

THE KNOWLEDGE OF NURSES BEFORE AND AFTER TRAINING ON WOUND CARE WITH NEGATIVE PRESSURE THERAPY IN VIETNAM

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ABSTRACT

Background: Vacuum Assisted Closure (VAC) therapy is increasingly utilized in hospitals, including those in Vietnam. Adequate nurse knowledge and proficiency in wound care, particularly VAC-treated wounds, are vital for patient care. **Objectives:** This study aims to evaluate nurses' knowledge before and after VAC training at our institution. **Materials and Methods:** A comparative analysis was conducted on 238 nurses from 13 clinical departments at our institution. Nurses' knowledge was assessed before and after a training course. Pre-training and post-training assessments were performed immediately after the course and again 2 months later. **Results:** Prior to training, nurses had a mean knowledge score of 10.18 ± 2.31 , which significantly increased to 28.86 ± 8.41 after the training program ($p < 0.001$). Most nurses lacked sufficient knowledge of VAC therapy initially, but a substantial improvement was observed post-training. **Conclusion:** Nurses' understanding of VAC therapy improved markedly following training, emphasizing the importance of continuous education to ensure patient safety and enhance care quality. Ongoing training programs are essential to equip nurses with updated knowledge for efficient and safe patient care.

Keywords: Nurse knowledge; VAC therapy; Wound care; Training assessment.

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I. INTRODUCTION:

Wound care is vital, with nurses playing a central role alongside medical treatments [1]. While simple wounds follow standard healing stages [2], complex or infectious wounds necessitate medical interventions, leading to prolonged healing and increased costs. Nurses must possess specialized knowledge and stay updated with advancements to ensure optimal patient care [3].

In the age of rapid scientific progress, Vacuum Assisted Closure (VAC) therapy has emerged as an effective method for treating various wounds, including traumatic injuries and chronic ulcers [4]. Its adoption in Vietnam, especially in pediatric hospitals, underscores the importance of nurses being well-versed in this technique and related equipment [5].

Assessing nurses' knowledge is crucial for tailored training programs, particularly in hospitals like City Children's Hospital in Vietnam, where many nurses lack experience with modern medical equipment [6]. Equipping them with necessary skills through surveys, assessments, and specialized training is imperative to ensure quality patient care [7].

II. MATERIAL AND METHODS:

The study utilizes a quasi-experimental design to assess the impact of a Vacuum Assisted Closure (VAC) therapy training course for nurses. Pre- and post-course evaluations, along with a two-month follow-up, were conducted between September 10th and November 11th, 2021.

A sample of 238 nurses from various departments, detailed in Table 1, participated. The selection process targeted nurses aged 18-55 with long-term contracts

who consented to participate and were not on administrative leave. Nurses in administrative roles or on leave during the research period were excluded.

Table 1: The distribution of nurses among different departments

Department	Total	Percentage (%)
General Surgery Department	29	12.2
Cardiothoracic Surgery	12	5
Neurology - Neurosurgery Department	12	5
Pediatric intensive care and toxic management Department	19	8
Neonatal Intensive Care Unit	38	16
Surgery Intensive Care Unit	15	6.3
Cardiology Intensive Care Unit	11	4.6
Infectious disease Department	13	5.5
Cardiology Department	10	4.2
Physiotherapy Department	15	6.3
Anesthesia Department	35	14.7
Hematology Department	12	5
Emergency Department	17	7.2
Total	238	100

The study comprised three stages: pre-test, intervention (VAC theory lecture), and post-test. Data were collected via Google Forms immediately after training and two months later. A validated questionnaire, endorsed by three experts, covered demographics, VAC knowledge (40 items), and staff satisfaction.

Ethical approval was obtained, and participants were briefed on the study's objectives and procedures. Completed questionnaires were securely stored, and demographics included age, gender, experience, education, and department. VAC knowledge was assessed via True/False items, with correct answers scoring 1 (2 for

crucial answers) and inadequate knowledge defined as <75% correct responses out of 40 questions.

III. RESULTS:

Table 2 outlines participant demographics, with a majority being female (84.9%) and 47.1% holding a College degree. The mean age was approximately 28.48 years, with over 50% having less than 5 years of professional experience. Marital status showed no significant relationship with VAC knowledge ($p=0.067 >0.05$).

Table 2: Characteristics of participants

Characteristics	Number (n)= 238	Percentage (%)
Age (Mean) 28,48		
Youngest	22	
Oldest	46	
Gender: The majority was female		
Female	202	84.90%
Male	36	15.10%

Characteristics	Number (n)= 238	Percentage (%)
Marital status: The majority was single		
Single	124	52.10%
Married	114	47.90%
Education level: The majority has college's degree		
College's degree	126	52.90%
Bachelor's degree	112	47.10%
Working experience: The majority has over 2 years of working experience		
Under 2 years	23	9.70%
2-5 years	108	45.40%
Over 5 year	107	44.90%

Before training, the results from Section A's questionnaire on knowledge of Vacuum Assisted Closure (VAC) revealed that only 16.81% of participants correctly understood that blood flow to the wound decreases with VAC, as indicated by Question 2. Similarly, Question 14 demonstrated a low level of understanding, with only 21.85% of participants recognizing that the suction device and fluid are connected by separate tubes.

In Section B, findings on wound care and management using VAC before training showed that just 17.23% of respondents correctly identified the four stages of wound healing, as highlighted in Question 17. Question 36 illustrated another area of misunderstanding, with only 38.66% of participants acknowledging that a leaked seal film requires replacing all foam dressing.

After training, there were notable improvements. For instance, in Section A, the understanding of decreased infection rates after VAC rose to 76.47% for Question 2. Similarly, in Section B, recognition of wound healing stages increased to 64.29% for Question 17. Additionally, awareness of the need to replace all foam dressing in case of a leaked seal film improved to 73.53% for Question 14.

Two months post-training, sustained or enhanced knowledge persisted. For instance, in Section A, 40.34% of participants understood the decreased infection rate after VAC (Question 2). Similarly, in Section B, 69.33% knew that pouring saline into the foam before removing a VAC system is unnecessary (Question 38).

IV. DISCUSSION:

The study examines participating nurses' demographics, knowledge levels, and the impact of training on their understanding of Vacuum Assisted Closure (VAC) therapy and wound care practices.

Initially, the gender distribution among participants revealed that 84.9% were female, in line with previous research [8]. The mean age of the nurses was 28.48 years, indicating a significant proportion of younger participants, consistent with prior findings [9]. Marital status showed no significant association with nurses' knowledge of VAC ($p=0.067 > 0.05$).

Assessing nurses' knowledge levels, the study found that 69.74% of participants possessed incorrect knowledge regarding VAC therapy, regardless of professional experience, similar to previous research [10]. This underscores the need for continuous educational programs and training

opportunities in VAC therapy to enhance nurses' competence in wound care practices.

In terms of educational attainment, 47.10% of participating nurses held a bachelor's degree in nursing, which differs from some prior studies [9] but aligns with others [11].

Training significantly increased knowledge scores, with a mean increase from 27.77 to 32.8 post-training. Two months later, scores slightly decreased but remained higher than pre-training levels ($p < 0.001$) [8]. This emphasizes the importance of ongoing training programs to ensure nurses stay updated on knowledge and enhance their professional qualifications.

Regarding knowledge of wound care using VAC, there were variations in knowledge scores over time, potentially due to practical application and retention differences [8].

V. CONCLUSION:

Nurses are central to patient care, especially in wound management, where their expertise is vital. Continuous training keeps them updated, particularly in intensive care settings, ensuring adherence to protocols and safety standards. This results in accurate, secure care, improving treatment efficiency and outcomes. Ongoing training not only reduces costs and enhances care quality for patients but also empowers nurses, boosting their competence and confidence in delivering effective care.

REFERENCES:

1. **Nagaraj S, Hosmani R, Shankar JC.** Negative Pressure Wound Therapy versus Conventional Wound Therapy in Large Wounds. *Int J Sci Res Public.* 2015;5(5):1-10.
2. **Guo, S., & DiPietro, L. A. (2010).** Factors Affecting Wound Healing. *Journal of Dental Research,* 89(3), 219–229. <https://doi.org/10.1177/0022034509359125>

3. **Wilkinson, H. N., & Hardman, M. J. (2020).** Wound healing: Cellular mechanisms and pathological outcomes. *Open Biology,* 10(9), 200223. <https://doi.org/10.1098/rsob.200223>.
4. **Baharestani, M. M., & Gabriel, A. (2011).** Use of negative pressure wound therapy in the management of infected abdominal wounds containing mesh: An analysis of outcomes. *International Wound Journal,* 8(2), 118–125. <https://doi.org/10.1111/j.1742-481X.2010.00756.x>
5. **Mohamed, E., Elmoniem, A. E., Zaki, H. M., & Shebl, A. M. (2019).** Effect of Training Program on Performance of Nurses Caring for Patient with Negative Pressure Wound Therapy. *Journal of Nursing and Health Science,* 8(1), 5. <https://doi.org/10.9790/1959-0801033135>
6. **Yadav, S., Rawal, G., & Baxi, M. (2017).** Vacuum assisted closure technique: A short review. *The Pan African Medical Journal,* 28. <https://doi.org/10.11604/pamj.2017.28.246.9606>
7. **Lim, K., Lim, X., Hong, Q., Yong, E., Chandrasekar, S., Tan, G. W. L., & Lo, Z. J. (2020).** Use of home negative pressure wound therapy in peripheral artery disease and diabetic limb salvage. *International Wound Journal,* 17(3), 531–539. <https://doi.org/10.1111/iwj.13307>
8. **Mohamed, E., Elmoniem, A. E., Zaki, H. M., & Shebl, A. M. (2019).** Effect of Training Program on Performance of Nurses Caring for Patient with Negative Pressure Wound Therapy. *Journal of Nursing and Health Science,* 8(1), 5. <https://doi.org/10.9790/1959-0801033135>
9. **Dung, P. T., Chinh, N. D., Hanh, B. M., & Notter, J. (2016).** Evaluating a training programme at Viet Duc University Hospital in Vietnam. *British Journal of Nursing,* 25(12), S14–S21.
10. **Zarchi, K., Latif, S., Haugaard, V., Hjalager, I., & Jemec, G. (2014).** Significant Differences in Nurses' Knowledge of Basic Wound Management – Implications for Treatment. *Acta Dermato Venereologica,* 94(4), 403–407. <https://doi.org/10.2340/00015555-1770>
11. **Elgamil, A. E., & Elhadi, M. M. (2017).** Assessment of Nurses' Knowledge and Practices Regarding Wound Vacuum Assisted Closure Therapy. *6(5),* 6. <https://doi.org/10.9790/1959-0605062732>