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ORIGINAL RESEARCH

Attitudes of Final-Year Medical Students in Jordan Towards Volunteering During a Pandemic

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Background: During COVID-19 pandemic in Jordan, a number of medical students participated in voluntary work. However, barriers and facilitators were unclear. Therefore, we aimed to evaluate their experience and attitudes towards volunteering during a pandemic and the factors affecting that.

Methods: A cross-sectional questionnaire-based study, using paper and online questionnaire which were distributed to final-year medical students at the University of Jordan from August 2021 to October 2021, about their experience and attitudes towards voluntary work during pandemics.

Results: A total of 375 of final year medical students responded to the questionnaire. The number of male and female respondents were equal. Past voluntary work experience prior to COVID-19 pandemic in 44.8% of students, while 79.2% of them did not volunteer during the COVID-19 pandemic. Around 60% of students were willing to participate in future voluntary work that does not involve patients infected with COVID-19, while 29.3% of them were willing to do so depending on the type of pandemic and the availability of vaccines. There were 86.1% of students who thought that participating in voluntary work involving infected patients during pandemics, should be optional; where 10.1% suggested that it should be compulsory if vaccines were available.

Conclusion: The majority of medical students did not volunteer during the COVID 19 pandemic. However, many of them expressed willingness to take part in future pandemics. Providing sufficient protection aids and adequate training, would affect positively the willingness of medical students to participate in voluntary work during a pandemic.

Keywords: volunteering, pandemic, medical students, Jordan

Introduction

The COVID-19 pandemic contributed to the disruption of healthcare, medical education, and student life.[1] COVID-19, caused by the Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2), appeared first in Wuhan, China in 2019.[2]

Jordan reported the first case in the country in March, 2020, followed by increasing number of cases.[3] National curfew was imposed middle of March, 2020 and lasted for 3 days, followed by near-total lockdown,[4] where hospitals continued to receive emergency cases and patients who need urgent management only, till end of May, 2020. The government, during that period, had facilitated delivering medications for patients with chronic diseases to their homes with the help of volunteers from various sectors. Following that, there was a gradual opening of various sectors, with keeping protective measures under strict regulations. Medical students returned back to their clinical training in hospitals in May, 2020, while other university and school students continued to receive their education online till complete return back to in-person education in October, 2021.

Health institutions had to rapidly adopt novel solutions as means to mitigate the impact of COVID-related challenges.[5] Throughout the early course of the pandemic, statistics demonstrated an ever-increasing trend of worse mortality, which prompted health institutions to find alternative recruits that are able to provide clinical care and mend

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the staff shortages.[6] Of the potential sources of medical staff, medical students were identified and were the preferred option to assist with the burden of healthcare system across a multitude of nations.[7–10] The recruitment of medical students during times of emergency is not an unprecedented idea. Medical students from the University of Pennsylvania took care of patients during the 1918 Spanish influenza pandemic.[11] Similar recruitments were facilitated during the 1952 Danish poliomyelitis pandemic.[12] Nonetheless, the deployment of medical students in face of the recent COVID-19 pandemic has been a controversial issue. A paradoxical attempt to balance students' roles and safety; versus the obligation to direct their education and skills toward addressing the health concerns of their community.[13] While different reports demonstrated the amplitude of medical students to take action as means to drive medical aid to their communities;[5,7] others showed that the intense psychological impact of the pandemic may act as an antisocial motivator to volunteering during such times of hardship.[13] The body of literature addressing medical students' attitudes is yet to be ripe, due to inherent differences between the various groups volunteering during the pandemic. It appears that regardless of state directive, volunteering is influenced by organizational, community, and regional characteristics, thus, every volunteering experience across the globe are able to provide valuable insight into the preparedness, willingness, and self-efficacy of medical volunteers.[10] Moreover, while attitudes toward COVID-19 volunteering were largely studied; only a handful of studies examine the attitudes of medical students who already participated in such activities.[1] The aim of our study was to investigate the experience and attitudes of final-year medical students in Jordan towards volunteering during pandemics, and to study factors affecting their attitudes.

Methods

This is a cross-sectional questionnaire-based study, conducted by distributing questionnaire personally in paper form or online using google forms, to final-year medical students at the University of Jordan from August 2021 to October 2021. Approval of Jordan University Hospital Institutional Review Board (no.: 2021/363) was obtained before commencing the study.

The Questionnaire

The questionnaire included information about the aim and expected benefits of the study of investigating attitudes towards volunteering during times of pandemics (Supplementary file 1). Completion of the questionnaire was considered consent for participation. It was developed in English, which is the main language used in teaching at our school of medicine. The questions included demographic and personal data of the participants including: age, gender, marital status, parental education, family monthly income, place of residence and whether driving a car or not. In addition to questions about history of chronic illnesses, history of COVID-19 infection and the number of COVID-19 vaccine doses received by participants and their household contacts.

The questionnaire contained specific questions about whether there was personal voluntary work experience prior to or during COVID-19 pandemic (including the complete lockdown or afterwards). Attitudes towards willingness to volunteer during future pandemics were collected with answers that could be either: yes, no or conditional according the circumstances during those pandemics including availability of vaccines and personal protective equipment. In addition, questionnaire investigated opinions of participants about whether volunteering should be optional, compulsory regardless if vaccines were available or not, or compulsory only if vaccines were available. Association between demographic, personal and socioeconomic characteristics of participants and their past experience and attitudes towards participation in future pandemics were analyzed.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, N.Y., USA). Continuous data were presented as mean ± standard deviation, and categorical data as frequency (%). Associations between dependent categorical variables were evaluated using Chi-squared analysis. P values less than 0.05 were considered statistically significant.

Results

A total of 375 final-year medical students participated in the survey and completed the questionnaire, out of total number of 389 students who were sent the questionnaire with response rate of 96.4%. The frequency of male and female students was equal, almost two thirds were Jordanian, and most of them had parents with education level higher than high school. The general characteristics of the participants were shown in Table 1.

Table 1 General Characteristics of the Participants (N = 375)

	Frequency (%)
Gender	
Male	189 (50.4%)
Female	186 (49.6%)
Age group (years)	
20–25	328 (87.5%)
≥25	47 (12.5%)
Where do you live during the academic year	
Amman	321 (85.6%)
City other than Amman	39 (10.4%)
Students' dorm/apartment	15 (4%)
Nationality	
Jordanian	228 (60.8%)
Arab country other than Jordan	140 (37.3%)
Foreign country	7 (1.9%)
Driving car?	
Yes	213 (56.8%)
No	162 (43.2%)
Father education level	
Primary school	10 (2.7%)
Secondary School	42 (11.2%)
Diploma/Bachelor or more	323 (86.1%)
Mother education level	
Primary school	16 (4.3%)
Secondary School	52 (13.9%)
Diploma/Bachelor or more	307 (81.9%)
Did you have COVID infection?	
Yes	134 (35.7%)
No	241 (64.3%)

(*Continued*)

Table 1 (Continued).

	Frequency (%)
Did Households have COVID-19 infection?	
Yes	258 (68.8%)
No	117 (31.2%)
Number of corona vaccine doses you received	
1	3 (0.8%)
2	280 (74.7%)
3	89 (23.7%)
None	3 (0.8%)
Did eligible household/housemates receive corona vaccine?	
Yes	299 (79.7%)
No	76 (20.3%)
Did you participate in voluntary work PRIOR to pandemic?	
Yes	168 (44.8%)
No	207 (55.2%)
Did you participate in voluntary work during lockdown (March/April 2020)?	
Yes	70 (18.7%)
No	305 (81.3%)
Did you participate in voluntary work during COVID-19 (either during lockdown or afterwards)?	
Yes	78 (20.8%)
No	297 (79.2%)

Many students (55.2%) were not involved in voluntary work prior to the COVID-19 pandemic. In addition, almost 81.3% and 79.2% of the students did not volunteer during the initial total lockdown or after that during the COVID-19 pandemic, respectively. Male students were more likely to volunteer during the initial total lockdown, P value 0.021. Jordanian students had the highest rate of participation in voluntary work before and during the COVID 19 pandemic, P value < 0.001 and 0.040 respectively (Table 2).

The voluntary work during COVID-19 (either during total lockdown or afterwards), included delivering medications to patients' homes, participating in giving COVID-19 vaccines, taking samples for coronavirus from suspected persons, and participating in public awareness campaigns regarding COVID-19 infection. The voluntary work did not involve participation in providing clinical care to patients.

Most of the participants (60.8%) were willing to participate in future voluntary work that does not involve patients infected with COVID-19. In a certain percentage (29.3%) of participants, their willingness to engage in clinical voluntary work depended on the type of pandemic and the availability of vaccines (Table 3).

The participants were asked about reasons for not volunteering during the pandemic; the most common answer was fear of getting infected or infecting their family members. Other reasons included: limited time for studying, not confident in the ability to deliver useful volunteering work, and not being vaccinated against infection. Factors associated with the attitudes of the students towards participation in clinical services to infected patients or non-medical voluntary work were shown in Table 4, where 86.1% of students think that participating in voluntary work involving patients

Table 2 Association Between Different Medical Students´ Characteristics and Their Voluntary Work Experience (N = 375)

	Did You Participate Prior to COVID-19 Pandemic in any Voluntary Work?			Did You Participate in Voluntary Work During the COVID-19 Lockdown (March and April/2020)			Did You Participate in Voluntary Work During COVID-19 (Either During Lockdown or Afterwards)?		
	Yes N = 168	**No N = 207**	**P value**	**Yes N = 70**	**No N = 305**	**P value**	**Yes N = 78**	**No N = 297**	**P value**
Gender			0.728			**0.021**			0.148
Male	83 (49.4%)	106 (51.2%)		44 (62.9%)	145 (47.5%)		45 (57.7%)	144 (48.5%)	
Female	85 (50.6%)	101 (48.8%)		26 (37.1%)	160 (52.5%)		33 (42.3%)	153 (51.5%)	
Where do you live during the academic year			0.314			**0.028**			0.105
Amman	148 (88.1%)	173 (83.6%)		67 (95.7%)	254 (83.3%)		72 (92.3%)	249 (83.8%)	
City other than Amman	13 (7.7%)	26 (12.6%)		2 (2.9%)	37 (12.1%)		4 (5.1%)	35 (11.8%)	
Students' dorm/apartment	7 (4.2%)	8 (3.9%)		1 (1.4%)	14 (4.6%)		2 (2.6%)	13 (4.4%)	
Nationality			**< 0.001**			0.159			**0.040**
Jordanian	120 (71.4%)	108 (52.2%)		45 (64.3%)	183 (60%)		49 (62.8%)	179 (60.3%)	
Arab country other than Jordan	44 (26.2%)	96 (46.4%)		22 (31.4%)	118 (38.7%)		25 (32.1%)	115 (38.7%)	
Foreign country	4 (2.4%)	3 (1.4%)		3 (4.3%)	4 (1.3%)		4 (5.1%)	3 (1%)	
Driving car?			**0.008**			**0.050**			0.085
Yes	108 (64.3%)	105 (50.7%)		47 (67.1%)	166 (54.4%)		51 (65.4%)	162 (54.5%)	
No	60 (35.7%)	102 (49.3%)		23 (32.9%)	139 (45.6%)		27 (34.6%)	135 (45.5%)	
Father education level			0.262			0.740			0.311
Primary school	4 (2.4%)	6 (2.9%)		2 (2.9%)	8 (2.6%)		4 (5.1%)	6 (2%)	
Secondary School	14 (8.3%)	28 (13.5%)		6 (8.6%)	36 (11.8%)		9 (11.5%)	33 (11.1%)	
Diploma/Bachelor or more	150 (89.3%)	173 (83.6%)		62 (88.6%)	261 (85.6%)		65 (83.3%)	258 (86.9%)	

(*Continued*)

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Table 2 (Continued).

	Did You Participate Prior to COVID-19 Pandemic in any Voluntary Work?			Did You Participate in Voluntary Work During the COVID-19 Lockdown (March and April/2020)			Did You Participate in Voluntary Work During COVID-19 (Either During Lockdown or Afterwards)?		
	Yes N = 168	**No N = 207**	**P value**	**Yes N = 70**	**No N = 305**	**P value**	**Yes N = 78**	**No N = 297**	**P value**
Mother education level			**0.021**			0.630			0.978
Primary school	3 (1.8%)	13 (6.3%)		2 (2.9%)	14 (4.6%)		3 (3.8%)	13 (4.4%)	
Secondary School	18 (10.7%)	34 (16.4%)		8 (11.4%)	44 (14.4%)		11 (14.1%)	41 (13.8%)	
Diploma/Bachelor or more	147 (87.5%)	160 (77.3%)		60 (85.7%)	247 (81%)		64 (82.1%)	243 (81.8%)	
Did you have COVID infection?						0.578			0.119
Yes				23 (32.9%)	111 (36.4%)		22 (28.2%)	112 (37.7%)	
No				47 (67.1%)	194 (63.6%)		56 (71.8%)	185 (62.3%)	
Number of corona vaccine doses you received						0.613			0.153
1				0 (0%)	3 (1%)		0 (0%)	3 (1%)	
2				50 (71.4%)	230 (75.4%)		55 (70.5%)	225 (75.8%)	
3				20 (28.6%)	69 (22.6%)		21 (26.9%)	68 (22.9%)	
None				0 (0%)	3 (1%)		2 (2.6%)	1 (0.3%)	
Did eligible household/housemates receive corona vaccine?						**0.007**			0.128
Yes				64 (91.4%)	235 (77%)		67 (85.9%)	232 (78.1%)	
No				6 (8.6%)	70 (23%)		11 (14.1%)	65 (21.9%)	

Note: Statistically significant P values are in bold text.

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Table 3 Association Between Different Medical Students´ Characteristics and Their Willingness to Participate in Future Voluntary Work (N = 375)

	Are You Willing to Participate in Future Voluntary Work not Involving Patients Infected with the Pandemic Cause During Future Waves or Other Pandemics?				Are You Willing to Participate in Giving Clinical Service Under Supervision to Patients Infected Future Pandemics as Part of Voluntary Work Under Supervision?			
	Yes N = 228	**No N = 39**	**Conditional* N = 108**	**P value**	**Yes N = 211**	**No N = 54**	**Conditional* N = 110**	**P value**
Gender				0.972				0.125
Male	115 (50.4%)	19 (48.7%)	55 (50.9%)		116 (55%)	23 (42.6%)	50 (45.5%)	
Female	113 (49.6%)	20 (51.3%)	53 (49.1%)		95 (45%)	31 (57.4%)	60 (54.5%)	
Where do you live during the academic year				0.436				0.907
Amman	199 (87.3%)	33 (84.6%)	89 (82.4%)		183 (86.7%)	46 (85.2%)	92 (83.6%)	
City other than Amman	19 (8.3%)	4 (10.3%)	16 (14.8%)		21 (10%)	6 (11.1%)	12 (10.9%)	
Students' dorm/apartment	10 (4.4%)	2 (5.1%)	3 (2.8%)		7 (3.3%)	2 (3.7%)	6 (5.5%)	
Nationality				0.421				0.376
Jordanian	133 (58.3%)	25 (64.1%)	70 (64.8%)		120 (56.9%)	33 (61.1%)	75 (68.2%)	
Arab country other than Jordan	89 (39%)	13 (33.3%)	38 (35.2%)		86 (40.8%)	20 (37%)	34 (30.9%)	
Foreign country	6 (2.6%)	1 (2.6%)	0 (0%)		5 (2.4%)	1 (1.9%)	1 (0.9%)	
Driving car?				0.109				0.101
Yes	133 (58.3%)	16 (41%)	64 (59.3%)		118 (55.9%)	25 (46.3%)	70 (63.6%)	
No	95 (41.7%)	23 (59%)	44 (40.7%)		93 (44.1%)	29 (53.7%)	40 (36.4%)	
Father education level				**0.038**				0.469
Primary school	9 (3.9%)	0 (0%)	1 (0.9%)		6 (2.8%)	0 (0%)	4 (3.6%)	
Secondary School	23 (10.1%)	1 (2.6%)	18 (16.7%)		23 (10.9%)	4 (7.4%)	15 (13.6%)	
Diploma/Bachelor or more	196 (86%)	38 (97.4%)	89 (82.4%)		182 (86.3%)	50 (92.6%)	91 (82.7%)	

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Table 3 (Continued).

	Are You Willing to Participate in Future Voluntary Work not Involving Patients Infected with the Pandemic Cause During Future Waves or Other Pandemics?				Are You Willing to Participate in Giving Clinical Service Under Supervision to Patients Infected Future Pandemics as Part of Voluntary Work Under Supervision?			
	Yes N = 228	**No N = 39**	**Conditional* N = 108**	**P value**	**Yes N = 211**	**No N = 54**	**Conditional* N = 110**	**P value**
Mother education level				0.197				0.347
Primary school	8 (3.5%)	0 (0%)	8 (7.4%)		9 (4.3%)	0 (0.0%)	7 (6.4%)	
Secondary School	29 (12.7%)	5 (12.8%)	18 (16.7%)		28 (13.3%)	10 (18.5%)	14 (12.7%)	
Diploma/Bachelor or more	191 (83.8%)	34 (87.2%)	82 (75.9%)		174 (82.5%)	44 (81.5%)	89 (80.9%)	
Did you participate in voluntary work PRIOR to pandemic?				**0.007**				**0.050**
Yes, in medical voluntary work	116 (50.9%)	11 (28.2%)	41 (38%)		105 (49.8%)	18 (33.3%)	45 (40.9%)	
No	112 (49.1%)	28 (71.8%)	67 (62%)		106 (50.2%)	36 (66.7%)	65 (59.1%)	
Did you participate in medical voluntary work during COVID-19 (either during lockdown or afterwards)?				**0.019**				0.066
Yes	58 (25.4%)	4 (10.3%)	16 (14.8%)		52 (24.6%)	6 (11.1%)	20 (18.2%)	
No	170 (74.6%)	35 (89.7%)	92 (85.2%)		159 (75.4%)	48 (88.9%)	90 (81.8%)	

Notes: Statistically significant P values are in bold text. *: Depends on the type of pandemic and the availability of vaccines.

Table 4 Association Between Different Medical Students´ Characteristics and Their Attitudes Towards Participation in Providing Clinical Services and Non-Clinical Voluntary Work (N = 375)

	What's Your Opinion in Senior Medical Students´ Participation in Providing Clinical Services Under Supervision to Patients Infected with the Causative Agent				What's Your Opinion in Senior Medical Students´ Participation in Voluntary Work NOT Involving Patients Infected with the Causative Agent of Pandemics			
	Optional N = 323	**Compulsory regardless of presence of vaccines or not N = 14**	**Compulsory just in case there are vaccines N = 38**	**P value**	**Optional N = 334**	**Compulsory regardless of presence of vaccines or not N = 15**	**Compulsory just in case there are vaccines N = 26**	**P value**
Gender				0.355				0.973
Male	162 (50.2%)	5 (35.7%)	22 (57.9%)		168 (50.3%)	8 (53.3%)	13 (50%)	
Female	161 (49.8%)	9 (64.3%)	16 (42.1%)		166 (49.7%)	7 (46.7%)	13 (50%)	
Where do you live during the academic year				0.122				0.327
Amman	279 (86.4%)	13 (92.9%)	29 (76.3%)		286 (85.6%)	12 (80%)	23 (88.5%)	
City other than Amman	34 (10.5%)	0 (0%)	5 (13.2%)		35 (10.5%)	1 (6.7%)	3 (11.5%)	
Students' dorm/apartment	10 (3.1%)	1 (7.1%)	4 (10.5%)		13 (3.9%)	2 (13.3%)	0 (0%)	
Nationality				0.638				0.921
Jordanian	198 (61.3%)	8 (57.1%)	22 (57.9%)		204 (61.1%)	9 (60%)	15 (57.7%)	
Arab country other than Jordan	120 (37.2%)	5 (35.7%)	15 (39.5%)		124 (37.1%)	6 (40%)	10 (38.5%)	
Foreign country	5 (1.5%)	1 (7.1%)	1 (2.6%)		6 (1.8%)	0 (0%)	1 (3.8%)	
Driving car?				0.744				
Yes	184 (57%)	9 (64.3%)	20 (52.6%)		192 (57.5%)	9 (60%)	12 (46.2%)	0.515
No	139 (43%)	5 (35.7%)	18 (47.4%)		142 (42.5%)	6 (40%)	14 (53.8%)	
Father education level				0.087				0.091
Primary school	7 (2.2%)	1 (7.1%)	2 (5.3%)		7 (2.1%)	1 (6.7%)	2 (7.7%)	
Secondary School	36 (11.1%)	4 (28.6%)	2 (5.3%)		36 (10.8%)	4 (26.7%)	2 (7.7%)	
Diploma/Bachelor or more	280 (86.7%)	9 (64.3%)	34 (89.5%)		291 (87.1%)	10 (66.7%)	22 (84.6%)	

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Table 4 (Continued).

	What's Your Opinion in Senior Medical Students´ Participation in Providing Clinical Services Under Supervision to Patients Infected with the Causative Agent				What's Your Opinion in Senior Medical Students´ Participation in Voluntary Work NOT Involving Patients Infected with the Causative Agent of Pandemics			
	Optional N = 323	**Compulsory regardless of presence of vaccines or not N = 14**	**Compulsory just in case there are vaccines N = 38**	**P value**	**Optional N = 334**	**Compulsory regardless of presence of vaccines or not N = 15**	**Compulsory just in case there are vaccines N = 26**	**P value**
Mother education level				0.094				**0.008**
Primary school	12 (3.7%)	2 (14.3%)	2 (5.3%)		11 (3.3%)	3 (20%)	2 (7.7%)	
Secondary School	45 (13.9%)	4 (28.6%)	3 (7.9%)		44 (13.2%)	4 (26.7%)	4 (15.4%)	
Diploma/Bachelor or more	266 (82.4%)	8 (57.1%)	33 (86.8%)		279 (83.5%)	8 (53.3%)	20 (76.9%)	
Family monthly income				**0.002**				**0.051**
200–400 JD	5 (1.5%)	2 (14.3%)	2 (5.3%)		7 (2.1%)	2 (13.3%)	0 (0%)	
200–400 JD	23 (7.1%)	2 (14.3%)	7 (18.4%)		27 (8.1%)	2 (13.3%)	3 (11.5%)	
More than 800 JD	295 (91.3%)	10 (71.4%)	29 (76.3%)		300 (89.8%)	11 (73.3%)	23 (88.5%)	
Did you participate in voluntary work PRIOR to pandemic?				**0.051**				0.435
Yes	143 (44.3%)	3 (21.4%)	22 (57.9%)		149 (44.6%)	5 (33.3%)	14 (53.8%)	
No	180 (55.7%)	11 (78.6%)	16 (42.1%)		185 (55.4%)	10 (66.7%)	12 (46.2%)	
Did you participate in voluntary work during COVID-19 (either during lockdown or afterwards)?				0.495				0.161
Yes	64 (19.8%)	4 (28.6%)	10 (26.3%)		66 (19.8%)	6 (40%)	6 (23.1%)	
No	259 (80.2%)	10 (71.4%)	28 (73.7%)		268 (80.2%)	9 (60%)	20 (76.9%)	

Note: Statistically significant P values are in bold text.

infected with the pandemic causative agent, should be optional; while 10.1% think that it should be compulsory provided that vaccines were available.

Discussion

Our study showed that COVID-19 pandemic had a major impact on students' desire to volunteer, as while 44.8% of students volunteered before the pandemic, only 20.8% did so during the pandemic. Male students were more likely to volunteer during the initial total lockdown, which was in line with previous studies.[6,14] Additionally, the majority of the volunteers, before and during the pandemic, were Jordanian students. Living in the capital city Amman and driving a car, aided in increasing volunteering during the initial total lockdown. We found that the choice to volunteer during the period after the initial lockdown, did not seem to be influenced by the number of COVID-19 vaccine doses received by the students, nor whether their household contacts had received the vaccine or not. It was an interesting finding that 134 (35.7%) students in our study were infected with COVID-19, while 258 (68.8%) had one or more of their households who had the infection. Only 0.8% of students did not receive any dose of the vaccine, compared to 20.3% of their households. It is noteworthy that COVID-19 vaccines started to be given in Jordan since mid-January 2021; which is seven months prior to collecting our questionnaire.

When asked about their willingness to participate in future voluntary work during pandemics, 228 (60.8%) students stated that they were willing to participate in voluntary work that does not involve caring for patients infected with the pandemic causative organism, and 211 students (56.3%) were willing to participate in providing clinical care under supervision to patients infected in future pandemics as part of voluntary work, even if vaccines were not available then. This is consistent with some literature in which students said that they can volunteer to assist physicians but not for case management;[7] this could be attributed to the fact that medical students lack the appropriate clinical experience and the lack of disaster training programs. On the other hand, there were 29.3% of students, stated that their future participation in voluntary work involving providing care for infected patients; depends on the type of pandemic and the availability of vaccines. This was similar to what was found in a study conducted in Nigeria; in which most of the respondents would volunteer if they were provided with adequate personal protective equipment (82.7%), and if they were adequately trained to do so (79.3%).[7]

It had been previously reported, that medical students are not essential as medical residents and the remaining medical staff and they should not come in direct contact with COVID-19-infected patients, and they recommended that medical schools should make this decision depending on their students' level of knowledge.[15] Actually, the potential risks of having medical students involved; include the increased risk of making mistakes and transmission of infection to family members; and if they were chosen to work then they should be provided with personal protective equipment.[16] On the other hand, in a study conducted in New Jersey, medical students were more knowledgeable than students in other medical fields as pharmacy and nursing students and more willing to work in infectious outbreaks.[17] A study had shown that medical students were reluctant to attend clinics for the fear of getting the infection or passing it to other people.[18]

We found that previous experience in volunteering prior to COVID-19 pandemic, had a significant impact on students' future willingness to participate in volunteering work, where 44.8% had volunteered before the pandemic and this was also addressed by Domaradzki and Walkowiak,[10] in a study conducted in Poland in which 70.1% had a volunteering experience prior to the pandemic. Having an experience in voluntary work in the medical field may contribute to students' confidence in their knowledge and their ability to care for patients.

Our study revealed several reasons for reluctance of senior medical students to volunteer during the COVID-19 pandemic. These included limited time for studying, being unconfident in the ability to deliver useful volunteering work, and not being vaccinated against infection. However, fear of being infected or infecting their family members was the most common cause. This was consistent with previous studies,[7,14] in which both studies showed that the risk of being infected was one of the main reasons behind preferring not to volunteer in the COVID-19 pandemic. In contrast, a study from Germany found that getting infected or infecting their parents were the least important reasons behind not volunteering during the pandemic,[6] this is in line with a study done in Saudi Arabia, where 68.42% of participants disagreed that fear was a major reason behind not volunteering.[19] In the aforementioned study, lack of interest, personal health issues, and lack of protocol and knowledge were the main causes of not volunteering during the pandemic. Similar to our findings, a study done in Hamburg, Germany revealed

that lack of time due to studying responsibilities or working in part-time jobs was one of the reasons behind not volunteering during the pandemic.[8]

Furthermore, we found that most of the final-year medical students believed that participating in voluntary work; either by providing clinical care to infected patients or non-medical voluntary work, must be an optional choice. This is consistent with a study which demonstrated that only 39.4% believed that medical and dental students have moral and professional obligations to volunteer, while the majority (62.3%) believed that they have a moral sense of duty to participate in volunteering.[7]

Students' beliefs that volunteering should be optional; highlight the need for ethical frameworks that respect individual autonomy. The findings are relevant to the global discourse on the role of medical students during health emergencies. Including a broader range of literature, particularly studies from different countries with contrasting experiences, would provide a more comprehensive understanding of how cultural and systemic factors influence medical students' willingness to volunteer.[16,20]

Ethical obligation is to provide adequate training and support before placing students in potentially dangerous situations, and to ensure their ability to contribute effectively without compromising their safety or the safety of others.[21] Understanding whether they were supporting the front line health workers, similar to those reported from Switzerland and France,[22,23] or participating in other supportive activities to increase public health awareness as those conducted in the US and Brazil,[24,25] could significantly impact interpretations of their experiences and attitudes.

One of the major drawbacks of our study is that, it involved students from one university in the capital city, and hence it did not reflect attitudes of medical students in the other five medical schools in Jordan. Additionally, the study was conducted for senior-year medical students, whose responses might be affected by their clinical experience of at least 2 years, as opposed to medical students in their first 3 years of medical school where they receive basic medical sciences education, and who have not yet begun their clinical rotations.

Conclusion

Medical students can be a supportive part of the health care system during pandemics. They are willing to participate to deliver medical and non-medical services in such conditions, provided that they would be supplied with sufficient protective aids. Inadequate knowledge of dealing with patients infected with the causative organism of a pandemic; necessitates modification of medical school curricula to cope with emergent health challenges as in times of pandemics.

Data Sharing Statement

The datasets analyzed during the current study available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

The statement of ethical approval was obtained from the Institutional Review Board (IRB) committee at Jordan University Hospital (no.: 2021/363). All methods were performed in accordance with the IRB regulations. Completion of the questionnaire was considered an informed consent for participation.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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