



**THE IMPLEMENTATION OF ELECTRONIC MEDICAL RECORDS ON  
PERFORMANCE THROUGH NURSES' WORKLOAD AND COMPLETENESS  
OF NURSING CARE DOCUMENTATION**

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**ABSTRACT**

Effective nursing care services are an indicator of healthcare service quality. The use of electronic medical records (EMRs) plays a crucial role in improving the quality of nursing care services. Complete and accurate nursing care documentation has significant implications for the quality of nursing care provided. Objective: This study aims to analyze the impact of implementing electronic medical records on nurses' performance through nurses' workload and the completeness of nursing care documentation. Method: This study employed a quantitative research design with a cross-sectional approach. A total sampling technique is applied involving 85 respondents as the sample. Data analysis was conducted using path analysis to determine the relationships between research variables. Results: Statistical regression tests (Model 1 and Model 2) showed that the implementation of electronic medical records significantly affects nurses' workload, the completeness of nursing care documentation, and nurses' performance. Path analysis results indicated that electronic medical records have a direct impact on nurses' performance (0.225). Additionally, the effect of electronic medical records on nurses' performance through workload was 0.178, while its effect on performance through the completeness of nursing care documentation was 0.108. Conclusions: The study concludes that there is no significant indirect effect of electronic medical record implementation on nurses' performance through workload and completeness of nursing care documentation.

Keywords: electronic medical records (EMR); nursing documentation; nurses' performance; workload

**How to cite (in APA style)**

Rudiantoro, D., Suprpto, S. I., & Agustin, A. (2025). The Implementation of Electronic Medical Records on Performance through Nurses' Workload and Completeness of Nursing Care Documentation. *Indonesian Journal of Global Health Research*, 7(3), 335-342. <https://doi.org/10.37287/ijghr.v7i3.6091>.

**INTRODUCTION**

Healthcare services are one of the fundamental needs required by every individual. The rapid advancement of the world has led to various challenges and crises in healthcare services. These services encompass the quality and availability of care infrastructure, professional healthcare workers, health policies, and quick, accurate access to information. This crisis has resulted in ineffective and inadequate healthcare services. Effective nursing care services are a crucial indicator in assessing the quality of healthcare services (Gultom et al., 2023). Adequate healthcare services are the expectation of every individual as a healthcare service user. The quality and effectiveness of healthcare services are influenced by the efficiency of human resources, particularly nurses (Basalamah et al., 2021). An excessive nursing workload leads to suboptimal services, resulting in patient dissatisfaction. Field surveys indicate that 51% of Indonesian nurses experience work fatigue, accompanied by symptoms such as frequent headaches, decreased friendliness, exhaustion, and insufficient rest (Pasaribu et al., 2021).

Excessive nursing duties in hospitals contribute to increased workload, making it difficult for nurses to complete their tasks efficiently (Hakman et al., 2021). A high workload

negatively affects nurses' performance, leading to patient dissatisfaction with healthcare services (Astuti, 2016). This issue exacerbates the healthcare service crisis. Manual data documentation is another issue contributing to the healthcare service crisis. Paper-based medical records require significant time and pose a high risk of data loss. The manual system also leads to data inaccuracies, which can affect decision-making and diagnosis by healthcare providers (Santosa et al., 2023). A study conducted by Semachew (2018) in Ethiopia found that out of 338 reviewed documents, 264 (78.1%) included nursing care processes attached to patient files, 107 (31.7%) lacked nursing diagnoses, 185 (54.7%) included prioritized care plans, 173 (51.2%) did not document interventions based on plans, and 179 (53.0%) failed to evaluate their interventions. Another study by Putra et al. (2016) found that an average of 45% of nurses did not fully document nursing interventions. Similarly, research by Devhy & Widana (2019) revealed that while 85.3% of administrative data was complete, clinical anesthesia documentation completeness was only 43%.

Effective documentation management and information systems play a vital role in supporting efficient hospital administration. Proper management significantly contributes to the provision of high-quality and safe nursing care. Incomplete or inaccurate documentation can negatively impact the quality of nursing services by hindering the ability to assess the success of nursing interventions (Syah, 2020). The rapid advancement of information technology has significantly benefited various sectors, including healthcare. The implementation of information systems in healthcare services provides numerous advantages (Siagian, 2016). These systems enhance service quality, reduce healthcare costs, improve efficiency, and optimize hospital operations and personnel productivity (Damanik & Rani, 2020). The use of EMRs plays a crucial role in improving healthcare service quality by addressing issues such as interoperability, efficiency, and flexibility. The successful implementation of EMRs requires comprehensive preparation, thorough planning, a dedicated team, and strong support from hospital management, funding organizations, and system developers (Mashoka et al., 2019). The implementation of EMRs facilitates easy access to patient data from different locations and departments, improves patient health monitoring, and minimizes medical errors. EMRs enhance the efficiency of medical documentation, accelerate patient information retrieval, and ensure secure data storage (Chaudhry et al., 2006).

The implementation of EMRs has proven beneficial in reducing both administrative and clinical tasks for nurses, increasing patient visits, and improving the accuracy of medical procedures. This aligns with the findings Irawan (2019), who emphasized that EMRs provide substantial benefits for hospitals and staff, but successful implementation requires personnel readiness to adapt to digital systems. Therefore, this study aims to analyze the relationship between the implementation of electronic medical records and nurses' performance, workload, and the completeness of nursing care documentation.

## **METHOD**

This research employs a quantitative approach using an observational analytical method with a cross-sectional study design. This design is used to examine the correlation dynamics between risk factors and outcomes by collecting data at a single point in time. The study does not involve continuous follow-up over a specific period, and both independent and dependent variables are measured simultaneously during the research process. The study framework outlines the planned activities and the relationships among the key variables being investigated. The research examines the implementation of EMR and its impact on nurses' performance, mediated by workload and the completeness of nursing care documentation at Santa Clara Hospital, Madiun. The study subjects consist

of all nurses at Santa Clara Hospital, Madiun, totaling 85 nurses. A total sampling technique is applied, meaning all members of the population are included as research participants. The objects of this study include electronic medical records, nurses' performance, nurses' workload, and the completeness of nursing care documentation. The data collection instruments used in this study consist of structured questionnaires, including: Electronic Medical Records Questionnaire, Nurses' Performance Questionnaire, Nurses' Workload Questionnaire, and Nursing Care Documentation Questionnaire

Independent Variable (X) in this study was Implementation of Electronic Medical Records (EMR). Dependent Variable (Y) in this study was Nurses' Performance. Moderating Variables (M) in this study was Nurses' Workload (M1) and Completeness of Nursing Care Documentation (M2). The research data is collected through questionnaires distributed to all selected respondents. The data analysis is performed using path analysis with the Statistical Product and Solution Service (SPSS) software to test the study hypotheses. The path analysis method is a form of multiple regression analysis used to evaluate causal models by examining relationships between a dependent variable and two or more independent variables. The study is conducted from August to December 2024 at Santa Clara Hospital, Madiun. This research adheres to ethical principles in human research, including: respect for human dignity which participants are provided with information about the research objectives, and informed consent is obtained, privacy and confidentiality which participants' personal information remains confidential and is not disclosed, justice and inclusiveness which the research process is conducted with transparency, fairness, and honesty, and balancing harms and benefits which the study aims to maximize benefits for society while minimizing potential risks to participants.

## RESULT

Table 1.  
Characteristics of Respondents (n=85)

Characteristic	Category	f	%
Age	<26 years	11	13
	26-35 years	49	58
	36-45 years	20	24
	46-55 years	5	6
Gender	Male	16	19
	Female	69	81
Marital Status	Single	18	21
	Married	67	79
Work Experience	<1 year	11	13
	1-3 years	36	42
	>3 years	38	45
Education Level	Diploma	24	28
	Nurse	61	72
Work Unit	Special Unit (ER, ICU, OR)	16	19
	Outpatient Clinic	15	18
	Inpatient Ward	54	64

The study involved 85 respondents, predominantly in the 26-35 years age group (58%), suggesting that most of the nurses are in their early to mid-career stage. The majority of respondents were female (81%) and married (79%), reflecting a typical demographic distribution in the nursing profession. Regarding work experience, nearly half of the nurses (45%) had more than three years of experience, while 42% had between 1-3 years, indicating a workforce with substantial clinical exposure. In terms of education level, most respondents

(72%) held a nurse qualification, whereas 28% had a diploma. The distribution of work units showed that the majority (64%) worked in inpatient wards, while fewer were in special units (19%) or outpatient clinics (18%).

The mean score of 66.34 ( $\pm 1.359$ ) on a scale ranging from 60 to 67 suggests that the adoption of EMR is relatively high among nurses. The low standard deviation indicates minimal variability in responses. Nurse Performance with a mean score of 47.21 ( $\pm 1.407$ ) on a scale of 42 to 48, nurse performance appears to be relatively high, with little variation among respondents. The mean of nurse workload score of 44.79 ( $\pm 1.787$ ) on a scale of 40 to 46 suggests that nurses experience a moderate workload. However, the slightly higher standard deviation indicates some variability in perceived workload among respondents. The highest mean score of Nursing Care Documentation is 95.04  $\pm 1.672$  on a scale of 90 to 96 implies that documentation completeness is well-maintained, with consistency among nurses.

Table 2.  
Descriptive Statistical Analysis of Research Variables

Variable	Min	Max	Mean	Std. Deviation
Electronic Medical Records (EMR)	60	67	66.34	1.359
Nurse Performance	42	48	47.21	1.407
Nurse Workload	40	46	44.79	1.787
Nursing Care Documentation	90	96	95.04	1.672

Table 3.  
Path Analysis of EMR Implementation on Nurse Workload

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.667	8.446		.434	.665
EMR	.620	.127	.471	4.869	.000

Based on the table above, the significance value of EMR implementation on nurse workload is 0.000 ( $<0.05$ ), indicating a significant effect.

Table 4.  
Path Analysis of EMR Implementation on Nursing Care Documentation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	62.111	8.202		7.573	.000
EMR	.496	.124	.403	4.015	.000

The significance value of EMR implementation on nursing care documentation is 0.000 ( $<0.05$ ), indicating a significant effect.

Table 5.  
Path Analysis of EMR Implementation on Nurse Performance through Workload and Nursing Care Documentation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-2.769	7.524		-.368	.714
EMR	.233	.106	.225	2.189	.031
Workload	.297	.075	.377	3.956	.000
Nursing Care Documentation	.223	.077	.266	2.889	.005

The table 5 shows that the direct effect of EMR on nurse performance is 0.225. The indirect effect of EMR on nurse performance through workload is  $0.471 \times 0.377 = 0.178$ . The indirect effect of EMR on nurse performance through nursing care documentation is  $0.403 \times 0.266 = 0.108$ . Since the direct effect (0.225) is greater than the indirect effects (0.178 and 0.108), it can be concluded that EMR has a significant direct impact on nurse performance, but its indirect effects through workload and documentation are not significant.

## **DISCUSSION**

Based on the statistical regression results of Model 1, it was found that the Electronic Medical Record (EMR) variable had a significance value of 0.000, which is  $< 0.05$ . This result suggests that in Model 1, the Electronic Medical Record (EMR) variable has a significant effect on the nurses' workload variable. The author assumes that respondents' age influences their workload and performance. According to the research data, most respondents were aged 26-35 years, totaling 49 respondents (58%). This age range is considered a productive age where individuals reach maturity in thinking patterns and the ability to process new knowledge. This also relates to their readiness to adopt new technology. Nurses' workload refers to the total amount of nursing services performed by nurses in providing patient care, both directly and indirectly. Manually filling out medical records by handwriting and then returning them to the storage unit adds to the list of tasks that nurses must complete. Implementing electronic medical records in healthcare services helps healthcare professionals, especially nurses, in efficiently recording patient medical records. This aligns with Irawan (2019), who stated that the use of electronic medical records benefits hospitals and hospital staff, although it must be accompanied by staff readiness in mastering computer systems. Similarly, Herlina (2023) found a significant relationship between the use of electronic medical records and nurses' workload.

Based on the statistical regression test of Model 1, it was found that the Electronic Medical Records (EMR) variable had a significance value of 0.000, which is  $< 0.05$ . This result suggests that Electronic Medical Records (EMR) significantly affect the completeness of nursing care documentation. The researcher assumes that nurses' education level is one of the factors influencing the use of electronic medical records. According to the research data, most respondents had a final education level of a nursing degree, totaling 61 respondents (72%). Education influences how individuals behave; the higher a person's education level, the broader and better their knowledge. Knowledge is an essential factor in shaping behavior. Behavior based on knowledge tends to persist longer than behavior without a knowledge foundation (Darsini et al., 2019). Nursing care documentation is part of nursing care services provided by nurses to patients. The process of filling out nursing care documentation begins with assessment results, determining nursing diagnoses, selecting nursing interventions, implementing nursing actions, and conducting evaluations. Electronic medical records contain notes on the patient's condition and progress, forming the foundation of e-health. Medical records serve as legal documents concerning patients within the hospital environment (Keshta & Odeh, 2021).

Electronic documentation increases efficiency for nurses in performing nursing care. Nurses and other healthcare professionals find it easier to access data more quickly, ensuring patient data security and improving nurses' performance. This aligns with Mathar & Igayanti (2021), who highlighted that EMR offer advantages such as easier information retrieval, safer data storage, and faster data access when needed. Likewise, Rahayu et al. (2024) found that electronic documentation facilitates nurses in documenting nursing care in terms of quality, quantity, and timeliness. Based on the regression analysis of Model 2, EMR had a significance value of 0.031, which is  $< 0.05$ . This result suggests EMR significantly affect nurses' performance at Santa Clara Hospital, Madiun, in 2025. The beta value was 0.225, indicating that electronic medical records have a direct impact of 0.225 on performance. The use of electronic medical records undeniably has a positive impact on nurses' performance in providing patient care. Government regulations through Minister of Health Regulation No. 24 of 2022 on medical records establish a mandatory policy for healthcare services to use EMR. The

implementation of EMR significantly impacts nursing care documentation, leading to improvements in nurses' performance and healthcare service quality.

This aligns with Swedarma & Dwidasmaria (2019), who found that electronic nursing documentation significantly affects nurses' performance in hospitals and clinics. Similarly, a study by Salleh et al. (2021) revealed that electronic medical record systems support clinical tasks and enhance healthcare providers' workflow, improving the quality of healthcare service systems. Based on the regression analysis of Model 2, the nurses' workload variable had a significance value of 0.000, which is  $< 0.05$ . This result indicates that workload significantly affects nurses' performance. According to Adelia et al. (2024), both partially and simultaneously, workload positively and significantly influences nurses' performance. Excessive workload causes nurses to lose focus and concentration. Proper workload management can prevent the negative impact of workload overload, such as declining nurses' performance and the quality of nursing services. Hamizar (2020) also found that workload affects performance. Similarly, Hati et al. (2024) concluded that nurses' workload significantly influences their performance.

Rochman & Ichsan (2021) emphasized that workload distribution should be balanced according to employees' competencies and abilities; otherwise, it can cause performance issues. This finding is reinforced by Basalamah et al. (2021), who stated that work stress, motivation, and workload affect nurses' performance. High workload is associated with lower nurses' performance, as an excessive workload forces nurses to perform tasks beyond their responsibilities, leading to suboptimal service delivery (Nartiningih et al., 2023). Based on the regression analysis of Model 2, the completeness of nursing care documentation had a significance value of 0.005, which is  $< 0.05$ . This result indicates that the completeness of nursing care documentation significantly affects nurses' performance. Nurses' performance is fundamentally evaluated based on the implementation of nursing care as a benchmark for nursing service practice. Performance documentation can be assessed through the completeness and accuracy of nurses in filling out medical records. Manual medical records often add an extra burden, as handwritten documentation increases the risk of errors. Additionally, hospital policies requiring nurses to retrieve and return medical records further increase their workload, ultimately impacting performance.

EMR provide an effective solution to enhance service quality, particularly in nursing care documentation. Standardized medical records determine the success of clinical systems, which rely on accessibility, completeness, and data accuracy (Tajirian et al., 2020). Salleh et al. (2021) also found that standardized electronic medical records are user-friendly, facilitate data entry, ensure accurate diagnoses, and enable timely and appropriate treatments. EMR implementation serves as an effort in the healthcare sector to improve service quality, including workflow enhancement and addressing documentation challenges associated with manual records. Electronic documentation significantly improves the accuracy and completeness of patient records while reducing issues related to illegible handwriting (Herlina et al., 2022).

## **CONCLUSION**

The implementation of Electronic Medical Records (EMR) at Santa Clara Hospital in Madiun has been found to have a significant impact on various aspects of nursing practice. Specifically, EMR adoption significantly affects nurses' workload, the completeness of nursing care documentation, and overall nurse performance. However, the study reveals that the impact of EMR on nurse performance is not mediated by workload or documentation completeness.

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