



# Willingness of Healthcare Students in Vietnam to Volunteer During the COVID-19 Pandemic

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## Abstract

Healthcare students play an important role in volunteering activity, often addressing staff shortages. However, during the COVID-19 pandemic, the willingness of students to volunteer in contribution to the pandemic response, especially in Vietnam, has not been thoroughly investigated. This study aimed to determine the prevalence of and factors associated with the willingness of healthcare students to volunteer during the COVID-19 pandemic in Vietnam. For this, an online cross-sectional survey was conducted, between June 7th and July 6th, 2021, among healthcare students from 10 fields of study at the largest public university of medicine and pharmacy in the Mekong Delta, Vietnam. Of 2032 respondents, 1473 (72.5%) reported that they would be willing to volunteer during the COVID-19 pandemic. More than half of the students reported having a desire to volunteer in non-patient contact activities such as data entry (65.9%) and logistics (57.7%). Whereas less than 50% of the participants were willing to volunteer with activities involving patients. Year of education, study field, educational format, living arrangements, health status self-perception, chronic illness possession, COVID-19 fear level, past volunteering experience in non-healthcare sectors, and COVID-19 prevention and control training course attendance were all associated with a willingness to volunteer. The strongest barriers preventing volunteering included fear for the health of their family and lack of training/knowledge. Conclusively, healthcare students reported a high level of willingness, indicating a positive attitude toward responding to the COVID-19 pandemic. Adequate training should be employed to increase the willingness among healthcare students in Vietnam.

**Keywords** Healthcare student · Willingness · Volunteering · COVID-19 · Vietnam

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## Introduction

Volunteering, an act of participating in “any activity in which time is given freely to benefit another person, group or cause” [1], has long been employed widely over the world, especially in universities and colleges, and is an almost universal aspect of student life [2]. Volunteering is meaningfully beneficial for both students and the communities they volunteer in. Furthermore, medical students, through utilizing the knowledge and skills learnt from their specialized programs, can practice and hone their skills at the same time as helping their communities and build up clinical experience. Depending on the level of the volunteers, volunteering can be divided into three main groups; (1) community-based volunteering, in which the volunteer originates from the community they volunteer in and is willing to help others, (2) professional volunteering, a referred act by someone with a professional qualification (i.e., pharmacist, physician), and (3) functional/emergency volunteering, whereby volunteers specific skills provide emergency treatment [3]. This third group is especially important in cases of natural or human-made disasters (i.e., earthquake, tsunami, pandemic), where local specialized human resource is inadequate, leading to an extreme demand for volunteering efforts, specifically those with skills from the healthcare sector. To this end, many medical students possess the traits needed to offer vital volunteer support, helping to reduce the burden placed on the healthcare workers in emergency events such as a global pandemic [4].

Recently, the disastrous emergency state caused by the global COVID-19 pandemic has affected even the most developed healthcare systems [5]. In such situations, the capacity for a national government to respond might be inadequate, but is likely to depend on a volunteer workforce. Volunteers from the healthcare sector, specifically medical students, are often provide a significant contribution, as reported in Saudi Arabia [6], China [7, 8], Indonesia [9], the United Kingdom [10, 11], Germany [12], Nigeria [13], Poland [14], Brazil [15], India [16], and Singapore [17]. In Vietnam, due to a shortage of medical workers (i.e., doctors, nurses, and laboratory technicians), students studying healthcare-related subjects at various medical universities have been employed in roles related to COVID-19 control, prevention, testing, diagnosis, and treatment [18, 19]. To maximize the benefit to the Vietnamese people, these students must be adequately trained and, more importantly, willing to be involved [20]. The willingness of healthcare students to volunteer is dependent on several factors, including, but not limited to, availability of time, knowledge, expertise, previous experience and training, fear of COVID-19, and the accessibility of

personal protective equipment (PPE) [11, 14–17, 21]. To date, no previous research has investigated the willingness of Vietnamese healthcare students to volunteer during the COVID-19 pandemic. A thorough understanding of this issue could potentially assist policymakers, as well as non-governmental organizations, in the precise and timely delivery of decisions during the COVID-19 state of emergency in Vietnam.

Herein, we report a cross-sectional online survey exploring the willingness of healthcare students to volunteer in the COVID-19 pandemic. Students were recruited from those attending courses in 10 different medical fields at the largest public university of medicine and pharmacy in the Mekong Delta, Vietnam. Participants’ socio-demographic and health-related characteristics, their willingness to volunteer, motivation to volunteer, and barriers preventing them from volunteering, were identified, collected, and analyzed. Factors influencing willingness to volunteer were interpreted, and recommendations for policy-makers were additionally formulated.

## Method

### Study Design

A cross-sectional online survey was conducted in healthcare students in Vietnam. Healthcare students were recruited from 10 different fields of study, namely general medicine, traditional medicine, pharmacy, medical technique, preventive medicine, nursing, dentistry, public health, midwifery, and medical imaging, at the largest public university of medicine and pharmacy in the Mekong Delta, Vietnam. A study introduction letter containing a link to the online survey in Google forms was sent to the entire student population of each course by email, with repeated reminders. The survey link was also shared on the university’s Facebook pages. The survey was conducted between June 7th and July 6th 2021. A total of 2032 students completed the online questionnaire.

The Cochran formula was used to calculate the study sample size, with a type 1 error of 5%, an absolute error of 5%, and an estimate of 50% Vietnamese students being willing to volunteer during the pandemic (this estimate was chosen to maximize the number of possible participants due to an absence of previous studies investigating student willingness in Vietnam). To this end, the minimum sample size was estimated to be 384. Therefore, the study was considered to have sufficient power for statistical analysis.

### Variables and Measurements

The questionnaire to investigate student willingness to volunteer during the COVID-19 pandemic comprised four sections as follows.

- (i) Socio-demographic and health-related characteristics: age (years), gender (man, woman), year of education (1, 2, 3, 4, 5, or 6), format of education (full-time, transitional), academic performance (poor, below average, average, good, very good, and excellent), field of study (each of the course names listed previously), living arrangements (family, friends/housemates, alone), perceived health status (very poor, poor, fair, good, and very good), history of chronic illness (yes, no), and COVID-19 fear level (low, high).
- (ii) Healthcare students' willingness to volunteer was assessed using a 5-point scale response format (5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree). Students were asked whether they would be willing to volunteer in the efforts to combat COVID-19. Based on the method used by Shi et al. [3], this variable was then grouped into two responses including unwilling (1, 2, and 3) and willing (4 and 5). In this section, to explore the characteristics of participants' volunteering experience and willingness, the questionnaire also contained several variables such as whether the participant had previously volunteered in the healthcare sector (yes, no), had volunteered in a non-healthcare sector (yes, no), had volunteered in COVID-19 prevention and control (yes, no), had registered to volunteer in COVID-19 prevention and control (yes, no), had attended COVID-19 prevention and control training (yes, no), was willing to volunteer in a remote area (yes, no), as well as their desired COVID-19 volunteering activity (i.e., vaccination, COVID-19 testing) and volunteering placement (i.e., on the medical front line, at a COVID-19 checkpoint, quarantine area).
- (iii) Student's motivating factors were captured using eight questions. Students were asked if they would be willing to volunteer to help during the COVID-19 pandemic if they (1) were healthy and able to, (2) received adequate training, (3) were required by the government, (4) were required by the university, (5) were given the opportunity, (6) were provided with adequate PPE, or (7) felt supported by their family. Participants were also asked that to what extent they would encourage friends, relatives, or colleagues to volunteer. As before, these questions used a 5-point scale. The responses 'strongly agree' and 'agree' were then grouped and interpreted as 'agree', and 'disagree' and 'strongly disagree' were considered as 'disagree'. These items were adapted from those used in previous studies [13, 22].
- (iv) Barriers preventing students from volunteering during the COVID-19 pandemic were identified using

a multiple choice question based on those used in previous studies [6, 23].

Three experts in the field of medicine and pharmacy were recruited to evaluate the content validity of the questionnaire. Following this, a pilot study was conducted in 30 students to address any ambiguities in the text. The questionnaire was deemed to be appropriate and therefore was used, unmodified, for the online survey.

### Data Analysis

Data were analyzed using SPSS version 20.0. Significance was considered at a threshold of  $p < 0.05$ . Descriptive analysis included frequency, percentage, median, and interquartile range (IQR). Associations between willingness to volunteer and socio-demographic, health-related, and other participant-related factors and characteristics were assessed using Chi-squared tests. Variables showing a significance of  $p < 0.25$  using a Chi-squared test were included in the multivariate analysis.

### Results

Of the 2032 respondents, 58.7% were women, and the sample had an average ( $\pm$  standard deviation) age of  $22.8 \pm 3.7$  years, 86.9% were attending courses full time, 62.8% in the field of general medicine, and 57.9% were achieving a good academic performance. A majority of students (88.1%) had no chronic illness, 74.1% had not attended any COVID-19 prevention or control training courses, and 81.3% had not volunteered in a prevention and control works during the COVID-19 pandemic. Student characteristics are given in Tables 1 and 2.

Table 2 describes the students' volunteering experiences as well as barriers preventing them from volunteering during the COVID-19 pandemic. To this end, most students have volunteered in a non-healthcare sector (65.7%) but not in the healthcare area (37%). Similarly, 81.3% of the respondents did not participate in any COVID-19 prevention and control activities. Barriers preventing them from volunteering included a fear for their family's health (61.4%), a lack of training (39.4%), and a lack of knowledge (38.6%). Furthermore, many participants agreed that they would be willing to volunteer if they received adequate training (79.04%), were healthy and able to (78.59%), and if adequate PPE was provided (81.40%) (Table 3).

The students' desired COVID-19 volunteering activities/responsibilities and placements are illustrated in Figs. 1 and 2, respectively. For this, more than half of the students reported having a desire to volunteer in non-patient contact activities such as data entry (65.9%) and logistics (57.7%).

**Table 1** Characteristics of the survey respondents

Variable	n (%)
<i>Socio-demographic characteristics</i>	
Age (years)	
Mean $\pm$ SD; min–max	22.8 $\pm$ 3.7; 18–45
Gender	
Man	840 (41.3)
Woman	1192 (58.7)
Year of education	
1	358 (17.6)
2	346 (17)
3	535 (26.3)
4	381 (18.8)
5	255 (12.5)
6	157 (7.7)
Form of education	
Full-time	1766 (86.9)
Transitional	266 (13.1)
Academic performance	
Below average/Poor	21 (1)
Average	361 (17.8)
Good	1176 (57.9)
Very good	404 (19.9)
Excellent	70 (3.4)
Field of study	
General medicine	1276 (62.8)
Traditional medicine	210 (10.3)
Pharmacy	146 (7.2)
Medical technique	107 (5.3)
Preventive medicine	103 (5.1)
Nursing	103 (5.1)
Dentistry	53 (2.6)
Public health	26 (1.3)
Midwifery	6 (0.3)
Medical imaging	2 (0.1)
Living arrangements	
With family	739 (36.4)
With friends/housemates	503 (24.8)
Alone	790 (38.9)
<i>Health-related characteristics</i>	
Health status self-perception	
Very poor/poor	116 (5.7)
Fair	481 (23.7)
Good	1021 (50.2)
Very good	414 (20.4)
History of chronic illness	
No	1790 (88.1)
Yes	242 (11.9)
Fear of COVID-19	
Low	1197 (58.6)
High	835 (40.9)

Whereas, for patient contact works such as infection tracking, sampling, and vaccination, less than 50% of the participants were willing to volunteer in these activities. The most popular places students reported wanting to volunteer at were COVID-19 checkpoints (63.2%) and online platform (50.4%).

Logistic regression analysis showed that year of education, field of study, living arrangements, perceived health status, having a chronic disease, fear of COVID-19, past experience volunteering in a non-healthcare sector, and having attended training on COVID-19 prevention and control were independent predictors of willingness to volunteer (Table 4). Students in years 1, 2, 3, and 4 were more likely to be willing to volunteer (OR 3.81 [95% CI 2.34–6.22], OR 1.8 [95% CI 1.13–2.87], OR 1.75 [95% CI 1.12–2.73], and OR 2.52 [95% CI 1.57–4.04], respectively; all  $p < 0.05$ ) than final-year students. Students studying traditional medicine were 1.62 (95% CI 1.1–2.38,  $p = 0.014$ ) times more likely to be willing to volunteer compared to students studying general medicine. Those living alone were 30% more likely to be willing to volunteer than students living with their family (OR 1.30 [95% CI 1.01–1.66,  $p = 0.040$ ]). Students with no chronic disease, those with prior volunteering experience in non-healthcare sectors, and those who had attended COVID-19 prevention and control training courses were 1.39 (95% CI 1.02–1.91,  $p = 0.040$ ), 1.94 (95% CI 1.55–2.44,  $p < 0.001$ ), and 1.78 (1.29–2.44,  $p < 0.001$ ) times more likely to be willing to volunteer than others. Willingness to volunteer was also positively associated with a low level of fear of COVID-19 (OR 1.47 [95% CI 1.18–1.82],  $p < 0.001$ ) and with perceiving their health as being fair, good, or very good (OR 2.23 [95% CI 1.42–3.51],  $p < 0.001$ ; OR 4.49 [95% CI 2.88–6.98],  $p < 0.001$ ; and OR 10.09 [95% CI 5.95–17.1],  $p < 0.001$ , respectively).

## Discussion

This study has revealed the willingness of students on healthcare courses to volunteer during the COVID-19 pandemic in Vietnam. Crucially, the findings include the motivating factors and barriers influencing their decision to volunteer or not, as well as the associations of willingness with socio-demographic and health-related characteristics of the students and their previous volunteering and training experiences. Although numerous reports have explored student volunteer work [11, 14–17, 21], the specific aspect of student willingness has not yet been explored in the context of the COVID-19 pandemic in Vietnam. As such, this report contributes novel findings to the current understanding of the volunteer workforce in Vietnam, and provides vital context to policy-makers making decisions during the COVID-19 emergency.

**Table 2** Healthcare students' volunteering experiences and perceived barriers during the COVID-19 pandemic

Items	n (%)
Volunteered in the healthcare sector	
No	1281 (63)
Yes	751 (37)
Volunteered in a non-healthcare sector	
No	696 (34.3)
Yes	1336 (65.7)
Attended COVID-19 prevention and control training	
No	1506 (74.1)
Yes	526 (25.9)
Volunteered in COVID-19 prevention and control	
No	1653 (81.3)
Yes	379 (18.7)
Willing to volunteer in remote areas	
No	828 (40.7)
Yes	1204 (59.3)
Registered to volunteer in COVID-19 prevention and control	
No	1386 (68.2)
Yes	646 (31.8)
Barriers preventing volunteering in those unwilling to do so (n=559)	
Fear for affecting family's/relatives' health	343 (61.4)
Lack of training	220 (39.4)
Lack of knowledge	216 (38.6)
Transportation issues	217 (38.8)
Time commitment	212 (37.9)
Personal health issues	260 (46.5)
Lack of protocol/guidance	120 (21.5)
Fear for own health	209 (37.4)
Have not had the opportunity	92 (16.5)
Inadequate PPE	88 (15.7)
Complicated documentation and procedures	59 (10.6)
Below-average/substandard working conditions	49 (8.8)
No interest in volunteering	56 (10)
Non-supportive family	10 (1.1)

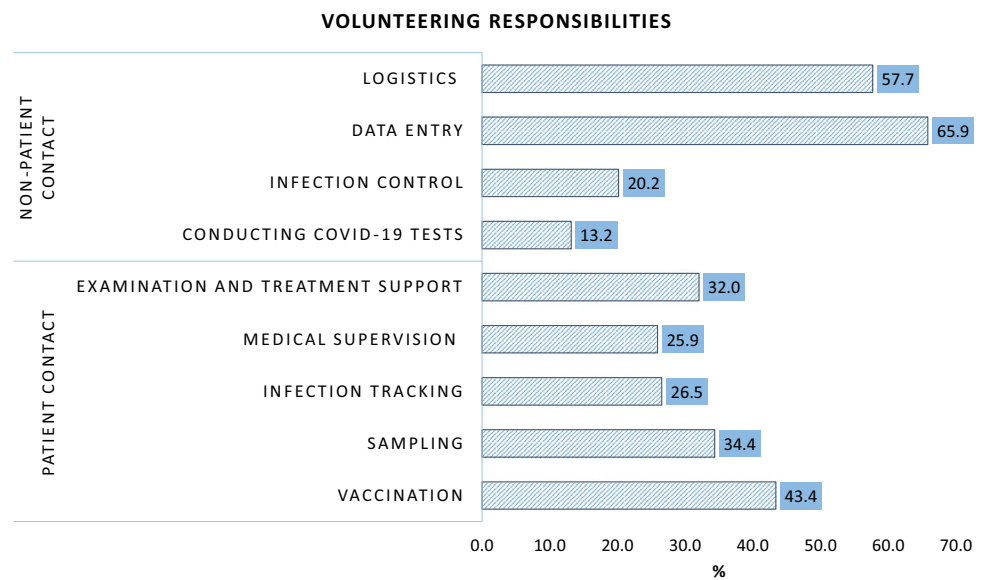
**Table 3** Healthcare students' motivation to volunteer during the COVID-19 pandemic

Items	n (%)			Median (IQR)
	Disagree	Neutral	Agree	
I would be willing to volunteer to help during the pandemic if				
I was healthy and able to	150 (7.38)	285 (14.03)	1597 (78.59)	4 (0)
Adequate PPE was provided	151 (7.43)	227 (11.17)	1654 (81.40)	4 (1)
I was adequately trained to do so	174 (8.56)	252 (12.40)	1606 (79.04)	4 (1)
Required by the government	171 (8.42)	287 (14.12)	1574 (77.46)	4 (0)
Required by the university	171 (8.42)	295 (14.52)	1566 (77.07)	4 (0)
My family supported it	223 (10.97)	312 (15.35)	1497 (73.67)	4 (1)
I was given the opportunity to do so	166 (8.17)	380 (18.70)	1486 (73.13)	4 (1)
I would encourage friends-relatives-colleagues to volunteer	98 (4.82)	450 (22.15)	1484 (73.03)	4 (2)

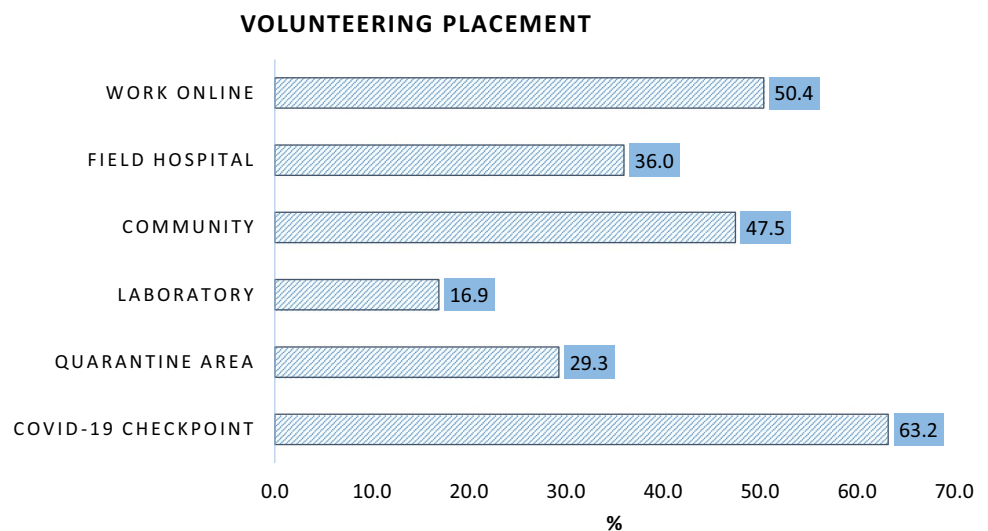
“Disagree”: responses of strongly disagree and disagree; “Agree”: responses of agree and strongly agree



**Fig. 1** Participants’ desired COVID-19 volunteering activities/responsibilities



**Fig. 2** Participants’ desired COVID-19 volunteering placement



The study recruited 2032 students on healthcare courses at the largest university of medicine and pharmacy in the Mekong Delta, Vietnam. Most students (72.5%) stated that they were willing to volunteer in the response to the COVID-19 pandemic, similar to the findings of a study conducted in Germany [12], and of an international meta-analysis [24]. Higher levels of willingness have been reported in China (85.6%) [7], the United Kingdom (82.7%) [10], and Canada (95.0%) [25]; whereas lower values have been reported in Ireland (59.1%) [2] and Indonesia (48.7%) [9]. Student willingness is likely to be affected by population differences as well as cultural and geographical factors.

Students in their final year were thought to be most willing to volunteer during the COVID-19 pandemic due to a higher level of knowledge and skills, as well as confidence, and the expectation that they will soon graduate

and join the medical workforce. Counterintuitively, the opposite was found, with final-year students expressing the lowest (60.5%) willingness. This result, however, was in agreement the findings of a Chinese study [7], and may be explained by taking into account that final-year students were preoccupied with searching and obtaining future employment, precluding them from having time to engage in voluntary work. Nevertheless, this issue should be further investigated.

More than two thirds of the participants perceived their health to be good or very good, and these students were 4 times more likely to be willing to volunteer than those reporting a very poor or poor perception of their health. Along the same lines, most students stated that they would willing to volunteer if they were healthy and able to (78.59%), and issues of personal health were one of the

**Table 4** Associated factors of willingness to volunteering

Variable	Total n (%)	Unwilling n (%)	Willing n (%)	Chi-squared (p-value)	OR (95% CI)	p-value	
<b>Gender</b>							
Man	840 (41.3)	240 (28.6)	600 (71.4)	0.368			
Woman	1192 (58.7)	319 (26.8)	873 (73.2)				
<b>Year of education</b>							
1	358 (17.6)	71 (19.8)	287 (80.2)	<b>&lt; 0.001</b>	3.81 (2.34–6.22)	<b>&lt; 0.001</b>	
2	346 (17)	102 (29.5)	244 (70.5)		1.8 (1.13–2.87)	<b>0.014</b>	
3	535 (26.3)	162 (30.3)	373 (69.7)		1.75 (1.12–2.73)	<b>0.015</b>	
4	381 (18.8)	77 (20.2)	304 (79.8)		2.52 (1.57–4.04)	<b>&lt; 0.001</b>	
5	255 (12.5)	85 (33.3)	170 (66.7)		1.49 (0.93–2.4)	0.101	
6	157 (7.7)	62 (39.5)	95 (60.5)		1		
<b>Format of course</b>							
Full-time	1766 (86.9)	464 (26.3)	1302 (73.7)	<b>0.002</b>	1	0.268	
Transitional	266 (13.1)	95 (35.7)	171 (64.3)		0.83 (0.6–1.15)		
<b>Academic performance</b>							
Below average/Poor	21 (1)	8 (38.1)	13 (62.9)	0.057			
Average	361 (17.8)	114 (31.6)	247 (68.4)				
Good	1176 (57.9)	326 (27.7)	850 (72.3)				
Very good	404 (19.9)	98 (24.3)	306 (75.7)				
Excellent	70 (3.4)	13 (18.6)	57 (81.4)				
<b>Field of study</b>							
General medicine	1276 (62.8)	388 (30.4)	888 (69.6)	<b>&lt; 0.001</b>	1		
Traditional medicine	210 (10.3)	46 (21.9)	164 (78.1)		1.62 (1.1–2.38)		<b>0.014</b>
Pharmacy	146 (7.2)	47 (32.2)	99 (67.8)		0.93 (0.62–1.4)		0.718
Medical technique	107 (5.3)	20 (18.7)	87 (81.3)		0.99 (0.56–1.73)		0.963
Preventive medicine	103 (5.1)	19 (18.4)	84 (81.6)		1.18 (0.67–2.09)		0.570
Nursing	103 (5.1)	18 (17.5)	85 (82.5)		1.14 (0.64–2.03)		0.647
Other	87 (4.3)	21 (24.1)	66 (75.9)		1.04 (0.59–1.84)		0.896
<b>Living arrangements</b>							
With family	739 (36.4)	233 (31.5)	506 (68.5)	<b>0.008</b>	1	0.055	
With friends/housemates	503 (24.8)	123 (24.5)	380 (75.5)		1.32 (0.1–0.1.75)		
Alone	790 (38.9)	203 (25.7)	587 (74.3)		1.30 (1.01–1.66)		<b>0.040</b>
<b>Perceived health status</b>							
Very poor/Poor	116 (5.7)	74 (63.8)	42 (36.2)	<b>&lt; 0.001</b>	1	<b>&lt; 0.001</b>	
Fair	481 (23.7)	198 (41.2)	283 (58.8)		2.23 (1.42–3.51)		
Good	1021 (50.2)	241 (23.6)	780 (76.4)		4.49 (2.88–6.98)		
Very good	414 (20.4)	46 (11.1)	368 (88.9)		10.09 (5.95–17.1)		
<b>History of chronic illness</b>							
No	1790 (88.1)	454 (25.4)	1336 (74.6)	<b>&lt; 0.001</b>	1.39 (1.02–1.91)	<b>0.040</b>	
Yes	242 (11.9)	105 (43.4)	137 (56.6)		1		
<b>Fear of COVID-19</b>							
Low	1197 (58.6)	278 (23.2)	919 (76.8)	<b>&lt; 0.001</b>	1.47 (1.18–1.82)	<b>&lt; 0.001</b>	
High	835 (40.9)	281 (33.7)	554 (66.3)		1		
<b>Previously volunteered in the healthcare sector</b>							
No	1281 (63)	382 (29.8)	899 (70.2)	<b>0.002</b>	1	0.953	
Yes	751 (37)	177 (23.6)	574 (76.4)		1.01 (0.79–1.29)		
<b>Previously volunteered in a non-healthcare sector</b>							
No	696 (34.3)	275 (39.5)	421 (60.5)	<b>&lt; 0.001</b>	1	<b>&lt; 0.001</b>	
Yes	1336 (65.7)	284 (21.3)	1052 (78.7)		1.94 (1.55–2.44)		

**Table 4** (continued)

Variable	Total n (%)	Unwilling n (%)	Willing n (%)	Chi-squared (p-value)	OR (95% CI)	p-value
Attended COVID-19 prevention and control training						
No	1506 (74.1)	480 (31.9)	1026 (68.1)	<b>&lt; 0.001</b>	1	<b>&lt; 0.001</b>
Yes	526 (25.9)	79 (15)	447 (85)			
Volunteered in COVID-19 prevention and control						
No	1653 (81.3)	489 (29.6)	1164 (70.4)	<b>&lt; 0.001</b>	1	0.309
Yes	379 (18.7)	70 (18.5)	309 (81.5)			

Bold values denote statistical significance at the  $p < 0.05$  level

most commonly cited barriers to volunteering among unwilling students, similar to the findings of AlOmar et al. [6]

This work highlights the positive attitudes held by trainee healthcare professionals in Vietnam, as evidenced by a high percentage of the sample being willing to volunteer if they were requested to by the government (77.5%) or by their university (77.1%), consistent with a report from Indonesia [9]. This positive attitude towards volunteering demonstrates that the next generation of the medical workforce in Vietnam shows great promise for the future.

Previous volunteering experience and training have been shown to be important predictors of willingness to volunteer in a pandemic [6, 8, 26]. Among our sample, most students did not have any previous volunteering experience in the healthcare sector (63%), especially in COVID-19 prevention and control (81.3%). Participants who had attended training in the prevention and control of COVID-19 and who had volunteering experience in a non-healthcare sector were more likely to be willing to volunteer than others, potentially due to the lived experience of the demands of previous voluntary work [3]. Unfortunately, only 25.9% of the sample had attended training in the prevention and control of COVID-19, and this lack of training was reported as a key barrier to volunteering in 39.4% of students. This finding highlights the dire need to increase “just-in-time” training programs and integrate more generalized versions of relevant subject matter into the official curriculum for healthcare students, such as pandemic preparedness and skills needed during national and international disasters. These programs help motivate students to more actively acquire the knowledge and skills, and build confidence, addressing any concerns or insecurities about lacking training and experience, thus increasing their willingness to volunteer [2, 3, 8].

Interestingly, regarding the desired COVID-19 volunteering responsibilities (Fig. 1), a majority of respondents were willing to volunteer in the non-patient contact works including logistics and data entry, rather than patient contact activities. These data are in accordance with previous studies [9, 27]. This might be due to the most concerned factor,

fear for the risk of getting infected, which will be further discussed in the next paragraph.

Fear greatly influences both individual and social behaviors at a time of crisis, such as during the COVID-19 pandemic. People often report feeling responsible for protecting health of their family and of the local community, avoiding contributing to the spread of disease [28]. By volunteering during the pandemic, students may increase their risk of exposure to infectious pathogens from patients and biological samples, thus, making them concerned about infecting family members [29]. Unsurprisingly, we found fear of affecting the health of their family/relatives was the commonly cited barrier to volunteering (61.4%), in agreement with previous studies [9, 27]. Such fear can negatively impact students quality of life and mental health [29], and alleviating this fear has been shown to improve student compliance with infection prevention and control measures, in turn improving student safety and reducing the likelihood of disease transmission [29]. Conversely, fear for one’s own health was not a major barrier to volunteering (37.4%), in agreement with previous work [6], and the majority of students reported a low level of fear of COVID-19 (58.6%).

### Limitations

Due to necessity of conducting this research during the COVID-19 pandemic, sampling was carried out on a voluntary basis rather than using a strictly random sampling method. As such, the self-selection to take part in the study may have created sample bias. Further, despite great efforts to send repeated e-mail reminders and recruit through social media, responses from students on mid-wifery and medical imaging courses were limited. Consequently this may limit the generalizability of these findings to different populations [8]. Future studies should recruit participants based on robust random sampling methods, such as randomly selecting a sample of healthcare students from all universities across Vietnam. Some parts of the questionnaire elicited participants’ subjective opinions



such as their perceived health status and their fear of COVID-19. These subjective metrics are not without bias, and future studies may want to develop more objective ways of capturing this information. Many further socio-demographic and cultural factors, such as ethnicity and religion, were beyond the scope of this study, and assessing these factors would be recommended in future work.

## Conclusions

This is the first study to investigate the willingness to volunteer during the COVID-19 pandemic of Vietnamese healthcare students across multiple disciplines. The large sample size provided by this study facilitates policy makers to make predictions and determine the optimal courses of action regarding maximizing the volunteering activities of medical students. Nearly three fourths of the students sampled were willing to volunteer. Factors positively affecting this decision included being in the earlier part of the course, studying in fields such as traditional medicine, studying full time, living alone, reporting their health status as being fair, good, and very good, not having a chronic illness, having a low level of fear of COVID-19, having past volunteering experience in non-healthcare sectors, and completing training in COVID-19 prevention and control. Factors limiting students' likelihood of volunteering including concern for their family's health risk, a lack of training, and a lack of knowledge. Consequently, we suggest potential solutions for policy-makers and non-governmental organizations to overcome these barriers and maximize volunteering among students, namely (1) implementing better infection prevention and control measures and (2) increasing and improving the training available to students on pandemic preparedness and specifically on the COVID-19 pandemic, to make future Vietnamese healthcare students better prepared for future emergencies.

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**Data Availability** The data that support the findings of this study are available from the corresponding author D.T.P. (i.e., upon reasonable request).

## Declarations

**Ethical Approval** The study was approved by the Medical Ethics Council of Can Tho University of Medicine and Pharmacy, Can Tho,

Vietnam. Participants were informed that taking part in the study was voluntary.

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