

Perception of medical undergraduate students regarding their readiness to volunteer in relief activities during the COVID-19 pandemic: a multi-institutional study carried out in South India

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary Background. India is currently experiencing a shortage of medical personnel to provide COVID-19 relief services among the population. The government came up with a proposal of involving final-year medical students to solve this problem. However, before initiating any such measures, the perspectives of medical students towards this initiative need to be assessed.

Objectives. To assess the perception of medical students regarding their self-preparedness and willingness to volunteer in COVID-19 relief activities.

Material and methods. This was a cross-sectional study conducted among medical undergraduate students in their third and fourth year at two private medical colleges. Data was collected using a semi-structured Google Form. The perceptions of the participants were assessed using a five-point Likert scale.

Results. The mean age of the 204 participants was 21.6 ± 1.1 years. Only 37 (18.1%) participants had good perception regarding their self-preparedness. As many as 116 (56.9%) participants strongly agreed/agreed, while 39 (19.1%) strongly disagreed/disagreed about their willingness to volunteer in COVID-19 relief activities. The most common reason for agreement among the participants was to make up for the current shortage of healthcare professionals, while for disagreement, it was the feeling of not being fully qualified. Third year students reported better self-preparedness ($p = 0.0371$). Good perception regarding self-preparedness was associated with strong agreement or agreement about a willingness to involve themselves in COVID-19 relief activities ($p = 0.0123$).

Conclusions. Although more than half of the participants were willing to volunteer, only one-fifth of the participants had good perception regarding their self-preparedness to offer relief services. Thus there is a need for training before involving final-year medical students in COVID-19 relief activities.

Key words: medical students, volunteers, COVID-19, pandemics.

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Background

The COVID-19 pandemic has placed an enormous burden on healthcare systems around the world. India ranks second among the countries worst affected by COVID-19. The recent impact of the second wave has clearly exposed a shortage of medical personnel and other healthcare resources in the country.

As the country is currently experiencing a third wave of COVID-19, it has become all the more important to strengthen the existing healthcare system. The involvement of final-year medical undergraduate students would be a timely initiative in this direction.

Developed countries have already taken measures to support this approach. In the USA, medical schools are permitting students to graduate early and join COVID-19 relief work [1, 2]. In the United Kingdom, the National Health Service plans to involve medical student volunteers in COVID-19 care. The medical councils of these countries have already brought forth guidelines for the involvement of medical students in patient care [3, 4].

On similar lines, the Government of India, in consultation with the National Medical Council, has suggested measures to involve final-year medical students to tackle the COVID-19 pandemic [5]. This initiative might be appropriate in India because of the inadequacy of doctors with respect to the large popula-

tion base they are providing medical care. The number of doctors per ten thousand population in the USA, and in the UK, is 26 and 58.2 respectively, in comparison to a mere 9.3 in India [6]. Hence, these countries are better placed as far as the availability of medical personnel is concerned to handle any epidemics. India thus needs to act fast in pooling its medical workforce to tackle the current third wave of COVID-19.

Added to this, a parallel assessment of the concerns, expectations and self-preparedness of medical students towards this initiative also needs to be carried out. A major challenge in involving medical students could be identification and recruiting volunteers [7]. There also exists uncertainties about the kind of role that can be assigned to the medical students [8]. Information on these aspects will help policy makers prepare a suitable training module for medical students, incorporating their suggestions and concerns. This study was therefore carried out to assess the perception of medical students regarding their self-preparedness and willingness to volunteer in COVID-19 relief activities.

Material and methods

This multi-institution based cross-sectional study was conducted among medical under-graduate students in their third



and fourth year at two private medical colleges affiliated to a single university. Ethical approval was granted in October 2020 from the Institutional Ethics Committee at Mangalore. Permission to conduct the study was subsequently granted from the heads of the respective institutions.

In a study done in Indonesia, 48.7% of medical students expressed their willing to volunteer in COVID-19 relief work [9]. Based on this proportion, at 95% confidence intervals and at 85% power, using the formula $Z\alpha^2pq/d^2$, the sample size was calculated as 180. Adding 10% as the non-response rate, the final sample size was considered as 200 participants.

A self-administered questionnaire designed using Google Docs was used for data collection. It was content validated with the help of faculty members from the Department of Medical Education at Mangalore. It was further pilot tested among 10 final-year medical students, 5 each chosen from the 2 institutions. The questionnaire was circulated among the students using WhatsApp.

The study information sheet and the consent form constituted the first page of the questionnaire. Participants not willing to participate in this research study were given the option to decline consent, leading to submission of an unfilled questionnaire.

The questionnaire was semi-structured and was prepared using extensive literature search. It had three sections. The first section of the questionnaire enquired about the basic demographic details of the participants. They were also asked whether they had undergone any prior training in disaster management and any details regarding the same.

In the second section, the perception towards self-preparedness among medical students to offer COVID-19 relief services were assessed using 25 questions designed using a five-point Likert scale. The ratings in this scale were “strongly agree”, “agree”, “neutral”, “disagree” and “strongly disagree”, which were scored from 1 to 5 points. The perceived level of self-preparedness among the respondents was thus proportional to the perception scores obtained by the participants. The minimum and maximum possible perception scores ranged from 25 to 125. Scores ranging from 25 to 57, 58 to 91 and 92 to 125 were considered to represent poor, average and good level of perceived self-preparedness, respectively.

The third section enquired about the willingness of participants to involve themselves in COVID-19 relief work, with ratings in the Likert scale ranging from “strongly agree” to “strongly disagree”. The reasons for agreement or disagreement among the respondents regarding the same were also enquired about. Opinions regarding the kind of services which medical students can offer were noted only by those participants who favoured the government decision by willing to volunteer in COVID-19 relief work.

The submitted responses were extracted from Google Forms to MS Excel and then transferred to SPSS version 25.0 for data analysis. Chi-square test and Fisher’s Exact test were used to test associations. The significance level was set at 5%.

The Cronbach’s alpha value of reliability of this questionnaire was found to be 0.942, indicating excellent internal consistency.

Results

The mean age of the 204 participants was 21.6 ± 1.1 years (Table 1).

Out of the total participants, 7 (3.4%) underwent prior training in disaster management. Among them, 4 attended a workshop (the theme being disaster management among 3 and “Treatment and Consultation for COVID-19 Patients – A Virtual Training Programme for Medical Students” in 1), 3 a guest lecture (theme being disaster management among 2 and emergency medicine in 1), 2 a conference (theme being disaster management in 1 and emergency medicine in 1) and 1 a combined medical education programme (theme being emergency medicine).

Multiple modes of training were reported by 2 participants (one had attended a guest lecture and a conference, while the other had attended a workshop, a guest lecture and a conference).

Table 1. Socio-demographic distribution of the study participants

Characteristics	Number (n)	Percentage (%)
Age (years)		
20	24	11.8
21	79	38.7
22	66	32.3
23	30	14.7
≥ 24	5	2.5
Gender		
males	85	41.7
females	119	58.3
Year of study		
third year	150	73.5
fourth year	54	26.5
Current place of stay		
rented apartment	28	13.7
hostel	154	75.5
at own house	21	10.3
paying guest	1	0.5
Nationality		
Indians	191	93.6
non-residential Indians	13	6.4
Permanent place of residence		
urban	182	89.2
rural	22	10.8
Total	204	100.0

The participants revealed several areas where they felt that their self-preparedness was lacking in offering COVID-19 relief services. 68 (33.3%) participants strongly disagreed/disagreed that they had adequate professional knowledge to render support in COVID-19 relief activities at the current point in time.

Regarding usage of personal protective equipment (PPE), 62 (30.4%) and 59 (28.9%), respectively, strongly disagreed/disagreed that they were confident in wearing facemask and hand gloves in the correct way. 56 (27.4%) participants strongly disagreed/disagreed that they had complete knowledge about the recommended hand washing technique. 53 (26%) participants strongly disagreed/disagreed that they were confident in practicing bio medical waste disposal as per the recommended guidelines.

Regarding consultation skills, 68 (33.3%) and 79 (38.7%) participants, respectively, strongly disagreed/disagreed that they were confident in eliciting a good history and in performing a comprehensive clinical examination among COVID-19 patients. 84 (41.2%) participants strongly disagreed/disagreed that they were confident in performing contact-tracing procedures following identification of newly diagnosed COVID-19 patients.

Regarding patient assessment, 68 (33.3%) participants strongly disagreed/disagreed that they had adequate knowledge about the danger signs in COVID-19, and 86 (42.2%) participants strongly disagreed/disagreed that they were confident in the triage procedure meant to differentiate stable from unstable COVID-19 patients.

Regarding patient management, 71 (34.8%) participants each strongly disagreed/disagreed that they were confident in administering basic life support skills or in providing inpatient care to admitted COVID-19 patients.

Regarding patient counselling, 63 (30.9%) participants strongly disagreed/disagreed that they were confident to dissuade stable patients with COVID-19 from being unnecessarily admitted to hospitals. Similarly, 55 (27.0%) participants strongly disagreed/disagreed that they were confident in providing emotional support, and 78 (38.2%) participants strongly disagreed/

Table 2. Perception among medical students regarding their willingness to volunteer in COVID-19 relief services and regarding pandemic management training programmes (n = 204)

Perception regarding	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Willingness to volunteer in COVID-19 relief services	37 (18.2)	79 (38.7)	49 (24.0)	27 (13.2)	12 (5.9)
Willingness to offer tele-consultation services for COVID-19 with appropriate training	40 (19.6)	63 (30.9)	42 (20.6)	36 (17.6)	23 (11.3)
Need of a short course in disaster management as a part of the undergraduate medical education curriculum	63 (30.9)	60 (29.4)	26 (12.7)	25 (12.3)	30 (14.7)
Need of a short course in Emergency Medicine to manage COVID-19 patients effectively	69 (33.8)	54 (26.5)	22 (10.8)	26 (12.7)	33 (16.2)

Table 3. Association between various parameters with perception regarding self-preparedness among the participants to offer COVID-19 relief services

Characteristics	Good perception n (%)	Average perception n (%)	Poor perception n (%)	Total
Age (years)				
20	6 (25)	15 (62.5)	3 (12.5)	24
21	11 (13.9)	55 (69.6)	13 (16.5)	79
22	15 (22.7)	38 (57.6)	13 (19.7)	66
≥ 23	5 (14.3)	19 (54.3)	11 (31.4)	35
				$\chi^2 = 2.992, DF = 3, p = 0.3929$
Gender				
males	15 (17.6)	49 (57.7)	21 (24.7)	85
females	22 (18.5)	78 (65.5)	19 (16)	119
				$\chi^2 = 2.448, p = 0.294$
Year of study				
third year	29 (19.3)	98 (65.4)	23 (15.3)	150
fourth year	8 (14.8)	29 (53.7)	17 (31.5)	54
				$\chi^2 = 6.59, p = 0.0371$
Nationality				
Indian	33 (17.3)	119 (62.3)	39 (20.4)	191
non-residential Indian	4 (30.8)	8 (61.5)	1 (7.7)	13
				$p = 0.2596$
Place of stay				
at own house	2 (9.5)	16 (76.2)	3 (14.3)	21
hostel	27 (17.5)	96 (62.4)	31 (20.1)	154
rented apartment/paying guest	8 (27.6)	15 (51.7)	6 (20.7)	29
				$p = 0.379$
Permanent place of residence				
urban	32 (17.6)	114 (62.6)	36 (19.8)	182
rural	5 (22.7)	13 (59.1)	4 (18.2)	22
				$\chi^2 = 0.35, DF = 1, p = 0.5542$
Prior training in disaster management				
yes	2 (28.6)	2 (28.6)	3 (42.8)	7
no	35 (17.8)	125 (63.4)	37 (18.8)	197
				$p = 0.6128$
Total	37	127	40	204

χ^2 – Chi-square value, DF – Degrees of Freedom, p – probability that the observed difference is by chance.

disagreed that they were confident to break bad news to COVID-19 patients or their attenders if the need arises.

Overall, 57 (27.9%) participants strongly agreed/agreed, while 79 (38.7%) strongly disagreed/disagreed that the current undergraduate medical education has provided them with the adequate knowledge or skills to deal with the COVID-19 pandemic. The remaining 68 participants were neutral in their perception.

Out of the total participants, 40 (19.6%), 127 (62.3%) and 37 (18.1%) had poor, average and good perception, respectively, regarding their self-preparedness to offer COVID-19 relief services.

Of the total participants, 116 (56.9%) strongly agreed or agreed, while 39 (19.1%) strongly disagreed or disagreed regarding their willingness to volunteer in COVID-19 relief activities (Table 2).

The services that could be offered by final-year medical stu-

dents during COVID-19 relief work in the opinion of the 116 participants who were willing to volunteer were: eliciting relevant history from the patients [92 (79.3%)], writing clinical history and examination findings in the patient's case files [87 (75%)], providing health education [74 (63.8%)], performing screening tests [56 (48.3%)], contact tracing [55 (47.4%)], offering counselling services [54 (46.6%)], performing triage [54 (46.6%)], writing down prescriptions as dictated by the treating doctors [51 (44.0%)], performing clinical examination of the patients [46 (39.7%)] and interpretation of laboratory reports [43 (37.1%)].

The most common reasons for agreeing to volunteer stated by these 116 participants were to meet the shortage of health-care professionals [99 (85.3%)] and the fact that involvement in COVID-19 relief activities would be a valuable learning experience [76 (65.5%)].

Table 4. Association between various variables with perception regarding willingness to involve oneself in COVID-19 relief services among the participants

Characteristics	Strongly agree/Agree <i>n</i> (%)	Neutral <i>n</i> (%)	Disagree/strongly disagree <i>n</i> (%)	Total
Age (years)				
20	11 (45.8)	6 (25)	7 (29.2)	24
21	50 (63.3)	16 (20.2)	13 (16.5)	79
22	34 (51.5)	18 (27.3)	14 (21.2)	66
≥ 23	21 (60.0)	9 (25.7)	5 (14.3)	35
				$\chi^2 = 4.4283, p = 0.619$
Gender				
male	51 (60.0)	21 (24.7)	13 (15.3)	85
female	65 (54.6)	28 (23.5)	26 (21.9)	119
				$\chi^2 = 1.395, p = 0.498$
Year of study				
third year	88 (58.7)	34 (22.6)	28 (18.7)	150
fourth year	28 (51.8)	15 (27.8)	11 (20.4)	54
				$\chi^2 = 0.816, p = 0.665$
Nationality				
Indian	109 (57.1)	44 (23)	38 (19.9)	191
non-residential Indian	7 (53.8)	5 (38.5)	1 (7.7)	13
				$\chi^2 = 2.176, p = 0.337$
Place of stay				
hostel	93 (60.4)	34 (22.1)	27 (17.5)	154
at own house	9 (42.9)	7 (33.3)	5 (23.8)	21
rented apartment/paying guest	14 (48.3)	8 (27.6)	7 (24.1)	29
				$\chi^2 = 3.4176, p = 0.4905$
Permanent place of residence				
urban	105 (57.7)	41 (22.5)	36 (19.8)	182
rural	11 (50)	8 (36.4)	3 (13.6)	22
				$\chi^2 = 2.156, p = 0.34$
Prior training in disaster management				
yes	5 (71.4)	1 (14.3)	1 (14.3)	7
no	111 (56.3)	48 (24.4)	38 (19.3)	197
				$p = 0.7011$
Perception level regarding self-preparedness to offer COVID-19 relief services				
good	27 (73.0)	5 (13.5)	5 (13.5)	37
average	70 (55.1)	37 (29.1)	20 (15.8)	127
poor	19 (47.5)	7 (17.5)	14 (35.0)	40
				$\chi^2 = 12.8044, p = 0.0123$
Total	116	49	39	204

χ^2 – Chi-square value, DF – Degrees of Freedom, p – probability that the observed difference is by chance

The most common reasons for disagreeing to volunteer, as stated by 39 participants, were the feeling of not being fully qualified [32 (82.0%)], fear of causing harm to the patients [24 (61.5%)] and concern for putting themselves at risk of exposure [22 (56.4%)].

Third-year students reported better self-preparedness to offer COVID-19 relief services than fourth-year students ($p = 0.0371$) (Table 3).

Good perception level regarding self-preparedness was associated with willingness to involve oneself in COVID-19 relief services among the participants ($p = 0.0123$) (Table 4).

The open remarks stated by the participants were: a short course of training will make medical students feel more confident in delivering COVID-19 relief services (by 4), adequate monetary compensation should be awarded to students carrying out COVID-19 relief work (by 2), any decision regarding whom to involve or not should be made by a panel of doctors and not by politicians or bureaucrats (by 1), this is a good strategy to mobilise resources during emergencies (by 1), and students involved

in relief work should be rewarded with additional marks in the postgraduate entrance examinations (by 1).

Discussion

Medical students constitute an untapped workforce who have the hidden potential to supplement healthcare services during emergencies. However, adequacy in self-preparedness to offer COVID-19 relief services was reported by fewer than 20% of the participants in this study. This was similar to 18.6% reported in an Indonesian study [9]. In a study done in Brazil, 79.1% of medical students felt that they knew how to use PPEs, and 38.4% felt that they could communicate positive test results to newly diagnosed patients [10].

The perceived self-preparedness was significantly more among the third-year compared to fourth-year medical students in this study. These observations imply that the conventional teaching and skill training given at medical schools, and

the information provided in the textbooks, may not be sufficient for preparing medical undergraduates for any relief activities. Introducing a course in disaster management is therefore essential in the current medical curriculum [11, 12]. Factors associated with readiness among participants in the Indonesian study were male gender, those studying in government colleges, those with relatively lower family income, those having chronic morbidities and those who volunteered in any relief activities in the past [9].

In other studies done in Indonesia [9] and New Delhi, India [13], 48.7% and 75.3% participants, respectively, expressed their willingness to volunteer in COVID-19 relief activities as compared to 56.9% participants in the present study. The most common reason for agreement among the participants in the present study was to meet the current shortage of medical personnel. In the study done in Indonesia, the participants stated the main reasons for agreement was to meet the shortage of medical personnel, and it being a sense of duty [9]. In the Brazilian study, the main reasons for willingness were: feeling of a sense of purpose or duty to serve people, altruism and this being a good learning experience for professional development [10].

The main reasons for disagreement in this study were: participants feeling that they were not fully qualified to take up this responsibility, followed by fear of causing harm to the patient and concern regarding putting themselves at risk of exposure. These issues put forth by the participants were obvious limitations of this initiative. Placement of insufficiently trained personnel could backfire into a situation where patient care would be compromised and would further worsen the quality of healthcare services [14]. Factors diminishing the willingness to volunteer among participants as stated in other studies were: scarcity of PPEs [1, 9, 13], issues concerning safety to one's own health [9, 10], concern regarding transmitting infection to family members [9], not being fully trained [1], fear of causing harm to patients [9] and absence of an established treatment regimen for COVID-19 [9].

These observations inferred that in addition to issues concerning self-competency to perform, emotional factors also influenced their decision to refrain from involvement. There is hence a need for practical training programmes which, as far as possible, should mimic a real crisis [15]. Sessions on appropriate practices in wearing and disposing of PPEs were observed to be as effective in online training as much as onsite instructor-led training. Hence, online training can be made use of under the current pandemic circumstances [16].

Among the open remarks, a couple of participants in this study stated that adequate monetary compensation should be awarded to students during COVID-19 relief work. In the recent guidelines issued by the Government, financial incentives were made available only if volunteers carry out relief work for at least 100 days [5]. Added to this, it is advisable to provide student volunteers other means of compensation in the form of partial reimbursement of tuition fees or a rebate on study loans for their services [14].

A majority (79.3%) felt that eliciting a relevant medical history from COVID-19-affected patients could be an important role for medical students. In a study done in New Delhi, a majority of the medical students (62.3%) expressed their willingness to work in areas of social work and indirect patient care [13]. The Government of India also suggested that final-year students could be utilised to offer teleconsultation services and to monitor the condition of mild COVID-19 patients with appropriate training and supervision [5]. In the Brazilian study, participants expressed their desire to involve themselves in areas such as: screening of people (61.3%), communication about positive test results (38.4%), triage (73.3%), treatment of COVID-19 patients

(31.2%) and health education on preventive measures (95.5%) [10]. Medical students could additionally play a role in the tracing and tracking of contacts of COVID-19-positive patients [17]. Translating standard COVID-19 guidelines from English into the local language for the benefit of the general population could be another essential role of medical students [18]. Involving students in relief work during times of a medical crisis will reinforce the values of a noble profession and will help them establish their identity to serve the society early in their career [10]. The medical councils in both the USA and UK therefore recommended the involvement of medical student volunteers in various relief activities within their level of competence. This has to be supported in parallel with appropriate training, continuous supervision and provision of adequate PPEs as required [3, 4].

Good perception towards self-preparedness was significantly associated with willingness to be part of COVID-19 relief work among the participants in this study. This implies that participants who perceived that their knowledge and skills regarding COVID-19 relief activities was good had the required confidence and positive frame of mind. Therefore, these participants were willing to offer COVID-19 relief services if called upon in the future. Hence, medical institutions and all concerned stakeholders need to provide ample opportunities for students to improve their preparedness in epidemic management. Training, in addition to basic life support and triage, should also provide skills related to leadership during crisis and emergency decision making [9]. Anything from simple onsite classroom discussions to multimodal simulative training, to hands on training programmes in disaster management, even if only for a single day, was reported to invoke a positive attitude among the students [15]. In previous studies, male participants [9, 10], female participants [13], those with higher pro-social motivation [19], those with prior volunteering experience in relief activities [9], those studying in government colleges [9] and place of living [9] were observed to be associated with readiness to volunteer in COVID-19 relief work among medical students.

Limitations of the study

The self-preparedness of the medical undergraduate students was self-reported and was not actually assessed by the investigators. However, this could not be avoided, considering that data was collected during the ongoing COVID-19 pandemic.

Conclusions

Although more than half of the final-year medical students were willing to volunteer, only one-fifth of them had good perception regarding their self-preparedness to offer COVID-19 relief services. Self-preparedness was particularly lacking in key aspects of COVID-19 control, such as performing clinical examination and triage, procedure of contact tracing and the process of breaking bad news to both patients and their attenders. Self-preparedness was reported to be specifically poor among fourth-year medical students. Poor self-reported preparedness was associated with disagreement in the willingness among participants to involve themselves in COVID-19 relief activities. Thus, suitable epidemic preparedness interventions and addressing the various issues raised by the participants need to be carried out before the successful implementation of this bold initiative.

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