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Assessing wound care knowledge among nursing students at Tay Nguyen University, Vietnam: A cross sectional study

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Abstract
This study assesses the wound care knowledge among nursing students at Tay Nguyen University, emphasizing the critical role of wound care in clinical practice. Enhancing this knowledge is essential for improving patient care quality. A cross-sectional study was conducted with 159 voluntary participants, utilizing the "C/WoundComp" instrument for data collection. The findings revealed an average participant age of 20.3 years and a low overall knowledge level, with a mean score of 21.4±4.4. Notably, 56% of students demonstrated poor knowledge, while only 0.6% exhibited a good understanding. Knowledge levels varied significantly by academic year, with third-year students achieving the highest scores (mean 23.0±3.4) and second-year students the lowest (mean 18.5±4.6). The study underscores the urgent need to enhance wound care education among nursing students to bridge the knowledge gap and improve their competence in this vital area.

Keywords: Wound care, knowledge, Tay Nguyen University, nursing students

1. Introduction

consequence or response and as are institution proposed a Wound care is a critical component of clinical practice, particularly within surgical departments where nurses frequently manage various types of wounds. Venous ulcers of the lower extremities are among the most prevalent, constituting 40%-60% of cases. Other common wound types include neural ulcers (15%-25%), ischemic ulcers (10%-20%), and composite ulcers (10%-15%) [1]. The prevalence of chronic wounds is notably higher in older adults compared to younger populations, a trend expected to worsen with an aging population, thereby increasing the burden on global health systems [2].

The financial impact of wound care is substantial. In the U.S., the cost was estimated at $28 billion in 2014 [3]. Denmark spent approximately 99 million Euros annually on wound care, with foot ulcers alone accounting for 2%-4% of total healthcare expenditures. In Australia, individuals may spend up to 10% of their income on wound care [4]. As the incidence of chronic wounds, particularly among the elderly, is expected to rise, these costs are likely to increase, placing a significant strain on healthcare systems globally.

Despite the critical importance of wound care, there is a notable lack of comprehensive research on the wound care knowledge of nursing students, particularly in developing countries like Vietnam. Previous study highlighted that after a training program, the mean scores of knowledge and practice among nurses significantly increased, demonstrating the effectiveness of targeted educational interventions [9]. These findings underscore the urgent need for improved wound care education among nursing students to bridge the knowledge gap and enhance their competence in this vital area.

This study was conducted at Tay Nguyen University to evaluate the wound care knowledge of nursing students. Given the scarcity of research on this topic in Vietnam, the study aims to fill this gap and contribute valuable insights to the global body of knowledge. The objectives include determining the level of knowledge among nursing students about wound care and identifying any differences in knowledge and attitudes based on demographic characteristics. The findings will provide a foundational understanding to guide future research and improve wound care education.

2. Materials and methods

2.1 Study Design and Participants

This cross-sectional observational study evaluated the wound care knowledge of nursing students at Tay Nguyen University, Vietnam. The research utilized the "C/WoundComp instrument" (TCWI) developed by Emilia Kielo-Viljamaa [5], comprising a two-part questionnaire. Part one gathered demographic data (gender, academic year, ethnicity), while part two assessed knowledge through 38 questions using a 3-point Likert scale: "True", "False", and "I don't know". The questionnaire, originally in English,

was translated into Vietnamese and validated by experts. A pilot study with 32 students confirmed high validity and reliability, with an I-CVI and S-CVI of 1, and a Cronbach's Alpha of 0.819.

2.2 Sample size

The sample size was determined using WHO guidelines with a 95% confidence level (α = 0.05), an anticipated proportion (p) of 0.73, and an absolute precision (d) of 0.07.

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

This calculation yielded a minimum sample size of 155. Total sampling was employed, resulting in a final sample of 159 nursing students.

2.3 Data Collection

Data were collected via a paper-based, self-administered questionnaire. Students had 30 minutes to complete it without external references. Out of 165 distributed questionnaires, 159 completed and usable responses were obtained after excluding six incomplete forms.

2.4 Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were used to describe demographic variables and knowledge scores. The t-test was employed to compare mean scores by gender and ethnicity, while one-way ANOVA was used to compare knowledge scores across academic years.

2.5 Ethical Approval

The study received ethical approval from the Scientific Research Ethics Committee of Tay Nguyen University (registration number TNU/2023/05-101, dated May 16, 2023), with informed consent obtained from all participants.
Results & Discussion
Results should be the major findings of your experiment. You have to compare the results with previous studies done in same.

3. Results and Conclusion

3.1 Distribution of the participants

The data in Table 1 provides a comprehensive demographic breakdown of 159 nursing students from Tay Nguyen University. The mean age of the participants is 20.3 years (SD = 1.5), with ages ranging from 18 to 26 years. Gender distribution shows 23 males (14.5%) and 136 females (85.5%). The academic year distribution includes 40 first-year students (25.2%), 45 second-year students (28.3%), 35 third-year students (22%), and 39 fourth-year students (24.5%). In terms of ethnicity, 86 students (54.1%) are Kinh, while 73 students (45.9%) belong to other ethnic groups. This detailed demographic information is essential for understanding the representativeness and diversity of the study sample.

Table 1: The distribution of nursing student participants

Baseline characteristic		Sample	
		N	%
Gender	Male	23	14.5
	Female	136	85.5
Academic year	First-year	40	25.2
	Second year	45	28.3
	Third year	35	22.0
	Fourth-year	39	24.5
Ethnicity	Kinh	86	54.1
	Other	73	45.9

3.2 The student's knowledge across various domains of wound care

The data provides a comprehensive evaluation of participant knowledge across various domains of wound care, structured into three categories: Anatomy and Physiology, Etiology and Key Principles of Care, and Wound Care and Assessment. Correct response frequencies ranged from 13.2% to 88.1%, reflecting significant variability in understanding. The highest correct frequency (88.1%) was observed for the statement "Malnourishment slows down wound healing," indicating strong awareness of the impact of nutrition on wound healing. Conversely, only 13.2% correctly responded to the statement "Recording the products used in sufficient detail and unequivocally is sufficient for recording wound care," suggesting a lack of understanding in this area (Table 2).

Table 2: The students' knowledge following different items

Items	Correct frequency (%)	Score mean ±SD	Rank in general
Anatomy and Physiology			
Lifestyle factors do not affect wound healing.	120 (75.5)	0.75±0.43	8
In venous insufficiency, the foot is often swollen.	112 (70.4)	0.70±0.45	13
The outermost layer of the skin is epithelial tissue.	109 (68.6)	0.69±0.46	15
When arterial circulation is compromised, the foot is often warm.	97 (61.0)	0.61±0.48	19
The layers of the skin are fascia and dermis	92 (57.9)	0.58±0.49	22
The first stage of wound healing is proliferation, i.e. repair/reconstruction phase.	50 (31.4)	0.31±0.46	33
Etiology and key principles of care			
Elimination of pressure, friction and shear is key in pressure ulcer care.	123 (77.4)	0.77±0.42	5
A pressure ulcer forms when tissues are affected by local mechanical factors, such as pressure, friction and/or	118 (74.2)	0.74±0.43	9

shear.			
Assessment and improvement of circulation in the extremity is key in arterial ulcer care.	115 (72.3)	0.72±0.44	10
Relieving pressure/offloading is key in diabetic foot ulcer care.	111 (69.8)	0.70±0.46	14
A venous ulcer is the result of increased venous pressure in the extremity.	103 (64.8)	0.65±0.47	17
Compression/prevention of swelling is key in venous ulcer care.	91 (57.2)	0.57±0.49	23
An arterial wound is the result of insufficient venous circulation.	83 (52.2)	0.52±0.50	24
Neuropathy is often behind a diabetic foot ulcer.	80 (50.3)	0.50±0.50	25
Compression/prevention of swelling is key in diabetic foot ulcer care.	69 (43.4)	0.43±0.49	27
Treatment with antibiotics is key in pressure ulcer care.	58 (36.5)	0.36±0.48	31
Mechanical debridement of the wound is key in arterial ulcer care.	56 (35.2)	0.35±0.47	32
Changing wound dressings daily is key in venous ulcer care.	41 (25.8)	0.26±0.43	35
Wound care and assessment			
Malnourishment slows down wound healing.	140 (88.1)	0.88±0.32	1
Wound-related pain must be assessed on each care occasion.	133 (83.6)	0.84±0.37	2
The nurse must consult a physician if the wound does not heal in 2-4 weeks.	130 (81.8)	0.82±0.38	3
The symptoms of acute wound infection are: pain, warmth, redness, swelling and odour.	127 (79.9)	0.80±0.40	4
Dead tissue must be removed from the wound bed to prevent infections.	122 (76.7)	0.77±0.42	6
Wound size is recorded as length x width x depth (cm)	121 (76.1)	0.76±0.42	7
Hydrophobic dressings are suitable for dressing infected wounds.	115 (72.3)	0.72±0.44	10
A diet rich in protein slows down wound healing.	113 (71.1)	0.71±0.45	12
Chronic wound care is multi-professional work.	105 (66.0)	0.66±0.47	16
Getting the necessary wound care products ready before starting wound care is not in compliance with aseptic principles.	99 (62.3)	0.62±0.48	18
Motivating a patient with a chronic wound to adopt healthy lifestyle choices is not part of actual wound care.	95 (59.7)	0.60±0.49	20
Oral patient guidance is sufficient if the patient has a wound.	95 (59.7)	0.60±0.49	20
Pain related to wound care can be treated with locally administered lidocaine.	72 (45.3)	0.45±0.49	26
An open wound must be kept moist.	67 (42.1)	0.42±0.49	28
A fibrin crust refers to infected tissue.	63 (39.6)	0.40±0.49	29
If the patient has several wounds, those that are infected are always treated first.	59 (37.1)	0.37±0.48	30
Foam dressing are not suitable for dressing wounds with abundant exudate.	49 (30.8)	0.31±0.46	34
An bacterial sample is taken from the wound before cleaning the wound.	26 (16.4)	0.16±0.37	36
Necrotic tissue must always be removed immediately from all wounds.	24 (15.1)	0.15±0.35	37
Recording the products used in sufficient detail and unequivocally is sufficient for recording wound care.	21 (13.2)	0.13±0.34	38

The mean scores for each item, accompanied by standard deviations (ranging from 0.13±0.34 to 0.88±0.32), provide further insights into the consistency of knowledge across participants. Items related to fundamental wound care practices, such as assessing wound-related pain (mean score 0.84±0.37) and consulting a physician if a wound does not heal in 2-4 weeks (mean score 0.82±0.38), were ranked highly, indicating solid knowledge in these areas. However, lower mean scores were observed in more specialized knowledge areas, such as the immediate removal of necrotic tissue (mean score 0.15±0.35) and the suitability of foam dressings for wounds with abundant exudate (mean score 0.31±0.46).

The data also reveal notable gaps in knowledge within the Etiology and Key Principles of Care category, particularly concerning the appropriate care for different types of ulcers, such as diabetic foot ulcers and venous ulcers. These results underscore the need for targeted educational interventions to address these deficiencies, particularly in the more nuanced aspects of wound care management. The variability in both correct frequencies and mean scores highlights the areas where participants are well-informed and those where further training is required to enhance competency and improve patient outcomes.

Our data reveal significant variability in nursing students' knowledge of wound care, with correct response frequencies ranging from 13.2% to 88.1%. This variability underscores the need for targeted educational interventions to address gaps in knowledge, particularly in specialized areas of wound care. For instance, while 88.1% of students correctly identified that malnourishment slows down wound healing, only 13.2% understood the importance of detailed and unequivocal recording of wound care products.

This finding aligns with global research indicating that nursing students often have uneven knowledge across different aspects of wound care. A study in Turkey found that the average wound care knowledge score among nursing students was 64.8±11.27, with students who had prior wound care experience scoring higher [6]. This suggests that practical experience plays a crucial role in enhancing wound care knowledge, a factor that should be considered in curriculum development. Similarly, research in Europe emphasizes the importance of integrating digital and hybrid learning approaches to improve wound care education, combining theoretical knowledge with practical skills [7]. In the United States, a study reported moderate knowledge levels among nursing students, with significant gaps in chronic wound management and infection control [8]. This highlights the need for comprehensive wound care modules in nursing curricula, a recommendation that could be beneficial for nursing education in Vietnam as well. In Vietnam, a study across eight hospitals found that nurses had varying levels of knowledge and confidence in wound care, with significant gaps in practice and confidence [9]. Another study at the Agriculture General Hospital demonstrated that targeted training programs significantly improved knowledge, practice, and confidence scores among nurses [10]. These findings collectively underscore the urgent need for enhanced wound care education among nursing students at Tay Nguyen University. By addressing the identified gaps through targeted educational interventions, it is possible to improve competency and ultimately patient care outcomes.

3.3 Overall knowledge score

The table 3 indicate a comprehensive statistical analysis of

nursing students' knowledge across multiple domains of wound care. Based on a total of 38 questions, the overall knowledge score has a mean of 21.4 with a standard deviation of 4.4, indicating moderate variability among the participants. Scores range from a minimum of 8 to a maximum of 31, reflecting a broad spectrum of knowledge levels. In the Anatomy and Physiology category (6 questions), the mean score is 3.6 (SD = 1.3), with scores spanning from 0 to 6. The Etiology and Key Principles of Care category (12 questions) shows a mean score of 6.5 (SD = 2.2), with a range of 1 to 12.

Table 3: Total knowledge score based on the items

No.	Items	Mean	SD	Max	Min
1	Total knowledge score (38 questions)	21.4	4.4	31	8
2	Anatomy and physiology score (6 questions)	3.6	1.3	6	0
3	Etiology and key principles of care score (12 questions)	6.5	2.2	12	1
4	Wound care and assessment score (20 questions)	11.1	2.5	16	3

In the Wound Care and Assessment category (20 questions), the mean score is 11.1 (SD = 2.5), with scores varying from 3 to 16. These results reveal substantial variability in knowledge across different domains, highlighting the critical need for targeted educational interventions to address identified gaps and to enhance the overall competency of nursing students in wound care management.

3.4 Classification of knowledge level of the students

Of the 159 participants, 89 students (56%) demonstrated poor knowledge levels, indicated by a total score of less than 22. Meanwhile, 69 students (43.4%) had moderate knowledge, with total scores ranging between 23 and 30. Only 1 student (0.6%) achieved a good knowledge level, with a total score of 31 points or more. These results indicate that the majority of students fell into the poor knowledge category, while a very small proportion reached the good knowledge level, underscoring the need for enhanced educational strategies to improve knowledge outcomes.

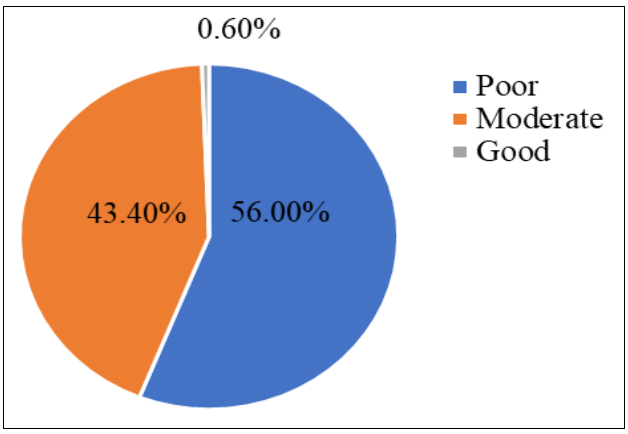

Fig 1: Classification of students' knowledge in wound care

The findings from the study highlight a significant gap in knowledge among nursing students, with the majority demonstrating poor understanding of wound care principles. This is consistent with existing literature, which suggests that nursing students often have limited knowledge in specialized areas such as wound care, despite its critical importance in clinical practice. For instance, a study by Doughty *et al*. (2017) [11] emphasized the need for improved wound care education in nursing curricula, suggesting that current training programs may not adequately prepare students for the complexities of wound management. Furthermore, Ubbink *et al*. (2020) [12] demonstrated that targeted educational interventions, such as hands-on workshops and simulations, can significantly enhance nursing students' competence and confidence in wound care. Given these findings, the results of the current study underscore the urgent need for curriculum reform and the implementation of more effective teaching methods to ensure that nursing students develop the necessary skills and knowledge to provide high-quality wound care.

4. Conclusion

In conclusion, this study reveals a substantial deficiency in wound care knowledge among nursing students at Tay Nguyen University, with the majority exhibiting poor comprehension in this critical area. The observed variation in knowledge levels across academic years, with notably higher scores among third-year students, indicates that the current educational strategies may not be adequately addressing the learning needs of all students. These findings highlight the pressing need for targeted educational interventions designed to bridge this knowledge gap. By strengthening wound care education within nursing programs, institutions can better equip students with the skills and knowledge required to deliver high-quality patient care, thereby improving clinical outcomes. This study underscores the necessity for curriculum reforms and the adoption of more effective teaching methodologies to ensure that nursing students are well-prepared to manage wound care effectively and excel in their professional practice.

Conflict of Interest
Not available

Financial Support
Not available

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