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Analysis of the Completeness of Electronic Medical Records in Outpatient Installations to Improve the Quality of Service in Hospital

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Abstract. *Digital transformation in the health sector encourages the adoption of Electronic Medical Records (EMR) as an effort to improve the quality of service and efficiency of information systems. This study aims to analyze the level of completeness of EMR filling in the Outpatient Installation of Hospital X and identify the factors that influence it. The method used is quantitative descriptive with data obtained from 100 outpatient EMR documents during March–April 2025. The results show that only the patient identity component reaches 100% completeness, while other components such as anamnesis, actions, and therapy are still low (52%), followed by CPPT (65%), doctor's signature (67%), physical examination (77%), and diagnosis (90%). This incompleteness risks reducing the quality of service, patient safety, and validity of documentation. The main factor contributing to incompleteness is limited human resources, especially elderly officers who have difficulty adapting to digital systems. The study recommends intervention strategies such as needs-based training, intergenerational mentoring, and routine evaluation to improve compliance with EMR filling. In conclusion, the success of RME implementation does not only depend on the digital system, but also on the readiness of human resources, documentation culture, and management support in building quality health services.*

Keywords: *Electronic medical records, completeness, outpatient installation, service quality, digital transformation*

1. Introduction

Digital transformation in the health sector has become a top priority in improving the quality of service and efficiency of information systems in various health care facilities. The development of information technology has enabled major changes in the way medical documentation is carried out, which was previously manual to systematic and computerized. One of the important innovations that emerged from this digitalization process is the implementation of Electronic Medical Records (EMR), a system designed to digitally document a patient's medical history, including identity information, complaints, diagnoses, procedures, treatments, and supporting examination results.

Electronic Medical Records are not only intended as a documentation tool, but also as a means to support clinical decision-making, interprofessional coordination, and comprehensive tracking of patient health journeys. According to Zhang et al. (2020), the use of EMR in various countries has been proven to improve patient safety, reduce medical errors, and accelerate service flows in health facilities. In Indonesia, the government through the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022, has stipulated the obligation to use EMR in all health service facilities such as hospitals, health

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centers, clinics, pharmacies, and laboratories. This regulation aims to improve the quality of service, guarantee legal protection, and ensure the security, integrity, and availability of medical record data that can be accessed digitally and in an integrated manner.

Although the RME system is able to provide a positive impact on improving the quality of service, its success is highly dependent on the completeness of data entry carried out by medical personnel. This completeness is an important indicator in ensuring the accuracy of information, the effectiveness of interprofessional communication, and patient safety. An incomplete medical record can cause inconsistencies in patient management, complicate clinical evaluation, and even have legal consequences for health care institutions. Therefore, the completeness of RME filling is one of the main focuses in efforts to continuously improve the quality of hospital services (Handayani et al., 2021; Saragih et al., 2020).

In this context, this study was conducted to analyze the level of completeness of filling in the RME in the Outpatient Installation of Hospital X. The Outpatient Installation is one of the service units that has a high administrative burden and diverse service complexity, so that there is often a risk of incomplete data. This study aims to identify which aspects are most often incompletely filled in the RME, and to evaluate their potential impact on service quality. It is hoped that the results of this study can be the basis for improving the medical documentation system and making quality policies at the hospital management level.

The novelty of this study lies in its specific analysis of elderly staff adaptation to EMR systems in outpatient settings, which is rarely explored in previous research. This research also contributes to the achievement of Sustainable Development Goal (SDG) 3: Good Health and Well-being, by promoting safe, efficient, and quality digital health services.

2. Methods

This study uses a quantitative descriptive approach with the aim of assessing the level of completeness of filling in Electronic Medical Records (EMR) in the Outpatient Installation of Hospital X. This approach was chosen to provide a more structured picture of the completeness variables of data recorded in the EMR system. Identifying sections that are often incompletely filled in. The data collection process took place in the period March to April 2025. The population studied was all EMR documents of outpatients recorded during that period. Sample selection was carried out using a *purposive sampling method* that met the inclusion criteria, namely:

- RME patients who have completed all medical services,
- Recorded in the RME system of Hospital X,
- Accessible to researchers through the Medical Records Unit with official permission.

The instrument used to collect data was the EMR completeness checklist, which was compiled based on the guidelines for filling out medical records issued by the Ministry of Health and the internal procedures of Hospital X. The results of the analysis are presented in the form of tables and bar charts to facilitate interpretation and understanding. In addition, this study also analyzed which components were most often incomplete to provide recommendations for improvement in filling out EMR.

3. Results and Discussion

In Hospital X, the use of Electronic Medical Records (EMR) has been implemented, including in the registration section. The results of this study indicate that the level of completeness of EMR in Hospital X still varies, the results of the study of 100 EMR documents

show that not all EMR documents are filled in completely, but some parts are complete. By using EMR, patients will get faster and easier services. Not only that, electronic medical records are also very helpful in minimizing storage, because patient documents are no longer stored in book form. This electronic medical record is not only profitable but can be detrimental to many parties. According to (Saragih et al. 2020), incomplete EMRs risk reducing patient safety and slowing down the medical decision-making process.

Table 1. Results of completeness analysis of electronic medical records

No	RME Components	Total Completed (n = 100)	Percentage %
1	Identity	100	100%
2	Anamnesis	52	52%
3	Cppt	65	65%
4	Diagnosis	90	90%
5	Action	52	52%
6	Therapy	52	52%
7	Physique	77	77%
8	Doctor's signature	67	67%

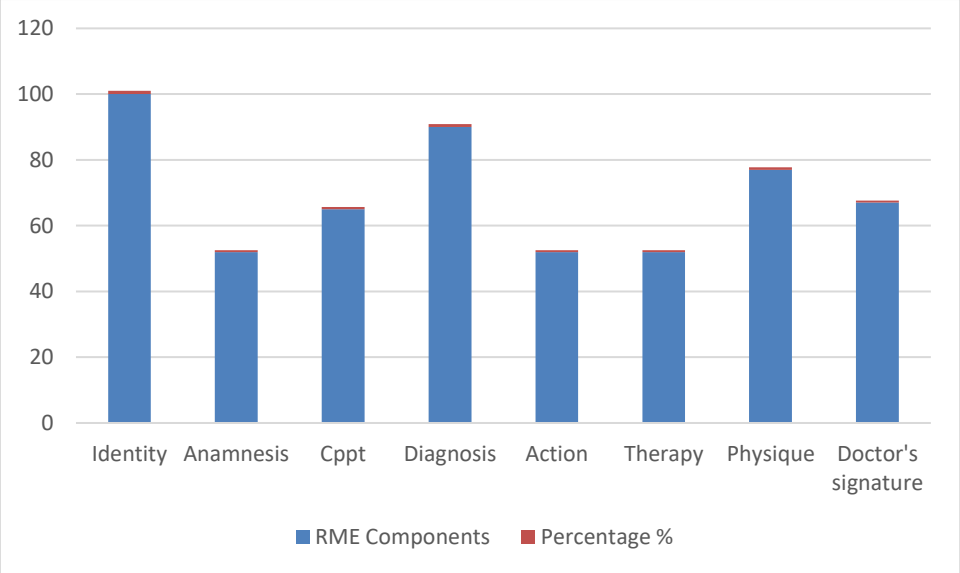

Figure 1. Level of Completeness of Electronic Medical Record Components

Based on the results of the analysis of the electronic medical record system in outpatient care at hospital x, the results showed very varied results, from the 8 components that I analyzed, only 1 component achieved 100% completeness, namely identity, patient identity is basic patient information that must be recorded, including, full name, medical record number, gender, telephone number and so on. This is in accordance with the basic principles of medical recording which emphasizes the importance of complete identity data as the foundation of all medical record documents .

However, several other important elements still show a low level of completeness. Such as anamnesis, actions and therapy. Anamnesis is information on the main complaint and medical history conveyed directly by the patient including, main complaint, medical history, drug/allergy history. Its function is to provide an initial picture of the patient's condition based on their perception. While actions are medical or nursing steps given to patients, such

as examinations, support, and so on, this is part of patient management that must be documented. Next there is therapy, therapy is the administration of drugs or other interventions intended to cure or reduce patient symptoms, ensuring that treatment is in accordance with the diagnosis and is completely recorded. Of the 3 components above, anamnesis, actions, and therapy only reached 52% completeness, indicating that almost half of the information regarding the patient's clinical history has not been fully filled in. This data is very important in the process of diagnosis, clinical decisions, and patient care. This incompleteness can hinder accurate diagnosis and may also cause problems in the security and legality of health documentation. The absence of data on this component has the potential to cause medical errors, hinder continuity of service, and reduce the quality of hospital services in general (Handayani et al., 2021; Widodo et al., 2022).

In addition, there is a doctor's signature, the doctor's signature is a verification and legalization that the doctor has conducted an examination, recorded the results, and approved the action/therapy. The Doctor's Signature rate only reached 67%, which illustrates that there is a lack of attention to legality and accountability in clinical documentation, which raises concerns about the legal validity of medical records. A signature is a very important proof of authentication to ensure that this data has been verified by the authorities.

The next component is the Integrated Patient Progress Note (CPPT), CPPT is a document that contains the development of the patient's condition, recorded by all health workers usually following the SOAP format (Subjective, Objective, Assessment, Plan) the function of CPPT is cross-professional documentation for coordination and continuity of service. The completeness of CPPT is only filled in 65% of documents, even though this CPPT should reflect the continuity of care from various medical professionals. Incompleteness in CPPT can indicate weak coordination and documentation between professions, as well as a lack of system integration that supports collaboration from the health team.

Meanwhile, there is a physical component showing a completeness level of 77%. This figure shows that the recording of physical examination results is quite good, but still does not meet ideal expectations considering the importance of this data for establishing a diagnosis. There is still room for improvement to ensure that all aspects of the examination are recorded completely.

And the last is diagnosis, diagnosis is the result of determining the patient's health problem by a doctor based on subjective and objective data, this diagnosis is the basis for further treatment or medical action. The diagnosis component shows a completeness level of 90%, which shows that most doctors still make this aspect a top priority in documentation . Recording of clinical diagnoses is quite good and generally in accordance with standards.

The results of this study indicate that the percentage of electronic medical record completion for outpatients is higher than the percentage of incompleteness. However, this result has not reached the minimum service standard set, which is 100% for all aspects according to the provisions of "Minister of Health Regulation No. 24 of 2022" . Overall, the findings of this study indicate that the success of EMR implementation is not only influenced by the existence of a digital system, but is also greatly influenced by user behavior, documentation culture, and support from management. This filling gap is in line with previous findings which state that barriers to the use of EMR often come from human factors such as lack of training, resistance to new technology, and suboptimal governance of health information systems (Saragih et al., 2020; Zhang et al., 2020). Therefore, increasing the completeness of EMR filling needs to be a priority in hospital quality management programs.

Routine training, internal audits, and automatic reminder systems can be strategies to improve documentation compliance by health workers (Ministry of Health of the Republic of Indonesia, 2022).

Several recent studies have supported this finding. For instance, Al-Kahtani et al. (2023) highlighted that a lack of training and resistance from older staff significantly impedes the effective use of EMR systems. Similarly, Lee et al. (2021) emphasized that hospitals with more robust digital literacy training showed better medical documentation outcomes. Mensah and Mensah (2022) also noted that in developing countries, the gap in technological infrastructure and user readiness remains a key barrier to EMR adoption.

From my observation at Hospital X related to Electronic Medical Records, there are many positive impacts on officers and patients but there are also negative impacts related to EMR. From the observation, this electronic medical record greatly simplifies and influences the speed of service in the hospital, can shorten patient waiting time, registration can be more efficient and can register using an online system, reducing the use of stationery. However, there are patients who are afraid that if their data is stored on the computer it will be accessed by people they don't know and cause data leakage. From the data I took, there are still many electronic medical records in Hospital X that are incomplete due to human resources. The factor that causes the incomplete filling of electronic medical records in health care facilities is the condition of human resources, because at Hospital X there are still many officers who are relatively old. Officers who are elderly often face various obstacles, especially those who have worked with manual systems for years, they find it difficult to adapt to using this EMR system again, because they are used to using manual systems. Limited digital literacy among elderly officers also has an impact on the accuracy and efficiency of patient data recording. A study by (Ramli and Suryani 2021) shows that health workers over the age of 50 have a higher tendency to make errors in filling out or inputting medical data due to lack of training. To overcome this problem, structured interventions are needed, including:

1. Conducting special training and guidance, periodic training that is adjusted to individual abilities needs to be carried out, with a practical learning approach and direct assistance. This aims to increase the confidence of officers in operating electronic systems (Yulianti et al., 2022)
2. Mentoring by younger officers, collaborative strategies such as the "buddy system", namely mentoring by younger and technology-savvy health workers, have proven effective in accelerating the adaptation of elderly officers to the use of digital systems (Putra & Lestari, 2021)
3. Conducting routine monitoring and evaluation, periodic evaluation of the completeness of RME filling must be carried out systematically by providing constructive feedback to improve performance and compliance.

By implementing this strategy, obstacles due to age limitations of officers can be minimized, so that filling in electronic medical records can be done completely and according to standards, for the sake of improving the quality of health services.

Conclusions

This study shows that the implementation of Electronic Medical Records (EMR) in the Outpatient Installation of Hospital X has provided convenience in the service process, time efficiency, and reduced the use of physical documents. However, the level of completeness of filling in EMR still varies between components, only the patient identity component reaches

the completeness standard of 100%. Other important components such as anamnesis, actions, and therapy still show a low level of completeness (52%), which has the potential to reduce the quality of service, patient safety, and the validity of medical documentation, the doctor's signature level only reaches 67%, which indicates a lack of attention to legality and accountability in clinical documentation. Integrated Patient Progress Notes (CPPT) are only 65%, which indicates weak coordination and documentation between professions. The physical component is 77%, and the diagnosis component is 90% complete. The gap in completeness is largely due to limited human resources, especially elderly officers who have difficulty adapting to digital systems. Low digital literacy, lack of training, and resistance to change are the main inhibiting factors for the success of the EMR system. Therefore, intervention strategies such as needs-based training, mentoring by young officers, and routine monitoring and evaluation are needed to improve compliance and completeness of RME filling. Overall, the success of RME implementation depends not only on the existence of a technology system, but also on the readiness of human resources, a strong documentation culture, and the commitment of hospital management. Increasing the completeness of RME filling is an important indicator in improving the quality of service, patient safety, and accountability of health care facilities.

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Conflict of Interest

The author declares no conflict of interest.

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