

# **Effectiveness of Training Programme on Nurses' Wound Care Competencies after One Year of Implementation**

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## ***ABSTRACT***

This study aims to review the impacts of the nursing training programme on the knowledge, skills and attitude among nurses working in seven clinical departments at Viet Duc University Hospital one year after the interventional programme has been conducted. It was carried out in 2014 and 2015 with a sample size of 145 nurses. The data collection tool included a wound care observation checklist to measure two indicators - the mean score and effects of training on wound care competencies. Data was analysed with SPSS 18.0. The study results showed that the post training rate of nurses with adequate practice competencies increased from the pre-training survey ( $p < 0.001$ ). The effectiveness indicators relating to the competencies of identification, planning, plan implementation and evaluation were 31.9%; 43.3%; 71.3% and 28.3% ( $p < 0.001$ ). Wound care training programme based on nursing competencies standards has proved to be effective.

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## **INTRODUCTION**

Wound care is the basic technique in patient care carried out by nurses, having direct effects on the quality of treatment [1, 2]. In England, wound care accounted for up to 3% of its healthcare budget (2.3-3.1 billion pounds/year) [3]. In reality, the effectiveness of wound care depends on nurses' wound care competencies and techniques. McCarthy (2012) conducted a quantitative study with a sample of 150 nurses who tended chronic wounds at hospital to explore the knowledge and competencies of wound evaluation and management. The study results showed that nurses' knowledge about wound evaluation indicators was relatively good. Besides, nurses who took care of wounds per week more often had better competencies [4, 5]. Viet Duc University Hospital is the tertiary level of surgical hospital and referral an education institution in Vietnam. Nearly 200 surgeries are performed on a daily basis and around 1,000 inpatients with wounds are tended. However, nurses working here

still had limited knowledge and practice of wound care, which may be because the “Vietnam Nursing Competency Standards” ratified by Vietnam’s Ministry of Health (2012) had not been applied by the Hospital [6]. So we conducted the study aiming to assess the impacts of the training programme on improving wound care competencies among nurses working in Viet Duc University Hospital one year after it was initiated.

## **MATERIALS AND METHODS**

### **1. Subjects**

The study was conducted between 2014 and 2015, and 145 nurses who directly took care of patients at seven clinical departments in Viet Duc University Hospital were enrolled .

### **2. Methods**

The following formula was used to compare the effectiveness of wound care after one year of intervention:

$$\text{Effectiveness indicator} = \frac{(\text{Pre-training indicator} - \text{Post-training indicator})}{\text{Pre-training indicator}} \times 100$$

Data were collected using a wound care practice checklist to determine two indicators: nurses’ mean scores and effectiveness of wound care competencies. The wound care observation checklist included four sections, namely identification; planning; implementation; and evaluation, with 16 indicators. The maximum score for practice competencies was 381 points; 70% of which (or 266.7 points) is considered as adequate.

To assess nurses’ competencies, we used a 5-point Likert scale in which 1 point represents “highly disagree”, 2 “disagree”, 3 “neither agree nor disagree”, 4 “agree”, and 5 “highly agree.” The practice competency score is the combination of knowledge, skills and attitude scores (practice section). Data were entered into Epidata 3.1 and analysed with SPSS 18.0. *T*-tests were used to make comparisons about knowledge, skills and attitude before and one year after the nursing training programme was launched. Additionally Chi-square tests and *p* values were used to describe the differences in the proportions of variables before and after training.

### **3. Ethical issues**

This study was approved by the Ethics Committee at Hanoi School of Public Health. The participants who volunteered in the study were reassured that they were entitled to withdraw

from the study at any time. All personal information from the participants was kept confidential.

## RESULTS

### **1. General information of subjects**

Of the 145 nurses participating in the knowledge assessment before the intervention (training programme), 137 participated in the assessment conducted one year after the intervention. Their average age was  $31.24 \pm 6.65$ . Females accounted for 74.5%, and 100% of them had at least secondary-level education. Their working duration at Viet Duc University Hospital averaged 6.3 years.

### **2. The effectiveness of the training programme one year after it was launched**

**2.1** Different types of competencies before and one year after training Table 1 showed that the total mean score for wound identification after training exceeded that before training ( $76.17 \pm 3.92$  vs.  $69.11 \pm 8.43$ ). All of the mean scores for knowledge, skills and attitude relating to the identification competencies rose from the pre-training assessment, with the biggest increase found in the nurses' knowledge of principles of comprehensive patient care and wound care (7.03 points higher than before intervention). According to Table 2, the total planning score increased from the pre-training assessment (a 14.35-point rise), from  $52.85 \pm 8.02$  to  $67.20 \pm 3.49$ . The most significant increase was found in the nurses' knowledge of principles, rules and procedures of bacterial infection control (7.03 points higher than before the intervention).

Tables 1 and 2

Table 3 showed that the total mean plan implementation score increased from the pre-training assessment, from  $113.33 \pm 15.58$  to  $145.48 \pm 10.46$ , a 32.15-point rise. The knowledge scores experienced the highest increase over one year (4.95 points). Table 4 showed that the total evaluation score increased by 13.72 points, from  $30.77 \pm 7.68$  in the pre-training assessment to  $44.49 \pm 7.09$  in the post-training assessment. The highest increase in scores can be seen in the nurses' knowledge of medical record documentation one year after the intervention (6.75 points).

Tables 3 and 4

## 2.2 Effectiveness for nurses' practice competencies before and one year after training

According to Table 5, the rate of nurses with adequate competencies increased between before and after the training. Particularly, the identification competency rose from 75.2% to 99.2%; planning competency from 69.2% to 99.2%; implementation competency from 57.9% to 99.2%; evaluation competency from 27.1% to 91.7%; and practice competency from 56.4% to 100%. The effectiveness indicators for each corresponding type of competencies were 31.9%; 43.3%; 71.3%; 238.3% and 77.3%. All of the changes in those five types of competencies before and after training were statistically significant ( $p < 0.001$ ).

Table 5

## DISCUSSION

According to a study conducted by Le Dai Thanh (2008), nurses failed to perform all the dressing change assessment criteria properly for 200 practices [7], while the figure in Do Thi Huong Thu's study (2005) with the same sample size was 21% [8]. In a study by Ngo Thi Huyen (2012) indicated 61.1% of 162 nurses performed at least one step of the dressing change procedure incorrectly [9]. So the training programme could help them to improve their competencies on nursing practices as well.

Professional training for nurses plays an important role in improving their knowledge and practice of wound care. Mohammad YN Saleh et al. (2012) conducted an intervention with pre- and post-assessment on the impacts of training programmes on nurses' knowledge, attitude and practice of pressure ulcers. This study showed that experienced nurses were, the more positive their attitude was and the better their intention of preventing pressure ulcers. Nurses with tertiary or part-time education had better intention of pressure ulcer prevention and control [10]. According to Sally Sutherland-Fraser (2012), 70 operating nurses had good knowledge of pressure ulcer stages after training ( $p < 0.05$ ) [11]. Phan Thi Dung indicated that nurses participating in a training programme were more likely to identify the wound conditions, patients' demand for care, wound care planning and the dressing procedure better than nonparticipants [12, 13].

### ***Mean scores of wound care competencies one year after the training***

Nurses scored  $76.17 \pm 3.92$  for wound identification one year after the training, higher than before the training ( $69.11 \pm 8.43$ ) (Table 1). In terms of the ability to make wound care plans, they scored  $67.20 \pm 3.49$ , also higher than before the training ( $52.85 \pm 8.02$ ) (Table 2). The mean score for plan implementation after the training was  $145.48 \pm 10.46$ , much higher than

that before the training ( $113.33 \pm 15.58$ ) (Table 3). The figure for evaluation was  $44.49 \pm 7.09$ , compared to  $30.77 \pm 7.68$  before the training (Table 4). The study results showed changes in all post-training competencies. The overall mean score increased by 71.74 points ( $p < 0.001$ ), in which the mean score for identification increased by 7.06 points, planning by 14.35 points, plan implementation by 32.15 points, and decision making by 13.72 points ( $p < 0.001$ ). These results proved the positive effects of the training on nursing competencies.

### ***Effectiveness of wound care competencies one year after the training***

Practice competencies increased significantly after the intervention. The proportion of nurses with adequate competencies saw a rise after the training ( $p < 0.001$ ). Nurses with adequate competencies after the training made up 99.2%, far higher than that before the training (75.2%), with the effectiveness indicator of 31.9% (Table 5). Similarly, planning, plan implementation, evaluation and practice competencies showed improvement one year after the training. The effectiveness indicators for those competencies ranged from 43.3% to 238.3% (Table 5). This proved the competencies-based wound care training programme to be effective, and the training programme contributed to improving the nurses' wound care knowledge and skills.

### **STUDY LIMITATIONS**

Despite the effectiveness of the intervention, the study had its own limitations. On the one hand, the study only focused on assessing the nurses' competencies based on the observation of their performing wound care, but not on patients' opinions about each element of the nursing competencies relating to wound care. On the other hand, due to the lack of resources and time, the impacts of the intervention on improving the quality of wound care were not assessed on the basis of indicators such as healing duration for each type of wound, the infection rate and average cost of each wound.

### **CONCLUSIONS AND RECOMMENDATIONS**

All competencies saw positive changes after the training. The mean scores and effectiveness indicators relating to identification, planning, implementation and evaluation all increased ( $p < 0.001$ ). This indicated the effectiveness of the training programme (or intervention) in improving the wound care competencies among nurses at Viet Duc University Hospital. However, due to the study limitations, it is necessary that further research is conducted with the aim to assess the training competencies, impacts of the competencies-based wound care training programme, and factors affecting nurses'

competencies. Based on the study results, proper interventive measures should be applied in order to better nurses' competencies as well as the quality of healthcare services.

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**Table 1: Mean wound identificationscores before and one year after training**

Identification	Total score	Mean score <u>Mean Score (<math>\bar{x} \pm SD</math>)</u>		Difference between mean scores	CI 95%	P*
		Pre- training	Post-training			
<b>Knowledge</b>						
Principles of comprehensive patient care and wound care	44	32.12 ± 6.40	41.15 ± 2.29	7	35.91 ± 8.15	<0.001
Principles, rules and procedures of bacterial infection control	10	7.00 ± 1.51	9.4 ± 1.03	2.39	2.08 ± 2.71	<0.001
<b>Skills</b>						
Identifying patients comprehensively and accurately	10	4.71 ± 2.57	8.12 ± 1.19	3.41	2.91 ± 3.91	<0.001
Identifying wounds comprehensively and accurately	10	7.00 ± 1.89	8.51 ± 1.08	1.51	1.14 ± 1.87	<0.001
Identifying/assessing devices/tools , dressings correctly and properly	10	8.00 ± 1.29	8.96 ± 1.02	0.96	0.70 ± 1.22	<0.001
<b>Attitude</b>						
Identifying/assessing devices/tools , dressings correctly	10	8.26 ± 1.43	8.97 ± 0.87	0.72	0.44 ± 1.00	<0.001
<b>Total score</b>	<b>94</b>	<b>69.11 ± 8.43</b>	<b>76.17 ± 3.92</b>	<b>7.06</b>	<b>5.51 ± 8.61</b>	<b>&lt;0.001</b>

\* Paired T tests were applied for 133 nurses participating in both before and after the intervention

**Table 2: Mean planning scores before and one year after the training programme**

Identification	Total score	Mean score <u>Mean Score (<math>\bar{x} \pm SD</math>)</u>		Difference between mean scores	CI 95%	P*
		Pre- training	Post-training			
<b>Knowledge</b>						
Principles of comprehensive patient care and wound care	44	7.00 ± 1.51	9.42 ± 1.03	2.39	2.08 - 2.71	<0.001
Principles, rules and procedures of bacterial infection control	10	34.12 ± 6.40	41.15 ± 2.29	7.03	5.91 - 8.15	<0.001
<b>Skills</b>						
Making wound care plans based on the nursing procedure	10	7.19 ± 1.84	8.74 ± 0.85	1.55	1.24 – 1.86	<0.001
<b>Attitude</b>						
Making sire patients understand proper and safe wound care	10	7.65 ± 1.73	8.91 ± 0.80	1.26	0.94 - 1.57	<0.001
<b>Total score</b>	<b>74</b>	<b>58.25 ± 8.02</b>	<b>67.20 ± 3.49</b>	<b>14.35</b>	<b>12.91 – 15.79</b>	<b>&lt;0.001</b>

\* Paired T tests were applied for 133 nurses participating in both before and after the intervention

**Table 3: Mean wound care planning scores before and one year after training**

Identification	Total score	Mean score Mean Score ( $\bar{x} \pm SD$ )		Difference between mean scores	CI 95%	P*
		Pre- training	Post-training			
<b>Knowledge</b>						
Principles and forms of communication at hospital	44	11.78 ± 3.67	15.65 ± 3.36	3.85	3.05 ± 4.65	<0.001
Methods of effective information exchange, professional principles, healthcare laws, health insurance	10	8.30 ± 1.80	9.49 ± 1.60	1.19	0.82 ± 1.57	<0.001
Principles, and procedures of clean wound care	2	1.66 ± 0.58	1.99 ± 0.08	0.33	0.23 ± 0.43	<0.001
Principles, and procedures of infected wound care	20	13.90 ± 3.61	18.86 ± 2.22	4.95	4.26 ± 5.64	<0.001
Principles, and procedures of taking out stitches	14	8.65 ± 2.34	12.26 ± 1.32	3.61	3.16 ± 4.07	<0.001
Principles, and procedures of tending wounds with drainage	8	5.37 ± 1.44	7.31 ± 1.06	1.93	1.64 ± 2.22	<0.001
Principles, and procedures of caring for pressure ulcers	10	7.08 ± 1.82	9.46 ± 1.22	2.37	2.02 ± 2.72	<0.001
<b>Skills</b>						
(Nurses) having the ability to introduce themselves and explain the wound care plan to patients and family members	10	5.98 ± 2.33	8.35 ± 1.66	2.37	1.89 ± 2.84	<0.001
Performing wound care techniques/dressing change to different wounds correctly	10	7.32 ± 1.73	9.00 ± 0.89	1.68	1.37 ± 2.00	<0.001
Applying sterilisation skills throughout the entire wound care procedure	10	6.92 ± 2.57	9.00 ± 0.93	2.08	1.61 ± 2.54	<0.001
Communicating well with patients, their family members and colleagues in the same wound care team	10	5.49 ± 2.09	8.67 ± 1.04	3.18	2.78 ± 3.57	<0.001
Performing the entire procedure properly	10	8.19 ± 1.29	8.87 ± 0.82	0.68	0.43 ± 0.93	<0.001
<b>Attitude</b>						
Making sure to complete the procedure of safe, high-quality and satisfactory patient care	10	8.26 ± 1.43	8.84 ± 0.75	0.99	0.69 ± 1.00	<0.001
Making sure the work environment be private and patients respected	10	7.57 ± 1.88	8.91 ± 0.91	1.34	0.99 ± 1.69	<0.001
Making sure wound care devices, consumables and waste after care be treated properly and safely	10	7.14 ± 2.06	8.69 ± 0.89	1.55	1.18 ± 1.93	<0.001
<b>Total score</b>	<b>161</b>	<b>113.33 ± 15.58</b>	<b>145.48 ± 10.46</b>	<b>7.06</b>	<b>29.07 ± 35.23</b>	<b>&lt;0.001</b>

\* Paired T tests were applied for 133 nurses participating in both before and after the intervention

**Table 4: Mean wound care evaluation scores before and one year after training**

Evaluation	Total score	Mean score		Difference between mean scores	CI 95%	p*
		<u>Mean Score (<math>\bar{x} \pm SD</math>)</u>				
		Pre- training	Post-training			
<b>Knowledge</b>						
Principles and regulations of medical record documentation	32	22.93 ± 6.23	41.15 ± 2.29	6.75	5.32 ± 8.18	<0.001
<b>Skills</b>						
Documenting medical records clearly and properly	10	6.21 ± 2.83	8.29 ± 1.17	2.08	1.59 ± 2.55	<0.001
<b>Attitude</b>						
Making sure to complete the procedure for safe patient care	10	7.95 ± 1.72	8.84 ± 0.75	0.99	0.44 ± 1.00	<0.001
Making sure patients know how to take care of and monitor their own wounds after nursing care	10	1.60 ± 2.56	6.49 ± 3.21	4.89	4.15 ± 5.63	<0.001
<b>Total score</b>	<b>52</b>	<b>30.77 ± 7.68</b>	<b>44.49 ± 7.09</b>	<b>13.72</b>	<b>12.11 ± 15.33</b>	<b>&lt;0.001</b>

\* Paired T tests were applied for 133 nurses participating in both before and after the interventions

**Table 5: Effectiveness for each type of competency**

Evaluation	Indicators	Before training		After training		p*	EI (%)
		N	%	N	%		
Identification	Adequate	100	75.2	132	99.2	<0.001	31.9
	Inadequate	33	24.8	1	0.8		
Planning	Adequate	92	69.2	132	99.2	<0.001	43.3
	Inadequate	41	30.8	1	0.8		
Implementation	Adequate	77	57.9	132	99.2	<0.001	71.3
	Inadequate	56	41.1	1	0.8		
Evaluation	Adequate	36	27.1	122	91.7	<0.001	236.3
	Inadequate	97	72.9	11	8.3		
Practice	Adequate	75	56.4	133	100	<0.001	77.3
	Inadequate	58	43.6	0	0		