

Motivational factors influencing undergraduate medical students' willingness to volunteer during an infectious disease pandemic in Saudi Arabia, a cross-sectional study

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Abstract. – OBJECTIVE: Healthcare outbreaks, especially infectious disease pandemics, often stretch the healthcare systems to its limits. Healthcare systems have no option other than being supported by the participation of young and motivated healthcare providers (HCPs) in their undergraduate medical studies during their prevention and control internship program during the outbreak. Understanding key motivation factors influencing HCPs are vital to ensure their effective participation in such situations.

SUBJECTS AND METHODS: A cross-sectional study was conducted on 410 undergraduate medical students at Qassim University in Saudi Arabia with the aim to describe the motivation factors that affect their willingness to volunteer during a pandemic. An online survey questionnaire was conducted.

RESULTS: 410 participants of which 239 (58.29%) were female, 108 (26.34%) were in their third academic year and 129 (31.46%) were between 21-22 years of age. More than 70% of participants showed willingness to volunteer during a pandemic. Their willingness to volunteer was motivated by distance of workplace to home, availability of transportation, being vaccinated, access to health care for self and family if affected, and provision of specialized training.

CONCLUSIONS: Healthcare administrators and policy makers need to address these factors effectively to ensure the availability of skilled and motivated healthcare providers during a pandemic.

Key Words:

COVID-19, Healthcare workers, Pandemic, Motivation, Workplace.

Introduction

In 2019, there was an outbreak of a respiratory disease caused by a novel coronavirus (COVID-19), which has a genome sequence similar to that of the Severe Acute Respiratory Syndrome Associated Coronavirus (SARS-CoV) and the Middle East Respiratory Syndrome coronavirus (MERS-CoV)¹. The disease had rapidly spread to emerge as a global pandemic. About 80% of cases were reported to be mild or asymptomatic, among the severe infections, 15% required oxygen and 5% required ventilation, as per World Health Organization (WHO) reports². In Saudi Arabia, the fatality rate is assessed to be about 0.9% of the more severely infected. The likely fatality rate among the mild and asymptomatic cases was assessed at about 0.2%, which is four times larger than the death rate for both influenza and pneumonia in Saudi Arabia³. During a pandemic the possibility of increased hospital admissions may place additional pressures on the healthcare system,

therefore, leading to over utilization of available resources to manage the situation⁴. Indeed, the heavy demand on available healthcare services exceeded the availability, thereby, necessitating the services of HCPs who are still undergoing their professional training as undergraduates medical students⁵⁻⁷. Furthermore, different countries have applied various measures to confront COVID-19 effectively, like encouraging the participation of medical students of different areas for support⁸.

A study from Switzerland reported that medical students showed great willingness to volunteer⁹. Similarly, another study from Denmark recruited final year medical students as temporary residents, nursing and ventilator therapy assistants¹⁰. The American Association of Medical Colleges (AAMC) of the United States and the Medical Schools Council (MSC) of the United Kingdom have published guidelines for medical students' participation; they have recommended volunteering, adequate training and adequate Personal Protective Equipment (PPE), moreover, they have also advised that those guidelines should only be undertaken by final year medical students¹¹.

An integrative review has reported that the level of training, availability of PPE or vaccine, professional ethics, family and personal safety, worker support systems facilities, interpersonal factors, concern and perceived risk, job-level factors, and outbreak characteristics were barriers of willingness to respond among Healthcare Workers (HW) during an infectious disease outbreak or bioterrorist event¹². In addition, another study reported a higher anxiety level among students during the pandemic¹³. Moreover, a study that has been conducted pre-COVID^{14,15} showed that depression and burnout were more common among medical students when compared to the general population leading to the possibility of their willingness to be affected to volunteer.

It is noticed that the numbers of studies investigating the factors affecting the motivation of professional HCPs are more than those focusing on undergraduates of the same group. Moreover, it is important to draw the attention that factors impacting the motivation of undergraduates in healthcare may be completely different than the motivation factors in already established professionals. Hence, this study aims to identify factors affecting the motivation of undergraduate medical students and their willingness to volunteer during an infectious disease pandemic.

Subjects and Methods

Study Population and Study Site

Participants are undergraduate medical students attending medical school and practicing at Qassim University teaching hospital in Buraydah City, Saudi Arabia. In addition, this teaching hospital is also one of many to participate in national efforts to contain the pandemic and provide necessary healthcare to those infected with COVID-19. Qassim University Hospital rapidly designed their own protocols that are in compliance with the national guidelines that involve all relevant human resources in pandemic control measures. Undergraduate medical and paramedical students were involved in voluntary work in providing the necessary information regarding prevention and screening of COVID-19, as well as initial screening and guidance to people seeking medical care etc.

Inclusion and Exclusion Criteria

Participants were only Saudi nationals who are undergraduate medical students at Qassim University in Saudi Arabia. Participants who were not Saudi nationals and participants who gave an incomplete response were excluded from the study.

Study Design and Sampling

The study is a cross sectional study. Sample size was calculated by assuming the proportion of the likelihood of volunteers as 49.2% as per the study by Rosychuk et al⁴. The absolute precision of 5% and 95% confidence level were considered for sample size calculation. The formula used for sample size was as per Daniel et al¹⁶. The required sample size as per the calculation was 385. To account for a non-participation rate of about 5%, other 19 subjects were added to the sample size. Hence the final required sample size was 404. Data collection was initiated on the 22nd of March 2021 at 4 pm and closed on the 15th of June 2021 at 4 pm. 410 responses were received, who were all included in the analysis.

Data Collection Tools

The study questionnaire conducted was based on the survey found in Ives et al¹⁷, questions were then prepared and modified multiple times to satisfaction. Questionnaire items were entered into "Question Pro" software in order to post it online in social media platforms (Facebook and WhatsApp) this is to target undergraduate medical students at Qassim University. The questionnaire was posted twice in some platforms to increase the number of

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

Demographic Variables		Frequency	Percentage
Gender	Male	171	41.71%
	Female	239	58.29%
Academic year	1	61	14.88%
	2	72	17.56%
	3	108	26.34%
	4	99	24.15%
	≥ 5	70	17.07%
Age group	19-20	73	17.80%
	21-22	129	31.46%
	23-24	113	27.56%
	25-26	51	12.44%
	≥ 27	44	10.73%

participants who missed it the first time. This was achieved by a snowball sampling technique.

The first part of the questionnaire was about demographic information of participants; this included age, gender and their study level of their academic year. The second part focused on workplace-related motivational factors on willingness to volunteer. Responses were collected as 'more likely' or 'about the same' and were represented as percentages. Scale level content validity index (S-CVI) average of the questionnaire was calculated for willingness to work during a pandemic, and it was 0.86. Therefore, the S-CVI value of 0.8 or more was accepted in the questionnaire¹⁸.

Statistical Analysis

Descriptive analysis was carried by frequency and proportion for demographic variables. Similarly, for all the variables of willingness to volunteer to work during pandemics, analysis was accepted by frequency and proportion.

Results

The number of responses that were included in this study was 410. Table I displays the demographic characteristics of the participants. The majority of participants were female (58.29%), (26.34%) of participants were in their third year of their undergraduate studies, and (31.46%) of them were in the 21-22 age group.

Participants were asked about their willingness to volunteer during infectious pandemics and if it would be "more likely" if certain conditions were met. More than 70% of participants were "more likely" to volunteer during a pandemic if they were allowed to work at the nearest hospital/healthcare

center to their home; if transportation was provided to work and then back home; if vaccination (when available) and treatment (when in need) were both offered to them and their families; and finally, if specialized training was conducted. Under certain conditions, at least 60% of participants were "more likely" to volunteer during a pandemic. Those conditions are stated in Table II.

Discussion

This study explores the motivation factors of undergraduate medical students influencing their willingness to volunteer during an infectious disease pandemic. Factors range from distance to the workplace (volunteering center), facilities provided to volunteers by the organization, safety at workplace and special healthcare and legal implications. In the following sections, we will discuss those motivation factors in more details.

Commuting to Workplace

More than 70% of participants were willing to volunteer when transportation facilities were provided, or the healthcare center was in close distance to where they live¹⁹. The difficulty in transportation and disruption of daily activities due to lockdown was imposed in various parts of the world. This global disruption caused a cessation in essential services adding further stress and concern on healthcare workers^{19,20}. This might be the reason for more participants showing their unwillingness to volunteer in the study.

Care and Support to Oneself and Family Members

In the study, 60.24% of participants were willing to work when childcare was provided. Some studies^{21,22} have reported that the fear for the safety of oneself and their loved ones acted as a barrier to their willingness to volunteer during infectious pandemics. A survey conducted by Gershon et al²³ reported that home healthcare workers, especially females, were concerned about childcare and the safety of their selves and family²³. Thus, this need can be fulfilled when supervisory care is provided for members of their family, i.e., their children, the elderly or mentally incompetent adults dependents²². The majority of participants were "more likely" to volunteer when vaccination or treatment was offered when they or their family members were in need. It was reported that the protection offered to them by their employer had a significant impact on their

Table II. Motivation factors influencing the willingness of participants to volunteer during a pandemic (N=410).

"More likely" to volunteer during a pandemic if:	About the Same n (%)	More Likely n (%)
[You are allowed to work at the nearest hospital/healthcare center to your home]	102 (24.88%)	308 (75.12%)
[You are provided with accommodation so that you do not take the infection home]	141 (34.39%)	269 (65.61%)
[Your employer provides transportation to work and back home]	122 (29.76%)	288 (70.24%)
[Availability of childcare]	163 (39.76%)	247 (60.24%)
[You are offered vaccination (when available) and treatment (when in need)]	104 (25.37%)	306 (74.63%)
[Your family is offered vaccination (when available) and treatment (when in need)]	122 (29.76%)	288 (70.24%)
[Your employer shares their emergency plans with you, and inform you in advance of what to expect during pandemics]	129 (31.46%)	281 (68.54%)
[You are offered personal protective equipment when working with or around affected patients]	127 (30.98%)	283 (69.02%)
[Your employer takes liability of any medical error you make while on duty to avoid lawsuit towards you]	132 (32.20%)	278 (67.80%)
[You are allowed flexible working hours]	130 (31.71%)	280 (68.29%)
[You are paid (overtime) during pandemics]	130 (31.71%)	280 (68.29%)
[You are provided with life/disability insurance]	128 (31.22%)	282 (68.78%)
[You are provided specialized training]	118 (28.78%)	292 (71.22%)

willingness to volunteer. The kind of protection they were seeking was in the form of provision of care and treatment for themselves and family members when in need. Furthermore, protection from malpractice as well as the financial compensation to their families if deceased on duty. It was observed that low rates of hesitation and higher rates of motivation were showed by such participants. The authors suggested that preferential access to PPE or antiviral therapy to participants and their families increases their motivation to willingly volunteer during a pandemic²⁴. Our findings were consistent with previous studies^{24,25} in which healthcare workers showed more willingness to volunteer when the protocols of the respiratory protection program were available and applied.

Suitable Compensation for Overtime

Around 68.29% of participants responded that they were "more likely" to volunteer when an overtime salary appropriate to their level of duties was provided. An earlier study²⁶ conducted in Saudi Arabia reported that approximately 90% of healthcare workers desired incentives and financial support for their families (85.6%). Similarly, another survey²⁷ conducted among medical students reported that more than half of the participants believed they should have remuneration above minimum wage. Although remuneration would not motivate all workers to work overtime, alternative reward options were sought, for instance promotions, additional paid-time-off, or recognition-of-service awards could be helpful especially

when healthcare workers already work extended hours at their own risk²².

Several studies²⁸⁻³⁰ reported that adequate preparedness to face a pandemic during an infectious disease showed more willingness of healthcare workers to respond. In this study, similarly, around 71.22% of participants were willing to volunteer if provided with specialized training to deal with the pandemic. Training in preparedness and response, use of PPE and self-confidence in formulating appropriate diagnosis and treatment of infectious diseases were reported to be the factors involved in motivating their willingness to volunteer²⁸⁻³⁰.

Strengths and Limitation of the Study

The primary limitation of the study was the selection of participants. Participants were only drawn from a one medical teaching institution, this can cause, therefore, questions to be raised about the generalizability of the study findings; however, considering the fact that participants are undergraduate medical students which is relatively questionable true identity of study participants. But anonymity of the online survey would have elicited less biased responses, as participants were not concerned about the social desirability. By far, the study should be merited for investigating the relatively unexplored aspects and perspectives of undergraduate medical students, therefore providing key insights to promote evidence informed decision making by different stakeholders.

Conclusions

Identifying motivation factors of undergraduate medical students and their willingness to volunteer during infectious pandemics assesses the formulation of appropriate strategies to improve safety and efficacy in the public healthcare system and, to an extent, can be a solution for scarcity in manpower. Close to two thirds of the participants showed willingness to volunteer. Participants' willingness to volunteer was motivated by the distance of the hospital or healthcare setting from home, provision of transportation facilities, availability of vaccination or treatment for the participants and their family members when in need, and provision of specialized training. Further, operational research quantifying the motivation levels and linking it with various personal, family and workplace related factors among different settings can be considered for further investigations. In addition, it is vital to be conscious of these factors and the institutionalization of necessary policy and administrative measures incorporated with periodic reviews of their impact which is essential to ensure willful and effective participation of the young healthcare professionals regarding pandemic control measures.

Authors' Contributions

Authors AA, EAA, FAA, were involved in all the stages of work, including conceptualization, methodology design, data collection, analysis, original draft preparation, review and finalization of the drafts. Author ASS, TA, SMA provided support by verifying and finetuning the methodology, data collection, draft enhancement, project management and final quality check. Author AA, FAA was involved in data collection, curing the data, draft review and approval.

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Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of Qassim University (No: 20-06-02).

Informed Consent Statement

Informed electronic consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

Conflicts of Interest

The authors declare that they have no conflict of interest.

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