
From Paper to Digital: A Study on the Digitization of Nursing Charting in the Neonatal Intensive Care Unit of Selected Hospitals: Basis for Implementation

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ABSTRACT

This study examined the transition from paper-based nursing documentation to digital charting in the Neonatal Intensive Care Unit (NICU) of a selected private tertiary hospital in Manila. Using a quantitative descriptive design, it assessed the demographic profile of 22 NICU healthcare personnel, the implementation of existing documentation practices, and their perceptions of digital charting. Data were gathered through a validated questionnaire and analyzed using descriptive statistics and the Kruskal–Wallis test. Findings revealed that documentation practices were generally implemented; however, issues related to redundancy, legibility, and accessibility persisted. Respondents viewed digital charting positively, citing improvements in efficiency, accuracy, patient safety, and accessibility of records. No significant differences in perceptions were found across demographic groups. Based on the findings, evidence-based recommendations were proposed to support the structured implementation of digital charting in the NICU.

Keywords: Accessibility, Digital charting, Documentation practices, Neonatal intensive care unit, Nursing documentation, Perception, Patient safety

INTRODUCTION

This study investigated the feasibility of transitioning from paper-based documentation to digital charting in the NICU of a private tertiary hospital in Manila. Paper-based records created challenges such as delayed documentation, illegible handwriting, duplicate entries, and difficulty retrieving patient information, which affected efficiency and patient safety. Given the increasing adoption of electronic health records worldwide, the study explored healthcare personnel's perceptions of digital charting and evaluated its potential to improve documentation quality, workflow efficiency, and patient care. The findings served as a basis for recommending the implementation of a digital documentation system in the NICU.

STATEMENT OF THE PROBLEM

The study aimed to:

1. Determine the demographic profile of NICU healthcare personnel.
2. Assess the implementation of current documentation practices regarding accuracy, timeliness, accessibility, redundancy, legibility, confidentiality, and compliance.
3. Evaluate healthcare personnel's perceptions of digital charting in terms of usefulness, ease of use, efficiency, accuracy, accessibility, and confidentiality.
4. Determine whether perceptions differed according to demographic characteristics.
5. Propose recommendations for successful digital charting implementation.

SCOPE AND LIMITATIONS

The study focused on 22 NICU healthcare personnel directly involved in patient documentation at Hospital A. It assessed current paper-based documentation practices and perceptions toward digital charting. Data were collected through a structured survey questionnaire. Limitations included the small sample size and reliance on self-reported responses.

REVIEW RELATED LITERATURE

The literature has extensively examined the transition from paper-based to digital documentation in healthcare, highlighting both its benefits and implementation challenges. Studies have shown that demographic factors such as age, educational attainment, work experience, and employment status influence healthcare personnel's readiness to adopt digital systems, with younger and more educated nurses generally demonstrating greater adaptability (Schooley et al., 2024; Alshammari et al., 2021). Digital literacy was also identified as a key factor affecting confidence and competence in using electronic documentation systems (Frontiers in Public Health, 2023; PubMed, 2023). In many healthcare settings, particularly NICUs, paper-based documentation remained vulnerable to delays, duplication, illegibility, and difficulties in retrieving patient information, which could affect efficiency and patient safety (Kruse et al., 2020; Villanueva & Javier, 2022). Research further indicated that electronic health records improved documentation accuracy, timeliness, and accessibility when supported by proper training and system integration (Schooley et al., 2024). The Technology Acceptance Model emphasized that perceived usefulness and ease of use were major factors influencing healthcare personnel's acceptance of digital charting. Studies found that nurses generally viewed digital systems positively for their potential to improve efficiency, reduce workload, and enhance patient safety, although concerns about usability and workflow disruptions persisted (Schooley et al., 2024). Successful implementation was found to depend on user-centered design, phased implementation, continuous training, and strong organizational support (Francisco et al., 2024; Rogers, 2003).

THEORETICAL FRAMEWORK

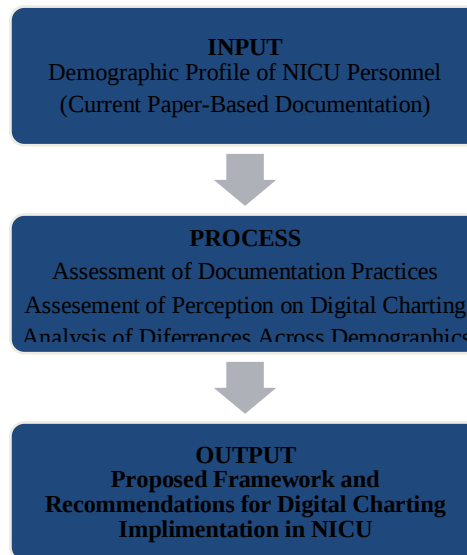
This study was grounded in Henderson's Need Theory (1966), which emphasized the nurse's responsibility to provide accurate and timely documentation to ensure continuity of care and meet patients' fundamental needs. It also applied King's Theory of Goal Attainment (1981), which highlighted effective communication and documentation as essential tools for achieving coordinated healthcare goals. Additionally, Benner's Novice to Expert Theory (1984) explained how nurses' experience levels influenced their clinical judgment, documentation practices, and adaptability to new technologies such as digital charting. Collectively, these theories provided a framework for understanding how digital documentation could improve accuracy, communication, workflow efficiency, and patient safety in the NICU (Henderson, 1966; King, 1981; Benner, 1984).

CONCEPTUAL FRAMEWORK

The study utilized the Input–Process–Output (IPO) Model. Inputs included demographic characteristics, current documentation practices, and perceptions of digital

charting. The process involved data collection through surveys and statistical analysis. Outputs included an assessment of documentation practices, an evaluation of perceptions, an identification of gaps, and the development of recommendations for digital charting implementation.

Figure 1. Conceptual Framework of the Study Using the Input–Process–Output (IPO) Model



METHODOLOGY

This study employed a systematic approach to assess nursing documentation practices and the feasibility of digital charting in the NICU at Hospital A. It included the research design, sampling technique, data collection procedures, data analysis, and ethical considerations to ensure reliable and valid results.

RESEARCH DESIGN

The study employed a quantitative descriptive research design to assess demographic characteristics, documentation practices, and perceptions of digital charting among NICU healthcare personnel. The Kruskal–Wallis test was used to assess significant differences in perceptions across demographic groups.

RESEARCH STEPS

A review of related literature was conducted to develop the research framework and identify the study variables. A researcher-made questionnaire was then developed, validated, pilot-tested, and administered after obtaining ethical clearance and institutional approval.

DATA COLLECTION AND SAMPLE SELECTION

Data were collected from 22 NICU healthcare personnel who were directly involved in patient documentation and had at least six months of experience. Total population sampling was used, and informed consent, confidentiality, and voluntary participation were ensured throughout the study.

DATA ANALYSIS METHODS

Data were analyzed using SPSS Version 25 through descriptive and inferential statistics. Frequency, percentage, mean, and standard deviation were used to describe the variables, while the Kruskal–Wallis test was used to assess differences in perceptions across demographic groups.

RESEARCH HYPOTHESIS AND VALIDATION

The study tested the null hypothesis that there was no significant difference in perceptions of digital charting when respondents were grouped by demographic characteristics. The questionnaire underwent expert validation and reliability testing, achieving a Cronbach's alpha of 0.903, which indicated excellent reliability.

STUDY LIMITATION AND ETHICAL CONSIDERATIONS

The study was limited to 22 NICU healthcare personnel from a single hospital and relied on self-reported survey responses. Ethical approval was secured, and participants' confidentiality, informed consent, and voluntary participation were strictly maintained throughout the research process.

RESULTS AND DISCUSSION

SOP 1. What is the demographic profile of the NICU healthcare personnel in terms of age, sex, civil status, highest educational attainment, years of nursing experience, years of NICU experience, and position?

Most respondents were young female staff nurses aged 23–32 years, married, with a Bachelor of Science in Nursing degree and 1–3 years of nursing and NICU experience.

SOP 2. What is the level of implementation of patient records and documentation practices in the NICU in terms of accuracy and completeness, timeliness, accessibility and organization, redundancy, legibility, confidentiality, and compliance with standards?

Documentation practices were fully implemented in terms of accuracy, completeness, confidentiality, and compliance with standards, while timeliness, accessibility, redundancy, and legibility were mostly implemented. Overall, paper-based documentation was effective but had some operational limitations.

SOP 3. What is the perception of NICU healthcare personnel regarding the potential use of digital charting in terms of usefulness, ease of use, efficiency, accuracy, accessibility, and confidentiality?

Respondents had a positive perception of digital charting, believing it could improve efficiency, accuracy, accessibility, patient care, and data security. However, some concerns regarding ease of use and adaptation were noted.

SOP 4. Is there a significant difference in the perception of digital documentation among healthcare personnel when grouped according to demographic characteristics?
No significant differences were found in perceptions of digital charting when respondents were

grouped according to demographic characteristics. This indicated a shared acceptance of digital documentation among all participants.

SOP 5. What recommendations can be proposed to guide the successful adoption of digital charting in NICU healthcare settings?

The study recommended a phased implementation of digital charting supported by continuous training, technical assistance, and workflow integration. These measures were considered essential for improving documentation quality and patient safety.

SUMMARY

The study found that most NICU personnel were young female staff nurses with 1–3 years of nursing and NICU experience, indicating readiness for technological adaptation. Documentation practices were generally effective, with strong implementation in accuracy, completeness, confidentiality, and compliance, although some gaps remained in timeliness, accessibility, redundancy, and legibility. Respondents also demonstrated positive perceptions of digital charting, and no significant differences were found across demographic groups.

CONCLUSIONS

The existing paper-based documentation system in the NICU generally complied with standards but was limited by issues of timeliness, accessibility, redundancy, and legibility. NICU healthcare personnel consistently supported digital charting and recognized its potential to improve documentation quality, workflow efficiency, and patient safety. Therefore, digital charting was considered a feasible and appropriate solution for enhancing NICU documentation practices.

RECOMMENDATIONS

Hospital administrators should implement digital charting through a phased approach supported by adequate infrastructure, clear policies, and strong data security measures. Nursing management should provide continuous training, technical support, and monitoring to facilitate staff adaptation and effective system utilization. Future studies should examine long-term outcomes and explore implementation experiences in other healthcare settings.

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AI DECLARATION STATEMENT

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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