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Evaluate the Nursing Process Competence of Nursing Students at Buon Ma Thuot Medical University

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Abstract
Introduction: The nursing process (NP) is not only a tool for nurses to use in providing comprehensive care to patients but also reflects th professionalism of nursing within the modern healthcare system. Nursing process competency is an essential aspect of nursing education and clinical practice, reflecting students' ability to apply theoretical knowledge to real patient care. In Vietnam, enhancing practical competence in the nursing process is a key goal in nursing training programs.
Materials and Methods: A cross-sectional descriptive study was conducted at Buon Ma Thuot Medical University (BMU) from January to June 2025, involving three groups of nursing students from different academic years (2nd, 3rd, and 4th years) who had already received training in the NP. The study aimed to assess their practical competence in implementing the nursing process through evaluation tools.
Result: The results showed that the majority of nursing students demonstrated good or very good competency in practicing the NP, accounting for 59.3%, with an average score of 3.53 ± 0.47. Specifically, the proportion of students with poor or very poor knowledge of the NP was 0.6%, while those with good or very good knowledge accounted for 74.1%. Regarding attitudes, 13.6% of students showed a negative attitude, whereas 74.1% demonstrated a positive attitude. In terms of practice frequency, 20.4% of students reported rarely performing the NP, while 59.3% reported practicing it often or very often. Gender, academic year, learning methods, learning tools, clinical specialty, and subjects were factors associated with nursing students' competency in practicing the NP. The average score of students' clinical decision-making (CDM) competency was 3.13±0.77. The competency in practicing the NP—including knowledge, attitude, and practice — was found to be associated with students' clinical decision-making ability.

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1. Introduction

In 2021, the Vietnam Ministry of Health issued Circular No. 31/2021/TT-BYT, followed by Circular No. 32/2023/TT-BYT and Decision No. 3474/QĐ-BYT in 2023, outlining the core competency standards for Vietnamese nurses. Additionally, the new Law on Medical Examination and Treatment No. 15/2023/QH15 clearly defines the roles, responsibilities, and professional activities of nurses. These legal documents emphasize the mandatory application of the NP in clinical practice as an essential approach to ensure comprehensive patient care. Moreover, the implementation of the NP demonstrates nurses' competencies and serves as evidence of professionalism in adapting and innovating within the modern healthcare system [1, 2, 3, 6]. However, the rate of nurses applying the NP in clinical settings remains limited. Contributing factors include high workloads caused by a shortage of nursing staff. In Vietnam, the Ministry of Health aims to reach a target of 25 nurses per 10,000 population by 2025, and it is projected that from 2021 to 2030, the country will need to recruit approximately 313,900 additional nurses.

This shortage has resulted in an excessive workload for nurses, leaving them with insufficient time to provide comprehensive and effective care for each individual patient. In other words, it has limited the full implementation of the nursing process in clinical practice.

Currently, the training of NP practice competency in universities still faces many challenges. These difficulties relate to inconsistencies in the curriculum and a lack of standardized guidelines for the NP. At present, some institutions rely on foreign materials for instruction, leading to a lack of uniformity. Moreover, clinical realities often differ significantly from the theoretical knowledge taught in classrooms. As a result, nursing schools are increasingly focusing on strengthening students' ability to make independent clinical decision-making (CDM) to handle situations flexibly. Meanwhile, the NP is a structured tool that helps nurses develop essential skills such as assessment, analysis, reasoning, and appropriate decision-making for each clinical situation. Therefore, the NP not only serves as a guideline for patient care but also functions as a method to enhance students' CDM competency, better preparing them to adapt to the dynamic healthcare environment after graduation [10].

2. Objectives

At the BMU, according to the nursing training program, students begin receiving instruction and guidance on both the theory and practical application of the NP starting in their second year. Throughout their studies, the NP is integrated into practice sessions through pre-constructed case scenarios and in clinical modules at hospitals through care plan discussions. It is also one of the key components evaluated in both the clinical module final exam and the nursing graduation examination. Therefore, we conducted this study with the following objectives: (1) To assess the level of competency in practicing the NP among nursing students at the BMU; (2) To identify factors associated with the competency in practicing the NP; (3) To analyze the relationship between NP competency and students' CDM competency.

3. Materials and methods

3.1. Study Design and Setting

Cross-sectional descriptive study with division

3.2. Sample Size

Select all nursing students from the second year to the fourth year studying at the BMU.

Total sample size: 162 nursing students

3.3. Data collection and analysis

A validated assessment tool for evaluating nursing process practice competency was adapted from related studies. The tool was translated into Vietnamese and reviewed by three experts for content validity. Revisions were made accordingly to finalize the instrument, and its reliability was tested through a pilot study involving 30 nursing students. The questionnaire consisted of three parts: Part 1 collected general information about the participants (gender, academic year); Part 2 included a total of 56 items divided into four domains to be assessed: knowledge, attitude, practice, and decision-making competency. These were rated using a 5-point Likert scale. Part 3 assessed associated factors through four multiple-choice items. For second-year students, only two of these factors were included in the survey.

Data were entered, processed, and analyzed using medical statistical algorithms with SPSS version 26.0. Descriptive statistics (frequency, percentage, standard deviation) were used to describe the characteristics of the sample, while inferential statistics (Chi-square, t-test, ANOVA, Kruskal-Wallis) were applied to examine the relationships between variables. For ANOVA tests showing statistically significant results, post hoc tests were conducted to identify specific group differences. Bonferroni was used for data with homogeneous variances, and Tamhane was applied for data with unequal variances. Statistical significance was determined at a $p \leq 0.05$.

3.4. Approval

This study was approved by the IRB of Buon Ma Thuot University for human subjects research.

4. Results and Discussion

4.1. Characteristics of the Participants

The results from Table 1 show that among the 162 nursing students who participated in the survey, the majority were female, with 148 students (91.4%), while only 14 students (8.6%) were male, distributed across all three academic years. This finding is consistent with similar studies conducted on nursing students or practicing nurses and reflects the current reality that the nursing profession continues to attract predominantly female participants. This is largely due to the nature of the work and inherent characteristics commonly associated with women, such as meticulousness, gentleness, thoughtfulness, and patience. However, while female nurses are known for their tenderness, attention to detail, and carefulness in patient care, male nurses possess advantages in agility and physical strength, which are beneficial in physically demanding tasks. In emergency situations, such as lifting or transporting patients, male nurses often perform more effectively. Additionally, many male nurses exhibit enthusiasm, dedication, and dexterity comparable to their female counterparts, which helps them gain trust and affection from patients. In a study by Budu *et al*. involving 150 patients in Ghana on their satisfaction with male nurses, most patients (especially female ones) highly appreciated male nurses for their politeness, sensitivity, and the comfort they provided during care [8]. This supports the view that male nurses are fully capable of meeting care requirements and are positively received by patients, even though they remain a minority in the profession.

The results from Table 1 indicate that second-year students accounted for the highest proportion, representing 43.8% (71 students), followed by third-year students with 33.3% (54 students), and the lowest was fourth-year students with 22.8% (37 students). Although there is a discrepancy in the number of students across academic years, the distribution still reflects the growing societal interest in the nursing profession in recent years. This trend is especially significant in the context of increasing demand for healthcare personnel and the expanding career opportunities for nurses. According to statistics from the Vietnam Nurses Association, Vietnam is among the countries with one of the lowest nurse-to-population ratios. In 2024, the estimated number of nurses per 10,000 people in Vietnam was 18, significantly lower than the global average. The association has set a target of reaching 25 nurses per 10,000 people by 2025, and the Ministry of Health forecasts that from 2021 to 2030, the

country will need an additional 313,900 nurses [4]. In light of this situation, expanding the scale of nursing education and enhancing efforts to attract more students into the field are urgently needed.

Table 1: Characteristics of the Participants (n=162).

Factor		n	Percentage
Gender	Male	14	8,6
	Female	148	91,4
Academic year	2nd	71	43,8
	3rd	54	33,3
	4th	37	22,8
Total		162	100

4.2. Nursing process practice competence

Table 2: Nursing process practice competence (n=162).

Level	n	Percentage
Knowledge		
Not good	1	0,6
Neutral	41	25,3
Good	120	74,1
Attitude		
Not agree	22	13,6
Neutral	20	12,3
Agree	120	74,1
Practice		
Rarely	33	20,4
Occasionally	53	32,7
Frequently	76	46,9
General competency		
Poor	3	1,8
Fair	63	38,9
Good	96	59,3

The results from Table 2 indicate that the majority of nursing students had good knowledge, with the highest proportion (74.1%). The level of knowledge among students in this study was higher compared to the research by Bui Thi Thanh Huyen and colleagues (2022), which assessed the knowledge and skills in applying the nursing care process in clinical practice among nurses at a hospital in Ho Chi Minh City, where the proportion of nurses with accurate knowledge was 63.3% [5].

The majority of students in this study demonstrated a positive attitude toward the NP, with 74.1% agreeing with its application. This relatively high percentage reflects the students' proper understanding and readiness to engage with a systematic and scientific patient care model early in their training. However, this result is still lower compared to the study by Fisseha Hagos *et al*. (2014), which reported that 99.5% of nurses had a positive attitude toward the NP [7]

Although most students had relatively good knowledge and attitudes, only 46.9% reported frequently implementing the steps of the NP. This indicates a gap between theory and practice. One possible explanation is that some students may understand the NP in theory but lack the skills and experience to flexibly apply it in patient care. Additionally, the role of clinical instructors is crucial. If hospital nurses do not regularly and properly implement all steps of the NP, students may develop a tendency to underestimate its importance and may not fully practice the process as required.

C. Factors related to nursing process practice competency

Table 3: Gender and NP practice competence (n=162).

Competency	Gender	n	(Mean ± SD)	p value
Knowledge	Male	14	3,78 ± 0,60	0,73
	Female	148	3,84 ± 0,62	
Attitude	Male	14	3,08 ± 0,89	0,001
	Female	148	3,79 ± 0,76	
Practice	Male	14	3,63 ± 0,44	0,01
	Female	148	3,25 ± 0,78	
General competency	Male	14	3,14 ± 0,31	0,56
	Female	148	3,53 ± 0,48	

The results from Table 3 indicate that female students had a higher mean knowledge score (3.84 ± 0.62) compared to male students (3.78 ± 0.60), though the difference was not statistically significant (p = 0.73). In terms of attitude, female students also scored higher (3.79 ± 0.76) than their male counterparts (3.08 ± 0.89), and this difference was highly significant (p = 0.001). This result is consistent with the study by Zamanzadeh *et al*., which showed that female students tend to demonstrate a more positive attitude toward the belief that applying the NP improves the quality of care [12]. These findings reflect the seriousness and carefulness of female students in their learning attitudes and patient care during clinical nursing practice. Conversely, male students had a higher mean score in practical performance (3.63 ± 0.44) compared to females (3.25 ± 0.78), and the difference was statistically significant (p = 0.01). This may be explained by the fact that male students often exhibit greater confidence, decisiveness, and responsiveness in fast-paced and flexible clinical environments.

Table 4: Academic year and NP practice competence (n=162).

Competency	Academic year	N	Mean ± SD	P value	
Knowledge	2nd	71	3,70 ± 0,68	0,03	0,02
	3rd	54	4,00 ± 0,50		
	4th	37	3,86 ± 0,61		0,62
Attitude	2nd	71	4,10 ± 0,59	<0,001	<0,001
	3rd	54	3,39 ± 0,86		
	4th	37	3,50 ± 0,75		<0,001
Practice	2nd	71	2,68 ± 0,58	<0,001	<0,001
	3rd	54	3,81 ± 0,44		
	4th	37	3,66 ± 0,61		<0,001
General competency	2nd	71	3,33 ± 0,38	<0,001	<0,001
	3rd	54	3,71 ± 0,40		
	4th	37	3,64 ± 0,57		0,01

The results from Table 3 indicate that second-year students had the lowest mean knowledge score (3.70 ± 0.68), while third-year students had the highest (4.00 ± 0.50). There was a decreasing trend in mean attitude scores by academic year: second-year students had the highest attitude score (4.10 ± 0.59), whereas third- and fourth-year students had lower scores of (3.39 ± 0.86) and (3.50 ± 3.75), respectively. This suggests that students' initial positive attitude when first introduced to the NP tends to decline over time, likely due to increased academic pressure. Practical skill scores showed a significant increase across academic years, which is reasonable as this competency is developed through accumulated learning and repeated practice in clinical settings. Overall, students' competency in practicing the NP tended to improve with each academic year, reflecting their growing experience throughout the course of study and practice.

Table 5: Related factors

Factors	N	Mean ± SD	P value
Learning Methods (n=162)			
Lecture-based	20	3,23 ± 0,4	0,02
Clinical practice	22	3,45 ± 0,41	
Review for exam	6	3,54 ± 0,5	
Case presentatiom	3	3,69 ± 0,26	
Using two or more methods	111	3,59 ± 0,47	
Learning tools (n=162)			
Text book	3	3,35 ± 0,35	0,85
NANDA	18	3,47 ± 0,43	
Handouts	3	3,56 ± 0,22	
Using two or more tools	138	3,54 ± 0,48	
Clinical Specialty (n=91)			
Internal medicine	19	3,71 ± 0,5	0,16
Surgery	6	3,36 ± 0,5	
Obstetrics and Gynecology	2	4,43 ± 0,65	
Chose 2 or more specialties	64	3,68 ± 0,45	
Subjects (n=91)			
Adult health nursing- internal medicine	22	3,49 ± 0,43	0.25
Adult health nursing- surgery	6	3,80 ± 0,66	
Women's, maternal and family health nursing	1	3,97 ± -	
Child health nursing	1	3,41 ± -	
Chose two or more subjects	61	3,74 ± 0,47	

The results from Table 4 indicate that there was a statistically significant difference between learning methods and nursing process practice competency (p = 0.02). Students tended to choose two or more learning methods and achieved relatively high average scores. This suggests that employing a variety of learning methods contributes to better learning outcomes. Notably, the case presentation method had the highest mean score (3.69 ± 0.26), which may be attributed to its highly active and student-centered nature. In contrast, no statistically significant differences were found between learning tools, clinical specialties, or academic subjects and nursing process practice competency.

4.4. Clinical desision-making practice competency

Table 6: Clinical Decision-Making competency

Level	n	Percentage
Data collection		
Rarely	42	26
Occasionally	72	44,4
Frequently	48	29,6
Processing information and identifying problems		
Rarely	32	19,8
Occasionally	70	43,2
Frequently	60	37
Planning		
Rarely	29	17,9
Occasionally	64	39,5
Frequently	69	42,6
Implementation, monitoring, evaluation		
Rarely	38	23,5
Occasionally	72	44,4
Frequently	52	32,1
General competency		
Poor	35	21,6
Fair	69	42,6
Good	58	35,8

The results from Table 3 indicate that students have not yet consistently performed decision-making skills, and this result is clearly linked to the current state of clinical training, where students have limited opportunities to make independent decisions. Most of them primarily observe or carry out tasks based on instructions under the supervision of healthcare staff, rather than independently analyzing and evaluating clinical situations. In contrast, a study by Beth Cusatis Phillips involving 168 final-year nursing students from 11 schools across four U.S. states found that most American students adopted a "quasi-intuitive" decision-making style-that is, a flexible approach that is neither purely analytical nor entirely intuitive, but depends on the specific context and situation [9]. This suggests that the key issue does not lie in the type of decision-making style used, but rather in whether Vietnamese nursing students are given adequate opportunities to practice and develop clinical decision-making skills in real-world settings.

Table 7: NP practice competency and CDM competency

	n	Mean ± SD	p value	
Knowledge of the NP/CDM				
Poor	1	2,68 ± -	0,002	
Fair	41	2,90 ± 0,53		
Good	86	3,08 ± 0,79		
Very good	34	3,54 ± 0,81		
Attitude of the NP/CDM				
Strongly disagree	3	4,58 ± 0,52	0,001	
Disagree	19	3,34 ± 0,69		0,27
Neutral	20	3,14 ± 0,47		0,26
Agree	76	3,16 ± 0,68		0,3
Strongly agree	44	2,87 ± 0,92		0,14
Practice NP/ CDM				
Never	5	1,83 ± 0,6	< 0,001	
Rarely	28	2,21 ± 0,35		0,59
Sometimes	53	2,92 ± 0,33		<0,001
Often	62	3,53 ± 0,48		<0,001
Always	14	4,43 ± 0,38		<0,001
General competency of NP/CDM				
Very good	12	4,19 ± 0,36	<0,001	
Good	84	3,31 ± 0,68		<0,001
Fairr	63	2,72 ± 0,64		<0,001
Poor	12	2,36 ± 0,11		<0,001

The results from Table 4 indicate that there was a statistically significant difference between levels of knowledge, attitude, and practice regarding the NP and CDM competency. Specifically, higher levels of knowledge and practice were associated with higher decision-making competency. However, a more positive attitude toward the NP was unexpectedly linked to lower decision-making competency. This inconsistency between the variables suggests that the nature of these two concepts is fundamentally different. A positive attitude toward the NP often reflects adherence to rules and protocols, indicating a preference for following each step as theoretically outlined. In contrast, CDM competency in real-world settings requires flexibility and the ability to adapt to varying situations [11].

5. Conclusion

The results of the study showed that the NP practice competency among students was generally at a good level (59.3%), with knowledge being the highest-scoring component. Gender, academic year, learning methods, learning tools, clinical specialty, and subjects were identified as factors related to NP practice competency. However, only academic year and learning methods showed statistically significant differences. The students' CDM competency was at a moderate level (42.6%). There was a correlation between NP practice competency (including knowledge, attitude, and practice) and CDM competency. As NP practice competency improved, so did the students' ability to make clinical

decisions.

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