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The effect of digital nursing documentation simulation on nursing informatics competency

Galih Jatnika, Yuswandi*, Ismafiaty, Asep Badrujamaludin, Asep Id Hadiana

Universitas Jenderal Achmad Yani
Corresponding author: *E-mail: useonedie24@gmail.com

Abstract

Background: Nursing informatics competencies are the skills and knowledge that nurses must master to effectively integrate digital technology into nursing practice. Digital nursing documentation simulation is an innovative learning program that utilizes digital technology to create nursing care documentation. This allows students to train in a safe environment that reflects real life clinical conditions, with a facilitator providing feedback.
Purpose: To determine the effect of digital nursing documentation simulation on nursing informatics competency.
Method: A quasi-experimental design with a pretest and posttest one-group design. The population was 22 undergraduate nursing students enrolled in the Faculty of Health Sciences, Jenderal Achmad Yani University, year level 4th, with a sample size of 22 participants. The digital nursing documentation simulation was administered in three stages: orientation to digital nursing documentation learning, completing nursing care documentation using a computer-based application program, and evaluation and feedback. Nursing informatics competency among nursing students was compared before and after the intervention using the Self-Assessment Informatics Competency Scale (SICS). Data were analyzed using the Wilcoxon test.
Results: The average informatics competency before the intervention was 3.32, while the average informatics competency after the simulation was 3.59. There was a significant effect of digital nursing documentation simulation on nursing informatics competency (p value: 0.014).
Conclusion: The application of digital nursing documentation simulation has a positive impact on Nursing Informatics Competency, especially in nursing students, in implementing nursing care.

Keywords: Competency; Digital Nursing Documentation; Nursing Informatics; Simulation.

INTRODUCTION

The development of digital health technology has had an impact on more effective health services, ensuring patient safety and improving service quality (Wahyuni & Haryati, 2024). The nursing profession is required to master nursing informatics competencies to better assist in providing nursing care to patients. One form of digital technology utilization is the use of digital technology-based nursing care documentation. Nursing care documentation using Electronic Health Records (EHR) can facilitate the work of nurses, allowing them to have more time to provide direct care to patients (Cahyanto, 2025).

Nurses can easily fill out electronic health records if they have nursing informatics competencies. Competencies are knowledge and skills that a person must master. Nursing informatics competencies are one of five competencies that nurses must master and must be trained and taught from the time nurses begin their academic education (Finkelman, 2017).

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Nurses can easily complete electronic health records if they possess nursing informatics competency. Competency is the knowledge and skills that a person must master. Nursing informatics competency is one of five competencies that nurses must master and must be trained and taught from the time nurses begin their academic education (Finkelman, 2019). Two out of three nursing students had inadequate nursing informatics competency. Current nursing education still teaches nursing students about creating nursing care documentation, which is still handwritten or manually paper-based, thus still considered inadequate in preparing graduates with nursing informatics competency (Kleib, Jackman, Wisnesky, & Ali, 2021).

Nursing informatics competency is the skills and knowledge that nurses must master to effectively integrate digital technology into nursing practice. Nurses with strong nursing informatics competency will be prepared for the application of digital technology in clinical settings. However, several previous studies have shown that nursing informatics competency is still low and requires continued improvement. Research results (Guo, Liu, Liu, Wang, Xu, & Chen, 2024) indicate that nursing informatics competency is still at a moderate level, and ongoing training strategies are needed to improve it. Furthermore, 46.7% of nurses at Tampan Mental Hospital in Riau had limited competency in nursing informatics (Ersya, Nurchayati, & Amir, 2024). One-third of nurses lacked nursing informatics competency (Al-Balawi, Salman Taie, & Alsesei, 2020).

Nursing informatics competency is essential for nurses to be able to complete electronic health records (Tabara, Rahman, & Herawati, 2023). Several previous studies have shown that nursing students and nurses still lack mastery of nursing informatics competency. Previous research results indicate that the nursing informatics competency of most nurses remains at a low or moderate level. However, no previous research from Indonesia has reported efforts to improve nursing informatics through digital nursing documentation simulations.

A synergistic strategy is needed between clinical settings and academic education to collectively address the low level of nursing informatics competency. Academic education can address this issue by designing learning innovations that provide knowledge and skills so graduates can master nursing informatics competencies.

The digital nursing documentation simulation is an innovative learning program that utilizes digital technology to create nursing care documentation. The digital nursing documentation simulation is implemented in three stages: orientation to digital nursing documentation learning, completing nursing care documentation using an application program, and evaluation and feedback. Currently, there is no application program for completing nursing care documentation at Faculty of Health and Technology Sciences, Jenderal Achmad Yani University. Learning to complete nursing care documentation is still done by hand on paper. The digital nursing documentation simulation will provide nursing students with knowledge and experience in documenting nursing care using digital technology. Nursing students will become skilled and have the expertise to document nursing care using an application program developed by researchers. The website-based digital nursing documentation application program was developed by a research team, adhering to Indonesian nursing care documentation standards, including the Indonesian Nursing Diagnosis Standard (SDKI), the Indonesian Nursing Outcomes Standard (SLKI), and the Indonesian Nursing Interventions Standard (SIKI). Furthermore, the digital nursing documentation application program is available for use by nursing students and nurses to train them in digitally documenting nursing care.

RESEARCH METHOD

This research design is a quasi-experimental research type with the design used being a pretest and posttest one group design, namely there is one group as an intervention group that is given a digital nursing documentation simulation. The population in this study are undergraduate nursing students year/level 4th of Faculty of Health and Technology Sciences, Jenderal Achmad Yani University. The minimum sample required in this study is determined based on the sampling formula. The sample size is determined using the Slovin formula (Notoatmodjo, 2015). The number of samples based on the calculation is 22 participants. Sampling is based on the inclusion criteria (1) Registered as a year level 4th nursing student of Faculty of Health and Technology Sciences, Jenderal Achmad Yani University, (2) Have a laptop/Android cellphone with a minimum version 13, (3) Passed the nursing information system and

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digital health technology course, (4) Willing to be a respondent. The digital nursing documentation simulation was implemented in three stages: digital nursing documentation learning orientation, completing nursing care documentation using an application program, and evaluation and feedback. The instrument used to measure nursing informatics competency was the self-assessment informatics competency scale (Choi, Woo, & Tarte, 2024). This instrument consists of three domains: basic computer skills (questions 1-4), role (questions 5-6), and applied computer skills (clinical informatics) (questions 7-18), totaling 18 questions. The questions were then answered on a numeric scale from 1 to 5, with 1 representing incompetence and 5 representing expertise. This instrument has high reliability with a Cronbach's alpha value of 0.90.

This study used a non-parametric test, the Wilcoxon test, due to the non-normal distribution of the data. To test the effect of the intervention, a 95% confidence level was used, with a p value at the 95% confidence level. This study adheres to the principles of research ethics and has received ethical clearance from the Health Research Ethics Committee Faculty of Health and Technology Sciences, Jenderal Achmad Yani University, with the number 130/KEPK/FITKes-Unjani/IX/2025. This study was conducted from August to September 2025 in the nursing laboratory of the Faculty of Health Sciences and Technology, Jenderal Achmad Yani University.

RESEARCH RESULTS

Table 1. Characteristics of the Respondent (N=22)

Variable	Results
Age (n/%)	
(Mean±SD)(Range)(Year)	(22.18±0.83) (21–24)
21	3/13.6
22	15/68.2
23	1/4.6
24	3/13.6
Gender (n/%)	
Male	9/40.9
Female	13/59.1

The results of the study showed that most of the participants were 22 years old, as many as 15 participants (68.2%), and most of them were male, as many as 13 participants (59.1%).

Table 2. The Effect of Digital Nursing Documentation Simulation (N=22)

Nursing Informatics Competency	Mean	Std. Deviation	Minimum	Maximum	*Mean different*	*p-value*
Pre-Intervention	3.32	0.716	2	5	0.27	0.014
Post Intervention	3.59	0.796	3	5		

The results of the study showed that the nursing informatics competency score before being given a digital nursing documentation simulation intervention, the average score was 3.32 (competent), with a standard deviation of 0.716, a minimum value of 2 (somewhat competent) and a maximum value of 5 (expert). Meanwhile, after being given a digital nursing documentation simulation intervention, the average score was 3.59 (proficient), with a standard deviation of 0.796, a minimum value of 3 (competent) and a maximum value of 5 (expert). Based on the Wilcoxon test, a p value of 0.014 was obtained, meaning that

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there was a significant influence between digital nursing documentation simulation and Nursing Informatics Competence.

DISCUSSION

The results showed a significant effect of digital nursing documentation simulation on Nursing Informatics Competence. This means that digital simulation can impact the quality of nursing documentation, particularly in determining nursing diagnoses, outcomes, and interventions. Furthermore, this website-based application is designed to simplify and expedite the nursing process. By simply typing in the patient's signs and symptoms, the application analyzes the diagnosis, outcomes, and appropriate interventions.

This study found that participants were in the competent category before the digital nursing documentation simulation intervention. The researchers' analysis attributed this result to the participants being final-year nursing students in the undergraduate nursing program, who had experience in providing nursing care during clinical practice in hospitals. However, after the digital nursing documentation simulation intervention, their nursing informatics competency increased to the advanced category. The researchers' analysis of this result was due to the application being designed to be user friendly and computer assisted, accelerating the process of determining nursing diagnoses, outcomes, and appropriate nursing interventions in accordance with Indonesian standards for diagnosis, outcomes, and interventions. Using an application significantly improved the speed of determining nursing diagnoses compared to a nursing diagnosis book (Yuswandi, Budiman, & Dewi, 2024). The intervention group reduced diagnosis formulation time from 8.51 minutes to 7.23 minutes, while the control group increased from 8.09 minutes to 13.05 minutes. The use of web-based or smartphone-based applications significantly assists nurses in carrying out their work, particularly in documenting nursing care. These findings align with previous research, which found that 40.84% of nurses were at the competent level, with the highest average score for basic information and communication skills and the lowest average score for information and knowledge management skills (Raghunathan, McKenna, & Peddle, 2023).

Nursing documentation, a crucial component of clinical practice, has shifted from traditional paper-based methods to digital platforms, requiring nursing students to acquire proficiency in electronic health record (EHR) or patient medical records. Currently, most nursing academic education still provides paper-based or handwritten nursing documentation, which is considered insufficient to train nursing students' nursing informatics competencies in documenting nursing care (Mahfouz, Bakr, & Aref, 2023).

Digital nursing documentation simulation is a learning innovation provided to undergraduate nursing students in creating nursing care documentation using digital information technology. Previous research examining the nursing informatics competency profile of nursing students at the Nursing Department of Applied Medical Sciences College, University of Hafr Al Batin, found that 70.5% were at the competent level, 21% at the beginner level, and 8.5% at the novice level in mastering nursing informatics competencies (Mohamed & Abouzaied, 2021). Furthermore, the results of the study showed that the nursing informatics competency in 205 Tabriz University Hospital nurses obtained an average total nursing informatics competency of 59.92%, the highest average sub-competency score was obtained for informatics skills at 62.98%, followed by the average informatics knowledge at 59% and basic computer skills at 58.70% (Khezri & Abdekhoda, 2019). Furthermore, according to the results of the study (le Roux, Bimerew, & Chipps, 2024) assessed the computer literacy domain significantly higher than the other two domains (2.63/4 [95%CI 2.5–2.76]), with an average rating approaching the 'comfortable' competency range. This was followed by clinical information management (2.09/4 [95%CI 1.95–2.23]), and information literacy (2.05/4 [95%CI 1.92–2.17]). Some of the research results can provide an overview of nursing informatics competencies in nursing students and nurses.

Previous research applying simulation learning models to improve nursing informatics competency has been conducted. According to (Choi, Bove, Tarte, & Choi, 2021), nursing students in the intervention group who were given electronic health record (EHR) simulations demonstrated higher nursing informatics competency compared to the control group who were only given paper assignments. Previous research on the use of EHR simulations has been conducted, but

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the study originated from abroad using the paid EHR application program DocuCare from Lippincoat. In this study, the researchers designed their own application program, developed by the research team and based on applicable documentation standards in Indonesia (McBride, Thomas, & Decker, 2020).

CONCLUSION

The study concluded that digital nursing documentation simulation significantly impacted nursing informatics competency, particularly in nursing students. The application of digitization in nursing documentation has been shown to improve nursing informatics competency, preparing competent graduates. Furthermore, this study also demonstrated the ease of using digital tools, particularly web-based application, in creating nursing processes, from diagnosis to outcomes to nursing interventions.

REFERENCES

Al-Balawi, Z. E., Salman Taie, E., & Alsesei, N. (2020). Nursing Informatics Competency Based Assessment for Nursing Personnel in Primary Healthcare Centers in Tabuk. *American Research Journal of Nursing*, *6*(1), 1-17.

Cahyanto, H. N. (2025). *Transformasi Sistem Informasi Keperawatan*. Surabaya: PT. Pustaka Saga Jawadwipa.

Choi, J., Bove, L. A., Tarte, V., & Choi, W. J. (2021). Impact of simulated electronic health records on informatics competency of students in informatics course. *Healthcare Informatics Research*, *27*(1), 67–72.

Choi, J., Woo, S., & Tarte, V. (2024). Informatics Competencies of Students in a Doctor of Nursing Practice Program: A Descriptive Study. *Healthcare Informatics Research*, *30*(2), 147–153.

Chung, J., & Reynolds, T. (2021). *The effect of early adoption of an academic electronic health record system in nursing education: A pilot outcome study. Journal of Nursing Education and Practice, 11*(5), 16.

Ersya, R. A., Nurchayati, S., & Amir, Y. (2024). Gambaran Kemampuan Informatika Perawat di Rumah Sakit Jiwa Tampan Riau. *Jurnal Kesehatan Jompa*, *3*(1), 70-77.

Finkelman, A. (2017). *Professional Nursing Concepts: Competencies for Quality Leadership* (3rd ed.). Burlington, MA: Jones & Bartlett Learning.

Finkelman, A. (2019). *Professional Nursing Concepts: Competencies for Quality Leadership* (4th ed.). Burlington, MA: Jones & Bartlett Learning.

Guo, J., Liu, J., Liu, C., Wang, Y., Xu, X., & Chen, Y. (2024). Nursing informatics competency and its associated factors among palliative care nurses: an online survey in mainland China. *BMC Nursing*, *23*(157).

Khezri, H., & Abdekhoda, M. (2019). Assessing nurses' informatics competency and identifying its related factors. *Journal of Research in Nursing*, *24*(7), 529–538.

Kleib, M., Jackman, D., Wisnesky, U. D., & Ali, S. (2021). Academic Electronic Health Records in Undergraduate Nursing Education: Mixed Methods Pilot Study. *JMIR Nursing*, *4*(2), e26944.

Le Roux, L., Bimerew, M., & Chipps, J. (2024). Preparation of nursing students in nursing informatics competencies for the South African healthcare practice environment. *BMC Nursing*, *23*(923).

Mahfouz, H. H. E.-S., Bakr, M. M., & Aref, M. A. E. (2023). Effect of Electronic Health Records Training Program Via Using Advanced Mobile Devices on Career Success among Intern-Nurses. *Original Article Egyptian Journal of Health Care*, *14*(1), 1246-1264.

McBride, S., Thomas, L., & Decker, S. (2020). Competency Assessment in Simulation of Electronic Health Records: Tool Development. *Computers Informatics Nursing*, *38*(5), 232-239.

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DOI: https://doi.org/10.33024/minh.v8i9.1689

Mohamed, L. K., & Abouzaied, M. T. (2021). Self-assessment of nursing informatics competencies and attitudes among baccalaureate-nursing students. *Egyptian Nursing Journal*, *18*(1), 28–38.

Notoatmodjo. (2015). *Metodologi Penelitian Kesehatan*. Jakarta: Rineka cipta.

Raghunathan, K., McKenna, L., & Peddle, M. (2023). Baseline evaluation of nursing students' informatics competency for digital health practice: A descriptive exploratory study. *Digital Health*, *9*.

Tabara, S. A., Rahman, L. O.A. & Herawati, T. M. (2023). Kompetensi dan pengetahuan nursing informatics dalam penggunaan electronic health record: A literature review. *Jurnal Ilmiah Keperawatan Altruistik*, *6*(2), 42-47.

Wahyuni, T., & Haryati, R. T. S. (2024). Sistem Pendokumentasian Elektronik (Simrs) Dalam Upaya Peningkatan Mutu Dan Keselamatan Pasien: A Literature Review. *Cendekia Medika: Jurnal STIKES Al-Ma'arif Baturaja*, *9*(1), 88-95.

Yuswandi, Y., Budiman, B., & Dewi, P. A. C. (2024). Aplikasi Android Diagnosis Keperawatan Terhadap Kecepatan Penentuan Diagnosis Keperawatan. *PIN-LITAMAS, 4*(1), 349-353.

Galih Jatnika, Yuswandi*, Ismafiaty, Asep Badrujamaludin, Asep Id Hadiana

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