



## Original article

# Factors relating to preventive practices of health science students during the early stage of the COVID-19 pandemic

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**Abstract: Objectives:** We assessed the factors relating to the prevention of the Novel Coronavirus Disease (COVID-19) for students at the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. **Methods:** A cross-sectional study was performed in February and March 2020. A 21 item self-administered questionnaire on the knowledge, attitude, and practices regarding COVID-19 was collected from students of the first to the sixth year using the strategy of simple random sampling. The aim was to establish factors that relate to practices using Odds ratio (OR) and 95% confidence interval (95% CI) which were estimated by the logistic regression model, p-value <0.05 shows a significant difference. **Results:** Of the 551 students, 41.0% recorded responses indicating good practices toward prevention measures, while around half the students reported that they did not wash their hands for 20 full seconds (50.5%). The overall rate of good knowledge and positive attitude was 49.0% and 26.1%, respectively. When adjusted for all variables in the logistic regression model, a positive overall attitude was associated with good overall preventive practice; AOR = 1.72 (95% CI: 1.16 – 2.55). Furthermore, students mainly accessed information via social media and television (95.8% and 85.8%, respectively). **Conclusions:** There were only 41.0% recorded responses indicating good practices toward prevention measures. Besides, knowledge and attitudes about COVID-19 among students were inadequate. Further health education interventions should be focused to change bad hand-washing habits via mass media messages.

**Keywords:** Knowledge; Attitude; Practice; COVID-19; Student.

## 1. INTRODUCTION

The Novel Coronavirus Disease (COVID-19) has caused acute respiratory infections in humans that was first identified in late December 2019 in Wuhan China, thereafter it spread worldwide with exponential growth in over 216 countries. In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic [1]. Data was updated on 31 August 2020, there were 25,085,685 confirmed cases and 843,927

deaths, with the majority occurring in Europe and the Americas [2]. Most people with mild or moderate symptoms of COVID-19 can recover without medical interventions or specific treatment at a hospital [3-5]. Brad Spellberg, reported that about 5% of COVID-19 cases among people experienced mild influenza-like illness without epidemiological risk factors [6]. Also, some studies recently found that infected individuals may report as asymptomatic [1, 7, 8], which makes

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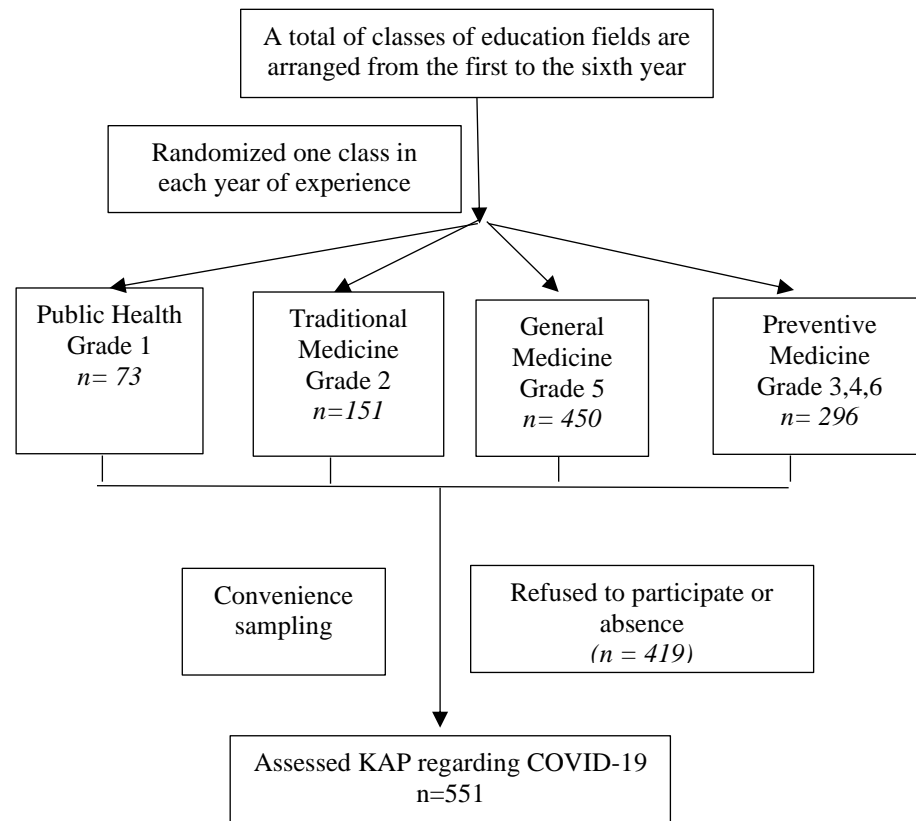
them potential sources of transmission within the community [3, 6]. Almost 20% of COVID-19 patients who had severe symptoms including dyspnea, the shock of sepsis, and multi-organ failure, needed hospitalization and about 2% of COVID-19 cases resulted in death [4]. Patients equal to or older than 65 years old, and people with underlying health conditions such as chronic diseases of the lungs, liver, and kidneys, heart failure, diabetes, hypertension, severe obesity, as well as immunocompromised patients were at a higher risk of serious illness and death from COVID-19 [3]. There has been evidence of the virus spreading from person to person through inhalation of saliva droplets or secretions of the nose

behaviors for infectious diseases are inadequate [14-16]. The aim of this study was to determine factors relating to preventive practice to reduce infection in these students.

## 2. MATERIALS AND METHOD

### 2.1. Study population

All students that are currently studying at the University of Medicine and Pharmacy at Ho Chi Minh City (UMP) in 2020 were eligible. A cross-sectional study was performed in February and March 2020. A total of 6 classes were chosen from the first to sixth-year students, using the strategy of



**Figure 1. The study flowchart**

from people with COVID-19 [9-11]. At this time, a vaccine or specific treatment for COVID-19 is not yet available [8]. Containment measures in the community are important including washing hands with soap or alcohol hand sanitizers regularly, practicing social distancing (2.0m gap), using personal protective equipment (PPE), and wearing face masks in public [1, 8]. Vietnam has recorded over 1,040 confirmed infections, and some hospital had to be isolated because of the spread within the facilities, plus there were 32 deaths recorded [12, 13]. During this time the Government instructed the community to wear face masks whilst in any public area, and wash hands frequently with soap and water [12, 13]. The lack of healthcare workers is noted as a major challenge in responding to this pandemic. Students of health sciences have been requested to assist if needed, but the previous studies have shown that knowledge and attitudes about preventive

simple random sampling. After that, convenience sampling was used to select participants. Finally, only 56.8% of students finished and returned the questionnaire (Figure 1).

### 2.2. Data collection

A structured self-administered questionnaire was set up according to our previous study toward COVID-19 among healthcare workers with a focus on Knowledge, Attitude, and Practices (KAP) [15]. A pilot study also was completed using 10 students to give their opinions regarding its simplicity and comprehensibility. The questionnaire was completed in approximately 10 minutes. The subjects that took part in the pilot study were not included in this study. The questionnaire consisted of four sections including the characteristics of demographics, 11- items relating to COVID-19 knowledge, 7- items for assessing attitudes, and 3-items for evaluating

practices relating to prevention. The collection of the data was completed in the lecture hall of the UMP. Notification of the study aims and the informed consent were completed with participants before completing the questionnaire, and their opinions were anonymous.

### 2.3. Method of analysis

The knowledge items were categorized into correct and incorrect. Good overall knowledge was defined as a correct response in all of knowledge items. The attitudes were collected by using 5 point Likert scales with answers ranging from strongly agree to strongly disagree. To each attitude item, the answer to strongly agree or agree was marked into a positive attitude, and the answer to strongly disagree or disagree or undecided was considered a negative attitude. The positive overall attitude was defined as a positive response in all of the attitude items.

Practices were the main outcome variables that consisted of 3-items toward “wearing face masks in crowded places”, “washing hands frequently with soap and water or with alcohol hand sanitizers”, and “the average time for washing hands  $\geq 20$  seconds”. A good overall preventive practice was defined as a “yes” response in all practice items.

### 2.4. Statistical methods

Data was analyzed using Stata 13.0 software. Frequencies and percentages were used to describe data. To establish an association of factors with practices, Odds ratio (OR) and 95% confidence interval (95% CI) were estimated. All factors which have a significance level  $<0.2$  in the univariable analysis were included in the multivariable analysis by the logistic regression model. Based on the hypothesis, literature, and P-value criteria, stepwise backward procedures were performed to reach a complete model that has P-value  $<0.05$  of all of the variables.

### 2.5. Ethical approval

The protocols of the study were approved by the Ethics Council of University of Medicine and Pharmacy at Ho Chi Minh City (Protocol number 162/ University of Medicine and Pharmacy – BOARD, February 26, 2020).

## 3. RESULTS

### 3.1 Demographic Characteristics of students

A total of 551 eligible students from first to sixth-year classes submitted completed questionnaires, with a majority of them being female (59.2%) and they had a mean age of  $21.6 \pm 1.9$ . COVID-19 information was recorded as being obtained mainly via social media (95.8%). The field of education of

participants included general medicine, preventive medicine, traditional medicine, and public health, in which the highest percentage was preventive medicine students (48.5%), and the highest percentage of participants were from the second year (33.4%) (Table 1).

**Table 1. Demographic characteristics of students (n=551)**

	Participants No. (%)
<b>Age (mean <math>\pm</math> standard deviation)</b>	21.6 $\pm$ 1.9
<b>Gender</b>	
Female	325 (59.2)
Male	224 (40.8)
<b>Year of education</b>	
1	62 (11.3)
2	184 (33.4)
3	84 (15.2)
4	71 (12.9)
5	95 (17.2)
6	55 (10.0)
<b>Education Field</b>	
Preventive Medicine	267 (48.5)
Traditional Medicine	116 (21.0)
General Medicine	97 (17.6)
Public health	71 (12.9)
<b>Do you have information toward the COVID-19 (yes)</b>	548 (99.5)
<b>Source of the COVID-19 information (yes)</b>	
Social network	528 (95.8)
Television	473 (85.8)
Book, newspapers	352 (63.9)

### 3.2 Prevalence of Practice toward COVID-19 prevention and associated factors

The results, as shown in Table 2, indicated that the good knowledge ranged from 66.6% to 99.3%, and 53.2% to 98.6% of participants reported positive attitudes. The overall rate of good knowledge and positive attitude was 49.0% and 26.1% respectively. The majority of the participants reported wearing face masks in crowded places (89.5%), and cleaning hands frequently with soap and water or with alcohol hand sanitizers (89.5%). When the participants were asked about the average time for washing hands, just half of them commented at least 20 seconds (50.5%). The overall result of the survey reporting good practice was recorded as 41.0%. When adjusted for all other variables in the logistic regression model, only a good overall attitude was associated with the good overall preventive practices ( $p < 0.05$ ), AOR = 1.72 (95% CI: 1.16 – 2.55) (Table 4).

**Table 2. Knowledge, Attitude and Preventive Practice toward the COVID-19 (n=551)**

	Correct answer No. (%)
<b>Knowledge toward COVID-19</b>	
COVID-19 is caused by a virus (yes)	547 (99.3)
COVID-19 spreads via respiratory droplets of infected people (yes)	544 (98.7)
Fever, cough, sore throats and shortness breath are common symptoms of Covid-19 (yes)	523 (94.9)
People with COVID-19 could manifest with mostly mild symptoms (yes)	498 (90.4)

	Correct answer No. (%)
The isolation period is 2 weeks if suspected infection (yes)	537 (97.5)
The COVID-19 vaccine is available in markets (no)	526 (95.5)
Antibiotics are the first-line treatment (no)	367 (66.6)
Washing hands, wearing face masks, avoiding crowded places (yes)	525 (95.3)
Patients with underlying chronic diseases are more likely to have severe symptoms (yes)	511 (92.7)
Health care workers are more likely to be at risk of infection (yes)	523 (94.9)
COVID-19 could be fatal (yes)	542 (98.4)
<b>Overall Knowledge (Good)</b>	<b>270 (49.0)</b>
<b>Attitude toward COVID-19</b>	
You think you will not probably get the illness (disagree)	293 (53.2)
You are worried one of your family members may get an infection (agree)	322 (58.4)
If getting COVID-19, you will accept isolation in health facilities (agree)	543 (98.6)
Transmission of COVID-19 can be prevented by washing hands with soap frequently (agree)	506 (91.8)
You will participate in the COVID-19 prevention program if mobilized (agree)	431 (78.2)
If a COVID-19 vaccine was available, I would have it (agree)	468 (84.9)
COVID-19 patients should be kept in isolation in health facilities (agree)	541 (98.2)
<b>Overall Attitude (Positive)</b>	<b>144 (26.1)</b>
<b>Practice toward COVID-19</b>	
Wearing face masks in crowded places (yes)	493 (89.5)
Washing hands frequently with soap and water or with alcohol hand sanitizers (yes)	493 (89.5)
The average time for washing hands $\geq$ 20 seconds (yes)	278 (50.5)
<b>Overall preventive Practice (Good)</b>	<b>226 (41.0)</b>

**Table 3. Factors Relating to Preventive Practice Regarding COVID-19 of Students (n=551)**

	Preventive Practice		Crude OR (95% CI)	P*
	Good (n=226, 41.0%) No. (%)	Poor (n=325, 59.0%) No. (%)		
<b>Participant characteristics</b>				
Age (year) (mean $\pm$ standard deviation)	21,4 $\pm$ 1,9	21,8 $\pm$ 1,8	0.88 (0.80 – 0.96)	0.007
Gender (male)	87 (38.7)	137 (42.3)	0.86 (0.60 – 1.24)	0.427
<b>Education Field</b>				
General Medicine	39 (17.3)	58 (17.9)	1	
Preventive medicine	96 (42.5)	171 (52.6)	0.83 (0.52 – 1.35)	0.459
Traditional medicine	64 (28.3)	52 (16.0)	1.83 (1.06 – 3.16)	0.030
Public health	27 (12.0)	44 (13.5)	0.91 (0.49 – 1.71)	0.775
<b>Overall Knowledge (Good)</b>	104 (46.0)	166 (51.1)	0.82 (0.58 – 1.15)	0.243
<b>Overall Attitude (Positive)</b>	71 (31.4)	73 (22.5)	1.58 (1.08 – 2.32)	0.023

\* Fisher's exact test

**Table 4. Results of Logistic Regression Factors associated with Preventive Practice Regarding COVID-19 of Students**

	Adjusted OR 95% CI	p <sup>#</sup>
<b>Participant characteristics</b>		
Age (year)	0.90 (0.79 – 1.01)	0.076
<b>Education Field</b>		
General Medicine	1	
Preventive medicine	0.67 (0.40 – 1.13)	0.136
Traditional medicine	1.28 (0.66 – 2.48)	0.458
Public health	0.61 (0.29 – 1.27)	0.185
<b>Overall Knowledge (Good)</b>	0.86 (0.58 – 1.26)	0.431
<b>Overall Attitude (Positive)</b>	1.72 (1.16 – 2.55)	0.007

<sup>#</sup> Z-test for Coefficients of logistic regression

#### 4. DISCUSSION

Results indicated that the overall rate of good knowledge and positive attitude was low, and the students reported

having insufficient knowledge and negative attitudes. COVID-19 was an emerging viral respiratory infection and our study was conducted in the early stages of the pandemic. Therefore, most students may not have learned much about this virus, so the results reported may be logical. The results will help education facilities prepare appropriate educational interventions and training for students who may be requested to assist if needed. For assessing practices toward prevention, a high proportion of participants reported wearing face masks in crowded places (89.5%) and cleaning hands frequently with soap and water or with alcohol hand sanitizers (89.5%). However, one unanticipated finding was that around half the students reported that they did not wash their hands for a minimum of 20 seconds (50.5%). This may be due to bad hygiene habits, and related to popular culture in Vietnam, which may need to change. According to WHO, cleaning hands is one of the measures to prevent COVID-19 transmission. Nevertheless, the length of time must be long enough to entirely remove all microbes on a person's hands [4, 17]. Previous research suggested that washing hands for between 15-30 seconds decreases more microorganisms than cleaning for a shorter period [18, 19]. Preventive practice should be evaluated by direct observation, while our result showed the assessment based only on the questionnaire, that might have an information bias. The findings have important implications for developing medical and personal hygiene messages in the media in the future. The results showed that participants with a positive attitude toward COVID-19 were more likely to report good practices. The findings were similar to an Australian study where students who agreed with the importance of vaccinations were significantly more likely to have received the influenza vaccination [20]. There was a high rate of students that received COVID-19 information via social media (95.8%), which was reported in our previous study amongst healthcare workers [15]. Also, it was recorded by Chu JN *et al*, that mass media messages directly correlated to the increase of hepatitis B screening among Vietnamese Americans [21]. This might be due to the ability of social media to deliver faster updating of information. Therefore, efforts to improve correct practices should include mass media messages.

The limitations of this study included the fact that sampling was collected during a short period at the UMP in Ho Chi Minh City. However, the results did reflect, in part, the knowledge, attitude, and practices of students in the country. The Vietnamese Authorities need to develop strategies to regularly support the students through applicable and relevant health education programs.

### Conclusion

There were only 41.0% recorded responses indicating good practices toward prevention measures. Besides, knowledge and attitudes about COVID-19 among students were inadequate. Further health education interventions should be focused to change bad hand-washing habits via mass media messages.

### DATA AVAILABILITY

The data used to support this study are available from the first author upon request.

### CONFLICTS OF INTEREST:

The authors declare that they have no conflicts of interest.

### FUNDING

There is no funding to report

### AUTHORS' CONTRIBUTIONS


This work was considered in collaboration between all authors. HG and TTT wrote the protocol and wrote the first draft of the manuscript. HG, NTV, and DTHT designed the study, were responsible for managed the analyses of the study. NTNH, NDD and PLA managed the literature searches. All authors read and approved the final manuscript.

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