An exploratory study of clinical competency among nursing students and associated factors

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Abstract

This study aimed to evaluate the clinical competency of final-year nursing students and to identify factors influencing their readiness for professional practice. A descriptive cross-sectional survey was conducted with 353 students using a validated self-assessment questionnaire covering nine standardized domains. Data was analyzed with descriptive statistics, t-tests, and ANOVA. Findings revealed that only 44.2% of students reached a competent level, while more than half (54.1%) remained partially competent. Strengths were observed in communication and patient safety, whereas significant gaps were found in technical skills and application of the nursing process. Competency was significantly associated with gender, academic performance, and the clinical learning environment. The novelty of this study lies in providing evidence-based insights for nursing education in Viet Nam, emphasizing that clinical competency is not a fixed trait but a trainable outcome. The findings highlight the urgent need for curriculum innovation, enhanced clinical mentorship, and simulation-based teaching strategies to strengthen practice readiness.

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Keywords

nursing students, clinical competency, nursing education, competency criteria and factors

1 Introduction

Clinical competency is a core criterion reflecting the quality of nursing education and the readiness of nursing students to practice independently after graduation. In the context of growing healthcare demands, especially at the grassroots level, ensuring adequate clinical competency is essential for improving care quality and patient safety [1]. Defined as the ability to apply knowledge, clinical skills, and professional attitudes in patient care, clinical competence plays a decisive role in both training quality and professional readiness. However, several studies have shown concerning results; for instance, a systematic review in Ethiopia reported that only 28% of nursing students were clinically competent [2].

To enhance training quality, Vietnamese Ministry of Health issued the *Basic Nursing Competency Standards* in 2022, which comprise 5 domains, 19 standards, and 73 criteria. Among these, the domain of clinical practice competency is the most emphasized, accounting for 9 standards and 37 criteria [3]. Similarly, international frameworks such as the Quality and Safety Education for Nurses (QSEN) and the American Association of Colleges of Nursing (AACN)

provide comprehensive definitions linking knowledge, skills, and attitudes to safe and high-quality care [4, 5]. For clarity, clinical competency is often classified into three levels − competent, partially competent, and incompetent − based on performance across standards and criteria. In Viet Nam, a study at Can Tho University of Medicine and Pharmacy reported that 61.5% of nursing students achieved the "competent" level in clinical practice competence, while the remainder fell into lower levels [6].

Despite these frameworks and initial evidence, limited research has systematically assessed nursing students' clinical competency in Viet Nam using standardized criteria. At Nguyen Tat Thanh University (NTTU), although hospital-based training and faculty development have been strengthened, no study has comprehensively evaluated competency outcomes and their associated factors. Therefore, this study aims to assess the clinical competency of nursing students at NTTU and identify related factors.

2 Research Methodology

2.1 Participants and Scope of Study

Participants: Fourth-year nursing students who had completed 11 out of 12 semesters at NTTU and participated in clinical practice at hospitals or medical centers in Ho Chi Minh City during the study period.

Inclusion criteria: Fourth-year nursing students who agreed to participate and had been involved in clinical placements.

Exclusion criteria: Students who did not complete the entire questionnaire.

Study setting and timeframe: Faculty of Nursing, NTTU, from June 2025 to July 2025.

2.2 Sample Size Determination

The sample size was calculated using a single population proportion formula designated as:

$$n = \frac{Z^2_{(1-\alpha/2)} \cdot p(1-p)}{d^2}$$

n = required sample size

Z = standard normal deviate corresponding to the desired confidence level (1.96 at 95% CI)

p = estimated proportion from a previous study

d = margin of error (precision), set at 0.05 in this study based on the assumption of p = 0.336, which was the proportion of clinical practice competency in Ethiopia university [2], a 95% confidence level, 5% margin of error (d) and 10% non-response rate. As a result, the total calculated sample size was 376 students, of which 353 completed the survey, yielding a response rate of 93.9%.

2.3 Data Collection Method

Data collection procedure: Data was collected using a self-administered questionnaire. Fourth-year nursing students at NTTU were invited to complete the survey, which required approximately 20 to 30 minutes to complete. Prior to data collection, participants were provided with detailed instructions and explanations regarding the questionnaire to ensure clarity and accurate responses.

Research instrument: Data was collected using a structured self-administered questionnaire. The first section focused on sociodemographic characteristics. The second section employed a 55-item Clinical Competency Scale developed by Nguyen Thi Ngoc Han (2023), comprising 9 domains and demonstrating a Cronbach's alpha of 0,89. Each item was rated on a 3-point Likert scale ranging from 0 to 2. Competency levels were categorized as follows: 0.00-0.67 = Incompetent; 0.68-1.34 = Partially Competent; and 1.35-2.00 = Competent [6]. A pilot study conducted with 30 nursing students yielded a Cronbach's alpha of 0.95, indicating excellent internal consistency.

2.4 Data Management and Analysis

Data was analyzed using SPSS version 27.0. Descriptive statistics were applied to present demographic characteristics and clinical competency of nursing students, including mean, standard deviation, frequency, and percentage. Inferential statistics, including independent t-test and one-way ANOVA, were used to examine the relationships between clinical competency and associated variables. A p-value of < 0.05 was considered statistically significant.

2.5 Ethical Considerations

This study complied with ethical guidelines for biomedical research involving human participants and was approved by the Institutional Review Board of

NTTU (Approval No. 20/GCN-NTT, dated June 9, 2025). Data collection was conducted only after obtaining informed consent from all participants. All information collected was kept strictly confidential, and participant anonymity was fully maintained.

3 Results

Table 1 Sociodemographic characteristics of nursing students (n = 353)

Sociodemographic variables		Frequency (n)	Percentage (%)
Age	22.05 ± 0.27 (min: 22, max: 25) *		
Gender	Male	35	9.9
	Female	318	90.1
Learning method	Self-study	231	65.4
	Group-study	122	34.6
Academic performance	Excellent	12	3.4
	Good	60	17.0
	Fair	274	77.6
	Average	7	2.0
Clinical learning environment	Conducive	338	95.8
	Uncond ucive	15	4.2
Support from instructors has influence on practice	Yes	253	71.7
	No	100	28.3
Staff-student interaction	Yes	274	77.6
	No	79	22.4

Abbreviations: Min = minimum value; Max = maximum value.

Table 1 illustrates the general characteristics of the study participants. The mean age was 22.05 ± 0.27 years, ranging from 22 to 25. Female students accounted for the majority (90.1%), while male students represented only 9.9%. Regarding learning methods, most participants reported engaging in self-study (65.4%), whereas 346% preferred group study.

In terms of academic performance, 77.6% of students were classified as "fair," followed by "good" (17.0%), "excellent" (3.4%), and "average" (2.0%). A large proportion (95.8%) evaluated their clinical learning environment as conducive. Additionally, 71.7% support from instructors has influence on practice, and 77.6% reported interacting with staff during their clinical training.

Table 2 Mean scores and level of clinical competency of nursing students (n = 353)

Level of clinical competence	Frequency (n)	Percentage (%)
Competent	156	44.2
Partially Competent	191	54.1
Incompetent	6	1.7
Mean ± SD	1.29 ± 0.27	

Abbreviations: SD: standard deviation.

Table 2 illustrates the mean score and level of clinical competency among the study participants. An analysis of the clinical competence levels among participants revealed that 44.2% (n = 156) were categorized as competent, whereas the majority, 54.1% (n = 191), were identified as partially competent. A minimal proportion, 1.7% (n = 6), fell into the incompetent category. The overall mean score for clinical competency was 1.29 ± 0.27, suggesting a predominance of partial competency within the study population.

Table 3 Mean scores and levels of clinical competency based on nine standardized clinical criteria among nursing students

Competency standard	Mean ± SD	Incompetent (%)	Partially competent (%)	Competent (%)
CS1. Knowledge Application: application of basic scientific knowledge, biomedical	1.12 ± 0.38	31 (8.8)	209 (59.2)	113 (32.0)

sciences, pathology, and nursing science in clinical practice				
CS2. Nursing Process: application of the nursing process in patient care across healthcare settings, home care, and community health in an appropriate and effective manner	1.08 ± 0.39	50 (14.2)	217 (61.5)	86 (24.4)
CS3. Safety & Respect: ensuring safety and respect for patients, individuals, families, and communities	1.51 ± 0.35	3 (0.8)	93 (26.3)	257 (72.8)
CS4. Technical Skills: performing clinical nursing procedures safely and effectively	1.34 ± 0.31	5 (1.4)	176 (49.9)	172 (48.7)
CS5. Medication Administration: safe and effective medication administration	1.31 ± 0.39	17 (4.8)	170 (48.2)	166 (47.0)
CS6. Continuity of Care: ensuring continuity of care	1.25 ± 0.44	37 (10.5)	216 (61.2)	100 (28.3)
CS7. Emergency Response: timely response in emergency situations	1.21 ± 0.38	31 (8.8)	173 (49.0)	149 (42.2)
CS8. Communication: appropriate communication with patients, families, colleagues, and the community	1.61 ± 0.46	19 (5.4)	104 (29.5)	230 (65.2)
CS9. Health Education: effective health education for individuals, families, and communities	1.15 ± 0.40	38 (10.8)	238 (67.4)	77 (21.8)

Abbreviations: CS: Competency standard; SD: standard deviation.

According to the findings presented in Table 3, among the nine standardized clinical competency standards assessed, nursing students demonstrated notable strengths in communication and patient safety competencies. For communication (CS8), the mean score was 1.61 ± 0.46, with 65.2% of students classified as competent. Patient safety and respect (CS3) yielded the highest level of competency among all standards, with a mean score of 1.51 ± 0.35 and 72.8% of students rated as competent. In contrast, clinical competencies showed greater variation. Technical skills (CS4), medication administration (CS5), and emergency response (CS7) had lower proportions of competent nursing students, with 48.7%, 47.0%, and 42.2%, respectively. The lowest competency levels were found in CS1 (32.0%), CS2 (24.4%), and CS6 (28.3%).

Table 4 Observation of factors affecting the level of clinical competency among nursing students

Observation items		**Mean ± SD**	**[a]t value**	**[b]F value**	**P value**
Gender	Male	1.39 ± 0.26	2.16		0.03
	Female	1.28 ± 0.27			
Learning method	Self-study	1.30 ± 0.29	0.33		0.74
	Group-study	1.29 ± 0.23			
Academic performance	Excellent	1.42 ± 0.31		8.80	0.01
	Good	1.40 ± 0.27			

	Fair	1.27 ± 0.26			
	Average	0.94 ± 0.34			
Clinical learning environment	Conducive	1.30 ± 0.27	2.40		0.02
	Unconducive	1.13 ± 0.18			
Support from instructors has influence on practice	Yes	1.29 ± 0.27	−0.25		0.80
	No	1.29 ± 0.28			
Staff-student interaction	Yes	1.28 ± 0.27	−1.49		0.14
	No	1.33 ± 0.26			

Abbreviations: SD: standard deviation; a: Independent t-test; b: ANOVA test.

Table 4 shows the factors associated with the clinical competency levels among nursing students. Gender was found to be significantly associated with clinical competency, with male students showing higher competency scores than female students (1.39 ± 0.26 vs. 1.28 ± 0.27, $p = 0.03$). Academic performance also had a significant effect on competency levels ($F = 8.80$, $p = 0.01$), where students with excellent and good academic standing achieved higher scores compared to those with fair or average performance. Furthermore, the clinical learning environment was identified as a significant factor. Students who perceived their clinical learning environment as conducive had higher competency scores (1.30 ± 0.27) compared to those in an unconducive environment (1.13 ± 0.18, $p = 0.02$). In contrast, learning methods (self-study vs group-study), support from instructors and staff-student interaction did not show statistically significant differences in clinical competency scores ($p > 0.05$).

4 Discussion

4.1 The Levels of Clinical Competency of Nursing Students

This study found that fewer than half of final-year nursing students (44.2%) achieved a competent level, while the majority (54.1%) remained partially competent and 1.7% were incompetent. These results pointed to persistent challenges in ensuring readiness for independent practice and echo findings from Ethiopia and other contexts, where suboptimal levels of competency were also reported [2, 7]. The consistency of results across studies suggests that limitations in clinical competence among nursing students are not context-specific but represent a wider issue in nursing education globally.

Strengths were observed in patient safety (72.8%) and communication (65.2%), aligning with international frameworks such as QSEN and the AACN Essentials, both of which highlight safety and communication as fundamental domains of nursing practice [4, 5]. However, lower performance was evident in the nursing process (24.4%), technical skills (48.7%), and medication administration (47.0%). These gaps suggest insufficient mastery of advanced competencies, likely due to limited opportunities for high-fidelity practice or simulation. Systematic reviews confirm that simulation-based learning significantly enhances technical and procedural competence [8], underscoring its importance for curriculum reform.

4.2 Factors Associated with Clinical Competency of Nursing Students

Several factors were found to be significantly associated with competency levels. Male students scored higher than female students (p = 0.03), which was inconsistent with studies that previously reported no gender differences [9]. Academic performance showed a strong positive relationship with competence, supporting evidence that higher GPA correlates with stronger clinical reasoning and decision-making [10, 11]. Furthermore, students who perceived their clinical learning environment as supportive achieved significantly higher competence scores, consistent with evidence that a positive environment fosters confidence, collaboration, and skill development [2, 12]. In contrast, learning methods, instructor support, and staff-student interaction were not significantly

related to competency levels, suggesting that broader contextual factors in the clinical environment may outweigh individual learning approaches.

Overall, the findings emphasize the urgent need for educational innovation in Vietnamese nursing programs. Strengthening clinical mentorship, enhancing the use of simulation-based teaching, and refining curricula to address identified gaps in technical skills and the nursing process are critical. Importantly, clinical competency should not be viewed as a fixed trait but as a trainable outcome that can be improved through targeted interventions. By addressing modifiable factors, nursing education can ensure graduates are adequately prepared to deliver safe, effective, and patient-centered care.

5 Conclusion

This study revealed that fewer than half of final-year nursing students achieved a competent level of clinical competency, while the majority remained only partially competent. Strengths were observed in communication and patient safety, whereas substantial gaps persisted in technical skills, medication administration, and application of the nursing process. Clinical competency was significantly associated with gender, academic performance, and the clinical learning environment, underscoring the influence of both individual and contextual factors on practice readiness. These findings highlight the urgent need for curriculum reform in Vietnamese nursing education. Targeted strategies, including strengthening clinical mentorship, enhancing supportive learning environments, and expanding the use of simulation-based teaching, are critical to address deficiencies and ensure that graduates are adequately prepared for safe, effective, and patient-centered care. Importantly, clinical competency should be recognized not as a fixed trait but as a trainable outcome that can be continuously improved through evidence-based educational interventions.

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Khám phá năng lực thực hành chăm sóc của sinh viên điều dưỡng và các yếu tố liên quan

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Tóm tắt Nghiên cứu này được thực hiện nhằm đánh giá năng lực thực hành chăm sóc của sinh viên điều dưỡng năm cuối và xác định các yếu tố ảnh hưởng đến mức độ sẵn sàng hành nghề. Thiết kế nghiên cứu mô tả cắt ngang được áp dụng trên 353 sinh viên, sử dụng bộ công cụ tự đánh giá đã kiểm định với 9 lĩnh vực chuẩn hóa. Dữ liệu thu thập được xử lý bằng thống kê mô tả, kiểm định t và ANOVA. Kết quả cho thấy chỉ 44,2 % sinh viên có năng lực thực hành chăm sóc đáp ứng tốt theo chuẩn năng lực Việt Nam trong khi 54,1 % chỉ đạt mức trung bình. Sinh viên thể hiện ưu thế ở kỹ năng giao tiếp và an toàn người bệnh nhưng còn hạn chế đáng kể ở kỹ năng kỹ thuật và quy trình điều dưỡng. Năng lực thực hành chăm sóc có mối liên quan có ý nghĩa thống kê với giới tính, kết quả học tập và môi trường học tập lâm sàng. Điểm mới của nghiên cứu là cung cấp bằng chứng thực nghiệm phục vụ giảng dạy điều dưỡng tại Việt Nam, khẳng định năng lực thực hành chăm sóc là một kết quả có thể đào tạo và cải thiện, qua đó nhấn mạnh yêu cầu đổi mới chương trình, tăng cường cố vấn lâm sàng và ứng dụng phương pháp giảng dạy mô phỏng để nâng cao sự sẵn sàng thực hành của sinh viên.
Từ khóa sinh viên điều dưỡng; năng lực thực hành chăm sóc; đào tạo điều dưỡng; tiêu chí năng lực và các yếu tố liên quan.