



IMPLEMENTATION OF NURSE UNIT MANAGER SUPERVISION TO IMPROVE THE QUALITY OF NURSING CARE DOCUMENTATION BASED ON ELECTRONIC MEDICAL RECORDS (EMR)

Vivianti Fraliana Lesnussa*, La Ode Abdul Rahman, Rr. Tutik Sri Hariyati

Fakultas Ilmu Keperawatan, Universitas Indonesia, Jl. Prof. Dr. Bahder Djohan, Depok, Jawa Barat 16424, Indonesia

*vivianti.fraliana@ui.ac.id

ABSTRACT

Structured Nurse Unit Manager Supervision to Improve the Quality of Electronic Nursing Documentation. Digital transformation through the adoption of Electronic Medical Records has not been fully accompanied by improvements in the quality of nursing documentation. An initial assessment in the inpatient wards of a teaching hospital in Depok, Indonesia, revealed that documentation was not performed in real time, the SOAP components were incomplete, and copy-paste practices persisted, rooted in the absence of structured supervision by the Nurse Unit Manager (NUM). This project aimed to evaluate the effect of structured, digitally supported Nurse Unit Manager (NUM) supervision on the quality of electronic nursing care documentation. This single-group pre-post quality improvement project aimed to improve the quality of electronic nursing documentation through the implementation of structured NUM supervision. The activity applied management functions, Lewin's change theory, and the Plan-Do-Study-Act cycle. Assessment was conducted through interviews, observation, and document review, analysed using SWOT and a fishbone diagram, and prioritised using the Growth-Seriousness-Manageability technique. The intervention comprised a digital NUM supervision tool piloted in one inpatient ward. A baseline audit of nine documents across three wards showed an average quality of 56% (fair). After supervision of nine nurses, quality rose to 71% (good), a 15-point increase, with the largest gain in timeliness (25% to 56%). Structured digital NUM supervision was effective in improving the quality of electronic nursing documentation. Standardisation through standard operating procedures, integration into quality indicators, and ward-wide expansion are recommended.

Keywords: electronic medical record; nursing documentation; nurse unit manager; quality improvement; structured supervision

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INTRODUCTION

Digital transformation in healthcare systems has driven the adoption of electronic medical records (EMRs) as a strategy to improve service quality and patient safety. Accurate and timely electronic documentation plays an important role in reducing the risk of clinical errors and maintaining continuity of care among healthcare providers (Wahyuni et al., 2024). In nursing practice, documentation serves as a record of the nursing care process as well as a means of communication across shifts and among Professional Care Providers (PCPs); therefore, its quality is a direct indicator of service quality (Forde-Johnston et al., 2023). However, the successful implementation of electronic medical records is determined not merely by the availability of the system but also by the quality of the documentation produced. Documentation quality can be assessed in terms of completeness, timeliness, accuracy, clinical relevance, continuity across shifts, and optimal utilization of the system (Wahyuni et al., 2024). Digitalization may also introduce new challenges, including a high documentation burden among nurses in acute and critical care settings (Cho et al., 2024) and the potential reduction in the quality of nurse–patient interactions when electronic systems are not accompanied by process improvement and adequate support (Forde-Johnston et al., 2023). In Indonesia, the implementation of electronic medical records, regulated under the Ministry of Health Regulation No. 24 of 2022, has accelerated the adoption of digital documentation in hospitals. Consequently, ensuring the quality of documentation, rather than merely compliance with

documentation requirements, has become increasingly important (Ministry of Health of the Republic of Indonesia, 2022).

Documentation quality is not merely an administrative concern but an integral component of patient safety. Complete and timely documentation supports the early recognition of patient deterioration through parameters such as the Early Warning Score, strengthens nurses' clinical reasoning, and provides a basis for clinical decision-making, continuity of care, and legal accountability for healthcare services (Flenady et al., 2024; Wahyuni et al., 2024). Incomplete or inaccurate documentation may increase the risk of patient safety incidents, as emphasized in global patient safety initiatives and hospital accreditation standards (Ministry of Health of the Republic of Indonesia, 2024). In the Indonesian context, Fattah and Hariyati (2022) and Solehudin et al. (2024) demonstrated that optimizing the quality of EMR-based documentation depends substantially on strengthening management functions, particularly directing and controlling. Consequently, a gap may emerge between compliance with documentation requirements and the substantive quality of the information documented.

Clinical supervision represents a potentially effective managerial mechanism for bridging this gap. As a first-line nurse manager, the Nurse Unit Manager (NUM) performs directing and controlling functions, including supervision of the quality of nursing care and documentation within the unit (Marquis & Huston, 2024). Structured clinical supervision based on audits has been shown to significantly improve quality-of-care indicators and positivity indices (Bras Baptista Sérgio et al., 2023). Furthermore, supervision supported by standardized instruments and systematic feedback is more effective than incidental administrative oversight (Masamha et al., 2022). Direct involvement of nurse managers has also been associated with improved patient care outcomes (Bayram et al., 2023; Zonneveld et al., 2024). Nevertheless, supervision in many nursing units remains incidental and tends to emphasize administrative completeness rather than the substantive quality of documentation.

An initial assessment conducted at a Class A teaching hospital in Depok demonstrated this situation. An initial audit of nine nursing documentation records revealed an average documentation quality score of 56%, with timeliness representing the lowest-performing domain. Meanwhile, NUM supervision remained incidental and had not yet been supported by a standardized instrument. This situation was further compounded by a high workload and a predominance of nurses with less than two years of work experience. Based on these findings, this residency project aimed to implement structured, digitally supported NUM supervision and evaluate its effect on the quality of electronic nursing care documentation. The primary question addressed was the extent to which structured, digitally supported NUM supervision could improve the quality of nursing care documentation.

The novelty of this project lies in integrating a concise digital supervision instrument package including a QR code, an online assessment form, and a real-time score monitoring dashboard into a framework incorporating management functions, Lewin's three-stage change theory, and the Plan Do Study Act (PDSA) cycle. This approach was implemented within the context of EMR-based nursing documentation in Indonesia, with the aim of developing a low-cost, sustainable, and replicable structured supervision model (Huber & Joseph, 2022). This project aimed to implement and evaluate the effect of structured, digitally supported Nurse Unit Manager (NUM) supervision on the quality of electronic nursing care documentation in a Class A teaching hospital in Depok, Indonesia.

METHOD

This project was conducted as a quality improvement initiative using a one-group quasi-experimental pretest–posttest design without a comparison group. The project was guided by management functions, Lewin's three-stage change theory, and the Plan–Do–Study–Act (PDSA)

cycle (Huber & Joseph, 2022; Marquis & Huston, 2024). Reporting was structured in accordance with the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) to ensure that the project stages, interventions, and evaluation processes were documented transparently and were traceable. The project was conducted from April to May 2026 in an inpatient unit of a Class A teaching hospital in Depok that implements the Professional Nursing Practice Model and an EMR-based documentation system. The initial assessment was conducted across three inpatient units to establish baseline conditions, while implementation of the supervision intervention was focused on one inpatient unit as a pilot unit. The pilot unit had a capacity of 55 beds and was staffed by 32 nurses, with a nurse-to-patient ratio of approximately 1:8, which could increase to 1:11 during full occupancy.

Assessment data were collected through interviews with the assistant manager of nursing care, the Nurse Unit Manager (NUM), and staff nurses; observation of documentation practices within the EMR system; and document review through an audit of nine nursing care records selected purposively, consisting of three records from each of the three inpatient units. The audit instrument was a 16-item documentation quality assessment checklist covering five domains: SOAP completeness, timeliness, clinical accuracy, continuity across shifts, and EMR utilization. Scores were converted into percentages and categorized as poor (<56%), moderate (56-70%), or good ($\geq 71\%$). Root causes were analyzed using a framework of managerial roles and management functions, a fishbone diagram, and SWOT analysis. Problem priorities were subsequently determined using the Growth–Seriousness–Manageability (GSM) technique. Content validity of the instrument was established through review and approval by the nursing service manager and the institutional nursing committee, with assessment items aligned with national nursing care standards, namely the Indonesian Nursing Diagnosis Standards, Indonesian Nursing Outcome Standards, and Indonesian Nursing Intervention Standards (SDKI, SLKI, and SIKI), applicable medical record regulations, and the framework of nursing documentation quality dimensions (Ministry of Health of the Republic of Indonesia, 2022; Wahyuni et al., 2024). Consistency of assessment was maintained by using the same criteria and assessor for both the baseline and final audits.

Based on the identified priority problems, a structured, digitally supported NUM supervision intervention was developed according to Lewin's three stages of change. The unfreezing stage involved communicating the identified quality gaps and developing a standard operating procedure and assessment instrument. The changing stage involved implementing structured supervision using digital NUM supervision tools. The refreezing stage involved developing follow-up plans to standardize the improved practices. The digital NUM supervision tools consisted of a QR code for rapid access, a Google Forms checklist for assessment, a spreadsheet dashboard for real-time score monitoring, and Google Sites as an integrated guidance platform. Each supervision session included observation, assessment, feedback using the sandwich feedback technique, reflection, and development of a follow-up plan, consistent with the logic of the PDSA cycle. Supervision was conducted on nine nursing care documentation records from May 19 to 22, 2026. Documentation content standards were based on applicable medical record regulations and institutional standard procedures for EMR-based documentation (Ministry of Health of the Republic of Indonesia, 2022).

Operationally, the supervision process proceeded as follows: the NUM accessed the assessment instrument by scanning the QR code and evaluated nurses' documentation using the 16-item Google Forms checklist. The assessment results were automatically compiled in a spreadsheet dashboard displaying domain-specific scores and aggregate mean scores. Based on the assessment results, the NUM provided immediate feedback to the nurses and jointly established an improvement plan. Google Sites served as an integrated platform containing guidelines, standard operating procedures, and links to the assessment instruments. These activities were mapped onto the PDSA cycle: development of standards and assessment instruments (plan), implementation of supervision and feedback (do), evaluation of pre- and post-intervention scores through the dashboard (study), and development of follow-up actions for nurses whose scores were below the established standard

(act). This approach was designed to facilitate iterative improvement and sustain the intervention after completion of the residency period.

The primary outcome was documentation quality, which was compared before and after the supervision intervention across the five domains using the same audit instrument. The evaluation was complemented by assessment of input, process, output, and outcome indicators. Given the small sample size and the quality improvement nature of the project, the analysis was descriptive and presented as percentages, differences in scores, and categorical changes without inferential statistical testing. Therefore, the observed changes were interpreted as indicative rather than as evidence of statistical significance. This project formed part of an internal quality improvement program that received approval from the institutional management and nursing committee and was therefore considered not to require formal ethical review. Nevertheless, ethical principles were maintained throughout the project. All documentation data were anonymized and handled confidentially and contained no patient-identifying information to protect the rights and privacy of the participants.

RESULT

Interview findings indicated that the quality of nursing documentation remained suboptimal despite relatively good compliance with documentation completion. NUM supervision was conducted incidentally, without a standardized instrument, and primarily focused on administrative completeness rather than the substantive quality of documentation. Nurses also faced time constraints due to a high workload, which was further compounded by the predominance of nurses with less than two years of work experience. Observational findings reinforced these results: SOAP components were not consistently completed, particularly the *Assessment* and *Planning* sections; documentation was not consistently entered in real time, as some entries were made toward the end of the shift; copy-and-paste practices were still observed; and the Early Warning Score and components of the 5P bundle were not consistently documented. The baseline audit identified timeliness as the lowest-performing domain, followed by EMR utilization and clinical accuracy.

Analysis of the NUM's managerial roles indicated that the interpersonal role was functioning well, whereas the informational role, particularly as a monitor and disseminator of documentation standards, remained suboptimal because monitoring was still administrative in nature and had not yet been data-driven. Analysis of management functions showed that planning, organizing, and staffing were relatively well implemented, while the largest gaps were identified in the directing and controlling functions. SWOT analysis identified the availability of the EMR system and management support as key strengths, the lack of structured supervision as the primary weakness, the development of digital supervision instruments as an opportunity, and the high workload as a major threat. The convergence of these findings established the lack of structured NUM supervision as the priority problem and guided the selection of structured, digitally supported supervision as the intervention.

All required resources were available and ready for implementation, including standard operating procedures, a 16-item checklist instrument, functional digital NUM supervision tools, NUM readiness to serve as supervisor, and nursing management support. Supervision was implemented as planned for nine nursing care documentation records from May 19 to 22, 2026, encompassing observation, assessment, feedback, reflection, and follow-up planning. Nurses were actively involved throughout the process, while the dashboard enabled real-time monitoring of assessment scores. Documentation quality increased from an overall mean of 56% (moderate category) to 71% (good category), representing a 15-percentage-point increase, with domain-specific results presented in Table 1. The most notable improvement occurred in the domain that had initially performed the worst, particularly timeliness, whereas the consistency/continuity domain, which had already been in the good category at baseline, showed only a slight increase. Evaluation of the input, process, output, and outcome components is presented in Table 2. The findings indicate that

structured supervision not only improved documentation quality scores but also increased nurses' awareness of the importance of high-quality documentation, strengthened the NUM's supervisory role, and produced a digital supervision instrument that could be sustained as part of routine practice.

Table 1.

Comparison of Nursing Care Documentation Quality Before and After Supervision by Domain

Assessment Domain	Pre (%)	Post (%)	Difference	Post-Intervention Category
SOAP completeness	66	72	+6	Good
Timeliness	25	56	+31	Moderate
Clinical accuracy	55	60	+5	Moderate
Consistency/continuity	72	74	+2	Good
EMR utilization	53	65	+12	Moderate
Overall mean	56	71	+15	Good

Note: Poor <56%; moderate 56–70%; good ≥71%. SOAP = subjective, objective, assessment, planning. EMR = electronic medical record.

Table 2.

Evaluation of Input, Process, Output, and Outcome of Structured NUM Supervision

Aspect	Indicator	Result
Input	Availability of standard operating procedures, assessment instrument, digital tools, and supervisor readiness	All required components were available and ready for use
Process	Implementation of structured supervision according to the established stages	Supervision of nine nursing care documentation records was fully implemented
Output	Improvement in documentation quality from pre- to post-intervention	Increased from 56% (moderate) to 71% (good), representing a 15-percentage-point increase
Outcome	Strengthening of NUM supervision and sustainability	A standardized instrument was available, the NUM's supervisory role was strengthened, and a culture of feedback was established

During implementation, behavioral changes accompanying the improvement in documentation scores were also observed. Nurses became more responsive in completing documentation immediately after providing care when they became aware that their documentation was being monitored and followed up. Specific feedback encouraged improvements in documentation components that had previously been frequently omitted. Active nurse participation in reflection sessions indicated acceptance of supervision as a developmental and coaching mechanism rather than merely an assessment process. Several implementation challenges were also identified, including time constraints related to the high workload, intermittent access to the EMR system during peak hours, and the need for adaptation to the relatively new assessment instrument. These challenges subsequently informed the development of the follow-up plan.

DISCUSSION

The findings of this quality improvement project indicate that structured, digitally supported NUM supervision was effective in improving the quality of electronic nursing care documentation. This finding is consistent with Bras Baptista Sérgio et al. (2023), who demonstrated that structured, audit-based clinical supervision significantly improved quality-of-care indicators and positivity indices. Masamha et al. (2022) likewise emphasized that supervision supported by standardized instruments and systematic feedback is more effective than incidental administrative oversight, as demonstrated in this project through the use of a 16-item checklist and sandwich feedback. The transition from incidental supervision to standardized, data-driven supervision represents a key mechanism underlying the improvement in documentation quality. The achievement of a good-quality category of 71% in this project is also consistent with Bunting and de Klerk (2022), who found that documentation audits accompanied by personalized feedback could achieve post-intervention compliance levels of ≥70% in acute inpatient care.

This mechanism was further strengthened by the quality of feedback provided. Through the sandwich feedback technique, supervision served not only as an assessment process but also as a

means of making quality expectations and clinical reasoning explicit to nurses. Thus, supervision functioned as a professional development and coaching mechanism rather than merely an administrative control measure. This finding is consistent with Masamha et al. (2022), who emphasized that the value of supervision lies in its structured nature and systematic feedback, as well as with Bras Baptista Sérgio et al. (2023), who demonstrated that team empowerment through audit-based clinical supervision can improve quality indicators. The effectiveness of audit and feedback is also influenced by how feedback is delivered. Dufour and Duhoux (2024) concluded that audit and feedback have the greatest impact when linked to the relational dimensions of nursing, measured at the team level, and communicated by emphasizing benefits to nursing practice, as was pursued through sandwich feedback and direct coaching in this project. Similarly, Ferguson et al. (2025) emphasized that audit and feedback have the greatest impact when data are presented at the individual level and compared with benchmarks, facilitated by local champions who are close to the recipients, and accompanied by interactive approaches and concrete follow-up plans. These characteristics were reflected in this project through real-time monitoring of individual nurses' scores, the NUM's role as a unit-level quality champion, and the development of data-driven follow-up plans. Direct involvement of the NUM in providing feedback also strengthened accountability and nurses' sense of ownership of documentation quality, consistent with evidence that the presence of first-line nurse managers is associated with better care outcomes (Bayram et al., 2023).

The most substantial improvements in timeliness and EMR utilization reflect the potential direct contribution of real-time dashboard monitoring and immediate feedback. This pattern is consistent with Cho et al. (2024) and Forde-Johnston et al. (2023), who reported that interventions targeting electronic documentation can improve timeliness and completeness when accompanied by managerial support and clearly defined standards, while also mitigating the documentation burden that represents a major challenge for nurses. In contrast, the smaller improvement in the consistency/continuity domain may be explained by a ceiling effect because its baseline score was already relatively high. Improvements in SOAP completeness and clinical accuracy, meanwhile, are likely to require longer-term and repeated coaching. From a theoretical perspective, Lewin's three-stage change model supported the management of documentation-related behavioral change, from creating awareness of the need for change, to implementing structured supervision, and ultimately to standardizing improved practices (Marquis & Huston, 2024). Integration with the Plan–Do–Study–Act cycle further enabled iterative, data-driven improvement (Huber & Joseph, 2022). The intervention also strengthened the NUM's informational and decision-making roles, which had previously lacked adequate instruments and supporting information (Robbins & Judge, 2023), consistent with evidence that direct involvement of nurse managers is associated with improved care outcomes (Bayram et al., 2023; Zonneveld et al., 2024).

The digital dimension of the intervention provided additional value by enabling rapid, standardized, and traceable assessment, allowing feedback to be delivered close to real time and potentially reducing the time-related barriers previously experienced by nurses (Cho et al., 2024). Nevertheless, technology functioned as an enabler rather than a substitute for managerial processes. Forde-Johnston et al. (2023) cautioned that electronic systems do not automatically improve documentation quality without appropriate process redesign. The added value of digitalization emerges when digital instruments are integrated with structured supervision, clear standards, and systematic feedback.

Improved documentation quality has direct implications for patient safety because documentation provides a basis for clinical decision-making, continuity of care, and the legal accountability of healthcare services. Consistent documentation of monitoring parameters such as the Early Warning Score contributes to the early recognition of patient deterioration and strengthens nurses' clinical reasoning (Flenady et al., 2024), in alignment with applicable patient safety and hospital accreditation standards (Ministry of Health of the Republic of Indonesia, 2024). In the Indonesian

context, these findings reinforce the work of Fattah and Hariyati (2022), Solehudin et al. (2024), and Wahyuni et al. (2024), who emphasized that optimizing EMR-based documentation quality depends on strengthening management functions. Thus, this intervention addressed a context-specific need by bridging the gap between relatively high documentation compliance and suboptimal substantive documentation quality through strengthening supervision as a unit-level quality control mechanism.

The sustainability of these improvements requires deliberate strategies. The digital nature of the instrument allows it to be reused across units at relatively low cost, while the dashboard provides a data source for periodic monitoring. To maintain the effect, the intervention should be institutionalized through standard operating procedures, integration of supervision results into nursing quality indicators, expansion to other inpatient units, strengthening of NUM supervisory competencies, and data-driven coaching and re-supervision for nurses whose scores remain below the established standard, particularly in the domains of timeliness and clinical accuracy. These findings may also be transferable to other hospitals in Indonesia facing similar challenges, namely high documentation compliance but suboptimal substantive quality. The approach can potentially be adapted to resource-constrained settings while taking into account organizational readiness, leadership support, and the local feedback culture (Masamha et al., 2022). Replication in other settings should ideally include adaptation of the instrument to local documentation standards and brief training for supervisors to maintain assessment consistency across raters and over time.

More broadly, these findings reinforce the position of the NUM as a unit-level quality champion. Strengthening the directing and controlling functions through structured supervision positions the first-line nurse manager as a link between organizational quality policies and everyday documentation practices at the bedside. This finding highlights the importance of investing in NUM supervisory competencies, including skills in providing feedback, interpreting quality data, and leading change, as part of nursing leadership development (Marquis & Huston, 2024; Robbins & Judge, 2023). With a simple instrument based on commonly available digital applications, this approach has the potential to be integrated into continuing professional development programs without imposing substantial additional costs on the institution. This project has several limitations. First, the sample was limited to nine documentation records, and therefore the findings should be generalized with caution. Second, the implementation period was relatively short, preventing assessment of long-term sustainability. Third, technical limitations of the EMR system, such as delays in data entry, may have affected documentation timeliness. Fourth, the pre-post design without a comparison group prevents the observed improvement from being attributed entirely to the intervention. Fifth, the improvement in scores may have been partly influenced by a Hawthorne effect, as nurses were aware that their documentation was being monitored; therefore, some of the observed changes may reflect responses to observation rather than sustained behavioral change after supervision ended. Sixth, documentation assessment was conducted by a limited number of assessors without formal inter-rater agreement testing, and therefore potential assessment bias cannot be completely excluded.

CONCLUSION

The implementation of structured, digitally supported Nurse Unit Manager (NUM) supervision was associated with improved quality of electronic nursing care documentation, with the overall mean score increasing from the moderate to the good category. The greatest improvements were observed in documentation timeliness and EMR utilization.

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