International Conference on Business Economics, Social Sciences & Humanities

CHALLENGES IN IMPLEMENTING ELECTRONIC MEDICAL RECORDS FOR THE EMERGENCY DEPARTMENT IN HOSPITALS

Fahmi Muhamad Mukhliansyah
Universitas Komputer Indonesia, Bandung, Indonesia

Raeni Dwi Santy
Universitas Komputer Indonesia, Bandung, Indonesia

ABSTRACT

The Minister of Health Regulation Number 24 of 2022 mandates that all types of healthcare facilities, including clinics and independent practices, must begin implementing Electronic Medical Records (EMR) no later than December 31, 2023. The implementation of EMR can facilitate the work of medical and administrative staff, simplify patient data retrieval, and enhance the exchange of patient information between healthcare facilities. (Implementation of Hospital EMR in Indonesia, n.d.)

Keywords: Electronic medical records, public hospital (RSUD).

To evaluate the implementation of Electronic Medical Records in the Emergency Department (ED) of Oto Iskandar Di Nata Regional General Hospital and the challenges encountered, considering technological, management, and human resource factors. This study employs a qualitative method with a case study approach. The evaluation model used to assess the EMR implementation in the Emergency Department of Oto Iskandar Di Nata Hospital is the Hot Fit Framework from October to December 2024. (Gesulga et al., 2017). The study results indicate that EMR implementation has a positive impact as it supports healthcare services and administration, accelerates access to patient information to aid clinical decision-making, and minimizes errors for patient safety. To achieve a more optimal implementation of EMR in the Emergency Department, additional infrastructure such as tablets and digital signature machines is needed to support the operational implementation of EMR in the ED. Research on EMR implementation can have various impacts, including reducing manual recording time for medical personnel, facilitating patient data access between units and even across healthcare facilities, and minimizing data duplication.

INTRODUCTION

Electronic Medical Records (EMR) are digital systems that store and manage patient medical data. EMR can replace conventional paper-based medical records. (Jimma & Enyew, 2022) The transition to electronic-based patient records began with the issuance of Minister of Health Regulation (PMK)

Number 24 of 2022 concerning Medical Records. Under this policy, healthcare facilities (Fasyankes) are required to implement an electronic system for recording patient medical history. The transition process must be completed no later than December 31, 2023.

The regulations that must be implemented by the Emergency Department (ED) of Oto Iskandar Di Nata Regional General Hospital regarding EMR adoption include: EMR must be integrated with the SATU SEHAT application; EMR must be utilized from the moment the patient is admitted until discharge, referral, or death. (Fennelly et al., 2020) EMR data must be stored for at least 25 years from the patient's last visit. After this period, the EMR data may be destroyed unless it is still in use or required.

Previous research has played a crucial role in providing theoretical foundations and building an understanding of the subject being studied. Several studies have examined the challenges of EMR implementation. For instance, research by Nadya Adina Zuhdi and Ede Surya Darmawan (2024) found that low support from healthcare workers, limited information technology infrastructure, data security concerns, and high implementation costs were significant challenges. (Adina Zuhdi & Surya Darmawan, n.d.) Similar findings were reported by Sri Siswati, Tuty Ernawati, and Muthia Khairunnisa (2024), who highlighted technological infrastructure limitations and the need for healthcare worker training. (Siswati et al., 2024) The study was conducted as a qualitative case study in hospitals that had recently adopted EMR and were serving as models for other regional general hospitals. EMR implementation also adds a technological or innovation dimension by integrating EMR with other systems. (Bain, 2015)

This research is a qualitative study with a case study approach. (Hailegebreal et al., 2023) The sampling technique used is purposive sampling, where the researcher deliberately selects study subjects based on specific criteria to ensure diverse perspectives on the challenges of EMR implementation. (Gesulga et al., 2017) The study is conducted at Oto Iskandar Di Nata Regional General Hospital, with the research period spanning from October to December 2024.

LITERATURE REVIEW

The use of Electronic Medical Records (EMR) as a computerized health information system has become a primary focus for hospitals in Indonesia today. EMR refers to the digital storage of patient medical data, including health records, medical history, examination results, prescriptions, and other critical information related to patient care. With advancements in information technology and the growing need for accessibility and integration of medical information, EMR has emerged as a promising solution for hospitals to enhance efficiency, accuracy, and the quality of healthcare services (Uslu & Stausberg, 2021).

Additionally, EMR supports sustainable and patient-oriented medical practices by providing comprehensive information about a patient's medical history. This enables doctors to make better-informed medical decisions and deliver more personalized and integrated patient care (Setyadi & Nadjib, 2023).

METHODOLOGY

This research is a qualitative study using a case study approach. The sampling technique employed is purposive sampling, in which the researcher deliberately selects research subjects based on specific criteria to obtain diverse perspectives on the obstacles to implementing Electronic Medical Records (EMR). This study was conducted at Oto Iskandar Di Nata Regional General Hospital (RSUD).

The researcher conducted interviews with 15 EMR user staff members, including the Head of the Medical Records Department, Head of the HMIS Department, Head of the Emergency Department (ED),

Specialist Doctors, General Practitioners in the ED, Triage Officers, ED Registration Staff, Cashier Staff, Nurses, Ponek Midwives, Laboratory Department Staff, and Radiology Department Staff. Additionally, two Focus Group Discussions (FGDs) were held with six ED Nurses and four Ponek Midwives. The inclusion criteria for this study were respondents aged at least 20 years, working in the ED or supporting departments at Oto Iskandar Di Nata Regional General Hospital (RSUD) for a minimum of one year, and being users of the Electronic Medical Records (EMR) system. The exclusion criteria were employees who were not actively working or were absent during the data collection process.

This study uses interview guide instruments and DKT, as well as field observations to assess the availability of facilities and infrastructure and the workflow of Electronic Medical Records. The variables examined in this study include the Human aspect, which covers system usage and user satisfaction; the Organizational aspect, which includes regulations, decision-making, and work culture; the Technological aspect, which consists of system quality, information quality, and service quality; and the Net Benefit aspect, which refers to the perceived benefits.

DISCUSSION

Result

RSUD Oto Iskandar Di Nata is a Type B hospital located in Bandung Regency, West Java. It has 26 outpatient clinics with 40 specialist doctors, 2 dentists, and 3 physiotherapists. The average number of patient visits per day is 500. The proportion of patients based on payment type is 79.4% BPJS patients and 20.6% general patients.

The Hospital Information System (SIMRS) used is a three-year lease system, where after three years, the application becomes the property of the hospital, allowing the hospital to develop features as needed. The initial phase of Electronic Medical Record (EMR) implementation began in February 2024 in the Outpatient Department. Subsequently, in June 2024, the Emergency Department started implementing EMR. In the initial phase, socialization and introduction were conducted for some Emergency Department staff.

The hospital provides the necessary facilities and infrastructure, including computers, servers, internet networks, and fingerprint scanners. EMR in the Emergency Department is used in the Triage section, registration, nurse and midwife assessment, doctor assessment and treatment, doctor prescriptions, supporting services, and cashier. Initially, EMR usage in the Emergency Department operated in a hybrid system alongside manual medical record. (See Table 1).

Table 1. Respondent characteristics.

Variable	Description	Persentase (%)
Sex	Male	38
	Female	62
Age	< 25 years	0
	25 – 35 years	4
	35 – 45 years	26
	> 45 years	70
Years of service	1 – 5 years	11

	5 – 10 years	24
	> 10 years	65
Education	Diploma	76
	Nursing Profession	24
Employment Status	PNS	42
	PPPK	21
	TKK	37

Net Benefit Aspect

Some of the benefits already experienced by users and the hospital organization include: for some EMR users, it simplifies and speeds up work processes as there is no need for manual recording, doctors' handwriting is more legible, and it facilitates communication between on-duty doctors and specialists who are not present at the hospital.

EMR also makes it easier to store and retrieve necessary data, such as patient records, previous examination history, and reporting needs.

Although some benefits have been experienced, they are not yet fully optimized. Some procedures have not been integrated into the EMR, inpatient admission orders are still manual, and some documents remain in paper form. The lack of optimization occurs due to existing barriers in the Human, Organizational, and Technological aspects.

“…no patient data is lost; everyone can access it…” (Head of Emergency Department)

“…less paper, simpler…” (Emergency Room Nurse)

Several benefits have been felt in the implementation of EMR, but it is still not optimal, including issues such as internet connection, Wi-Fi signal, lack of user-friendliness, and the absence of notification for requests to supporting departments.

"…if the computer network is down, radiology images are automatically not sent to the EMR…" (Radiographer)

"...lack of computer facilities in the ER triage section..." (ER staff)

The benefits have not been fully optimized due to existing obstacles in the areas of Human, Organization, and Technology.

Barriers in the Human Aspect

In the system user dimension, the level of EMR usage in the Emergency Department is still low. Based on observations, EMR users, particularly emergency department nurses, face challenges related to their knowledge of using the EMR and the time required to input patient data. Some nurses have not received any training or guidance at all.

Some users feel that the implementation of EMR has led to changes in workflow and increased workload. Users hope for a more user-friendly system, improved internet network, and feature modifications to better suit their needs.

“…requests from the outpatient clinic/ER sometimes do not include a referral letter, and occasionally the e-order has not been made in the EMR…” (Radiographer)

Barriers in the Organizational Aspect

Computerization and supporting facilities are among the challenges in the development of the Hospital Information System (SIMRS) and Electronic Medical Records (EMR). The hospital has allocated a budget to provide the necessary infrastructure to support EMR implementation.

Additionally, the absence of a programmer in the hospital's IT team and the limited number of IT staff affect response time, leading to delays in resolving issues, especially outside working hours.

To ensure that EMR is well accepted by doctors and staff, effective communication from management to users is essential. Additionally, EMR implementation has led to instances of miscommunication with patients. Therefore, providing information to patients is necessary, as EMR is a new system and they may not be familiar with it yet.

"…not all computers are able to view the X-ray results yet…" (ER staff).

Barriers in The Technological Aspect

Some of the obstacles encountered include database inconsistencies, such as inaccurate medication stock levels, unregistered tariffs, and data entry errors in the system. Regarding technical support, some necessary facilities and infrastructure are still lacking, including an insufficient number of computers and the absence of tablets to support doctors.

"…the Hospital Information System (SIMRS) and Electronic Medical Records (EMR) are not yet fully integrated; some billing information in SIMRS still cannot be accessed through the EMR…" (Radiology staff).

The implementation of EMR is driven not only by regulatory pressure from the government and BPJS but also by the need to improve service quality. Before implementation, the hospital must first carry out proper planning. Planning is a crucial stage in the adoption of an Information System. Some important aspects related to digital technology implementation include a strategic plan. System development plan, budget plan, information system infrastructure plan, risk management, and IT division governance.

Various obstacles are still encountered in the EMR implementation process. In the Human aspect, the level of usage remains low, some users have not entered data into the EMR, and data entry is incomplete. This issue is related to the level of knowledge about EMR. The lack of usage and knowledge is also linked to training factors, as users feel that EMR has not been adequately socialized.

In the Organizational aspect, obstacles in the structural dimension include the need to improve compliance with EMR data entry. The EMR development strategy should be incorporated into the hospital's strategic plan (Renstra), and the targets to be achieved should be outlined more specifically, including the budget required for EMR system development. This is also related to management support for EMR development facilities, which are still considered insufficient. Planning the hospital's annual budget to accommodate the high operational and maintenance costs of EMR should be part of routine expenditures rather than an unplanned burden on hospital resources.

RSUD Oto Iskandar Di Nata uses a Hospital Information System (SIMRS) on a rental basis from a vendor or third party under a three-year contract. After the contract expires, the SIMRS application becomes the property of the hospital. The benefits in terms of quality of care include faster patient service with the use of EMR. Additionally, EMR improves legibility, making it easier to continue previous treatments. Patient safety is also enhanced due to more accurate and consistent prescriptions, improved readability, and better-quality monitoring. However, the current EMR system has some

weaknesses. When switching to the next patient, data or examination results from the previous patient may still appear, which can lead to errors if users are not careful. Furthermore, all users have access to the prescription input feature, often resulting in medication request errors. The organization needs to identify areas within health information technology that can contribute to improving patient safety, such as medication security, compliance, and guidelines. Additionally, it is essential to ensure that all relevant staff receive adequate training on the health information technology being used.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the research findings and discussion, it can be concluded that the implementation of Electronic Medical Records (EMR) has provided several benefits, including faster and easier processes compared to manual medical records, improved legibility of doctors' handwriting, enhanced communication between staff for continued patient care, easier storage and retrieval of necessary data, and faster billing. However, improvements and efficiency enhancements are still needed to better control patient expenses.

Nevertheless, there are still challenges in the aspects of Human, Organization, and Technology. Therefore, efforts must be made to optimize EMR implementation and further enhance the benefits experienced.

Recommendation

Efforts are needed to optimize the implementation of EMR and further enhance its benefits. The improvement plan for EMR implementation should be included in the hospital's strategic plan (Renstra), along with the necessary budget planning. Equally important is the recruitment of at least three programmers to support the future development of EMR.

REFERENCES

Zuhdi, N. A., & Darmawan, E. S. (n.d.). Tantangan dalam implementasi rekam medis elektronik terkait kualitas pelayanan di Rumah Sakit: A scoping review. *Innovative: Journal of Social Science Research*, 4, 11389–11399.

Bain, C. (2015). The implementation of the electronic medical records system in health care facilities. *Procedia Manufacturing*, 3, 4629–4634. https://doi.org/10.1016/j.promfg.2015.07.547.

Fennelly, O., Cunningham, C., Grogan, L., Cronin, H., O'Shea, C., Roche, M., Lawlor, F., & O'Hare, N. (2020). Successfully implementing a national electronic health record: A rapid umbrella review. *International Journal of Medical Informatics*, *144*. https://doi.org/10.1016/j.ijmedinf.2020.104281.

Gesulga, J. M., Berjame, A., Moquiala, K. S., & Galido, A. (2017). Barriers to electronic health record system implementation and information systems resources: A structured review. *Procedia Computer Science*, 124, 544–551. https://doi.org/10.1016/j.procs.2017.12.188.

Hailegebreal, S., Dileba, T., Haile, Y., & Abebe, S. (2023). Health professionals' readiness to implement electronic medical record system in Gamo Zone public hospitals, Southern Ethiopia: An institution

based cross-sectional study. *BMC Health Services Research*, 23(1). https://doi.org/10.1186/s12913-023-09745-5.

Jimma, B. L., & Enyew, D. B. (2022). Barriers to the acceptance of electronic medical records from the perspective of physicians and nurses: A scoping review. *Informatics in Medicine Unlocked*, *31*. https://doi.org/10.1016/j.imu.2022.100991.

Oufkir, L., & Oufkir, A. A. (2023). Understanding EHR current status and challenges to a nationwide electronic health records implementation in Morocco. *Informatics in Medicine Unlocked*, *42*. https://doi.org/10.1016/j.imu.2023.101346.

Penerapan RME Rumah Sakit di Indonesia. (n.d.).

Siswati, S., Ernawati, T., & Khairunnisa, M. (2024). Analisis tantangan kesiapan implementasi rekam medis elektronik di Puskesmas Kota Padang. *Jurnal Kesehatan Vokasional*, 9(1), 1. https://doi.org/10.22146/jkesvo.92719

Vickers, A. J., Van Calster, B., & Steyerberg, E. W. (2016). Net benefit approaches to the evaluation of prediction models, molecular markers, and diagnostic tests. *BMJ (Online)*.

About The Authors

Fahmi Muhamad M, email: fahmi.75224005@mahasiswa.unikom.ac.id

Fahmi MM is a Masters student at the Universitas Komputer Indonesia majoring in Information Systems.