare workers' perceptions, implementation barriers, and strategies for handling those barriers. The analysis followed three main stages: data reduction, data presentation, and conclusion drawing. Triangulation of interview, observation, and documentation data was used to strengthen the interpretation of findings.

The study focused on five analytical domains: (1) outpatient service efficiency; (2) quality and accuracy of medical-record data; (3) healthcare workers' perceptions of EMR; (4) barriers to EMR use; and (5) efforts to address implementation barriers.

RESULTS

Impact on Outpatient Service Efficiency

The findings show that EMR implementation improved outpatient service efficiency at Toto Kabila Regional General Hospital. Informants consistently described faster patient registration, faster retrieval of patient information, and easier documentation compared with the previous paper-based process. Medical records could be searched electronically using patient identifiers, reducing the need to locate physical files in storage.

The head of the medical records unit reported that electronic recording and data management accelerated input and access to patient information. The medical records officer similarly explained that staff no longer needed to spend time searching for, arranging, and returning physical files. At the outpatient registration unit, patient identity and previous visit information could be displayed through the system, helping shorten the registration process and reduce queues during busy periods.

The efficiency improvement was particularly visible in administrative processes. The study found that the basic clinical service flow did not change substantially after EMR implementation; rather, the administrative processes became more concise and structured. Therefore, the main contribution of EMR in this setting was the optimization of existing workflows through faster information access and electronic documentation.

The reduction in paper use also produced operational benefits. The source document reports reduced use of paper and printers, reduced physical storage requirements, and easier management of patient records. These findings are consistent with the cited literature describing EMR as a mechanism for streamlining documentation and improving access to patient information (Ayuni et al., 2025; Yanti et al., 2024).

Impact on Data Quality and Accuracy

EMR implementation was also associated with improvements in the completeness and accuracy of medical-record data. Informants reported that patient information was stored electronically in a structured database and could be retrieved when needed. Patient identity, examination information, diagnoses, medical actions, and service history could be documented and accessed through the system.

The electronic format reduced the risk of physical record loss and facilitated correction when errors were identified. Informants also described the use of usernames, passwords, and role-based access to protect patient information. Thus, EMR supported not only data accessibility but also controlled access to confidential medical information.

The findings are consistent with Andriani et al. (2024), who emphasized that EMR data need to be complete, accurate, and timely to support effective and efficient healthcare services. They also support Asih et al. (2024), who reported the potential of EMR to reduce data loss, improve documentation accuracy, and facilitate access to patient information.

Healthcare Workers' Perceptions of EMR

Healthcare workers generally expressed positive perceptions of EMR. Although the transition from paper-based records required an adaptation period, informants reported that the system subsequently became easier to use as they gained experience. Observation also indicated that EMR had become part of routine outpatient activities. Healthcare workers reported that EMR helped them access patient information, perform documentation, and support service delivery. The consistency with which registration personnel, medical-record staff, nurses, and IT personnel used the system indicated that EMR had been accepted as an important working tool. Nevertheless, positive perceptions did not mean that implementation was free of difficulties; users still identified network problems, technical errors, and infrastructure limitations as factors affecting their experience.

Barriers to EMR Implementation

The most frequently identified barrier was unstable internet connectivity. When the connection weakened, the EMR system could become slower, affecting data retrieval and data entry. This was particularly relevant during periods of high patient volume because delays could affect the pace of outpatient services.

Other barriers included system errors, limited supporting devices such as computers or laptops, incomplete integration with BPJS, and the need to improve user competencies. During system maintenance or technical disruptions, some service stages could be delayed. The findings therefore indicate that the benefits of EMR depend not only on the software itself but also on the availability and reliability of supporting infrastructure and user capacity.

Efforts to Address Implementation Barriers

The hospital and healthcare workers used several strategies to maintain service continuity. When network or system problems occurred, staff followed established procedures and continued service activities that could still be performed while waiting for the system to recover. Data entry could then be completed after the connection stabilized.

Coordination among medical-record staff, registration staff, healthcare workers, and IT personnel was another important response. When technical problems could not be resolved directly by users, the IT unit was contacted for troubleshooting and repair. The informants also emphasized the need for periodic training, network-capacity improvement, additional supporting devices, system maintenance, and continuous technical assistance.

These measures indicate that EMR implementation at Toto Kabila Regional General Hospital is an ongoing organizational process rather than a one-time technological intervention. Sustainable implementation requires continued attention to infrastructure, human resources, technical support, and operational procedures.

DISCUSSION

The findings demonstrate that EMR implementation at Toto Kabila Regional General Hospital has produced both beneficial effects and continuing operational challenges. The positive effects are most apparent in administrative efficiency, information accessibility, data management, and coordination among service units. At the same time, the benefits are dependent on stable technological infrastructure and the ability of staff to use the system appropriately.

The improvement in administrative efficiency is consistent with the role of EMR in replacing manual searching and paper-based documentation with electronic retrieval and recording. In this study, the basic outpatient workflow remained largely unchanged, but the activities within that workflow became more efficient. This distinction is important because digitalization does not necessarily redesign a service process; it may initially improve the performance of existing processes.

The findings concerning data quality further indicate that the value of EMR extends beyond speed. Structured electronic storage makes information easier to retrieve, update, and review. Access controls also provide a mechanism for limiting access to authorized personnel. However, the study did not quantitatively measure data accuracy or security performance, so the findings should be understood as qualitative perceptions and observations rather than as numerical estimates of improvement.

The generally positive perception among healthcare workers suggests that practical experience with the system may support acceptance after an initial adaptation period. The source study indicates that staff initially needed time to learn system features and adjust to digital workflows. Continued training is therefore relevant not only for technical competence but also for maintaining consistent data-entry practices.

The barriers identified in the study show that technology implementation is closely connected to organizational readiness. Unstable connectivity, limited devices, system errors, and incomplete integration can reduce the efficiency gains expected from EMR. The incomplete BPJS integration is particularly relevant because staff may need to work across more than one system, creating additional data-entry and verification steps.

Overall, the findings are consistent with the literature cited in the source document. Ayuni et al. (2025) describe efficiency and reduced dependence on paper documentation as benefits of EMR implementation, while Andriani et al. (2024) emphasize the importance of complete, accurate, and timely electronic data. Asih et al. (2024) highlight data security considerations, and Diastri and Kurniawan (2025) report benefits in information access and service

efficiency alongside implementation challenges. The present study adds a site-specific qualitative account that integrates efficiency, data quality, user perception, barriers, and response strategies within outpatient services at Toto Kabila Regional General Hospital.

Limitations

The study was conducted only in the outpatient unit of Toto Kabila Regional General Hospital; therefore, the findings describe the conditions at this site and cannot automatically be generalized to hospitals with different systems, resources, or organizational characteristics. The study also involved a limited number of informants and relied on interviews, observation, and documentation. Consequently, some findings reflect the experiences and perceptions of the selected informants.

The study did not quantitatively examine implementation costs, patient satisfaction, technical system performance, or information-security effectiveness in depth. Future studies may complement these qualitative findings with quantitative measures of waiting time, data completeness, user acceptance, cost, system availability, and patient experience.

CONCLUSION

EMR implementation at Toto Kabila Regional General Hospital has had a positive impact on outpatient services. It has accelerated patient registration, patient-data retrieval, and electronic documentation while reducing dependence on paper records and physical storage. EMR has also improved the completeness, accessibility, and perceived accuracy of medical-record data and has strengthened coordination among service units.

Healthcare workers generally perceive EMR positively because it facilitates access to patient information and supports daily service activities. Nevertheless, implementation continues to face barriers, particularly unstable internet connectivity, system errors, limited supporting devices, incomplete integration with BPJS, and the need for continuing user development.

The study therefore indicates that the benefits of EMR should be sustained through system optimization, stronger technological infrastructure, periodic maintenance and evaluation, continuous user training, adequate technical support, and improvement of interoperability among relevant systems.

RECOMMENDATIONS

Strengthen internet connectivity, server capacity, and supporting computer equipment to minimize interruptions in outpatient services.

Improve interoperability between the EMR system and other systems used in the hospital, including BPJS-related processes, to reduce duplicate data entry.

Provide periodic training and technical assistance for healthcare workers, with emphasis on accurate and complete data entry.

Maintain clear procedures for service continuity during system or network disruptions and ensure that staff understand the applicable standard operating procedures.

Conduct periodic evaluations of EMR implementation using operational indicators such as service time, data completeness, system availability, user experience, and patient-service continuity.

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