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Attitude towards Control of COVID-19 Infection in Clinical Practice and Related Factors among Nursing Students in Vietnam

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Abstract*—** *The coronavirus disease 19 (COVID-19) pandemic has significantly impacted many countries worldwide. Training in infection prevention and control plays a crucial role in mitigating the transmission of COVID-19. The study aimed to access the attitude of undergraduate nursing students towards control of COVID-19 infection in clinical practice and identify related factors.* ***Materials and methods: *A cross-sectional descriptive study was conducted on 468 nursing students at Da Nang University of Medical Technology and Pharmacy in 2022. Data were collected through self- reported questionnaires* ***Results:*** *The study revealed that 30.8% of nursing students had negative attitude towards COVID-19 infection control. Attitude was significantly associated with gender, age, academic year, clinical practice experience, and knowledge related to COVID-19 (p<0.05).)* ***Conclusion:*** The *development of targeted intervention program tailored to the general characteristics of each individuals is important to improve infection control attitude. Such efforts may contribute to reducing the risk of disease transmission among nursing students more broadly.*

***Keywords*—** *Attitude, clinical practice, control of COVID-19 infection, nursing student.*

I. Introduction

The COVID-19 pandemic has continued to pose complex challenges in many countries around the world, particularly with the emergence of highly transmissible variants. The increasing number of COVID-19 cases in healthcare settings has created a favourable environment for the further transmission, potentially leading to outbreaks within medical facilities. This situation poses a significant risk to both healthcare workers and patients. Therefore, implementing effective strategies to minimize COVID-19 transmission in hospitals is a critical component in enhancing patient safety and ensuring continued access to healthcare services during the pandemic [1].

Clinical practice in healthcare settings during the COVID-19 pandemic has posed significant health risks to nursing students due to their frequent contact with potentially infected individuals [2]. Therefore, implementing effective infection control measures during clinical placements is essential to help students protect themselves, prevent the transmission of COVID-19 to patients and healthcare personnel, and reduce the risk of outbreaks within medical facilities [3]. Students' attitudes toward infection control are particularly important, as current strategies for managing the COVID-19 pandemic emphasize the interruption of SARS-CoV-2 transmission pathway [4].

According to literature review, medical students generally demonstrate a high level of positive attitudes toward COVID-19 infection control practices. For instance, a study by Osman et al. (2020) conducted among medical students in Saudi Arabia reported that 81.1% of participants held positive attitudes regarding COVID-19 infection control [5]. Similarly, a study in Nigeria involving dental students found that 95.1% had a positive attitude toward infection control practices in healthcare settings [4]. Moreover, the effectiveness of infection control among students during clinical practice is closely associated with several factors, including knowledge about COVID-19, clinical experience, access to updated information, health status, year of study, gender, and age [6-9].

In Vietnam, at the time this study was conducted, attitudes toward COVID-19 infection control in clinical practice remained a subject of debate. Therefore, assessing nursing students' attitudes toward infection control during clinical placements is essential to support the development of appropriate attitudes, ensure consistent and proper use of infection control measures, and enhance their readiness to participate in clinical practice during the pandemic.

This study aimed to (1) assess the attitudes of nursing students toward COVID-19 infection control during clinical practice; and (2) identify factors associated with these attitudes.

II. Materials And Methods

A. Design and sampling

This descriptive cross-sectional study was conducted at Da Nang University of Medical Technology and Pharmacy. A convenience sampling method was employed, and a total of 468 undergraduate nursing students participated in the study.

B. Data collection

Data collection was carried out from March to April 2022. Nursing students who met the inclusion criteria were approached and invited to participate in the study. The researchers met the students during break times or at the end of their classes. After providing a detailed explanation of the study's purpose and procedures, the researchers distributed the self-administered questionnaires to the participants. Completing the questionnaire took approximately 10 minutes.

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All collected information was used solely for research purposes and was kept strictly confidential.

C. Instruments

The study employed a self-reported questionnaire that was adapted from a previously published study and translated into Vietnamese using a back-translation procedure to ensure linguistic accuracy. The translated questionnaire was then reviewed by five subject-matter experts to assess its content validity. A pilot study was subsequently conducted with a random sample of 30 participants to evaluate the reliability of the instrument. The reliability coefficients (Cronbach's alpha) were 0.68 for the knowledge scale and 0.80 for the attitude scale regarding COVID-19 infection control.

The questionnaire consisted of three parts. The first part included questions on participants' personal characteristics, such as gender, age, year of study, access to updated information about COVID-19, self-reported health status, and clinical practice experience. The second part assessed knowledge regarding COVID-19 through 12 items divided into three components: general characteristics of the disease (questions 1–4), transmission routes (questions 5–8), and prevention and control measures (questions 9–12). Each correct answer was awarded 1 point, while incorrect answers and responses of "I don't know" were scored 0. The total knowledge score ranged from 0 to 12, with higher scores indicating greater knowledge about COVID-19. The reliability of the original knowledge scale was reported as 0.87 [10]. The third part evaluated attitudes toward COVID-19 infection control using 13 items on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). The total attitude score ranged from 13 to 65, with scores of 39 or above indicating a positive attitude toward COVID-19 infection prevention and control. The reliability of the original attitude scale was reported as 0.814 [4].

D. Data Analysis

Data were analysed using SPSS version 22.0. Knowledge variables were presented as mean scores and standard deviations, while personal characteristics and attitude variables toward COVID-19 infection control were summarized using frequencies and percentages. Associations between study variables were examined using the Chi-square test and the Mann–Whitney U test, as appropriate. A p-value of less than 0.05 was considered statistically significant.

E. Ethics

This study was approved by Ethical Council for Biological Research of Da Nang University of Medical Technology and Pharmacy (No.193/QĐ-ĐHKTYDĐN). All participants fulfilled in the informed consent when received a full explanation the aim of the study, confidentiality, and the right to refuse or withdraw anytime.

III. Results

A total of 468 nursing students participated in the study. The majority were female (95.7%), and more than half of the participants were aged between 18 and 20 years (57.7%). First-year students accounted for the largest proportion (35.7%), while fourth-year students represented the smallest group (12.6%). Most students reported being in good health (97.2%) and having access to updated information about COVID-19 (96.6%). Additionally, 63.5% of the students had no prior clinical experience. The mean score for knowledge related to COVID-19 prevention was 10.29 ± 1.48, corresponding to an average correct response rate of 85.6% (Table 1).

TABLE 1. Personal characteristics of nursing students and knowledge regarding COVID-19 (n= 468)

Characteristics		Number	Frequency (%)
Gender	Male	20	4.3
	Female	448	95.7
Age	18 – 20	270	57.7
	21 – 23	198	42.3
Year of study	1st	167	35.7
	2nd	135	28.8
	3rd	107	22.9
	4th	54	12.6
Updated information regarding COVID-19	Yes	452	96.6
	No	16	3.4
Health status	Good	455	97.2
	Not good	13	2.8
Clinical practice experience	Yes	171	36.5
	No	297	63.5
Knowledge about COVID-19	Mean ± SD = 10.29 ± 1.482 (Min= 0, Max =12)		

TABLE 2. Level of attitude towards COVID-19 infection control (n= 468)

	Number	Frequency (%)
Positive attitude	324	69.2
Negative attitude	144	30.8

Table 2 presents the results regarding students' attitudes toward COVID-19 infection control. Notably, 30.8% of students demonstrated negative attitudes toward infection control practices.

TABLE 3. Association between characteristics with attitude towards COVID-19 infection control of participants

Characteristics		Positive attitude		Negative attitude		*p*
		n	%	n	%	
Gender	Male	9	1.9	11	2.4	**0.016**
	Female	315	67.3	133	28.4	
Age	18 – 20	173	37	97	20.7	**0.01**
	21 – 23	151	32.3	47	10	
Year of study	1st	107	22.9	60	12.8	**0.02**
	2nd	89	19	46	9.8	
	3rd	78	16.7	29	6.2	
	4th	50	10.7	9	1.9	
Updated information regarding COVID-19	Yes	316	67.5	136	29.1	0.09
	No	8	1.7	8	1.7	
Health status	Good	316	67.5	139	29.7	0.54
	Not good	8	1.7	5	1.1	
Clinical practice experience	Yes	128	27.4	43	9.2	**0.04**
	No	196	41.9	101	21.6	

Statistically significant associations were found between students' attitudes and several variables, including gender, age,

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academic year, and clinical practice experience ($p < 0.05$). However, no significant relationships were observed between attitude and either updated information about COVID-19 or current health status ($p > 0.05$) (Table 3).

TABLE 4. Difference between positive and negative attitude groups with knowledge about COVID-19

	Positive attitude (Mean ± SD)	**Negative attitude** (Mean ± SD)	***p***
Knowledge about COVID-19	10.4 ± 1.42	10.1 ± 1.6	**0.045**

Furthermore, the study identified a statistically significant association between knowledge scores and attitudes toward COVID-19 infection control ($p < 0.05$) (Table 4).

IV. Discussion

1. Attitude towards COVID-19 among nursing students

This study revealed that a considerable proportion of nursing students (30.8%) exhibited negative attitudes toward COVID-19 infection control. This finding is comparable to the study in Iran that reported a similar rate of 34% [8]. In comparison, studies conducted among dental and medical students by Shenoy and Osman reported negative attitude rates of 36.2% and 19.9%, respectively [9]. A positive attitude toward infection control is essential for ensuring the safety of both patients and healthcare workers. Therefore, for students exhibiting negative attitudes, universities and educators should implement targeted interventions to foster a more positive outlook. Incorporating structured training programs on infection prevention and control into clinical education is particularly important to reinforce and sustain positive attitudes among healthcare students.

2. *Related factors with attitude towards COVID-19 infection control*

The study identified a significant association between gender, age, academic year, clinical experience, and knowledge of COVID-19 with nursing students' attitudes toward COVID-19 infection control ($p < 0.05$). Female students exhibited more positive attitudes compared to their male counterparts. This finding is consistent with a study by Yuan et al. (2020), which also reported more favorable attitudes among female nursing students [7]. In contrast, studies involving different participant populations have shown divergent results. For instance, Shenoy and Ma found that male participants demonstrated more positive attitudes toward COVID-19 infection control than females [9,11]. This discrepancy may be attributed to differences in psychological responses to the pandemic. Evidence suggests that women are more likely to experience heightened anxiety and stress related to COVID-19, possibly due to increased perceived vulnerability to infection [12]. Furthermore, female healthcare workers often perceive the pandemic as a serious health threat and tend to exhibit higher levels of compliance with infection prevention measures. Consequently, they are more likely to adopt a positive attitude toward infection control strategies and demonstrate greater responsibility in healthcare settings [13].

A significant correlation was also found between age and attitude toward COVID-19 infection control ($p < 0.05$). This finding is consistent with those reported in Iran, Southern Ethiopia, and China, that also observed more positive attitudes among older participants [8, 11, 14]. Older students may demonstrate greater confidence and optimism in managing the challenges of the COVID-19 pandemic, which could contribute to their more favorable attitudes toward infection control practices. Increased maturity, life experience, and awareness of health risks may also explain why students in older age groups tend to adopt more responsible behaviors in clinical settings [14].

The study found a significant association between students' academic year and their attitudes toward COVID-19 infection control. Specifically, fourth-year students demonstrated more positive attitudes compared to first-year students. This finding aligns with the results of Yuan [7] and Esmaeelinejad [8], who reported similar trends among nursing and dental students, respectively. This pattern is consistent with the structure of nursing education, in which senior students, particularly those in their final year, have typically completed multiple clinical internships. As a result, they possess greater clinical experience and are more familiar with infection control protocols, which likely contributes to their more favorable attitudes. Additionally, final-year students receive more comprehensive training in disease prevention and control, including specific strategies for managing COVID-19 in clinical settings [4,8]. The observed association between clinical practice experience and students' attitudes in this study ($p < 0.05$) underscores the importance of hands-on training in shaping students' perceptions and behaviors regarding infection control. However, these findings differ from those reported in China [7], Southern Ethiopia [14], and Saudi Arabia [15], where no consistent correlation was observed between academic year or clinical experience and attitude. It is worth noting that students who have not yet participated in clinical practice may exhibit heightened concern or anxiety about infectious diseases due to unfamiliarity with real-world clinical environments. To address these concerns and prepare students for clinical placements during pandemics, it is essential to cultivate positive attitudes through targeted interventions. This includes equipping students with accurate and up-to-date knowledge about COVID-19 and reinforcing the importance of infection control measures. Such efforts can enhance students' confidence and readiness to engage in clinical practice, even in the context of ongoing public health threats [16].

The study also revealed a statistically significant association between knowledge about COVID-19 and attitude towards control of COVID-19 infection ($p < 0.05$). This correlation means the higher of students' knowledge related to COVID-19 pandemic, the more positive their attitude were. The result is similar to Osman [5] and Jin [17] on healthcare students generally and nursing students particularly. Consistent outcomes were also observed in studies conducted on other student populations, such as those by Yesse and Fatimah [13, 18]. Knowledge is considered a fundamental prerequisite for forming preventive health beliefs and fostering positive attitudes. A more comprehensive understanding of COVID-19 may lead to increased awareness of risks, the importance of

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infection prevention strategies, and personal responsibility, thereby promoting favorable attitudes toward infection control. As such, knowledge not only shapes students' beliefs but also influences their coping behaviors and the effectiveness of their infection prevention strategies to a certain extent [19].

While this study was successfully conducted and offers valuable insights, several limitations should be acknowledged. First, data were collected using a self-reported questionnaire, which may have introduced social desirability bias. Participants might have provided responses they perceived as socially acceptable rather than their genuine beliefs or behaviors. Second, the study was limited to undergraduate nursing students from a single public university, which may limit the generalizability of the findings to other student populations or educational contexts. Future studies should consider involving multiple institutions and using mixed-method approaches to enhance the validity and applicability of results.

V. Conclusion

Among nursing students in Vietnam, 69.2% demonstrated a positive attitude toward the control of COVID-19 infection, while 30.8% exhibited a negative attitude. Regarding the factors associated with students' attitudes, the study found statistically significant relationships between attitude and variables such as gender, age, academic year, clinical practice experience, and knowledge about COVID-19 ($p < 0.05$). Conversely, no significant association was observed between students' attitudes and their self-reported health status or access to updated information about COVID-19.

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