

## KNOWLEDGE, ATTITUDE, AND PRACTICE OF HAND HYGIENE AMONG NURSING STUDENTS AT CAN THO UNIVERSITY OF MEDICINE AND PHARMACY

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### ABSTRACT

**Background:** Healthcare-associated infections are major causes of morbidity and mortality associated with clinical, diagnostic, and therapeutic procedures in healthcare organizations. Enhancement of hand hygiene practices among healthcare workers is responsible for decreasing 30 to 50% of healthcare-associated infections. However, previous studies have indicated inadequate adherence to hand hygiene procedures in healthcare institutions. Therefore, increasing knowledge, attitude, and practices of hand hygiene among nursing students who participate in caring for patients is essential to improve the quality of care and patient safety. **Objectives:** This study aimed to examine knowledge, attitude, the practice of hand hygiene, and their associations among nursing students at Can Tho University of Medicine and Pharmacy. **Materials and methods:** A descriptive correlational study was conducted with 104 nursing students as study participants. Knowledge and attitude were examined by using a self-structured questionnaire, while practice was evaluated by observation based on the hand hygiene checklist of the Vietnamese Ministry of Health. **Results:** The findings showed that 44.2% and 66.3% of participants had good knowledge and positive hand hygiene attitudes, respectively. Poor adherence of 5 moments of hand hygiene and 6 steps of the hand hygiene procedure were revealed. Half of the respondents showed low to moderate compliance with the hand hygiene procedure. There were significant associations between knowledge, attitude, and hand hygiene practices among nursing students. **Conclusion:** among nursing students, poor knowledge, attitude, and hand hygiene practices were reported. The study findings supported previous literature and found that respondents emphasized the importance of training programs and hand hygiene monitoring in improving hand hygiene practices.

**Keywords:** hand hygiene, knowledge, attitude, practice, nursing students.

## I. INTRODUCTION

Healthcare-associated infections (HAIs) are important problems in healthcare services worldwide, especially in developing countries with the incidence of HAIs being 2 to 20 times higher in developing countries [7]. HAIs constitute major causes of morbidity and mortality associated with clinical, diagnostic, and therapeutic procedures. In addition, they are related to an extended hospital stay, increased healthcare costs, economic hardship to patients and their families, higher resistance to pathogenic organisms, and lower quality of life [1]. All nursing care activities could arise risks of HAIs in patients if compliance with hand hygiene is poor. According to World Health Organization and Vietnamese Ministry of Health, there are 5 moments of hand hygiene and 6 steps of the hand hygiene procedure that require nurses to adhere to while caring for patients [3]. Nurses are the nucleus of the health care system. Unfortunately, previous studies have demonstrated that the prevalence of compliance with the hand hygiene procedure is poor among nurses and nursing students – who also participate in caring for patients. Therefore, it is essential to investigate and examine nursing students' knowledge, attitudes, and practices about hand washing to develop appropriate strategies to promote hand hygiene adherence.

## II. METHODS

### 2.1. Research design, population, and sample

**Design:** A cross-sectional descriptive design was used to examine knowledge, attitude, hand hygiene practices, and their associations among nursing students at Can Tho University of Medicine and Pharmacy.

**Population and Sample:** 139 third and fourth year nursing students at Can Tho University of Medicine and Pharmacy were invited to participate in this study. However, the researchers received 104 responses to participation, and the response rate was 74.8%.

### 2.2. Research instruments

**Demographic Questionnaire:** students' demographic data were collected by using a demographic questionnaire which contained information on age, gender, year of university education, and grades.

Knowledge of hand hygiene was examined by using a self-reported questionnaire including 30 items. Among them were 15 yes or no questions and 15 multiple-choice questions. The correct answer was scored by 1, and the total score was calculated by the sum of each item's score. It ranged from 0 to 30. It was also categorized as good knowledge (21–30 scores) and poor knowledge (0 – 20 scores) [4].

The attitude toward hand hygiene was measured by a 5 Likert scale with 9 items. Each item ranged from 1 as strongly disagree to 5 as strongly agree. Total score of attitudes was 9 to 45 and classified into positive attitude (32-45 scores) and negative attitude (9-31 scores) [4].

The practice of hand hygiene was evaluated by observation with a checklist of hand hygiene procedures. Each participant was observed when they provided care for a patient to evaluate their compliance with 5 moments and 6 steps of hand hygiene [4].

The knowledge and attitude of hand hygiene questionnaires were tested for their internal consistency reliability with 20 nursing students who had similar characteristics to the sample of this study. Their reliabilities were 0.81 and 0.84, respectively.

### 2.3. Data collection and analysis

**Data collection:** we conducted an entire sample including 104 third- and fourth-year nursing students who consented to participate in the study from August to December 2022.

**Data analysis:** Data were collected, encoded, and inputted using SPSS 22.0. Descriptive statistics in frequency, percent, mean, standard deviation, and range were used to examine demographic characteristics, knowledge, attitude, and practice of hand hygiene. Independent samples T-test was used to determine relationships between variables, and statistical significance was considered at lower than 0.05.

### 2.4. Ethical considerations

This study was approved by The Ethical Review Board of Can Tho University of Medicine and Pharmacy.

## III. RESULTS

### 3.1. Demographic characteristics

The nursing student’s mean age was  $21.7 \pm 0.8$ . Most nursing students were female (86.5%). 81.7% of participants had a good level of GPA. 100% of the students were educated about hand hygiene in their course.

### 3.2. Knowledge, attitude, and practice of hand hygiene among nursing students

**Table 1.** Knowledge of hand hygiene among nursing students

	Mean	Good knowledge	Poor knowledge
Knowledge of hand hygiene	20.1	49 (44.2%)	55 (55.8%)

Half of the nursing students (55.8%) had poor hand hygiene knowledge.



**Figure 1.** Knowledge regarding hand hygiene among nursing students

Students achieved a high score in the significance of hand hygiene while knowledge of using soap and alcohol in hand washing was low.

**Table 2.** The attitude of hand hygiene among nursing students

	Mean	Positive attitude	Negative attitude
Attitude of hand hygiene	33.4	69 (66.3%)	35 (33.6%)

66.3% of nursing students had a positive attitude toward hand hygiene.

**Table 3.** The practice of hand hygiene among nursing students

	Mean	SD	Range
Compliance with 5 moments of hand hygiene	57.5	25.7	0-100
Compliance with 6 steps of hand hygiene procedure	42.8	25.8	0-100

There were poor practices of hand hygiene among nursing students. In detail, 57.5% of the students had a good level of compliance with 5 moments, and 42.8% had good compliance with 6 steps of the hand hygiene procedure.

### 3.3. Relationships between knowledge, attitude, and practice of hand hygiene among nursing students

**Table 4.** Relationships between knowledge, attitude, and compliance with 5 moments of hand hygiene

Factors		Compliance with 5 moments of hand hygiene	t	p
Knowledge	Good (n = 49)	65.9 ± 24.6	-3.098	0.003
	Poor (n = 55)	50.9 ± 24.7		
Attitude	Positive (n = 69)	67.9 ± 21.5	-6.98	<0.001
	Negative (n = 35)	37.1 ± 20.7		

There were associations between knowledge, attitude of hand hygiene and compliance with 5 moments of hand hygiene among nursing students.

**Table 5.** Relationships between knowledge, attitude, and compliance with 6 steps of hand hygiene

Factors		Compliance with 6 steps of hand hygiene	t	p
Knowledge	Good (n = 49)	49.6 ± 28.4	-2.469	0.015
	Poor (n = 55)	37.4 ± 22.3		
Attitude	Positive (n = 69)	53.3 ± 23.4	-7.051	<0.001
	Negative (n = 35)	22.1 ± 16.1		

There were significant associations between knowledge, attitude of hand hygiene and compliance with 6 steps of hand hygiene procedure among nursing students.

## IV. DISCUSSION

### 4.1. Knowledge, attitude, and practices of hand hygiene among nursing students

Hand hygiene is the single most preventive means of the spread of infectious organisms and hospital-acquired infections. The study findings showed poor knowledge, attitude, and practice of hand hygiene among nursing students. These findings supported previous studies, revealing low hand hygiene practices among nursing students and healthcare workers. According to Qasmi, only 56.8% of medical and nursing students adhered to hand hygiene procedures when caring for patients [9]. A study conducted on 270 students (140 medical, 83 nursing, and 47 medical technique students) in Saudi Arabia indicated a low incidence of hand hygiene practices among students. However, among participants, nursing

students' compliance was the highest [2]. According to Nair et al., nursing students had moderate knowledge and poor hand hygiene attitudes. Their study results showed that only 9% of participants had good knowledge of hand hygiene, and the majority of students had a poor attitude toward hand hygiene [5].

Related literature investigating health care workers also supported our findings. A study conducted by all healthcare workers in a general hospital showed low compliance with hand hygiene protocol, although the participants had good knowledge and a positive attitude [8].

Knowledge, attitude, and hand hygiene practice to enhance infection control among nurses were limited. This assumption was demonstrated by a study by Tran et al. on nurses who worked in a general hospital in Vietnam. Tran et al. found that 55% of nurses answered correctly about hand hygiene in this study. In detail, 40%, 56.3%, and 75% had good knowledge of significance, choosing soap or alcohol, and technique of the hand hygiene procedure, respectively [10].

Based on open ended questions, training might be a factor that promotes hand hygiene practices. Most nurses from previous studies reported attending many training courses and updated conferences regarding hand hygiene at their working institutions. However, our respondents indicated that they did not participate in any training course but learned and practiced in the fundamental nursing course.

#### **4.2. Relationships between knowledge, attitude, and practice of hand hygiene among nursing students**

Our study found that knowledge and attitude were significantly associated with hand hygiene practices among nursing students in compliance with 5 moments and 6 steps of hand washing procedures. Our study was consistent with the related literature. A study by Nair et al. showed strong relationships between knowledge, attitude, and hand hygiene practices among nursing students. The student with higher knowledge and a positive attitude would have had better practices of hand hygiene protocol [5].

A study conducted at Vinh Medical University with 337 students to examine their compliance with standard precautions found that 65,9% of students had a positive attitude related to hand washing. Besides, the group of students with a positive attitude had an incidence of compliance with hand hygiene 2.7 times higher than those with a negative attitude [11].

Knowledge and attitude were predictors of hand hygiene practices among nurses. Nabavi et al. conducted research at Imam Hossein hospital, Tehran, Iran with 270 healthcare workers. The findings showed that healthcare workers had moderate knowledge but poor attitudes and practices overall. Their knowledge and attitude significantly predicted their compliance with the hand hygiene procedure in their caring activities [6].

Consistent results were also found by Le et al. in 2019. They involved 371 healthcare workers (59 doctors, 185 nurses, 27 paramedics, 71 nursing students, and 29 medical assistants) in evaluating factors related to hand hygiene practices among study subjects. The findings indicated that 38.8% of nurses had good practices and achieved the highest scores in practices with hand hygiene procedures compared to other groups. In addition, good knowledge and a positive attitude positively associated with hand hygiene performance among healthcare workers [3].

Our study found the significance of improving the current training programs targeting hand hygiene practices among nursing students. Hand hygiene training sessions may need to be conducted more frequently for students with continuous monitoring and performance feedback to encourage them to increase their compliance with hand hygiene procedures.

## V. CONCLUSION

Nursing students had poor knowledge, attitude, and practices concerning hand hygiene. Relationships between knowledge, attitude, and practices were indicated. Therefore, information, education, and communication should be intensified among nursing students to reduce hospital-acquired infections.

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