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Factors Associated with Incomplete Electronic Medical Records by Nurses after the Transition from Manual Documentation

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ABSTRACT

Introduction: Electronic medical records are a crucial part of healthcare. Nursing staff have a crucial responsibility to document all nursing actions or care provided to patients. Incomplete medical records can impact the quality of care and patient safety.
Objective: The purpose of this study was to determine factors associated with incomplete electronic medical records by nurses following the transition from manual documentation.
Method: This type of research was conducted with a cross-sectional design through a quantitative method approach. The population in this study were all nurses in the inpatient ward at Dr. (H.C) Ir. Soekarno Regional General Hospital in 2025 with a total of 160 nurses and a sample of 125 people. The sampling technique used in this study was the Non-Probability Sampling Technique with the Quota Sampling method. Data analysis used univariate analysis and bivariate analysis with the chi-square test with a 95% confidence level (α = 0.05).
Result: This study shows that there is a relationship between workload (p = 0.033, POR = 2.526), motivation (p = 0.003 and POR = 5.238) and attitude (p = 0.004, POR = 3.441) with incomplete electronic medical records by nurses after the transition to manual documentation. In the variables of age (p = 0.210) and length of service (p = 0.127) it was concluded that there was no relationship with incomplete electronic medical records by nurses after the transition to manual documentation.
Conclusion: The suggestion from this study is the importance of maintaining and improving nurse motivation, maintaining nurse attitudes, regulating the distribution of nurse workload in inpatient rooms and conducting a refresher regarding the use of electronic medical records in the hospital environment.

Keywords: attitude, electronic medical records, hospital, motivation, workload

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Introduction

Documentation is any form of written or printed record that can be used as reliable evidence by authorities. In nursing practice, client medical record documentation plays a crucial role. Nursing documentation must be accurate, comprehensive, and flexible to collect important data, maintain continuity of care, track client outcomes, and reflect applicable practice standards. Effective documentation ensures continuity of care, saves time, and minimizes the risk of errors (Widyanti et al., 2020).

Indonesia has now entered a modern era rich in technology. Amidst globalization, developments in information technology are encouraging every sector to adapt to rapid and continuous change. One area significantly impacted by this technological advancement is hospital information systems. As institutions focused on public health services, hospitals must strive to improve the quality of their services to remain competitive (Yoga et al., 2021). One service in healthcare facilities that can be integrated with information technology is medical records. Most of the processes that were traditionally carried out manually have been converted into digital format (Jip Stefani, 2023).

Medical records are a crucial part of healthcare services. The quality of healthcare services and the performance of healthcare workers are significantly influenced by technical support for medical records, especially in the initial stages of implementation. Manual medical records are considered inefficient because hospitals require large amounts of paper to create patient records (Johnson WG, 2021). The completeness of medical records is crucial because it influences the care provided by healthcare workers and impacts the quality of hospital care. One way to assess the quality of hospital services is by examining medical record management (Siwayana et al., 2020).

Incomplete medical records can be problematic, given that medical records are often the only records that provide detailed information about a patient's care in the hospital. Incomplete medical records can hinder patients' rights to access information contained in their medical records. Furthermore, they complicate the disease classification and coding process, hinder hospital report preparation, legal documentation, and the patient insurance claim process. Ultimately, incomplete medical records can impact the quality of care and patient safety (Siwayana et al., 2020).

Electronic medical records were first used in American hospitals in 1967 and were later developed in other countries, including Asian countries, particularly in Southeast Asia. Given the numerous benefits brought by the development of medical record technology, it has received a warm welcome (Aji R, 2018). Electronic medical records are called electronic medical records (EMD) in Indonesia, beginning with the development of e-health. In Indonesia, not all medical facilities use electronic medical record systems. Currently, 78 hospitals have implemented electronic health record technology, but most remain underutilized (Ardiansyah, 2022). A March 2022 study by the Indonesian Hospital Association (PERSI) found that 50% of 3,000 hospitals in Indonesia have implemented electronic health records, but only 16% are likely to be successful (PERSI, 2022).

Based on a preliminary survey conducted by researchers at Dr. (H.C.) Ir. Soekarno Regional General Hospital, of the 20 medical records collected, 8 (40%) were completed completely, while 12 (60%) were incomplete. In practice, there were deficiencies in assessment, nursing care, education, discharge preparation, and nursing implementation, all of which were incomplete in the medical records. Interviews with several nurses revealed that the numerous procedures required for patients resulted in a lack of time for complete documentation. Some nurses, however, had performed procedures but failed to document

them, prompting the next nurse on duty to document the results. Based on previous research by Sevtia Andriana (2024), entitled "Evaluation of 3S Documentation (SDKI, SIKI, SLKI) in the Hospital Management Information System (SIMRS) in the Class III Adult Ward of Dr. (H.C.) Ir. Soekarno Regional General Hospital in 2024," it was found that documentation was SIMRS-based and had been running well in accordance with PPNI guidelines, although there were still obstacles in its implementation. Factors that hinder nurses in documenting nursing care were categorized into two parts: problems related to the system itself and limitations in SIMRS implementation, with the keyword being some nurses' lack of understanding of SIMRS documentation (Andriana, 2024).

Given the importance of completing complete medical records, researchers wanted to identify factors that lead to incomplete medical record documentation. Electronic medical records remain a form of documentation that has not been widely researched. Based on the background that has been explained, the researcher is interested in conducting research on Factors Related to Incomplete Electronic Medical Records by Nurses After the Transition to Manual Documentation at Dr. (H.C) Ir. Soekarno Regional General Hospital, Bangka Belitung Islands Province in 2025.

Objective

The factors related to incomplete electronic medical records by nurses after the transition to manual documentation at Dr. (H.C.) Ir. Soekarno Regional General Hospital, Bangka Belitung Islands Province in 2025 were identified.

Method

This study was conducted with a cross-sectional design through a quantitative method approach. The population in this study were all nurses in the inpatient ward of Dr. (H.C) Ir. Soekarno Regional General Hospital in 2025 with a total of 160 nurses and a sample of 125 people. The sampling technique used in this study was the Non-Probability Sampling Technique with the Quota Sampling method. This study was conducted on May 2, 2025 to June 20, 2025 in the inpatient ward of Dr. (H.C) Ir. Soekarno Regional General Hospital, Bangka Belitung Islands Province. In the process, the research was conducted by the researcher establishing a common perception with the head of the room regarding the documentation of EMR by nurses. The researcher explained the research process, namely by asking questions by sharing the questionnaire link (https://forms.gle/AyacRFYJEkWrrEsw5) to respondents explaining the informed consent sheet. After the respondents were ready and agreed, they then clicked the agree column to fill out the questionnaire. Next, the researcher gave the respondents time to fill out the questionnaire. After the questionnaire was filled out, the researcher checked the questionnaire that had been filled out by the respondents. The researcher was assisted by the head of the room to conduct observations in documenting electronic medical records by nurses, making tabulations and processing data. Data analysis used univariate analysis and bivariate analysis with the chi-square test at a 95% confidence level ($\alpha = 0.05$).

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Result

Table 1. The relationship between age and incomplete electronic medical records by nurses after the transition to manual documentation

Age	Electronic Medical Record Documentation						p value	POR (95%CI)
	Incomplete		Complete		Total			
	n	%	n	%	n	%		
Late adolescence – early adulthood	25	72.5	66	72.5	91	100	0.210	0.541 (0.237 – 1.233)
Late adulthood	14	41.2	20	58.8	34	100		

Table 1 shows that 14 nurses (41.2%) with incomplete electronic medical record documentation were in late adulthood, more than nurses in late adolescence – early adulthood. Meanwhile, 66 nurses (72.5%) with complete electronic medical record documentation were in late adolescence – early adulthood.

Based on the analysis results using the Chi-Square Test on Continuity Correction, p (0.210) > α (0.05) was obtained. Therefore, it was concluded that there was no relationship between age and incomplete electronic medical records by nurses after the transition to manual documentation at Dr. (H.C.) Ir. Soekarno Regional General Hospital.

Table 2. The relationship between length of service and incomplete electronic medical records by nurses after the transition to manual documentation

Length of Service	Electronic Medical Record Documentation						p value	POR (95%CI)
	Incomplete		Complete		Total			
	n	%	n	%	n	%		
New	18	40.9	26	59.1	44	100	0.127	1.978 (0.907 – 4.314)
Long-Term	21	25.9	60	74.1	81	100		

Table 2 shows that nurses with incomplete electronic medical record documentation who were new in their service numbered 18 (40.9%), more than nurses with long-term service. Meanwhile, nurses with complete electronic medical record documentation were more likely to be long-term, with 60 (74.1%). Based on the results of the analysis using the Chi-Square Test on Continuity Correction, p (0.127) > α (0.05) was obtained, so it was concluded that there was no relationship between length of service and incomplete electronic medical records by nurses after the transition to manual documentation at Dr. (H.C.) Ir. Soekarno Regional General Hospital.

Table 3. The relationship between workload and incomplete electronic medical records by nurses after the transition to manual documentation

Workload	Electronic Medical Record Documentation						p value	POR (95%CI)
	Incomplete		Complete		Total			
	n	%	n	%	n	%		
Severe	26	40.6	38	59.4	64	100	0.033	2.526 (1.146 – 5.567)
Light	13	21.3	48	78.7	61	100		

Table 3 shows that 26 nurses (40.6%) had incomplete electronic medical record documentation, more than those with light workloads. Meanwhile, 48 nurses (78.7%) had complete electronic medical record documentation. Based on the results of the analysis using the Chi-Square Test on Continuity Correction, p (0.033) < α (0.05) was obtained, so it was concluded that there was a significant relationship between workload and incomplete electronic medical records by nurses after the transition to manual documentation at Dr. (H.C) Ir. Soekarno Regional General Hospital. Further analysis obtained a POR value of 2.526 (95%CI = 1.146-5.567), meaning that nurses with heavy workloads had a tendency to document incomplete EMR 2.526 times greater than nurses with light workloads.

Table 4. The relationship between motivation and incomplete electronic medical records among nurses after the transition to manual documentation

Motivation	Electronic Medical Record Documentation						p value	POR (95%CI)
	Incomplete		Complete		Total			
	n	%	n	%	n	%		
Weak	11	64.7	6	35.3	17	100	0.003	5.238 (1.772 – 15.484)
Strong	28	25.9	80	74.1	109	100		

Table 4 shows that nurses with incomplete electronic medical record documentation who were weakly motivated numbered 11 (64.7%), more than nurses with strong motivation. Meanwhile, nurses with complete electronic medical record documentation were more strongly motivated, totaling 80 (74.1%).

Based on the results of the analysis using the Chi-Square Test on Continuity Correction, p (0.003) < α (0.05) was obtained, so it was concluded that there was a significant relationship between motivation and incompleteness of electronic medical records by nurses after the transition to manual documentation at Dr. (H.C) Ir. Soekarno Regional General Hospital. Further analysis obtained a POR value of 5.238 (95%CI = 1.772-15.484), meaning that nurses with weak motivation had a tendency to document incomplete EMR 5.238 times greater than nurses with strong motivation.

Table 5. The Relationship Between Attitudes and Incompleteness of Electronic Medical Records by Nurses After the Transition to Manual Documentation

Attitude	Electronic Medical Record Documentation						p value	POR (95%CI)
	Incomplete		Complete		Total			
	n	%	n	%	n	%		
Negative	27	44.3	34	55.7	61	100	0.004	3.441 (1.537 – 7.703)
Positive	12	18.8	52	81.3	64	100		

Table 5 shows that 27 nurses (44.3%) with incomplete electronic medical record documentation had a negative attitude, outnumbering those with positive attitudes. Meanwhile, 52 nurses (81.3%) had a positive attitude. Based on the results of the analysis using the Chi-Square Test on Continuity Correction, p (0.004) < α (0.05) was obtained, so it was concluded that there was a significant relationship between attitudes and incompleteness of electronic medical records by nurses after the transition to manual documentation at Dr. (H.C) Ir. Soekarno Regional General Hospital. Further analysis obtained a POR value of 3.441 (95%CI = 1.537-7.703) meaning that nurses with negative attitudes had

a tendency to document incomplete EMR 3.441 times greater than nurses with positive attitudes.

Discussion

Nurses of all ages who actively learn and follow these developments tend to produce more complete documentation. Older age doesn't mean they're behind on information, just as younger age doesn't guarantee they're always up-to-date. Furthermore, the completeness of documentation is greatly influenced by the design of the documentation system itself, whether it's a manual form or a feature in the EMR. An intuitive, structured system with clear templates will make it easier for nurses of all ages to document completely. Nurses, regardless of age, who are overworked often have limited time to document in detail, resulting in incomplete documentation.

Furthermore, effective supervision and constructive feedback from superiors or colleagues can help nurses improve the completeness of their documentation. A workplace culture that emphasizes the importance of accurate and complete documentation and provides support encourages all nurses to perform well in this aspect. Therefore, it's not age itself that matters. Nurses of all ages need appropriate support and development to document to the highest standards.

Based on the results of related research, researchers conclude that there is no significant relationship between length of service and the variable of length of service, which is more influenced by knowledge, skills, motivation, documentation systems, compliance with applicable procedures, and the work environment. Therefore, whether length of service is new or long, or sufficient experience does not guarantee that healthcare workers will complete medical records completely. In the era of EMR, nurses' ability to operate the system is key. Length of service does not guarantee proficiency in adapting to technology. Implemented recording systems that are not user-friendly, lack of infrastructure, or frequent technical issues will be barriers for all nurses.

The work environment, such as a heavy workload, is another cause of incomplete documentation. This affects all nurses, both recent graduates and those with decades of experience. When nurses are overloaded and time-constrained, they will struggle to complete documentation. Time pressure and fatigue can lead to missed details. Electronic documentation can be efficient, but it still requires sufficient time allocation. Effective supervision and constructive feedback from superiors or colleagues, such as praise or rewards, can help all nurses improve the completeness of their documentation.

Researchers argue that an imbalance in workload can negatively impact the performance and quality of nursing services, including nurse documentation. As a result, nursing services become less effective. Therefore, nurses are expected to manage their work time so that work can be completed.

With the RME system, nurses spend too much time in front of computers inputting data, reducing the time spent interacting directly with patients. Nurses who experience burnout due to high work stress tend to lose motivation in all aspects of their work, including documentation.

Support from management and coworkers is crucial for motivation. Without consistent supervision or constructive feedback on documentation quality, nurses feel unappreciated, leading to decreased motivation. Good documentation is rarely rewarded or recognized. Nurses feel their hard work in documenting goes unappreciated, especially if there are no incentives (e.g., bonuses, promotions).

Therefore, it is crucial for nurses to recognize, understand, and maintain their motivation to document and the results they achieve. In this study, motivation was the primary factor strongly related to the completeness of RME documentation because high motivation can encourage nurses to actively and voluntarily document, regardless of other factors. Nurse motivation can also determine nurse performance in terms of documentation implementation.

Nurses attitudes are the foundation that shapes their behavior in electronic documentation. A positive attitude will encourage nurses to adapt, learn, and utilize EMR optimally, resulting in more comprehensive and high-quality documentation. Conversely, a negative attitude can be a significant obstacle, even if the system is highly sophisticated. Negative attitudes can arise from a lack of full understanding or appreciation of the crucial role of documentation. If nurses perceive documentation as a vital communication tool, legal evidence, and the basis for ongoing care, they will feel the need to perform it diligently. Therefore, nurses are expected to view documentation as an integral and essential part of quality care. Efforts to improve the quality of electronic documentation should include interventions aimed at developing and maintaining positive nurse attitudes toward EMR, through training, support, and effective communication to enhance patient safety and care efficiency.

Conclusion

The study conducted at Dr. (H.C.) Ir. Soekarno Regional General Hospital, Bangka Belitung Islands Province, in 2025 revealed that factors associated with incomplete electronic medical records by nurses after the transition to manual documentation were workload, motivation, and nurse attitudes. Meanwhile, age and length of service were found to be unrelated to the completeness of medical record documentation. Among all the variables examined, motivation emerged as the most dominant factor influencing incomplete documentation, highlighting the importance of enhancing nurses' work motivation to improve the quality of medical record documentation in the hospital.

Conflict of Interest

No declare.

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