Original Article

Nursing Supervision and Electronic Medical Record Documentation Quality among Practicing Nurses: A Cross-Sectional Study

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ABSTRACT

Background: Digital transformation in healthcare has promoted the use of Electronic Medical Records (EMR) as the standard for nursing documentation. Supervision is a key managerial strategy influencing its successful implementation among practicing nurses. However, empirical evidence on how supervision components affect the quality of electronic nursing documentation in low- and middle-income countries remains limited. Therefore, this study aims to analyze the strategic role of nursing supervision in strengthening EMR documentation.

Methods: This analytical cross-sectional study examined the relationship between the role of supervision and the strengthening of electronic medical records. The sample included 352 practicing nurses selected through total sampling. Data were collected using a validated and reliable structured questionnaire (Cronbach's alpha > 0.60). Analysis was conducted using Spearman's rank correlation and binary logistic regression to assess the relationship and influence of supervision on documentation quality.

Results: The results showed that the supervision variable (planning, coordination, control, monitoring, and feedback) was significantly related to electronic medical record documentation ($p < 0.001$), with feedback being the most dominant factor (Exp(B)=233.049; 95% CI: 15,606–3480.287).

Conclusion: Nursing supervision plays a strategic role in strengthening the implementation of Electronic Medical Record documentation. From a managerial and policy perspective, these findings confirm that strengthening the supervision system, primarily through standardized and continuous feedback mechanisms, should be a priority for nursing leaders and hospital management.

Keywords: Electronic Medical Records; Nursing Supervision; Nursing Documentation; Patient Safety; Health Services

Implications for Practice:

- Nursing supervision should be strengthened as a key policy strategy to improve the quality and consistency of electronic nursing documentation, with structured supervision integrated into Electronic Medical Record implementation policies, particularly in resource-limited health facilities.
- Constructive supervisory feedback should be incorporated as a mandatory component of electronic nursing documentation standards, as it enhances nurses' professional awareness, accountability, and compliance with documentation practices.
- In Low- and Middle-Income Countries, policy efforts should prioritize strengthening nursing supervisors' competencies in clinical leadership, effective communication, and digital literacy to support nurses in adapting to digital documentation systems within existing infrastructure and resource

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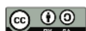

Implications for Practice:

constraints.

Introduction

Recording by nurses not only demonstrates accountability in their work but is also a crucial part of ensuring that patients continue to receive high-quality care and are protected from harm. Accurate and detailed data provide medical staff with the opportunity to understand the patient's condition in depth, prevent errors in treatment, and ensure effective collaboration between different professions (Alkharji et al., 2019). In terms of service quality, accurate documentation shows that care is provided regularly, while to improve patient safety, well-organized records are an important way to avoid risks, identify adverse events, and serve as a basis for routine evaluation of the patient's condition (Nurfanita, 2025).

Documentation in nursing is one of the crucial elements in nursing activities that acts as a means of communication between professionals, a legal evidence tool, a basis for clinical decision-making, and a measure of service quality. Accurate, comprehensive, and timely documentation greatly affects patient safety and continuity of care. However, many healthcare institutions, from international to local levels, still face challenges regarding the completeness, accuracy, and consistency of nursing documentation (Douma et al., 2024).

Technological developments in the field of health have become one of the strategies to overcome the challenges of documenting nursing care. The integration of technology has encouraged the transition from paper-based medical records to Electronic Medical Records (Otayf et al., 2024). The implementation of Electronic Medical Records can provide various benefits, such as better access to information, reduced possibility of data loss, faster communication flow in clinics, and improved accuracy and clarity in recording. The implementation of electronic documentation systems in nursing can improve the quality of documentation indicators and several aspects of patient safety (Corbett et al., 2025).

Based on the results of research conducted by, it is stated that incomplete data in EHR is an important variable in the quality of electronic medical records. These research results are also supported by (Zabolinezhad et al., 2022), whose assessment of EMR data quality in several hospitals in Iran showed that the total EMR quality score (completeness × accuracy) was < 70%, indicating that there are still many data issues in EMR. Meanwhile, data prevalence at a community health center in Surabaya shows that 23% of data in EMR is still incomplete (Novana et al., 2024). This condition is also similar to the results of research conducted by, where 33.3% of EMR records are incomplete, and there are gaps in data entry.

The integration of technology in nursing documentation is something new for nurses to explore further. The COVID-19 situation in Indonesia has created strong conditions for the comprehensive integration of technology in healthcare services. Nurses view this integration of technology as having a diverse impact on the provision of quality healthcare services for patients and their colleagues. Indirectly, this integration has an impact on changes in the work system that require professional adaptability. These changes are not only technical in nature but also impact the way nurses think, work, and interact in providing nursing care (Jedwab et al., 2022).

The transition from manual recording to Electronic Medical Records is a systemic change in nursing practice that serves as a stimulus that triggers the adaptation process of individuals and organizations

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(Hosseini & Soltanian, 2022). Effective coping mechanisms will result in adaptive responses in the form of increased work efficiency, improved documentation quality, and enhanced patient safety. However, if the coping mechanism process is ineffective, ineffective responses will arise in the form of resistance to the use of RME, work stress, data entry errors, and a decline in the quality of nursing documentation. Nursing supervision is one of the organizational interventions that helps nurses develop adaptive coping through technical coaching, documentation audits, constructive feedback, modeling of good practices, and advocacy for improvement (Alrasheeday et al., 2023).

In the realm of human resource management in nursing, nursing supervision is a vital managerial step to ensure the quality of nursing practice, including in terms of documentation. Supervision includes elements such as monitoring, guidance, feedback, auditing, and capacity building. Various local and global studies show a positive relationship between efficient supervision and improved quality of care documentation, in terms of both completeness and accuracy. Organized supervision can help detect gaps in documentation, improve practices, and increase compliance with existing standards (Wongso et al., 2024).

The role of supervision is becoming increasingly important in the era of digital health, where electronic medical records require new competencies (clinical digital literacy), workflow adaptations, and different documentation behaviors compared to paper records. Supervision that is solely administrative or inspection-based tends to be less effective. Supervision models that combine coaching, mentoring, indicator-based audits, and periodic learning have proven to be more successful in driving changes in documentation behavior. Additionally, managerial support, such as time allocated for documentation, availability of equipment, and information technology support, combined with clinical supervision, reinforces the positive effects on documentation quality (Tumanggor et al., 2023).

Supervision is part of nursing care management that provides planning, direction, organization, supervision, and feedback on nursing care services, including documentation, both manually and using digital systems. In Indonesia, the implementation of digital-based documentation or the use of electronic medical records is not yet fully uniform, especially in areas where technological reach is not as rapid as in urban areas. Even in health facilities in technologically advanced areas, the implementation of structured and optimal electronic medical record documentation by nurses is not necessarily guaranteed. Therefore, the initial strategy of the organization is through a supervision strategy that is expected to lead and facilitate documentation using electronic medical records (Asih & Indrayadi, 2023).

Based on the results of studies that have been conducted, technology integration has the potential to improve the quality of documentation, but the results of implementation vary and depend on non-technical factors such as training, system design, and organizational support. Nursing supervision as an organizational intervention that strengthens the quality of digital-based documentation has not been systematically documented in many local and national contexts.

This study empirically examines the role of nursing supervision as a key managerial determinant in the quality of Electronic Medical Record (EMR) documentation. Previous studies on the implementation of Electronic Medical Records (EMR) have mostly focused on technological aspects, system readiness,

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and documentation completeness. At the same time, the role of nursing supervision has been discussed only to a limited extent and descriptively. In particular, there has been little research analyzing the contribution of each supervision indicator (planning, coordination, control, monitoring, and feedback) to the quality of EMR documentation in a comprehensive and quantitative manner.

This study aims to comprehensively analyze the role of nursing supervision in improving the quality of Electronic Medical Record (EMR) documentation by examining the contribution of each supervision indicator, including planning, coordination, control, monitoring, and feedback.

Methods

Study Design

This study used an analytical observational design with a cross-sectional approach to analyze the relationship between nursing supervision and the quality of Electronic Medical Record (EMR) documentation. The independent variable in this study is the supervisory role, which includes planning, organizing, directing, supervising, and following up. Meanwhile, electronic medical records, specifically in nursing, are the dependent variable, which consists of indicators of assessment, diagnosis, planning, implementation, and evaluation.

Participants

This study used a total population of 352 nurses at the Klungkung District Hospital, Bali, Indonesia. The researchers used a total sample to ensure that all characteristics of nurses were represented and to minimize representation errors. The sample used in this study was a sample that met the inclusion criteria, namely nurses practicing at Klungkung Regional Hospital, both in the inpatient ward and in the polyclinic, as well as nurses who were willing to be respondents. Meanwhile, the exclusion criteria in this study were practicing nurses who were on leave or sick when the data collection was carried out. The data collection period was approximately 3 months, from July to September 2025, during which the researcher completed data collection, especially from respondents who were on leave or sick, until a total of 352 respondents filled out the questionnaire.

Instruments

The data collection tools used in this study were questionnaires. Respondents filled out the questionnaire via a Google Form link shared by researchers through groups in each room at the Klungkung District General Hospital. The questionnaire instruments used included:

A supervision questionnaire

The supervision questionnaire in this study was adopted from the (Suryani, 2021) questionnaire, which had been tested for validity and reliability with a calculated r value (0.36–0.78) > r table (0.316) and a Cronbach's alpha value of (0.91–0.94) > 0.60. The questionnaire used in this study was in Indonesian. The questionnaire consists of 26 valid questions. These questions are a description of the supervision variable indicators, which include planning, organizing, directing, controlling, and following up. The answer choices on the questionnaire use a Likert scale, ranging from 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, and 5 = strongly agree.

Electronic Medical Record Documentations Questionnaire

The Electronic Medical Record Questionnaire in this study is a component of nursing care documentation, which is an elaboration of assessment indicators, problem formulation, intervention,

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implementation, and evaluation. This medical record questionnaire was adopted from a questionnaire, which had been tested for validity and reliability with a calculated r value (0.35–0.80) > r table (0.316) and a Cronbach's alpha value of (0.89–0.95) > 0.60. The questionnaire consists of 25 valid questions. The questionnaire used in this study was in Indonesian. The answer choices on the questionnaire use a Likert scale ranging from 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, and 5 = strongly agree.

Data Collection

The data collection period was approximately 3 months, from July to September 2025, during which the researcher completed data collection, especially from respondents who were on leave or sick, until a total of 352 respondents filled out the questionnaire. The researcher conducted the data collection process with the assistance of the room heads in each room, who distributed questionnaires created in the form of Google Forms. Through the room heads, the researcher followed up on the number of respondents who had not completed the questionnaire until the number of respondents was reached.

Data Analysis

After the research data were collected, a normality test was conducted using the Kolmogorov-Smirnov test. This test was performed using IBM SPSS version 25 software with a significance level of 0.05. The researcher conducted a normality test on the research data and obtained a p-value of < 0.05, which means that the data is not normally distributed. Next, bivariate analysis was performed using Spearman's rank correlation analysis. Then, multivariate analysis was performed to determine the most influential supervision indicators on documentation with electronic medical records. Multivariate analysis used binary logistic regression analysis.

Ethical Considerations

This study has received ethical approval from the Klungkung District Hospital Research Ethics Committee, with number 000.7.2/2245/RSUD/2025.

The study involves data sourced from electronic medical records that are highly sensitive, so it is mandatory to pay attention to ethical principles, including confidentiality, privacy, and data protection. Nurses who participated as respondents were given informed consent before completing the questionnaire, as evidence of their willingness to participate.

Results

This study used a sample of 352 nurses in all units of the Klungkung District General Hospital. The characteristics of the respondents in this study included age, gender, education, and length of service. **Table 1** below shows the characteristics of the respondents.

Table 1. Table of general characteristics of respondents (n=352) at Klungkung Regional General Hospital

Characteristics	N	%
Age (years)		
Late adolescence	10	2,8
Early adulthood	137	38,7
Late adulthood	144	41,2
Early elderly	48	13,6
Late elderly	13	3,7
Gender		
Male	70	19,9
Female	282	80,1
Highest Education		
D3 Nursing	94	26,9
Nurse	257	72,7
Master's Degree	1	0,4
Length of Service		
New (1-5 years)	61	17,2
Medium (6-10 years)	111	31,7

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Characteristics	N	%
Long (>10 years)	180	51,1

Table 1 illustrates that the majority of respondents were in late adulthood (36-45 years old), namely 144 people (41.2%), with 282 people (80.1%) being female, 257 people (72.7%) having a nursing degree as their highest level of education. Most had been working for a long time (>10 years), totaling 180 people (51.1%).

Bivariate analysis was used to analyze the relationship between supervision and the strengthening of electronic medical record-based documentation. The analysis used was Spearman's rank nonparametric test, as shown in the **table 2.**

Table 2. Bivariate analysis of the relationship between supervision and the strengthening of electronic medical record-based documentation (n=352)

Variables	Planning	Organizing	Directing	Controlling	Following Up	EMR Documentation
Planning	1	0.91	0.884	0.884	0.819	0.825
Organizing	0.91	1	0.896	0.87	0.88	0.767
Directing	0.884	0.896	1	0.87	0.88	0.837
Controlling	0.884	0.87	0.87	1	0.855	0.837
Following Up	0.819	0.88	0.88	0.855	1	0.859
EMR Documentation	0.825	0.767	0.837	0.837	0.859	1

Table 2 illustrates that the five supervision indicators, which include planning, coordination, controlling, monitoring, and feedback, have a significant relationship with electronic medical record documentation, with a p-value <0.001, α = 0.05.

Multivariate analysis in this study used logistic regression testing, also known as binary logistic testing. Binary logistic testing is used to determine the effect of predictor variables on response variables. The results of the multivariate analysis can be seen in the **table 3.**

Table 3. Variables most closely related to electronic medical record documentation (n=352)

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% CI Lower	95% CI Upper
Planning	4.806	1.282	14.044	1	0	122.266	9.9	1509.958
Organizing	-5.802	2.205	6.924	1	0.009	0.003	0	0.228
Directing	4.588	1.752	6.857	1	0.009	98.346	3.171	3049.706
Controlling	4.106	1.452	7.994	1	0.005	60.698	3.524	1045.367
Following Up	5.451	1.379	15.617	1	0	233.049	15.606	3480.287
Constant	-9.085	2.45	13.751	1	0	—	—	—

Table 3 presents the variables most closely related to electronic medical record documentation, namely the feedback variable with a value of Exp(B)=233.049; 95%CI: 15.606-3480.287, which means that positive and targeted feedback in the supervision process has a 233 times better chance of implementing electronic medical record documentation.

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Discussion

The results of this study indicate that supervision has a relationship with the implementation of electronic medical record documentation. Supervision in nursing is a vital managerial function that directly impacts the improvement of nursing practice quality, including the quality of electronic medical record documentation management. In an increasingly digital healthcare world, the successful implementation and use of EMRs depends not only on existing technology but also greatly on the quality of supervision provided by nursing leaders, such as ward heads and nursing managers (Laukvik et al., 2024).

Efficient nursing supervision functions as a quality control system that ensures consistent application of electronic documentation standards. Nurses who receive structured supervision tend to show higher levels of compliance in EMR-based documentation, thanks to clear guidance, routine monitoring, and constructive feedback (Sulaiman et al., 2024).

Clinical supervision plays a role in shaping nurses' work attitudes, increasing professional responsibility, and strengthening a culture of patient safety through accurate and timely documentation (Douma et al., 2024).

According to research conducted by, supervision has a significant influence on the implementation of complete medical record documentation in accordance with standard operating procedures. The results of this study are also supported by a systematic review conducted by (Wahyuni et al., 2024), which states that the supervision component is an important part of the implementation of electronic medical record documentation because supervision is an organizational effort that can directly lead and set an example for nurses in using electronic medical records as a medium for documenting nursing care that has been provided.

Planning is the initial component in supervision carried out by the head of the room as a manager. Planning serves as the foundation that establishes the basis and rules for service implementation, particularly in the implementation of electronic medical record documentation (Abudalbouh, 2023). Strong, systematic, and measurable planning will empower nurses in applying each component or step in the creation of electronic medical record documentation (Kariotis et al., 2022). The results of this study also show that there is a significant relationship between planning in supervision and electronic medical record documentation.

Organization in the context of nursing supervision refers to how supervisory functions are structured and carried out systematically. This organization is structural and operational in nature because it determines how supervision is translated into daily actions that affect documentation practices. These components include the division of roles and responsibilities, scheduling, and coordination mechanisms between nursing units and support units such as health informatics.

Good supervision organization creates a clear structure of accountability and communication channels. When the responsibilities for recording and verifying documentation are mapped out, nursing units tend to show an increase in the completeness and consistency of electronic records (Ryu et al., 2025). The results of this study also show a significant relationship between organization and the implementation of electronic medical record documentation.

The results of the study show that supervision, namely guidance, also has a significant relationship with the implementation of electronic medical

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record documentation. Guidance in the context of nursing supervision refers to the activities of nursing leaders in providing concrete operational guidance to staff, ranging from setting work objectives, explaining procedures to be followed, directing task priorities, providing technical instructions on the use of tools/systems, and providing corrections or reinforcement of behavior through feedback. In an environment that implements electronic medical records, the guidance function is crucial because electronic medical records are not just software that can be directed like paper documentation, but require the provision of clear workflow examples. Effective guidance aligns organizational expectations for the implementation of complete, accurate, and timely electronic medical record documentation (Shahzeydi et al., 2024).

Feedback during the supervision stage is the most influential component in the implementation of electronic medical record documentation in this study. Conceptually, effective feedback facilitates changes in professional behavior aimed at improving the gap between standards and actual practice. Feedback is not merely a corrective activity, but a key strategy in continuously improving the quality of electronic documentation (Ivers et al., 2025).

The concept of feedback in improving the quality of electronic medical record documentation can be explained through the Roy Adaptation Model (RAM) developed by Sister Callista Roy. This model views individuals and organizations as adaptive systems that continuously interact with their environment through stimulus processes, coping mechanisms, and adaptive responses. Through regulatory and cognator coping mechanisms, healthcare professionals process this feedback to generate adaptive responses in the form of improved documentation compliance, record-keeping accuracy, and professional responsibility. Thus, feedback serves not only as an evaluation tool but also as an adaptive learning mechanism (Wang et al., 2025). Studies in high-income countries show that audits and feedback are key strategies for improving the quality of electronic documentation. In addition, organizational culture also plays an important role in the success of feedback mechanisms (Hansen & Oktamianti, 2025).

Implications and limitations

The results of this study indicate that nursing supervision plays a strategic role in improving the quality of electronic medical record documentation. Therefore, nursing practice needs to integrate supervision as part of an organizational strategy to improve quality and patient safety and in policy-making related to the development of nursing care, particularly in documentation using electronic medical records. The theoretical implications of this study enrich nursing management studies by emphasizing nursing supervision as a determining factor in the success of the digital transformation of health services.

This study was conducted in one health care facility with specific organizational characteristics. Hence, the results of the study have limitations in terms of generalization to other institutions with different levels of technological readiness, organizational culture, and electronic medical record systems.

This study has several limitations that need to be considered when interpreting the results. First, data collection was conducted using a self-report questionnaire, which has the potential to cause self-reporting bias. Respondents may have provided answers that they considered to be in line with professional standards or organizational expectations rather than their actual practices.

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Second, this study used a cross-sectional design, in which the independent and dependent variables were measured at the same time. This design has limitations in explaining direct cause-and-effect relationships, as it cannot confirm the temporal sequence between exposure and research outcomes.

Relevance to Practice

The description of each component or indicator of supervision is expected to serve as a basis for policy makers to evaluate guidelines related to nursing supervision in the digital era and strengthen the implementation of supervision in a sustainable manner. The results of this study are also useful for ward heads and ward managers to strengthen the implementation of supervision as an effort to improve the implementation of electronic medical record documentation.

Nursing managers need to ensure the availability of ongoing training related to the use of electronic medical record systems, provide constructive feedback based on individual and work unit performance data, and create a culture of safety and learning that supports openness to evaluation. Meanwhile, policymakers at the institutional and health system levels need to develop digital integration policies supported by adequate technological infrastructure, proportional allocation of human resources, and a national monitoring and evaluation system oriented towards improving service quality. Collaboration between clinical leadership and organizational policy is expected to improve the adaptation of health workers to digital transformation while ensuring the quality, accountability, and continuity of health service documentation.

Conclusion

Supervision plays a strategic role in strengthening the implementation of electronic medical record documentation through planning, organizing, directing, monitoring, and providing feedback. Structured and continuous supervision helps improve the consistency of documentation practices in accordance with applicable standards. An effective supervisory approach also encourages nurse compliance and supports more accurate, complete, and timely clinical documentation. Thus, supervision is an important component in maintaining the quality of electronic-based service documentation.

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CrediT Authorship Contributions Statement

Luh Gde Nita Sri Wahyuningsih: Conceptualization, Methodology, Supervision, Writing Original Draft

NLP Dina Susanti: Software, Validation, Formal Analysis, Writing Review and Editing

Sarah Kartika Wulandari: Investigation, Resources, Data Curation, Project Administration

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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Supplementary Materials (OPTIONAL)

Supplementary File S1: Research Instrument contains the full questionnaire used for data collection.

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