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Clinical self-efficacy and critical thinking disposition of Anaesthesiology nursing students practicing at the hospital

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Abstract

Introduction: Self-efficacy significantly impacts academic performance and clinical competence in healthcare education. Students need to develop confidence and adaptability to handle unpredictable situations in high-pressure fields like anaesthesia nursing. While global studies emphasise self-efficacy's role in clinical training, research on Vietnamese nursing students is limited. This study aimed to evaluate the clinical self-efficacy beliefs of anaesthesia nursing students to understand their confidence levels and identify factors influencing this.

Methods: A cross-sectional descriptive study was conducted from February to June 2024, with Stratified sampling of 205 third- and fourth-year anaesthesia nursing students at the University of Medicine and Pharmacy in Ho Chi Minh City. The Self-Efficacy in Clinical Performance (SECP) scale was used to evaluate students' self-efficacy, and the Critical Thinking Disposition Inventory for Medical College Students (CTDI-M) measured critical thinking disposition.

Results: The overall clinical self-efficacy score for students was 105.4 ± 12.87 . A statistically significant positive correlation was found between self-efficacy and critical thinking disposition among students ($r_s = 0.37$, $p < 0.001$). Furthermore, a significant linear regression analysis indicated that critical thinking disposition (coefficient = 8.6, $p < 0.001$), attitudes regarding the characteristics of anaesthesia nursing students (coefficient = 0.9, $p < 0.001$), and academic year (coefficient = 6.1, $p < 0.001$) are significant predictors of clinical self-efficacy.

Conclusion: Integrating the promotion of critical thinking, addressing specific attitudes, and considering students' academic progression into clinical training programmes is essential. This has important implications for developing training programmes that enhance essential skills and better prepare students for their professional careers.

Keywords: *Anaesthesia Nursing Students, Clinical Self-Efficacy, Critical Thinking Disposition, Clinical Practice*

Practice Highlights

- Anaesthesia nursing students demonstrated a moderate level of self-efficacy in clinical practice, highlighting the need for targeted interventions to enhance their confidence and competency.
- A significant positive correlation was identified between self-efficacy and critical thinking disposition ($p = 0.001$), suggesting that students with stronger critical thinking skills tend to have higher confidence in clinical settings.
- Strengthening critical thinking skills and positive attitudes concerning professional characteristics may serve as a key strategy to enhance clinical self-efficacy among anaesthesia nursing students, improving their readiness for professional practice.

I. INTRODUCTION

In nursing education, the concepts of self-efficacy and critical thinking are essential for developing competent practitioners who can make sound clinical decisions.

Self-efficacy, as defined by Bandura, refers to an individual's belief in their ability to perform the behaviours required to achieve specific outcomes (Bandura, 1991). Higher self-efficacy in nursing correlates with improved clinical performance,

motivation, job satisfaction, and patient care outcomes (Köseoglu, 2015; Shorey & Lopez, 2021). Nursing students, especially those in the Anaesthesia specialisation, face unique clinical challenges, including high-pressure hospital environments, which necessitate strong self-efficacy to manage professional responsibilities and emergencies (Albooghobeish et al., 2023). Additionally, errors in this field can lead to serious consequences for both patients and practitioners, including legal issues and psychological trauma.

Critical thinking is equally vital, as it involves the objective analysis of information necessary for effective clinical decision-making (Nederland, 2010; Yildirim et al., 2012). This is particularly important for nurse anaesthesia students, who must cultivate strong critical thinking skills to navigate the complexities of anaesthesia care. They need to make quick and accurate decisions in unpredictable situations during operations (Burns et al., 2013; Scott Imus et al., 2017).

Moreover, transitioning from classroom learning to clinical practice presents significant challenges for students. Numerous studies have highlighted the connection between critical thinking skills and confidence in clinical practice. Students who possess strong critical thinking abilities are more likely to demonstrate greater confidence in making clinical decisions and performing nursing tasks (Albooghobeish et al., 2023; Dehghani et al., 2011; İşeri et al., 2023; Sahebi & Barkhordari-Sharifabad, 2023; Salimi et al., 2017). This connection not only enhances students' clinical experiences but also creates a bridge between theory and practice.

Some Research indicates that educational interventions, such as simulation-based learning and case-based learning platforms, can enhance essential competencies in nursing education, especially having positively impacted nursing students' self-efficacy and clinical performance (Azizi et al., 2022).

Despite the recognised importance of self-efficacy and critical thinking in nursing education, there is a notable lack of research specifically focused on anaesthesia nursing students, particularly in Vietnam. Understanding the relationship between these constructs is crucial for developing targeted educational strategies that enhance clinical competence. Therefore, the research question focuses on whether there is a relationship between students' clinical self-efficacy and their critical thinking disposition, as well as the factors that influence this relationship.

The University of Medicine and Pharmacy in Ho Chi Minh City (UMP HCMC) is a leading institution for training anaesthesia nursing professionals in southern Vietnam, emphasising the importance of assessing and enhancing students' self-efficacy and critical thinking skills.

This study aims to evaluate the levels of self-efficacy and critical thinking disposition among third- and fourth-year anaesthesia nursing students at UMP HCMC. Additionally, it seeks to examine the relationship between these variables and their combined impact on clinical performance. The findings are expected to inform curriculum development and instructional methodologies, ultimately improving the preparedness of anaesthesia nursing students for clinical practice. This, in turn, will contribute to enhancing the quality of training and support the comprehensive development of students, ensuring they meet the demands of the profession in the near future.

II. METHODS

A. Design and Setting

This cross-sectional research employed an exploratory, descriptive, and quantitative study design that utilised a structured questionnaire to gain insights into nursing students' perspectives. It was conducted at the School of Nursing and Medical Technology at the University of Medicine and Pharmacy in Ho Chi Minh City from February 2024 to June 2024.

B. Sample

This study involved 205 students enrolled in the anaesthesia nursing degree programme at the University of Medicine and Pharmacy in Ho Chi Minh City, Vietnam. The sample size was determined through a two-step process: first, an initial sample size for the mean was calculated, and then Cochran's formula for finite populations was applied to make the necessary correction. A stratified random sampling method was employed, based on the academic year, to ensure proportional representation. Since the curriculum for this four-year programme requires students to begin clinical practice related to their major in their third year, we stratified the population of eligible students into two groups: third-year students and fourth-year students. Simple random sampling was then applied within each stratum to select participants until the required sample size for that stratum was reached. This process resulted in 53% of the participants (110 students) being in their third year, accurately reflecting their proportion within the total student population. Only students who provided informed consent were included in the study.

C. Instruments

This study evaluated the self-efficacy of nursing students in the clinical practice environment using the Self-Efficacy for Clinical Performance (SECP) scale (Cheraghi et al., 2009). The translation and back-translation technique was used to convert the English version to Vietnamese, and four experts assessed the content validity with a CVI (content validity index) of 1. The SECP scale includes 37 questions divided into four subcategories: Assessment (12 items), Diagnosis and Planning (9 items), Implementation (10 items), and Evaluation (6 items). Each item on the questionnaire is rated on a Likert scale ranging from 1 (not relevant) to 5 (very relevant). The total score is calculated by summing the ratings for all questions, with possible scores ranging from a minimum of 37 to a maximum of 148. A higher score reflects greater self-efficacy. The questionnaire demonstrated a high Cronbach's alpha coefficient of 0.96 in a pilot test, indicating strong reliability.

This study also utilised the Critical Thinking Disposition Inventory for Medical College Students (CTDI-M) to assess critical thinking skills. Developed by Wang et al. in 2019 (Wang et al., 2019), the inventory consists of 18 items categorised into three factors: open-mindedness, systematic/analytical thinking, and truth-seeking. To adapt the instrument for the Vietnamese context, a translation and back-translation methodology was employed. The content validity of the translated instrument was then independently assessed by four experts, who collectively assigned a Content Validity Index (CVI) of 0.9. Participants respond using a Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). The overall score for each factor is calculated by averaging the scores of the relevant questions. The questionnaire achieved a Cronbach's alpha of 0.85, indicating good reliability.

To evaluate the internal reliability of the questionnaire, a pilot study was conducted with 25 students from the anaesthesia nursing programme at the University of Medicine and Pharmacy in Ho Chi Minh City. We employed a stratified simple random sampling method to select participants, ensuring the sample was representative of the different academic years (third and fourth year) engaged in clinically relevant practice. The study included only students who provided informed consent and did not participate in the main study.

D. Data Analysis

The study data were processed using Stata 15.0, a statistical software. The first step involved analysing background variables through descriptive statistics, which included calculating the mean, standard deviation, percentiles, and ranges for all parameters. To examine the relationship between sociodemographic characteristics and nursing students' self-efficacy and critical thinking, we used one-way analysis with the Kruskal-Wallis test and the Mann-Whitney U test. Spearman's correlation was employed to identify the relationship among the main variables. We set the threshold for statistical significance at $p < 0.05$. Finally, we used multivariate linear regression to predict self-efficacy in clinical practice based on several independent variables.

III. RESULTS

A. Participant Characteristics

In the study, 74.1% of the participants were women. The youngest student was 21 years old, while the oldest was 30, with an average age of 21.69 years (± 1.01 years). The majority of the students (95.1%) identified as belonging to the Kinh ethnic group, which is the predominant ethnic group in Vietnam. Additionally, more than half of the participants (65.9%) did not identify with any specific religious affiliation. Third-year students made up the largest proportion of participants at 53.7%, while fourth-year students accounted for 46.3%. Moreover, the average score of students' attitudes towards the professional characteristics of anaesthesia nursing students in clinical practice was 27.50 ± 3.80 , with a minimum score of 16 and a maximum score of 33.

Variables		N (%)
Academic year	3 rd year	110 (53.7)
	4 th year	95 (46.3)
Gender	Men	53 (25.9)
	Women	152 (74.1)
Ethnicity	Kinh	195 (95.1)
	Others	10 (4.9)
Religion	Atheists	135 (65.9)
	Buddhist	43 (21)
	Christian	24 (11.7)
	Others	3 (1.4)
		Mean ± SD
Age		21.7 ± 1,01
Attitude Concerning Characteristics of Anaesthesia Nursing Students		27.5 ± 1,01

Table 1. Participant Characteristics (N = 205)

B. Descriptive Statistics of Self-Efficacy for Clinical Practice, Critical Thinking Disposition, and Associated Factors

Variables	Min - Max	Mean ± SD or Mean (IQR) ⁺
Critical Thinking Disposition	1.1 – 5.0	3.7 ± 0.47
Open-mindedness ⁺	1.1 – 5.0	3,8 (3.4-4.0)
Truth-seeking ⁺	1.0 – 5.0	3,7 (3.4-4.0)
Systematicity ⁺	1.2 – 5.0	3,7 (3.3-4.0)
Self-Efficacy for Clinical Practice	75-148	105,4± 12,87
Assessment ⁺	24-48	34.7 (31-37)
Diagnosis and Planning ⁺	14-36	24.4 (22-27)
Implementation ⁺	20-20	29.9 (28-32)
Evaluation ⁺	12-24	16.5 (14-18)

+ Nonnormal distribution
IQR: interquartile range

Table 2. Descriptive Analysis of Critical Thinking Disposition and Self-Efficacy for Clinical Practice of Nursing Students (N = 205)

Regarding critical thinking disposition, the students exhibited relatively strong critical thinking skills, demonstrated by an average score of 3.7 ± 0.47 . Among the various categories of critical thinking dispositions, “open-mindedness” received the highest average score of

3.8, with an interquartile range (IQR) of 3.4 to 4.0. In terms of self-efficacy, the total score was 105.4 ± 12.87 . The highest score was obtained in the area of “Assessment” (mean = 34.7, IQR = 31-37), while the lowest score was in “Evaluation” (mean = 16.5, IQR = 14-18).

Variables	Self-Efficacy for Clinical Practice r_s ($p < 0.01$)				
	Assessment	Diagnosis and Planning	Implementation	Evaluation	SECP
Critical Thinking Disposition	0.33	0.31	0.30	0.36	0.37
Open-mindedness	0.26	0.20	0.22	0.20	0.24
Truth-seeking	0.28	0.30	0.29	0.33	0.34
Systematicity	0.33	0.33	0.30	0.43	0.40

Table 3. The Correlation Between Self-Efficacy for Clinical Practice and Critical Thinking Disposition (N=205)

The results presented in Table 3 show a significant positive correlation between nursing students' self-efficacy in clinical practice and their disposition toward critical thinking ($r_s = 0.37$, $p < 0.0001$). There are also notable relationships with factors associated with critical thinking ($p < 0.001$). The highest score was recorded in the area of "Systematicity" ($r_s = 0.40$, $p < 0.001$), while the lowest score was noted in "Open-mindedness" ($r_s = 0.24$, $p < 0.001$). Additionally, the strongest correlation was found between the "Systematicity" aspect of critical thinking disposition and self-efficacy in "Evaluation" ($r_s = 0.43$, $p < 0.001$). Conversely, the weakest scores were

observed for the "Open-mindedness" disposition concerning the "Evaluation" skill ($r_s = 0.20$, $p < 0.001$), as well as the "Diagnosis and Planning" skill of self-efficacy ($r_s = 0.20$, $p < 0.001$).

This study employed linear regression analyses to investigate the impact of several factors on students' self-efficacy in clinical practice. The model satisfied the assumptions of multicollinearity and homoscedasticity, ensuring the reliability of the regression estimates. Table 4 presents the confidence intervals for the predictors of self-efficacy.

Variables	Coef.	SE	t	p	95% Conf. Interval
Critical thinking disposition	8.6	2.0	4.28	0.000	4.6 - 12.5
Attitude Concerning Characteristics of Anaesthesia Nursing Students	0.9	0.2	4.42	0.000	0.4 - 0.9
Academic year	6.1	1.6	3.82	0.000	2.9 - 9.2

$F = 23.6$ ($p < 0.0001$), $R^2 = 0.26$, VIF = 1.01 – 1.07, Const = 40.2

Table 4. Factors Affecting Anaesthesia Nursing Students' Self-Efficacy for Clinical Practice (N = 205)

Three key factors, including academic year ($p < 0.0001$), attitudes toward the characteristics of Anaesthesia Nursing students ($p < 0.0001$), and critical thinking disposition ($p < 0.0001$), emerged as crucial determinants in predicting overall clinical self-efficacy. According to the model, each one-point increase in critical thinking disposition and attitude toward professional attributes increases self-efficacy by 8.6 and 0.9 points, respectively. Additionally, an increase in self-efficacy would necessitate an increase of 6.1 units in the academic year. The model was significant and accounted for 26% of the variance in self-efficacy ($F = 23.6$, $p < 0.0001$, VIF = 1.1).

IV. DISCUSSION

A. Clinical Self-Efficacy among Anaesthesia Nursing Students

After collecting and analysing the data, the research team found that students' self-efficacy scores were at a moderate level. A study by Vũ Thị Thu Hà in Vietnam reported that approximately 78.8% of nursing students displayed only a moderate level of confidence during

clinical practice (Vũ et al., 2023). Similarly, research conducted by Phan Hoang Trong found that the highest percentage of students (55.6%) exhibited moderate levels of confidence (Trong et al., 2023). These findings offer an overview of the current state of nursing students' self-efficacy perceptions in clinical practice. Additionally, the results of this study align with several international studies. For instance, Zahra reported an overall self-efficacy perception score of 102.40 ± 21.57 among 194 nursing students (Sahebi & Barkhordari-Sharifabad, 2023). A study conducted in China on third-year nursing students reported a mean self-efficacy score of 23.62 ± 3.98 out of a possible 40, indicating a relatively low perception of self-efficacy (Jin & Lv, 2018). In contrast, some international studies have demonstrated higher self-efficacy levels among nursing students. For example, research conducted on 214 nursing students in the United Arab Emirates revealed that approximately 56% of students exhibited high self-efficacy (Tirgari, 2018). Additionally, various studies in Iran indicated that nursing students demonstrated a high level of self-efficacy during clinical training (Motahari et al., 2020; Sajadi & Mehrabi, 2019). One possible

explanation for this discrepancy could be the differences in cultural and educational contexts, which may significantly influence self-efficacy perceptions. In Vietnam, traditional educational paradigms often emphasise theoretical knowledge over practical application, potentially limiting opportunities for students to develop confidence in real-world clinical scenarios. Additionally, cultural factors such as a tendency towards modesty or a hierarchical educational system might lead students to express moderate rather than high self-efficacy, even if their competence is higher.

B. Factors Influencing Students' Clinical Self-Efficacy

The analysis results indicated a correlation coefficient of $r_s = 0.37$ ($p < 0.0001$) between self-efficacy and critical thinking disposition among anaesthesia nursing students. Several studies have also demonstrated a positive correlation between clinical self-efficacy and critical thinking in nursing students. For example, research conducted by Orujlu and Hemmati Maslakhpak found a significant positive correlation ($r_s = 0.42$; $p = 0.002$) (Orujlu & Hemmati Maslakhpak, 2017). Another study by Özge İşeri revealed a positive correlation between perceived self-efficacy and critical thinking disposition among nurses working in the operating room ($r_s = 0.213$; $p < 0.05$) (İşeri et al., 2023). For anaesthesia nursing, where split-second decisions can have profound consequences, strong critical thinking skills are not merely an academic asset but a crucial component of clinical confidence and effective patient care. When students can objectively analyse information and make sound judgments, their belief in their ability to perform tasks in complex and high-pressure situations naturally increases. This highlights the clear need for nursing education programmes to integrate training that focuses on critical thinking and self-efficacy in clinical practice.

Furthermore, Self-efficacy among anaesthesia students regarding their professional characteristics during clinical practice showed a positive correlation ($r_s = 0.30$; $p < 0.0001$). This finding aligns with research by Esra Türker and Özlem Ülkü Bulut (2023), which explored the relationship between self-efficacy and the attitudes of nursing students in clinical settings (Esra & Özlem Ülkü, 2023). Additionally, a study by Azza Fathi Ibrahim (2019) revealed that nursing students who reported high satisfaction with their clinical environment also exhibited elevated levels of self-efficacy in various clinical learning activities and tasks (Ibrahim et al., 2019). Therefore, it is essential for nursing students to receive a thorough and accurate orientation before entering clinical practice. Clinical instructors should encourage students to take on challenging tasks to enhance their perception of self-efficacy.

The analysis results also indicated a statistically significant difference in the self-efficacy of students in clinical practice based on their "Academic Year" ($p = 0.0002$). Research conducted by Esra Türker also supported this finding, showing that as students progressed through their grade levels, their self-efficacy in clinical practice improved (Esra & Özlem Ülkü, 2023). This can be attributed to increased clinical exposure and practical experience, which provide more opportunities for students to handle diverse situations and solidify their skills, thereby boosting their confidence. Besides, two studies conducted in Turkey revealed that students with more clinical experience had higher perceptions of self-efficacy in their clinical practice compared to those with less experience (Karahan Okuroğlu, 2022; Terry & Peck, 2020).

The linear regression model identified three significant predictors of self-efficacy in clinical practice: academic year, critical thinking disposition, and attitudes towards the characteristics of Anaesthesia Nursing students. Among these variables, critical thinking disposition had the most substantial impact, surpassing both academic year and professional attitude. This finding once again emphasises the essential role that critical thinking skills play in shaping students' confidence and competence in clinical settings. Therefore, promoting the development of critical thinking and professional identity in nursing education may be an important strategy for enhancing clinical self-efficacy.

This study reveals crucial implications for enhancing self-efficacy among anaesthesia nursing students, underscoring a clear need for pedagogical advancements. Nurse educators should prioritise integrating innovative teaching strategies, including high-fidelity simulation, problem-based learning, and case-based learning. These methods provide a safe environment for students to apply theoretical knowledge, cultivate critical thinking through decision-making, and receive immediate feedback, boosting their confidence. Clinical instructors are equally vital, needing to consistently provide assessment of progress and strategically encourage students to undertake incrementally challenging clinical tasks aligned with their academic year. Furthermore, a comprehensive orientation to clinical practice is essential to clarify expectations, mitigate anxiety, and foster a positive attitude towards anaesthesia nursing. These combined interventions are critical for cultivating capable and confident nursing professionals.

While rigorous attempts were made to conduct the research accurately, the study acknowledges inherent limitations. This study utilised a cross-sectional design, limiting causal inference and the ability to track changes

in self-efficacy and critical thinking over time. Data was collected through self-report questionnaires, which could introduce bias due to socially desirable responses. Furthermore, the research was conducted at a single university, restricting the generalisability of the findings to other nursing programmes or cultural contexts outside of Vietnam.

Future research should use longitudinal designs to track the development of self-efficacy and critical thinking throughout the anaesthesia nursing programme. This approach will reveal how these constructs evolve and the impact of educational interventions. Moreover, mixed-methods research, including qualitative approaches like interviews, could provide deeper insights into factors influencing self-efficacy and the challenges students face in clinical practice. Lastly, evaluating the effectiveness of simulation- or case-based learning interventions on improving self-efficacy and critical thinking would be valuable for evidence-based curriculum development.

V. CONCLUSION

The study found that anaesthesia nursing students exhibited a moderate level of self-efficacy in clinical practice. This indicates a need for targeted interventions aimed at enhancing their confidence and competency in clinical settings.

A significant finding of the study was the positive correlation between self-efficacy in clinical practice and critical thinking disposition, with critical thinking having the most substantial impact among the factors examined. This underscores the vital role that critical thinking skills play in developing clinical confidence and decision-making abilities in anaesthesia nursing students. In light of these findings, curriculum improvements should focus on fostering critical thinking skills to optimise self-efficacy during clinical training. Enhancing critical thinking can be a key strategy for better preparing students for professional practice. Future research should explore longitudinal changes in self-efficacy and evaluate the effectiveness of interventions specifically designed to improve clinical competence.

Notes on Contributors

The Lead Author conceived the study, designed the experimental methodology, oversaw data collection, performed the primary statistical analysis, drafted the initial manuscript and contributed significantly to the interpretation of the results and the overall structure and content of the paper.

The Contributing Author assisted in the development of the experimental design and data collection protocols, conducted key experiments and contributed to data curation and preliminary analysis.

Ethical Approval

This study was approved by the ethics review committee of the University of Medicine and Pharmacy of Ho Chi Minh City (IRB No. 339/HDDD-DHYD) in 2024. The researcher informed the participants about the project and its purpose. The students who agreed to participate were requested to sign a form known as "Commitment to Participating in Research". This form confirmed that the students understood the information provided and participated voluntarily.

Data Availability

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request. Specific datasets are available on the Figshare repository:

<https://doi.org/10.6084/m9.figshare.28845323>.

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Declaration of Interest

There are no conflicts of interest, including financial, consulting, institutional, and other relationships that could lead to bias or a conflict of interest.

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