

# Personal and family-related factors on willingness to volunteer among undergraduate medical students during COVID-19 pandemic in Saudi Arabia: a cross-sectional study

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**Abstract.** – **OBJECTIVE:** This study aimed to describe personal and family-related factors affecting undergraduate students' willingness to volunteer during the pandemic. This cross-sectional study was conducted on undergraduate medical students at Qassim University in Saudi Arabia through an online survey.

**PATIENTS AND METHODS:** A pre-validated online questionnaire on willingness to volunteer during the pandemic was distributed through various messenger groups and social media. The questionnaire comprised two sections to collect demographics and how likely the volunteers work during the pandemic in different circumstances. The distribution of these parameters was reported by frequency and proportion for categorical variables. In addition to descriptive analytics, a chi-square test was used to compare key explanatory parameters between the low and high likelihood of volunteering. Data were analysed using IBM SPSS statistical software (version 25, Armonk, NY, USA).

**RESULTS:** There was a high likelihood of willingness (60.7%) to volunteer among undergraduate medical students. However, there was no statistically significant difference in baseline parameters like gender, academic year, age (in years), marital status, children, and elderly dependents between the high and low likelihood of volunteer ( $p > 0.05$ ). However, a statistically significant difference indicated the best description of one's living arrangement between volunteers' high and low probability ( $p < 0.05$ ).

**CONCLUSIONS:** Our findings suggested that undergraduate medical students can be motivated to volunteer effectively in this pandemic by ensuring personal and family protection. This is vital to optimally redistribute the work burden and effectively channelize the workforce during a pandemic situation.

*Key Words:*

COVID-19, Medical student, Pandemic, Saudi Arabia, Volunteer, Willingness to work.

## Abbreviations

HW – healthcare workers, SARS-CoV – Severe Acute Respiratory Syndrome Associated Coronavirus, S-CVI – Scale level content validity index.

## Introduction

The coronavirus pandemic (COVID-19) outbreak caused an unprecedented challenge for health care systems across the globe and emerged as an international concern. The World Health Organization (WHO) has declared more than 173 million confirmed cases of COVID-19 and 3.7 million deaths, as of June 9, 2021, across 219 countries and territories. For example, in Saudi Arabia, 458,707 confirmed cases and 7,471 deaths due to COVID-19 were reported to WHO as of June 8, 2021<sup>1</sup>.

COVID-19 caused severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a highly infectious condition transmitted through respiratory droplets or saliva. The disease manifestations may vary from asymptomatic to fever, cough, fatigue, and severe life-threatening complications in specific individuals<sup>2</sup>. The unprecedented and sudden increase in the burden of COVID-19 infections resulted in a shortage of staff in the healthcare sector, forcing health systems to utilize the services of medical students at various stages of their careers to fill the gap. This was essential to redistribute the enormous burden imposed on the healthcare work-

ers (HW)<sup>3</sup>. In Europe, the WHO office has recommended including final-year medical students in the task force within their limits of competence<sup>4</sup>. However, few experts suggested that medical students are considered to be clinicians undergoing training and deploy them to serve many clinical roles in addition to their learning<sup>5</sup>.

Effective management of any public health crisis, diverse roles played by the health care workers like screening, diagnosing, triaging, and monitoring the patients as per the best available evidence plays a critical role. The effectiveness of a country's healthcare system, especially during these emergencies, primarily depends on front-line healthcare workers' availability, motivation, and skills. This, in turn, is influenced by the knowledge and willingness to work during uncertain times. The perceptions and willingness to work during pandemics were influenced by the diverse array of factors like availability of personal protective equipment, perceived personal risks, gender of HW, the type of employment, family obligations, appropriate training, personal health problems, etc. in various studies<sup>6-9</sup>. The desire for additional financial support and financial or non-financial incentives for the family members was also a strong influencing factor<sup>10</sup>.

To provide effective healthcare services, it is essential to assess various facilitators and barriers faced by the HWs, which affect the motivation and willingness to work during pandemics<sup>11</sup>. Hence, the present study aimed to describe personal and family-related factors that affect undergraduate medical students' willingness to volunteer during pandemics.

## **Patients and Methods**

### ***Study Population and Study Site***

The study was conducted on medical students at Qassim University in Saudi Arabia. Undergraduate medical students pursuing various years of their course belonging to both genders were included. However, only the Saudi nationals were included. Non-Saudi nationals were excluded, even when they had satisfied the other inclusion criteria, to maintain the homogeneity of study participants. It was also decided to exclude the participants with an incomplete response.

### ***Study Design and Sampling***

The current study was a cross-sectional study of the eligible population. Sample size was calculated assuming the proportion of likelihood of vol-

unteers as 49.2% as per the study by Rosychuk et al<sup>12</sup>. The other parameters considered for sample size calculation were 5% absolute precision and 95% confidence level. Daniel et al<sup>13</sup> formula was used for sample size estimation. The required sample size as per the calculation mentioned above was 385. To account for a non-participation rate of about 5%, another 19 subjects were added to the sample size. Hence the final sample size required was 404. Based on the availability, 410 cases were included in the final study.

The Snowball sampling technique was used to recruit the study participants. Initially, the link to the electronic survey tool to capture the data was shared with the primary contacts of the investigators through WhatsApp, emails, and other social media platforms. Also, a small note on inclusion criteria was shared across these platforms, urging the group members to forward the link to suitable friends and colleagues who satisfy the inclusion criteria. The responses received were monitored daily, and people with incomplete responses were requested to complete their responses. Persons who have not responded positively to this request after three reminders were excluded from the final analysis. This process of snowballing and reviewing continued till we reached the sample size. The online survey tool was disabled after reaching the desired sample size.

### ***Study Duration***

The data collection was initiated on March 22, 2021, at 4 PM, and closed on June 15, 2021, at 4 PM.

### ***Ethical Considerations***

The study was approved by the Committee of Research Ethics at Qassim University (No. 20-06-02). Informed electronic consent was obtained from all the study participants. All the items in the questionnaire also were made non-mandatory to avoid any compulsion to respond to items perceived by the participants as sensitive. Furthermore, due care was taken to anonymize and delink the personal details of the participants from the data to ensure confidentiality.

## **Procedure**

### ***Data collection tools and clinical examination***

The questionnaire for the study was prepared and modified according to the study done by Ives

et al<sup>14</sup>. Google form was used to develop an online semi-structured questionnaire, with a consent form appended to it. After clicking the link, the participants were directed to the informed consent and study questionnaire automatically. In addition, a set of several questions appeared sequentially after the participants accepted to take the survey, which the participants were supposed to answer.

Demographics included age, gender, academic year. Marital status and the living arrangement was included in the first part of the questionnaire. In the second part, a suitably designed, self-administered questionnaire on how likely is the willingness to volunteer was prepared. A panel of experts involving a general physician and an epidemiologist made face validation (content). Expert opinion on whether to include a question/statement in the survey tool was placed on four-point LIKERT scale ranges strongly agree 4, agree 3, disagree 2, and strongly disagree 1. Finally, the scale level content validity index (S-CVI) average was calculated for willingness. (0.85). A value of 0.8 or more for S-CVI was considered the threshold point for acceptance of the content in the survey questionnaire<sup>15</sup>.

### Statistical Analysis

The study listed the demographic characteristics and how likely the volunteers work during the pandemic in different circumstances. Taking ‘Definitely yes’ and ‘probably yes’ responses as

positive answers and ‘definitely No’ and ‘probably No’ as negative answers, a compilation of total scores for the likelihood of volunteer done. High likelihood of volunteer defined as the total score > median and low likelihood of volunteer defined as total score < median value. The distribution of these parameters was reported by frequency and proportion for categorical variables. Using the Chi-square test, various personal and family-related parameters were compared between people with a high and low likelihood of volunteering to work.  $p < 0.05$  was considered statistically significant.

## Results

The final analysis included responses from 410 eligible participants. More than half (58.29%) of the respondents were female, 26.34% were in the 2<sup>nd</sup> year in academics, and 31.46% were within the age of 21-22 years. In terms of marital status 89.76% of the respondents were single, 4.63% had children, 54.63% were living with parents/brothers/sisters, and 54.88% had elderly dependents in the family (Table I).

On exploring their willingness to work, 34.63% of them responded with “definitely yes” while the highly infectious time of the disease and 36.83% are definitely willing to volunteer when the mode of disease transmission is evolving, 32.93% were ready to

**Table I.** Summary of baseline parameters in the study population (N=410).

		Frequency	Percentages
<b>Gender</b>	<b>Male</b>	171	41.71%
	<b>Female</b>	239	58.29%
<b>Academic year</b>	1	61	14.88%
	2	72	17.56%
	3	108	26.34%
	4	99	24.15%
	≥ 5	70	17.07%
<b>Age</b>	19-20	73	17.80%
	21-22	129	31.46%
	23-24	113	27.56%
	25-26	51	12.44%
	≥ 27	44	10.73%
<b>Marital status</b>	Married: Single	42: 368	10.24%:89.76%
	<b>Do you have children</b>	19	4.63%
<b>Please indicate which of these best describes your living arrange</b>	Live with parents/ brothers/sisters	224	54.63%
	Share with friends	82	20.00%
	Live with spouse	41	10.00%
	Live alone	63	15.37%
	Do you have any elderly dependents	225	54.88%

**Table II.** Summary of how likely is it that you would volunteer and work during a pandemic in the following circumstances? in the study population (N=410).

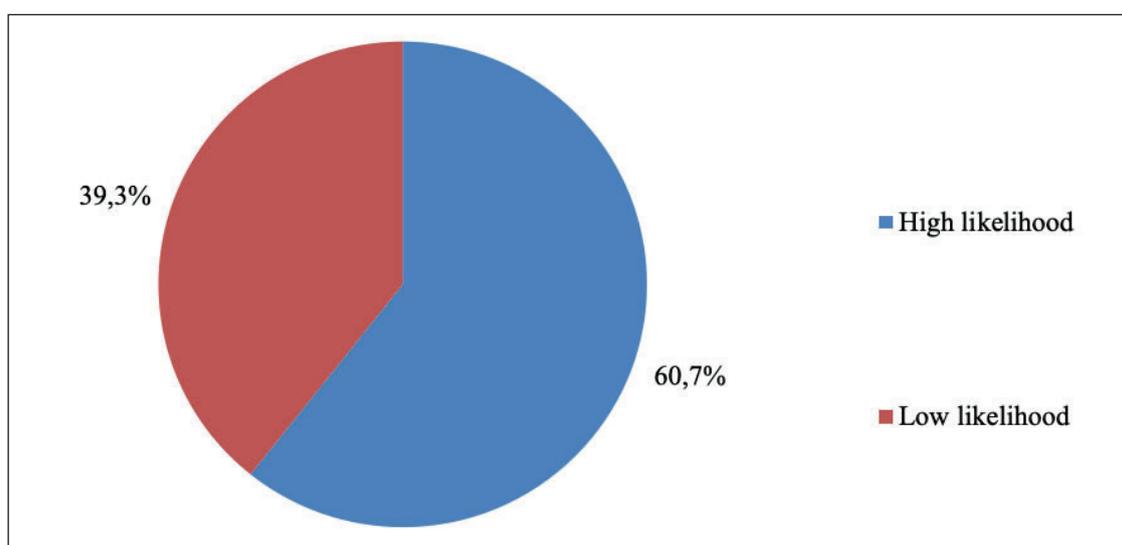
	Definitely Yes	Probably Yes	Probably No	Definitely No
[If the disease is highly infectious]	142 (34.63%)	122 (29.76%)	115 (28.05%)	31 (7.56%)
[If the mode of disease transmission is evolving, not yet confirmed]	112 (27.32%)	151 (36.83%)	121 (29.51%)	26 (6.34%)
[If there was a greater than usual risk of becoming infected at work and falling ill yourself]	121 (29.51%)	135 (32.93%)	120 (29.27%)	34 (8.29%)
[If there was a greater than usual risk of infecting your family]	94 (22.93%)	132 (32.20%)	106 (25.85%)	78 (19.02%)
[If you were asked to take on different or additional work/ duties for which you have not been trained]	112 (27.32%)	159 (38.78%)	101 (24.63%)	38 (9.27%)
[If you were asked to work long hours]	124 (30.24%)	178 (43.41%)	78 (19.02%)	30 (7.32%)
[If services were disrupted and closed (lockdown)]	123 (30.00%)	171 (41.71%)	87 (21.22%)	29 (7.07%)
[If Your Family Fell Ill]	99 (24.15%)	124 (30.24%)	110 (26.83%)	77 (18.78%)
[If you were asked to work at a far distance hospital/ healthcare practice to your home]	135 (32.93%)	138 (33.66%)	91 (22.20%)	46 (11.22%)
[if you had to make decisions about who not to treat/care for]	112 (27.32%)	153 (37.32%)	103 (25.12%)	42 (10.24%)
[If you had to work with untrained volunteers or workers]	114 (27.80%)	158 (38.54%)	84 (20.49%)	54 (13.17%)
[If your colleagues were dying]	116 (28.29%)	137 (33.41%)	86 (20.98%)	71 (17.32%)

work even though there was greater than usual risk of becoming infected at work and falling ill.

From the family members' point of view, 32.20% volunteered themselves when the chance of greater than usual risk of infecting your family. Willingness to take on different or additional work/ duties for which they have not been trained was expressed by 38.78%. More than 50% responded definitely yes or probably yes for working for long

hours if services were disrupted and closed, if family fell ill, if we are asked to work at a far distance hospital/healthcare practice from home, it had to make decisions about who not to treat/care for, it had to work with untrained volunteers or workers and if the colleagues were dying (Table II).

There were 249 (60.7%) who reported a high likelihood of volunteer, and 161 (39.3%) reported a low likelihood of volunteer (Figure 1).



**Figure 1.** Pie chart of total score in the study population (N=410).

**Table III.** Comparison of baseline parameter between total score (N=410).

Parameter	Total Score		p-value
	Low Likelihood of Volunteer	High Likelihood of Volunteer	
<b>Gender</b>			0.061
Male (N=171)	58 (33.92%)	113 (66.08%)	
Female (N=239)	103 (43.1%)	136 (56.9%)	
<b>Academic year</b>			0.457
1 (N=61)	19 (31.15%)	42 (68.85%)	
2 (N=72)	28 (38.89%)	44 (61.11%)	
3 (N=108)	40 (37.04%)	68 (62.96%)	
4 (N=99)	45 (45.45%)	54 (54.55%)	
≥ 5 (N=70)	29 (41.43%)	41 (58.57%)	
<b>Age (in years)</b>			0.520
19-20 (N=73)	33 (45.21%)	40 (54.79%)	
21-22 (N=129)	52 (40.31%)	77 (59.69%)	
23-24 (N=113)	44 (38.94%)	69 (61.06%)	
25-26 (N=51)	15 (29.41%)	36 (70.59%)	
≥ 27 (N=44)	17 (38.64%)	27 (61.36%)	
<b>Marital status</b>			0.925
Married (N=42)	16 (38.01%)	26 (61.90%)	
Single (N=368)	150 (40.76%)	218 (59.23%)	
Do you have children (N=19)	6 (31.57%)	13 (68.42%)	0.054
<b>Please indicate which of these best describes your living arrangement</b>			
Live with parents/brothers/sisters (N=224)	105 (46.87%)	119 (53.12%)	<0.001
Share with friends (N=82)	21 (25.61%)	61 (74.39%)	
Live with spouse (N=41)	19 (46.34%)	22 (53.65%)	
Live alone (N=63)	16 (25.4%)	47 (74.6%)	
<b>Do you have any elderly dependents (N=225)</b>	83 (36.89%)	142 (63.11%)	0.277

There was no statistically significant difference in baseline parameters like gender, academic year, age (in years), marital status, children, and elderly dependents between high and low likelihood to volunteer for work during the pandemic ( $p > 0.05$ ). However, there was a statistically significant difference in one's living arrangement, as the likelihood of volunteering was low when the person was living with parents/spouse, as compared to when they were alone ( $p < 0.001$ ) (Table III).

### Discussion

A total of 410 respondents were included in the study. This study showed a high likelihood of willingness (60.7%) to volunteer among un-

dergraduate medical students. More than half of the respondents (58.29%) were females, 26.34% were in the 2<sup>nd</sup> year in academics, 31.46% were 21-22 years old, and 54.63% were living with parents/brothers/sisters. More than 30% of respondents showed a willingness to volunteer to different scenarios about the pandemic put up in the questionnaire like a highly infectious disease, mode of disease transmission is evolving, more risk of becoming infected at work and falling ill, risk of infecting family, etc. The living arrangement showed a statistically significant difference between the high and low likelihood of volunteering.

More than half of the participants (60.7%) were willing to volunteer during pandemics in the present study, higher than the findings of a previ-

ous study conducted among healthcare students in Saudi Arabia (30.31%)<sup>16</sup>. These differences between rates might be because the data collected in the previous study was in May 2020, when many control measures were put into action, and the lockdown was imposed, causing a shift in direct clinical learning to distance learning and information COVID-19 was less. However, in another Saudi-based study<sup>17</sup>, similar to the present study's findings, overall positive response to willingness was observed among HWs, including nurses and physicians. In addition, their data showed that the HWs had high morale and the potential to work in emergency situations<sup>17</sup>. Similar findings were reported in another study conducted in Ireland, in which 60% of respondents were willing to volunteer during an infectious epidemic event<sup>18</sup>.

Many studies<sup>17,19</sup> have reported that family responsibilities and concerns for personal safety play a very important role in healthcare workers' decision to report to work in the event of a disaster. The majority of the respondents (54.63%) lived with parents/brothers/sisters, and more than half (54.88%) had elderly dependents in the present study. The living arrangement of the respondent showed a statistically significant difference in the likelihood of volunteering. Recently, a study<sup>20</sup> conducted in UAE reported that most of the participants (80.6%) were most anxious about transmitting the disease to their family members. While living with parents was a protective factor for anxiety among college students in a cross-sectional study conducted in China<sup>21</sup>. An earlier study<sup>22</sup> conducted after the influenza pandemic concluded that pre-planned care for dependents of employees, provision of PPE, vaccines, or antivirals might increase their willingness to respond to emergency situations. Another study<sup>23</sup> identified that interventions undertaken for the employee's immediate family had a significantly higher impact than those targeting the employee alone, like additional leave or monetary compensation.

Similar to the present study's findings, HWs were willing to work extra hours or stay on duty past their shift during the COVID-19 pandemic, as reported by Al Maghrabi et al<sup>17</sup>. In contrast, some studies reported lower willingness to respond among HWs and emergency medical technicians when they had to work longer hours or had part-time status during an outbreak<sup>24,25</sup>. Unwillingness to work extra hours was suggested as a screening tool to identify staffs at risk for non-illness absenteeism during the crisis by Balicer et al<sup>22</sup>.

The fear of causing harm to the patients influenced the decision of medical students to participate in clinical activities. Hence, the authors suggested that clinical confidence could be achieved through adequate training programs, which could be useful during a global health crisis, and medical students can act as firm support for the healthcare system<sup>26,27</sup>.

Apart from the factors mentioned *above*, working with untrained volunteers reduced willingness to respond during pandemics among HWs. Hence, it is essential to provide adequate training to all volunteers and surge capacity workers<sup>25</sup>. In addition, colleagues getting infected was also found to be a concern among HWs<sup>20</sup>. However, in the present study, this concern did not hinder the willingness of the majority of the respondents to volunteer.

The baseline parameters like gender, academic year, age, marital status, children, and elderly dependents did not show a statistically significant difference in the likelihood to volunteer in the present study. While previous research<sup>16</sup> in Saudi among healthcare students demonstrated that older participants volunteered more than younger ones.

The key strength of the current study is its attempt to explore the highly relevant issue of HW motivation during a public health crisis, with specific emphasis on HW in the lowest end of the spectrum, whose interests are often ignored. Online anonymous data collection would have resulted in genuine reporting of the concerns, as there is no concern regarding socially desirable responses. Undergraduate medical students being a relatively homogenous group, the study findings can very well be generalized to entire UG medical students of not only Saudi Arabia but also of other nations with similar health system.

## Limitations

The sample size was calculated to assess the level of willingness was relatively limited, precluding us from conducting a more robust statistical analysis to find out independent predictors of high willingness was a key limitation. The willingness and factors associated with it are extremely dynamic, especially during a public health crisis. The cross-sectional nature of the study may not adequately capture this extremely dynamic phenomenon. In addition, the role of selection bias can't be completely ruled out as we have adopted snowball sampling. The limitations of any online survey, like the anonymity of the

participants, contamination of the responses, etc., can be considered other limits to the study.

## Conclusions

The majority of undergraduate medical students in Saudi Arabia are willing to volunteer during the COVID-19 pandemic. However, we discovered that sex, age, academic year, marital status, and having elderly dependents were not associated with willingness to volunteer except for living arrangements. The greatest challenge lies in ensuring a healthcare workforce that will respond to the call. A disaster of any sort would certainly stress our already constrained healthcare system. Our findings suggested that we can ensure more willful participation of undergraduate medical students by ensuring personal and family protection. Policymakers and health care administrators need to engage in open conversations is highly essential. More structured and robust scientific studies are needed to help all the stakeholders to plan effective interventions.

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## Conflict of Interests

The authors declare that they have no conflict of interest.

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