

ANALYSIS OF THE USE OF ELECTRONIC MEDICAL RECORDS IN IMPROVING HEALTHCARE SERVICE EFFECTIVENESS AT MATARAM UNIVERSITY HOSPITAL IN 2026

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Abstract

Electronic Medical Records (EMR) are a digital patient data recording system designed to improve the quality, efficiency, and effectiveness of healthcare services. Mataram University Hospital has implemented the EMR system in its patient service process; however, several technical challenges still have the potential to affect service effectiveness. This study aimed to determine the effectiveness of hospital services following the implementation of Electronic Medical Records at Mataram University Hospital and to identify the impact of EMR implementation on service effectiveness. This study employed a qualitative research method with a descriptive approach. The research informants consisted of three registration officers selected through purposive sampling, namely the head of the registration unit, a morning-shift registration officer, and an afternoon-shift registration officer. Data were collected through observation, interviews, and documentation, while data analysis was conducted using data reduction, data presentation, and conclusion drawing. Data validity was ensured through triangulation. The results showed that the implementation of Electronic Medical Records had a positive impact on the effectiveness of healthcare services at Mataram University Hospital. The use of EMR facilitated patient data recording and retrieval, accelerated service processes, improved staff work efficiency, and strengthened coordination among healthcare service units. Nevertheless, several challenges were still encountered, including internet network disruptions, system failures, and differences in staff competency in operating the

application. Overall, the implementation of Electronic Medical Records has contributed to improving the effectiveness of hospital services, although further improvements in technological infrastructure and staff competency are still needed to optimize its implementation.

Keywords: *Electronic Medical Records; Service Effectiveness; Hospital Services; Healthcare Services; Qualitative Research*

INTRODUCTION

Hospitals serve as healthcare institutions that provide comprehensive and integrated services to the community, encompassing health promotion, disease prevention, treatment, and rehabilitation. In delivering these services, hospitals are required to maintain medical record systems as essential documentation of patients' clinical and administrative care processes. Medical records play a critical role in ensuring continuity of care, supporting accurate clinical interventions, and providing a basis for clinical and managerial decision-making (Ministry of Health of the Republic of Indonesia, 2020). Along with advances in information technology, hospitals are increasingly required to implement Electronic Medical Records (EMRs) as part of efforts to improve the quality, efficiency, and effectiveness of healthcare services (WHO, 2021; Ministry of Health of the Republic of Indonesia, 2022). EMRs enable patient health information to be documented, stored, processed, and retrieved digitally, thereby facilitating faster and more accurate access to integrated patient information compared with conventional paper-based records.

The digital transformation of healthcare services in Indonesia has been strengthened through the issuance of Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning Medical Records, which provides a regulatory foundation for the implementation of EMRs in healthcare facilities. The regulation requires healthcare facilities to progressively implement integrated electronic medical record systems to support more efficient, accurate, secure, and interconnected healthcare information management. Khasanah (2020) defines an EMR as a collection of patients' health information stored digitally and documented systematically by healthcare professionals throughout the provision of healthcare services. The transition from paper-based records to EMRs facilitates rapid access to patient information, improves documentation efficiency, reduces the potential for recording errors, and supports healthcare professionals in delivering timely and appropriate services (Khasanah, 2020). Thus, EMR implementation represents an important component of healthcare digitalization and an instrument for strengthening the continuity and quality of patient care.

Despite its potential benefits, the implementation of EMRs in Indonesia has not yet been fully optimized. Widianoro et al. (2025) identified several challenges, including inadequate technological infrastructure, insufficient training for healthcare personnel, and resistance to changes in established work processes. These challenges may affect service effectiveness, particularly in outpatient units characterized by high patient volumes and the need for rapid, accurate, and

efficient services. Yulitiawati and Rusmidarti (2021) define effectiveness as the extent to which an organization succeeds in achieving predetermined objectives, which can be assessed by comparing the outcomes achieved with the targeted goals. In this context, the effectiveness of healthcare services can be reflected in the speed of service delivery, accuracy of patient information, efficiency of administrative processes, and ability of healthcare personnel to provide services according to established standards.

Previous studies have demonstrated the potential contribution of EMRs to healthcare service effectiveness. Farid, Fernando, and Sonia (2021) reported that EMRs support clinical decision-making by providing patient information rapidly and accurately, while also facilitating patient data retrieval and improving the efficiency of outpatient services. Their findings indicate that EMR implementation can accelerate service processes, facilitate access to patient information, and reduce administrative barriers. Similarly, Siregar (2024) stated that EMR implementation supports more effective healthcare services and more structured patient data management, while also contributing to data integrity and validity. Nevertheless, successful implementation remains dependent on adequate technological infrastructure, reliable network connectivity, system stability, and the readiness and competence of healthcare personnel. Technical disruptions and limited user understanding of EMR applications may therefore reduce the optimal benefits of the system.

Mataram University Hospital has implemented Electronic Medical Records as part of its healthcare service delivery system. However, the extent to which EMR utilization is associated with service effectiveness at the hospital remains insufficiently documented. This condition provides a basis for further empirical investigation of the implementation and utilization of EMRs within the hospital setting. Therefore, this study aims to analyze the use of Electronic Medical Records at Mataram University Hospital and examine its relationship with healthcare service effectiveness. The findings are expected to provide empirical information regarding the implementation of EMRs and their contribution to service effectiveness, particularly in terms of service speed, data accuracy, administrative efficiency, and the overall quality of healthcare delivery.

METHOD

This study employed a qualitative descriptive design to obtain an in-depth understanding of the implementation of Electronic Medical Records (EMRs) and their relationship with healthcare service effectiveness at Mataram University Hospital. The study was conducted in the Medical Records Unit of Mataram University Hospital, located at Jl. Majapahit No. 62, Kekalik Jaya, Sekarbela District, Mataram City, West Nusa Tenggara, Indonesia, in March 2026. Three informants were purposively selected based on their direct involvement in patient registration and service data management, consisting of one registration unit supervisor, one morning-shift registration officer, and one afternoon-shift

registration officer. Data were collected through direct observation, in-depth interviews, and documentation. Observation was conducted using an observation checklist to assess the EMR implementation, patient registration procedures, service workflows, and factors affecting service effectiveness. In-depth interviews were conducted using a semi-structured interview guide to obtain information regarding EMR implementation, service effectiveness, and operational challenges. Documentation included relevant Standard Operating Procedures (SOPs), hospital policies, and supporting records, supplemented by photographic documentation. These data collection methods were used to obtain comprehensive information regarding actual conditions in the field (Creswell, 2016; Moleong, 2018; Sugiyono, 2019).

Data were analyzed descriptively through three stages: data reduction, data presentation, and conclusion drawing. During data reduction, information obtained from observations, interviews, and documentation was selected, categorized, and simplified according to the research focus. The main themes included the implementation of EMRs in patient registration and data management, barriers to EMR utilization such as system disruptions, limited supporting facilities, and differences in staff competencies, as well as the effects of EMR use on service effectiveness, particularly service speed, accessibility of patient information, and the continuity of service processes. The reduced data were subsequently organized and presented narratively according to the identified themes to facilitate interpretation and examination of relationships among findings. Conclusions were then drawn by integrating evidence from observations, interviews, and documentation to determine the extent to which EMR implementation supported healthcare services, the challenges encountered, and the contribution of EMRs to service effectiveness. Data credibility was strengthened through source triangulation by comparing information obtained from the three informants with different responsibilities in the registration unit (Moleong, 2018; Sugiyono, 2020).

The research was conducted through three stages: planning, implementation, and final reporting. The planning stage involved preparing the research proposal, developing the interview guide and observation checklist, and obtaining research permission from Mataram University Hospital. The implementation stage consisted of direct observation and interviews with the registration supervisor and registration officers working morning and afternoon shifts, followed by data organization and analysis. The final stage involved systematic preparation of the research report based on the findings. Ethical principles were applied throughout the research process, including informed consent, confidentiality, anonymity, non-maleficence, and veracity. Participants were informed about the objectives, benefits, and procedures of the study and participated voluntarily without coercion. Personal identities were protected through the use of codes or initials, and all information obtained was kept confidential and used solely for research purposes. Data collection was conducted

without disrupting hospital services, and all findings were reported honestly and consistently with the conditions observed in the field.

RESULTS AND DISCUSSION

The implementation of Electronic Medical Records (EMRs) at Mataram University Hospital has been carried out gradually since 2024 and was implemented comprehensively across the hospital in 2025. According to an interview with the registration unit supervisor, Hendri Rahman, S.Pt., the gradual implementation allowed hospital personnel to adapt to the electronic system before its full-scale application. The EMR workflow begins with patient registration and continues through clinical examinations, documentation of examination results by physicians and nurses, and pharmaceutical services. An afternoon-shift registration officer, Lis Niati, A.Md.Ars., explained that the system has been integrated across service units, enabling authorized personnel to access patient information efficiently. This integrated workflow facilitates the continuity of patient care and supports more coordinated service delivery. These findings are consistent with Khasanah (2020), who described EMRs as systems that integrate patient information from registration through clinical and pharmaceutical services within a connected information system.

The implementation of EMRs has provided several operational benefits for healthcare services at Mataram University Hospital. According to Baiq Nuke Rahmasari, a morning-shift registration officer, EMR utilization has accelerated service processes, improved work efficiency, facilitated patient data retrieval, supported patient data confidentiality, reduced paper use, and enhanced coordination among healthcare professionals. These benefits indicate that EMRs contribute to service effectiveness by reducing reliance on physical records and enabling faster access to patient information. The findings are in line with Pribadi et al. (2018), who reported that EMRs facilitate access to patient data, improve service efficiency, reduce documentation errors, and strengthen coordination among healthcare personnel. However, several operational challenges remain, particularly internet connectivity problems, hospital information system disruptions, and delays in entering patient data. Lis Niati, A.Md.Ars., reported that these problems may interfere with service continuity, while Hendri Rahman, S.Pt., noted that network disruptions do not occur every day but may arise relatively frequently during network or server maintenance. These findings are consistent with Latipah et al. (2021) and Trisnawati (2020), who identified network and system disruptions as common challenges in EMR implementation.

System disruptions were found to have direct implications for healthcare service delivery. Hendri Rahman, S.Pt., explained that system interruptions may delay patient registration, hinder the entry of examination results by healthcare professionals, and create difficulties for the pharmacy unit in accessing electronic prescriptions. Because several stages of patient care are interconnected through the EMR system, technical disruptions may affect both administrative and clinical

processes. This finding supports Widianoro et al. (2025), who reported that information system disruptions can delay healthcare services and restrict access to patient information. Nevertheless, Mataram University Hospital has implemented measures to maintain the security and confidentiality of patient information. Based on the interview, each staff member is provided with an individual account according to their duties and responsibilities, while access to specific system menus is restricted according to their professional roles. Such role-based access controls represent an important mechanism for protecting patient confidentiality and limiting unauthorized access to health information, consistent with the requirements of Minister of Health Regulation Number 24 of 2022.

Regarding compliance with EMR documentation procedures, Baiq Nuke Rahmasari reported that electronic medical record entries were generally completed in accordance with the applicable Standard Operating Procedures (SOPs), with an estimated compliance level of approximately 80%. This relatively good level of compliance indicates that personnel have generally understood the importance of completing patient records appropriately; however, further improvement remains necessary to achieve more consistent and comprehensive documentation. Overall, the findings indicate that EMR implementation at Mataram University Hospital has supported healthcare service effectiveness through improved service speed, easier access to patient information, greater coordination among healthcare personnel, and reduced dependence on paper-based documentation. At the same time, system and network disruptions, delays in data entry, and incomplete staff compliance remain important operational issues that require continuous improvement through infrastructure maintenance, system optimization, and staff training.

This study has several limitations. First, the research focused specifically on the implementation and utilization of EMRs in relation to healthcare service effectiveness and did not examine other potentially influential factors in depth, such as human resource availability and competency, infrastructure adequacy, patient satisfaction, organizational management, or other institutional factors. Second, the qualitative design means that the findings reflect the conditions identified through observation, interviews, and documentation during the study period. Consequently, the findings provide an in-depth description of EMR implementation and its perceived contribution to service effectiveness but are not intended to quantify the level of service effectiveness using numerical or statistical measures. Further studies using quantitative or mixed-method approaches may provide additional evidence regarding the magnitude of the relationship between EMR utilization and healthcare service effectiveness.

CONCLUSION

Based on the findings of the study conducted at Mataram University Hospital, the implementation of Electronic Medical Records (EMRs) contributes to improving the effectiveness of hospital services. The EMR system facilitates

healthcare professionals in accessing and managing patient information, accelerates service delivery, improves work efficiency, and supports coordination among healthcare service units. Through an integrated system, patient data can be managed more rapidly, systematically, and effectively, thereby supporting more optimal healthcare delivery. Nevertheless, EMR implementation continues to face several challenges, including internet connectivity disruptions, technical problems within the system, and differences in staff competencies in operating the application. Despite these challenges, the overall benefits of EMR implementation remain evident, particularly in terms of service speed, accessibility of patient information, work efficiency, and coordination among healthcare professionals, indicating that EMRs have made a positive contribution to enhancing the effectiveness of healthcare services at Mataram University Hospital.

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