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Implementation of EMR on the Completeness of Inpatient Medical Records at Oto Iskandar Di Nata General Hospital

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Abstract: As health service providers, hospitals have been required to implement an electronic medical record (EMR) system. The goal of implementing an EMR is to improve the accuracy, efficiency, and security of patient medical data. Good medical records are also an indicator of hospital quality, supporting the accreditation process and service efficiency. The author's analysis is motivated by the need to understand the impact of EMR implementation at Oto Iskandar Di Nata General Hospital on the completeness of medical record data. The research method is a descriptive, quantitative analysis with a checklist form as the research instrument. The results showed that the highest percentage of completeness was in the important part of the report with an overall percentage of 89%, while the lowest percentage was in the author authentication section with an overall percentage of 66%. One of the reasons for incompleteness was due to system limitations. In conclusion, although the EMR system has begun to be implemented, the level of data completeness still does not meet the standards set by the Ministry of Health Regulation.

Keyword: Implementation, Electronic Medical Record, Data completeness, Inpatients

INTRODUCTION

The current development of technology has made various aspects of life easier. This condition has encouraged various health service providers to utilize technology, both in service delivery and data management (Setiatin & Agustin, 2019). Medical records are one of the tools in health service facilities that can be applied to information technology (Andriani et al., 2017).

The obligation to implement Electronic Medical Records (EMR) as a form of information technology utilization in healthcare services is stipulated in Ministry of Health Regulation No. 24 of 2022, Article 3, Paragraph 1. Each healthcare facility is required to implement electronic medical records. Electronic medical records are medical records created using an electronic system intended for the management of medical records (Menteri Kesehatan RI, 2022).

The implementation of EMR is a crucial step in improving the quality and excellence of healthcare services (Surahman & Setiatin, 2024). With the implementation of this electronic

medical record system, hospitals are expected to be able to offer faster or more time-efficient services, better coordination, and improved patient care quality (Privy, 2024). Additionally, EMR facilitates access to patient health information for various healthcare providers involved in patient care, such as doctors, nurses, pharmacists, laboratory staff, and other healthcare professionals (Madtive Studio, 2024). Medical records also serve as a data source for determining strategic steps to improve healthcare services (Adhytama & Yunengsih, 2022).

Good medical records must be complete because they play a crucial role in healthcare administration, medical decision-making, and legal accountability (Meisari & Muhlizardy, 2022). The quality of medical records can be assessed based on completeness, accuracy, and protection of the information contained within them. (Siwayana et al., 2020).

Medical records must be filled out completely because they are closely related to financial administration, namely the claims process (Febrianti & Sugiarti, 2019). Along with the improvement in the quality of health services, hospitals need to develop and implement medical records in accordance with applicable regulations (Sari & Rukmini, 2022).

Incomplete medical record completion can lead to complications that impact the quality of services provided by the hospital (Devhy & Widana, 2019). Therefore, the completeness of medical records must always be improved.

In the Minimum Service Standards for hospitals, there are several indicators that must be met, including completing and filling out medical record documents within 24 hours after patient care is completed (Fahrunisa et al., 2023). If data corrections are required, these must be carried out by healthcare providers, administrative staff, medical record keepers, and health information officers, with the maximum timeframe being 2× 24 hours after the data is entered. As stated in the Minister of Health Regulation, the recording and storage of clinical information or medical records must be done after the patient receives health services, including the identity, time, and signature of the healthcare provider (Menteri Kesehatan RI, 2022)

However, in practice, the completeness of medical records still does not meet the Ministry of Health standards, with incomplete and missing data frequently found (Arie et al., 2023). To address this issue, Oto Iskandar Di Nata General Hospital has begun implementing an Electronic Medical Record (EMR) system to support the efficiency and effectiveness of medical record documentation.

This study aims to determine the impact of EMR implementation on the completeness of inpatient medical records at Oto Iskandar Di Nata General Hospital.

METHOD

This study is a descriptive study with quantitative analysis aimed at examining the implementation of EMR and the percentage of completeness of inpatient medical records at Oto Iskandar Di Nata General Hospital in March 2025, with a total population of 1,552 inpatient visits. The sample size in this study was determined using the *Slovin* formula as follows:

$$n = \frac{N}{(1 + N\,e^2)}$$

Notes:
n = Sample Size
N = Total Population
E = Error rate in sampling (10%)

$$n = \frac{1}{(1 + 1552\,(0.1)^2)}$$

$$n = \frac{1}{(1 + 15.52)}$$

n = 93.9 rounded to 94 Medical Records
Therefore, the sample used is 94 medical records. The instrument used in this study is *a* checklist form. The sample was taken randomly or using random sampling.

RESULT AND DISCUSSION

Result

Based on the results of the analysis of the completeness of inpatient EMR in March 2025 at Oto Iskandar Di Nata General Hospital, the percentage of data completeness was as follows:

Table 1. Patient Identification

Component	Number of EMR		Percentage	
	C	IC	C	IC
Name	94	0	100%	0%
Address	94	0	100%	0%
Place, and Date of Birth	94	0	100%	0%
National ID Number	85	9	90%	10%
Responsible Party	25	69	27%	73%
Total			83%	17%

The results of the data completeness analysis of the patient identification section of the EMR show that several components are 100% complete, namely the name, address, and place and date of birth. Meanwhile, the National ID Number (NIK) component is 90% complete, and the data on the responsible party has the lowest percentage at 27%.

Table 2. Important Reports

Component	Number of Medical Records		Percentage	
	C	IC	C	IC
• Medical Assessment	73	21	78%	22%
• Nursing Assessment	86	8	91%	9%
• Internal Transfer	87	7	93%	7%
• CPPT	88	6	94%	6%
Nursing Care	84	10	89%	11%
• EWS	88	6	94%	6%
• E-Resume	82	12	87%	13%
Total			89%	11%

The analysis of the completeness of important report sections shows that no component has achieved 100% completeness. Integrated Patient Progress Notes (CPPT) and Early Warning System (EWS) having the highest percentage at 94%, internal transfers at 93%, nursing assessments at 91%, nursing care plans and nursing care records at 89%, e-resumes at 87%, and medical assessments having the lowest completeness percentage at 78%.

Table 3. Author Authentication

Component	Number of Medical Records		Percentage	
	C	IC	C	IC
Attending Physician	94	0	100%	0%
Nurse Name	94	0	100%	0%
Electronic signature and Barcode	0	94	0%	100%
Total			66%	34%

The results of the analysis of the completeness of the author authentication section for doctors (Attending Physician) and nurses filling out the EMR are 100% complete. However, for the Electronic Signature and barcode components, the percentage of data completeness is 0%.

Discussion

Oto Iskandar Di Nata General Hospital has implemented the EMR system since February 16, 2024. The analysis results show that the completeness of electronic medical records for inpatients in March 2025 at Oto Iskandar Di Nata General Hospital has not yet reached 100%. However, there has been an improvement in the completeness of medical records since the implementation of the EMR system. However, as of now, the implementation of the EMR system has not been uniformly applied to all components that should be included in inpatient medical records. Some data is still written and must be filled out manually on paper.

Out of the 56 forms required to support digital inpatient EMR services, two forms have not been included in the system: the admission and discharge summary, and the refusal of referral statement. Five forms cannot be fulfilled within the system due to infrastructure limitations or regulatory requirements. As a result, the EMR achievement rate for inpatient care stands at 77.7%, with 22.3% of forms still not fully compliant. This situation impacts the completeness of electronic medical records. The obstacles faced that have prevented EMR from being fully implemented in all components that have an impact on data completeness include:

1. *User* Influence

Some *users* have not yet maximized their use of the EMR system, resulting in some menu forms within the system not being tested in the field. This has hindered the optimization process of the forms to identify their shortcomings.

Although the inpatient EMR system already has many components, in reality, some are still not filled out, such as *general consent*. Even though the EMR system provides a *general consent* form, in reality, many are still not filled out because staff prefer to fill out the form on paper.

In addition, inadequate user knowledge or a lack of full understanding of the EMR system implementation also posed obstacles. Age was also a factor, as senior doctors needed more time to adapt to the EMR system, which could lead to data accumulation or even forgotten data.

Another factor contributing to the incompleteness of medical record data entry is the limited time available for filling out forms, which is caused by the high workload of doctors (Wirajaya, 2019).

2. Unmaximized Feature Functions

Some features on the forms available in the system are not functioning optimally, such as edit, print, delete, view, and link.

For example, incomplete data in the Responsible Party (RP) component is caused by limitations in the information management system used. At the inpatient registration unit, staff have entered the name and phone number of the responsible party into the system. However, this information does not appear in the Electronic Medical Record (EMR) for inpatient care. As a result, the patient's responsible party data is not stored in the system. Only the patient's biological mother's data is recorded in the EMR, if it is filled in by the officer. In addition, the complete identity of the patient's responsible party is actually written on paper.

The main cause of incompleteness in the components with the lowest percentage, namely the electronic signature barcode for nurse and doctor , is that the system has not been fully accommodated. This is due to an information system that is not yet fully supportive, where the EMR only contains the doctor's barcode on the patient's e-resume. Meanwhile, in the Integrated Patient Progress Notes (*CPPT*) section, the electronic signature and barcode of the attending physician, as well as the initial medical assesment, were still missing. As for the nurse's TTE and barcodes, they are not available at all. As a result, the entire EMR shows an incompleteness rate of 100%.

The legality of medical records is ensured by the staff responsible for inputting patient medical records, including the names of doctors, midwives, or nurses, as well as the signatures of service providers (Alif, 2018).

3. Form completeness is not yet optimal.

Some forms cannot be entered into the system because they are complex, such as graphs, images, or documents that cannot be replaced digitally (e.g., baby footprints). Therefore, these forms are still written on paper.

This study aligns with research conducted by Mudzanifah, Noor Yulia, Deasy Rosmala Dewi, and Puteri Fanya titled “Identifikasi Kelengkapan Pengisian Rekam Medis Elektronik Pasien Rawat Inap Di RSKD Duren Sawit Jakarta Tahun 2022” which showed that the percentage of complete medical records was higher at 84%, while 16% of medical records were incomplete (Munazhifah et al., 2023).

Based on the study titled “Gambaran Penerapan Dan Kelengkapan Pengisian Rekam Medis Elektronik Rawat jalan Di Rumah Sakit TK. II Udayana Denpasar” the percentage of completeness was higher than the percentage of incompleteness. However, this still does not meet the minimum service standard for medical record completion, which must be 100% complete in all aspects of quantitative analysis (Suriawan et al., 2025).

This can be interpreted that the completeness of medical record data entry studied has not yet met the criteria set by the Ministry of Health Regulation, which is 100%.

Incomplete medical record entries hinder insurance claim procedures and administrative compliance processes. The quality of medical records is crucial as it directly influences the quality of healthcare services provided at healthcare facilities (Suriawan et al., 2025).

RECOMMENDATIONS AND CONCLUSION

Recommendation

The implications of incomplete medical record data can impact the quality of the hospital. Therefore, it is important for the Oto Iskandar Di Nata General Hospital to conduct regular evaluations.

1. Conduct regular evaluations and socialization to ensure that the completion of the Medical Record Form (MRF) is smooth and timely. For *users* who are unfamiliar or less experienced with the system, short training sessions, direct guidance, and practical manuals can be provided to facilitate adaptation.
2. Conduct regular checks on existing features, followed by system evaluation and development to ensure all features function properly.
3. Forms should be grouped based on difficulty level and organized in a simpler yet comprehensive format. For sections still using a hybrid system (manual and digital), it is recommended to transition fully to a digital system to improve data entry efficiency and avoid confusion.

Conclusion

In conclusion, the completeness of inpatient electronic medical record (EMR) at Oto Iskandar Di Nata General Hospital in March 20225 has not yet met the 100% standard required by the Indonesian Ministry of Health Regulation No. 24 of 2022 on Medical Records, which outlines the minimum standards for patient documentation in healthcare facilities. While has been a significant improvement since the implementation of the EMR system, with a completeness rate of 79% and an incompleteness rate of 21%, full integration across all required components has not yet been achieved.

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