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Clinical competence and related factors among Vietnamese nursing students: a cross-sectional study

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Abstract

Background & Objective: Clinical competence is a key outcome of nursing education and a fundamental determinant of high-quality patient care. Although numerous studies have examined factors influencing clinical competence, limited evidence is available regarding nursing students in Vietnam. This study aimed to assess clinical competence and identify associated factors among Vietnamese nursing students.

Materials & Methods: A cross-sectional study was carried out from January to April 2024 among 326 full-time nursing students who had completed at least one clinical course at Da Nang University of Medical Technology and Pharmacy, using a convenience sampling approach. Data were collected using four instruments: a demographic questionnaire, the Generalized Self-Efficacy Scale, the Self-Directed Learning Readiness Scale, and the Clinical Competence Questionnaire. Descriptive statistics summarized participant characteristics and study variables, and correlations were examined using Spearman's rank-order, point-biserial, and Pearson's correlation analyses, as appropriate. All analyses were conducted using SPSS version 20.0, with $p < 0.05$ considered statistically significant.

Results: The participants had a high level of clinical competence, with a mean score of 4.20 ± 0.37. Among the domains, core nursing skills had the highest mean score (4.43 ± 0.38), while advanced nursing skills had the lowest (3.81 ± 0.69). Academic year, satisfaction with the clinical learning environment, relationships with medical staff, self-efficacy, and self-directed learning readiness were significantly correlated with clinical competence. Notably, self-directed learning readiness demonstrated the strongest correlation ($r = 0.51$, 95% CI: 0.425 – 0.586, $p < 0.001$).

Conclusion: Vietnamese nursing students demonstrated a high level of clinical competence, with psychological factors, particularly self-efficacy and self-directed learning readiness, emerging as significant correlates. These findings highlight the need for nursing programs to strengthen self-directed learning activities, enhance student self-efficacy through supportive teaching and mentorship, and foster positive clinical learning environments to further improve clinical competence.

Keywords: clinical competence; learning environment; students, nursing; self-efficacy; self-directed learning

Introduction

Clinical competence is a core component of professional nursing practice. Within Benner's Novice to Expert framework, it reflects the progressive integration of and knowledge, skills, clinical judgment developed through experience to deliver safe and effective patient care [1]. It is widely recognized as a key determinant of healthcare quality and is closely linked to improved patient outcomes [2]. Growing global expectations for high-quality healthcare, driven by rapid scientific and

technological advances and the increasing burden of chronic diseases, also highlight the need for nurses to show strong clinical competence [3]. Thus, developing clinical competence is a central goal of nursing education, as it directly contributes to care quality, patient safety, and patient satisfaction [4, 5]. Despite its recognized importance, gaps in clinical competence have been reported among nursing students and newly graduated nurses.

These gaps may create challenges during the transition to practice and can affect workforce retention [6, 7]. Recent international evidence focusing on nursing students also shows ongoing concerns about clinical competence. For example, Mohammadi and Khoskhoo reported that nursing students showed only a moderate level of clinical competence [8]. Likewise, a recent meta-analysis found that overall clinical competence among nursing students remained relatively low across diverse educational contexts [9]. Together, these findings highlight a global concern about the adequacy of clinical competence in nursing education.

Previous research suggests that the development of clinical competence is shaped by multiple factors that can be broadly grouped into demographic and academic factors, clinical learning environment factors, and psychological factors [9–17]. Demographic and academic factors include gender, year of study, academic performance, and leadership experience, all of which have been reported as possible correlates of clinical competence [9–11].

Factors related to the clinical learning environment also play an important role. Higher satisfaction with clinical placements and supportive relationships with healthcare staff have consistently been linked to better competence development [8, 12–14]. In addition, psychological factors such as self-confidence, self-efficacy, and self-directed learning readiness have emerged as important influences on clinical competence among nursing students [8, 15–17].

Although the need for a clinically competent nursing workforce is widely recognized, empirical evidence on clinical competence among nursing students in Vietnam remains limited. Existing studies in the Vietnamese context have mainly described overall levels of clinical competence, which have generally been reported as moderate [18, 19].

However, these studies have given limited attention to the roles of psychological factors and the clinical learning environment in shaping clinical competence. To address this gap and provide evidence to inform educational strategies for workforce readiness, this study aimed to assess the level of clinical competence and examine its correlation with selected factors among Vietnamese nursing students.

Materials & Methods

Design and setting(s)

This cross-sectional study was designed and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (https://www.strobe-statement.org). Data were collected at Da Nang University of Medical Technology and Pharmacy, located in central Vietnam. The data collection period lasted from January 2024 to April 2024.

Participants and sampling

Participants were recruited using a convenience sampling approach. The study population consisted of full-time nursing students at Da Nang University who had completed at least one clinical course. All eligible students who were present during the data collection period were invited to participate voluntarily, whereas those who were absent were excluded. The required sample size was calculated using G*Power version 3.1.9.4.

For the correlational analysis, a two-tailed test was applied with an assumed small-to-moderate effect size of 0.20, an alpha level of 0.05, and statistical power of 0.95. This effect size was selected based on Cohen's guideline for correlation analyses [20]. Based on these parameters, the minimum required sample size was 319 participants. A total of 326 students who met the inclusion criteria were invited to participate, and all agreed, resulting in a final sample of 326 students.

Tools/Instruments

Data were collected using a four-section questionnaire that included participants' characteristics, the Generalized Self-Efficacy Scale, the Self-Directed Learning Readiness Scale, and the Clinical Competence Questionnaire. The participants' characteristics questionnaire was developed by the research team based on a review of relevant literature.

It included items assessing gender, academic year, satisfaction with the clinical learning environment, satisfaction with the nursing profession, and relationships with medical staff. Content validity was assessed through expert review by five nursing educators with experience in nursing education and clinical

practice. The experts confirmed that the items were appropriate and relevant to the study context. The Generalized Self-Efficacy Scale (GSES) is a 10-item instrument used to assess individuals' confidence in their ability to cope with a variety of challenging demands. Items are rated on a 4-point Likert scale ranging from 1 (completely incorrect) to 4 (completely correct).

Total scores are calculated by summing all item responses, with higher scores indicating higher levels of self-efficacy. The GSES has shown strong reliability in previous studies, with Cronbach's alpha values ranging from 0.82 to 0.93 [21].

The Self-Directed Learning Readiness Scale (SDLR), developed by Fisher et al., is a 40-item instrument used to assess students' readiness for self-directed learning. The scale includes three subscales: self-management (13 items), desire for learning (12 items), and self-control (15 items).

Items are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with items 3, 11, 20, and 40 reverse-scored. Total scores range from 40 to 200, with higher scores indicating greater readiness for self-directed learning.

A total score above 150 reflects a high level of readiness, while scores of 150 or below indicate lower readiness. The original study reported a Cronbach's alpha of 0.92 [22]. Clinical competence was measured using the 47-item Clinical Competence Questionnaire (CCQ) [23]. The CCQ evaluates competence across two subscales: professional nursing behavior (16 items) and clinical nursing skills (31 items). The clinical nursing skills subscale is further divided into general performance (13 items), core nursing skills (12 items), and advanced nursing skills (6 items). Items are rated on a 5-point Likert scale ranging from 1 (no knowledge) to 5 (able to perform without supervision).

To support interpretation and comparison across items and domains, clinical competence was presented as a mean score. This score was calculated by dividing the total score by the 47 items, producing a possible range from 1 to 5, with higher scores indicating greater clinical competence. This scoring approach has been used in previous studies using the CCQ to allow comparison across domains with different numbers of items. The CCQ showed excellent reliability, with a Cronbach's alpha of 0.98 [23].

After permission for use was obtained, the GSES, SDLR, and CCQ were translated into Vietnamese using a forward–backward translation procedure following the guideline proposed by Cha et al. to ensure linguistic and cultural equivalence [24]. The Vietnamese versions of the instruments then underwent content validation by a panel of five experts in nursing education and clinical practice, who evaluated the relevance and clarity of the items.

The content validity index values were 1.00 for the GSES, 0.96 for the SDLR, and 0.97 for the CCQ, indicating excellent content validity. Before the main data collection, the translated instruments were pilot tested with 30 nursing students to assess internal consistency reliability. The Cronbach's alpha coefficients were 0.83 for the GSES, 0.92 for the SDLR, and 0.95 for the CCQ, indicating good to excellent reliability.

Data collection methods

Data were collected from January to April 2024 using a self-administered questionnaire. The research team approached nursing students in their classrooms immediately after a theory session. All potential participants received detailed information about the purpose and procedures of the study.

Informed consent was obtained before the questionnaires were distributed. Students completed the survey on-site, which took about 15 to 20 minutes, and returned the completed questionnaires to the research team.

Data analysis

All statistical analyses were carried out using SPSS version 20.0. Descriptive statistics, including frequencies, percentages, means, and Standard Deviations (SD), were used to summarize participant characteristics and study variables. The normality of continuous variables was assessed through visual inspection of histograms and normal Q-Q plots, which suggested that the data were approximately normally distributed.

Spearman's rank-order correlation was used to examine associations between clinical competence and ordinal variables, including academic year, satisfaction with the clinical learning environment, satisfaction with the nursing profession, and relationships with medical staff. Point-biserial correlation was applied to assess the association between clinical competence and the dichotomous variable of gender.

Pearson's product-moment correlation coefficient was used to examine relationships between clinical competence and the continuous psychological variables of self-efficacy and self-directed learning readiness. Statistical significance was set at $p < 0.05$.

Results

The majority of participants were female, accounting for 93.6% of the sample. The distribution of students across academic years was relatively balanced. About half of the students reported satisfaction with their clinical learning environment and with the nursing profession. In addition, most participants described their relationships with medical staff as either good or fair (**Table 1**).

Table 1. Characteristics of the participants (n = 326)

Variables	n (%)
Gender	
Female	305 (93.6)
Male	21 (6.4)
Academic year	
Third year	166 (50.9)
Fourth year	160 (49.1)
Satisfaction with the clinical learning environment	
Very satisfied	15 (4.6)
Satisfied	130 (39.9)
Neutral	176 (54.0)
Dissatisfied	5 (1.5)
Satisfaction with the nursing profession	
Very satisfied	13 (4.0)
Satisfied	132 (40.5)
Neutral	161 (49.4)
Dissatisfied	18 (5.5)
Very dissatisfied	2 (0.6)
Relationship with medical staff	
Good	101 (31.0)
Fair	222 (68.1)
Poor	3 (0.9)

Abbreviations: n, number of participants.

The mean self-efficacy score among participants was 26.33 ± 3.33), while the mean self-directed learning readiness score was 142.17 ± 12.62. Detailed results are presented in **Table 2**. As presented in **Table 3**, the overall mean clinical competence score was 4.20 ± 0.37. Among the subscales, the highest mean score was observed for core nursing skills (4.43 ± 0.38), whereas the lowest mean score was reported for advanced nursing skills (3.81 ± 0.69). As shown in **Table 4**, five variables were significantly associated with clinical competence.

Based on Cohen's criteria [20], weak positive correlations were found between clinical competence and academic year, satisfaction with the clinical learning environment, and relationships with medical staff. Self-efficacy showed a moderate positive correlation with clinical competence. Self-directed learning readiness had the strongest association with clinical competence (r = 0.51, 95% CI: 0.425–0.586, p < 0.001).

Table 2. Self-efficacy and self-directed learning readiness among the participants

Content	Mean ± SD	Possible range (Min–Max)	Observed range
Self-efficacy	26.33 ± 3.33	10 – 40	14 – 40
Self-directed learning readiness	142.17 ± 12.62	40 – 200	111 – 172

Note: Values are presented as mean ± standard deviation.
Abbreviations: SD, standard deviation; Min, minimum; Max, maximum.

Table 3. Clinical competence among nursing students

Contents	Mean ± SD	Possible range (Min–Max)	Observed range
Professional nursing behaviors	4.35 ± 0.40	1–5	2.94–5.00
Clinical nursing skills			
General performance	3.99 ± 0.55	1–5	2.46–5.00
Core nursing skills	4.43 ± 0.38	1–5	3.00–5.00
Advanced nursing skills	3.81 ± 0.69	1–5	1.50–5.00
Clinical competence (total)	4.20 ± 0.37	1–5	3.04–4.89

Note: Values are presented as mean ± standard deviation.
Abbreviations: SD, standard deviation; Min, minimum; Max, maximum.

Table 4. Factors related to clinical competence among nursing students

Variables	r	95% CI for r	p-value
Gender	0.08[b]	− 0.029–0.187	0.137
Academic year	0.14[s]	0.032–0.245	0.009*
Satisfaction with the clinical learning environment	0.18[s]	0.073–0.283	< 0.001**
Satisfaction with the nursing profession	0.09[s]	− 0.019–0.197	0.091
Relationship with medical staff	0.13[s]	0.022–0.235	0.017*
Self-efficacy	0.32[p]	0.219–0.414	< 0.001**
Self-directed learning readiness	0.51[p]	0.425–0.586	< 0.001**

Note: r indicates correlation coefficient. * p < 0.05; ** p < 0.001.
Abbreviations: [p] Pearson correlation test; [b] Point-biserial correlation test; [s] Spearman's rho correlation test; CI, confidence interval.

Discussion

This study indicates that Vietnamese nursing students showed a relatively high level of clinical competence. Compared with findings from previous studies, the overall competence level observed in the present study appears favorable [15, 18, 19, 25]. However, comparisons across studies should be interpreted cautiously because reported levels of clinical competence can vary depending on differences in study populations, curricular structures, and clinical training environments. Differences in learning opportunities and the extent of clinical exposure across educational contexts may influence the development of clinical competence among nursing students.

Professional nursing behaviors emerged as a relative strength among students in this study. Compared with findings reported in other educational settings [15, 25, 26], students in the present study showed stronger performance in this domain. This difference may reflect contextual variations in educational organization and clinical training systems. In Vietnam, nursing curricula commonly emphasize early and sustained clinical exposure through extensive rotations in various healthcare settings. Such longitudinal exposure may increase patient contact, support professional socialization, and facilitate the internalization of professional values, which are important for developing professional nursing behaviors.

Within the domain of clinical nursing skills, students showed stronger performance in core nursing skills than in general clinical performance. This pattern is consistent with previous studies suggesting that fundamental nursing procedures are more readily developed during undergraduate education [25]. Compared with some international reports, students in this study appeared to demonstrate relatively higher proficiency in clinical nursing skills [15, 26]. In the Vietnamese context, clinical training often takes place in large tertiary hospitals where students encounter a wide range of patient conditions. These environments may provide frequent opportunities for hands-on practice and skill development, which may contribute to higher competence in core nursing skills.

Advanced nursing skills represented the lowest-performing domain in this study, a finding consistent with reports from other countries [26, 27]. This may be explained by the limited opportunities for undergraduate nursing students to independently perform advanced procedures during clinical placements, as these tasks are typically reserved for licensed nurses and require close supervision. As a result, students may have fewer opportunities to gain experience with complex clinical tasks during routine training.

This study identified a statistically significant association between academic year and clinical competence, with fourth-year students showing higher levels of competence than third-year students. This finding aligns with evidence from studies conducted in Ethiopia [9]. This pattern may reflect differences in the amount and diversity of clinical exposure across academic years, as students in later years usually participate in longer and more varied clinical placements. Such experiences may provide more opportunities for repeated practice, skill improvement, and consolidation of previously learned knowledge. Extended clinical immersion may also support the integration of theoretical knowledge with practical experience, contributing to the development of clinical reasoning and a more comprehensive approach to patient care, which may be associated with higher perceived clinical competence.

A significant correlation was also observed between clinical competence and satisfaction with the clinical learning environment, consistent with findings from studies conducted in China and Iran [13, 14]. This relationship may reflect the important role of the clinical setting in enabling students to apply theoretical knowledge in practice. A supportive and well-organized clinical learning environment may increase students' confidence, encourage engagement in patient care activities, and provide more opportunities for skill development through authentic clinical experiences.

This study also found a weak positive correlation between clinical competence and students' relationships with medical staff. This result is consistent with previous studies among Ethiopian nursing students [12, 28]. Positive interactions with healthcare professionals may shape students' clinical learning experiences. Supportive relationships with medical staff may provide more opportunities for informal learning, role modeling, and constructive feedback, which can facilitate students' participation in clinical activities and support the application of theory in practice.

The present study identified a moderate positive correlation between self-efficacy and clinical competence, which is consistent with previous research among nursing students in other contexts [14, 15, 17]. For example, Pu et al. reported that self-efficacy was statistically associated with both the clinical learning

environment and clinical competence [17]. These findings suggest that higher self-efficacy may be related to greater confidence in handling clinical challenges and lower susceptibility to performance-related anxiety in clinical settings. Existing evidence therefore highlights self-efficacy as an important psychological correlate of clinical competence among nursing students.

Self-directed learning readiness is widely recognized as an important component of nursing students' development during clinical education [29]. In the present study, a strong positive correlation was observed between self-directed learning readiness and clinical competence, which is consistent with earlier findings [13, 16]. For instance, Vasli and Asadiparvar-Masouleh reported that self-directed learning readiness was significantly associated with clinical competence among Iranian nursing students, highlighting its importance in clinical education contexts [13]. Taken together, these findings suggest that self-directed learning readiness may play an important role in the development of clinical competence.

The present study found no significant differences in clinical competence based on gender or students' level of satisfaction with the nursing profession. The absence of gender differences is consistent with previous studies [8, 15], suggesting that male and female students may have similar opportunities to develop clinical competence through educational and clinical learning experiences. However, clinical competence did not differ significantly across levels of professional satisfaction in this study, which contrasts with findings reported among Iranian nursing students [8].

This discrepancy may reflect contextual differences between countries, including variations in national policies and economic conditions that influence perceptions of the nursing profession.

In settings where incentives such as competitive salaries, stable employment opportunities, and possibilities for academic advancement are more prominent, professional satisfaction may be more closely related to students' motivation and engagement in clinical learning.

This study has several limitations that should be considered.

First, the cross-sectional design limits the ability to establish causal relationships between the examined factors and clinical competence. Second, the sample was drawn from a single university in Vietnam, which may limit the generalizability of the findings to other settings, regions, or countries with different educational systems or healthcare structures. Finally, the use of self-reported questionnaires may introduce potential biases, such as social desirability bias or response bias, which could influence the accuracy of the reported data.

Conclusion

The findings of this study indicate that Vietnamese nursing students demonstrated a relatively high level of clinical competence.

Academic year, satisfaction with the clinical learning environment, and relationships with medical staff showed weak positive correlations with clinical competence, while self-efficacy and self-directed learning readiness showed moderate and strong positive associations, respectively.

These findings suggest several implications for nursing education. Promoting self-directed learning readiness may enhance students' engagement in clinical learning. In addition, teaching strategies that strengthen self-efficacy, such as constructive feedback, supportive supervision, and gradual increases in clinical responsibility, may improve students' confidence in managing clinical challenges.

Efforts to improve the clinical learning environment through closer collaboration between nursing schools and healthcare institutions, together with strengthened mentorship and interprofessional support during clinical placements, may also contribute to more supportive learning contexts and more effective clinical training.

However, these findings should be interpreted with caution due to the cross-sectional design and the single-institution sample of the study.

Ethical considerations

The study received ethical approval from the Ethics Committee in Biomedical Research, Da Nang University, Vietnam (approval number: 79/BB-HDDD, dated October 30, 2023). Informed consent was obtained from all participants prior to their participation in the study.

Artificial intelligence utilization for article writing

ChatGPT (OpenAI) was used only for language editing. All scientific content, data interpretation, and conclusions presented in the manuscript are entirely the work of the authors.

All AI-assisted edits were carefully reviewed and verified by the authors to ensure accuracy and compliance with ethical standards.

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Conflict of interest statement

The authors declare that they have no conflict of interest.

Author contributions

LTAN, TTTL, LTT, and TTHO contributed to the conception of the study. The study design was developed by LTAN and TTTL, and supervision was provided by TTTL. Data collection was carried out by LTAN and TTTL. Data analysis was performed by LTAN, TTTL, LTT, and TTHO. The literature search was conducted by LTAN, LTT, and TTHO. The manuscript was written by LTT and TTHO and critically reviewed by LTAN and TTTL.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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