International Journal of Basic & Clinical Pharmacology
Halvadia DR et al. Int J Basic Clin Pharmacol. 2022 Nov;11(6):615-620
http://www.ijbcp.com
pISSN 2319-2003 | eISSN 2279-0780

DOI: https://dx.doi.org/10.18203/2319-2003.ijbcp20222744

Original Research Article

Occurrence of depression, anxiety and stress among medical students working during COVID Pandemic

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Received: 26 August 2022
Revised: 22 September 2022
Accepted: 23 September 2022

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ABSTRACT

Background: Since the COVID-19 pandemic began, medical students have been allotted various duties like rapid antigen testing, Sanjivani corona ghar seva (service provided by the government for home quarantine people), RTPCR swab collection, and posting in wards and intensive care units (ICUs). While executing the COVID-19 duties, students had a significant degree of a significant degree of ambiguity and apprehension. The purpose of this study was to determine the psychological impact of COVID-19 on medical students performing COVID-19 duties.
Methods: A questionnaire-based, cross-sectional observational study was conducted among undergraduate and postgraduate students of a tertiary care teaching hospital, who were deployed on COVID-19 duty during pandemic. A google form-based questionnaire was structured, encompassing demographic details, Depression, Anxiety and Stress Scale-21 (DASS-21) questionnaire and other (additional) COVID-19 duty related questions. The analysis of data was done by using unpaired t-test and chi-square test in Statistical package for social sciences (SPSS) version 20.0
Results: In our research study, we found that occurrence of depression, anxiety, and stress was 40.46%, 48.37%, and 30.69% among the medical students during COVID -19 duty, respectively. Higher occurrence and more severity ($p<0.01$) of depression, anxiety and stress was seen in female medical students during COVID-19 duty in pandemic.
Conclusions: We observed a higher occurrence of depression, anxiety, and stress among medical students while performing their COVID-19 duty in a pandemic. Medical students played a significant role in the COVID-19 pandemic. Therefore, measures should be taken to ensure the psychological wellbeing of medical students.

Keywords: COVID-19, DASS-21, Medical students

INTRODUCTION

In December 2019, a cluster of patients with dry cough, fatigue, fever, and pneumonia of unknown origin was reported in Wuhan, Hubei Province, China. China's national authorities reported 44 patients with pneumonia of unknown aetiology to World health organization (WHO) in three days. A novel coronavirus caused this highly contagious acute respiratory disease (SARS-CoV-2).[1] Since then, the COVID-19 virus spread around the world and infected 549 million people. COVID-19 declared as a pandemic by WHO on March 11, 2020.[2] A total of 604,440,633 COVID-19 cases were reported worldwide until August 26, 2022, with 18,675,806 active cases and 6,483,354 deaths caused by COVID-19.[3] There were multiple COVID-19 waves that various nations,

including India, had to deal with. The presentation of clinical symptoms of covid infection changed along with each wave and so did the treatment modalities. Healthcare professionals, including medical students, kept themselves updated about COVID-19. Reports of negative psychological effects were common in quarantined people, as shown in a review of psychological sequel.[4] The uncertainties regarding the COVID-19 pandemic may create psychological conditions such as depression, anxiety, and stress in the normal community as well as health care professionals (HCPs).[5] There is a growing concern about the psychological wellbeing of HCPs who are involved in treatment and care of COVID-19 patients around the world.[1] Prior research studies indicate that healthcare workers had a substantial negative effect on their psychological health than the general population.[6] Since the COVID-19 pandemic began, medical students have been allotted various duties like rapid antigen testing, Sanjivani corona ghar seva (Service provided by the government for home quarantine people), RTPCR swab collection, and posting in wards and intensive care units (ICUs), among others, as part of their obligations as health care providers during the COVID-19 pandemic. While executing the COVID-19 duties, the students had to face a significant degree of ambiguity and apprehension. Furthermore, medical students had to face a variety of challenges, including abrupt changes in their routine, such as online teaching and assessment via online sessions, decreased patient communication, and decreased interaction with peers. All of these factors might have an inevitable impact on the medical student's emotional and psychological well-being. The purpose of this study was to evaluate the psychological impact (depression, anxiety & stress) of COVID-19 on medical students, which was analyzed using depression, anxiety and stress scale-21 (DASS-21) self-reporting tool.[7]

Aim and objectives

The aim of research study was to assess the occurrence of depression, anxiety, and stress among medical students while conducting COVID-19 duty during a pandemic using a structured questionnaire regarding their experience during COVID-19 duty and DASS 21 questionnaire.

METHODS

This questionnaire-based, cross-sectional observational study was conducted among undergraduate and postgraduate students of Sheth L. G. municipal general hospital, Ahmedabad, Gujarat. The study was initiated after getting the approval from Institutional Review Board (IRB). The questionnaire-based study was conducted during October 2021 to December 2021, while medical students were engaged in various COVID-19 duties (i.e., Covid ward, COVID OPD, Rapid antigen testing, etc.). A google form was structured and circulated encompassing demographic details, DASS-21 questionnaire and other (additional) COVID-19 duty related questions. Before enrolling participants in our study, an informed consent was taken from them. Strong negative states (i.e., depression, anxiety and stress) were recorded using DASS-21 questionnaire, which is shorter version of DASS-42.[7] Seven closed ended questions were asked for each condition. Each response was graded on a scale of 0 to 3, with 0 signifying "did not apply to me at all" and 3 signifying "applied to me very much". We can determine the severity of these three psychological conditions using the total score, which ranges from normal to extremely severe (Table 1).

Table 1: Severity rating of DASS-21 used to measure the severity of depression, anxiety and stress.

Severity rating	Psychological Conditions		
	Depression	**Anxiety**	**Stress**
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	28+	20+	34+

COVID-19 duties related questions were asked into multiple choice question (MCQ) format. All questions were mandatory to attend. The data was collected for the duration of 2 months. The collected data was entered in Microsoft Excel 2019 and analysis of data was done by using unpaired t-test and chi-square test in Statistical package for social sciences (SPSS) version 20.0.

RESULTS

In our study, we received a total of 215 responses within stipulated time. The average age of medical students was (22.08±2.93) years. There were a total of 132 (61.4%) male medical students, and 83 (38.6%) female medical students. The majority (85.12%) of medical students were undergraduate, and a higher proportion (29.51%) of these students were studying in third year Part-I. A total of 32 (14.88%) postgraduate students were enrolled in study, and the majority (50%) of these students were first year resident (Table 2). Depression, anxiety, and stress were diagnosed in 87 (40.46%), 104 (48.37%), and 66 (30.69%) of 215 medical students during COVID-19, respectively. Out of 215 medical students, 32 (14.88%) medical students were found to suffering from all three negative psychological conditions (depression, anxiety and stress). Moreover, 23 (10.70%) medical students had depression and anxiety and 6 (2.79%) medical students had anxiety and stress. Only 4 (1.86%) medical students were observed to be depressed and stressed. Individual psychological conditions, depression, anxiety, and stress, were found in 28 (13.02%), 43 (20%), and 24 (11.16%) of medical students, respectively.

The occurrence of depression, anxiety and stress was found to be 36 (16.74%), 50 (23.25%) and 24 (11.16%), respectively among male medical students. A higher

(23.72%, 25.12%, 19.53%) percentage of female medical students were found to be suffering from depression, anxiety, and stress as compared to male medical students ($p<0.05$) (Figure 1).

Table 2: Demographic details and distribution of medical students according to their educational status.

Variable		Medical students N (%)
Age (years)	19-21	110 (51.16)
	>21	105 (48.84)
	Total	215
Gender	Male	132 (61.40)
	Female	83 (38.60)
	Total	215
Undergraduate students	2nd year	48 (26.23)
	3rd year (part -I)	54 (29.51)
	3rd year (part-II)	40 (21.86)
	Internship	41 (22.40)
	Total	183 (85.12)
Postgraduate students	1st year	16 (50)
	2nd year	8 (25)
	3rd year	8 (25)
	Total	32 (14.88)

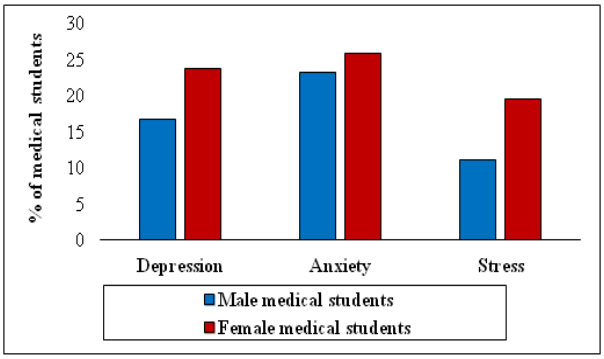

Figure 1: Gender based occurrence of depression, anxiety and stress among all medical students.

For depression, anxiety, and stress, the cumulative DASS-21 score of total population was found to be 19.26±8.25, 13.08±4.46, and 22.73±6.49, respectively. The cumulative DASS-21 score of male medical students were found to be 16.1±6.55, 11.28±4.21, and 18.33±2.81 for depression, anxiety, and stress, respectively. Female medical students' cumulative DASS-21 score were found to be 21.49±8.65, 13.74±4.64, and 25.24±6.68 for depression, anxiety, and stress, respectively. Thus, female medical students exhibited a higher severity of depression, anxiety, and stress during COVID-19 duty compared to the male students ($p<0.05$) (Table 3). Among 215 medical students, 87 (40.47%) were found to have depression, while 128 (59.53%) did not. Out of these 87 medical students, 36 (41.38 %) were male medical students and 51 (58.62%) were female medical students. Majority (40.23%) of these students were experiencing moderate depression. Gender wise occurrence of moderate depression was found to be 17 (48.57%) and 18 (51.43%), in male and female medical students, respectively. Out of 215 medical students, 111 (51.63%) medical students did not exhibit any symptoms of anxiety while 104 (48.37%) medical students were found to be anxious during COVID-19 duty.

Table 3: Gender based cumulative DASS-21 score of all medical students.

Cumulative score (Mean±SD)	Gender		P value
	Male medical students (Mean±SD)	Female medical students (Mean±SD)	
Depression (19.26±8.25)	16.11±6.55	21.49±8.65	0.0023
Anxiety (13.08±4.46)	11.28±4.21	13.74±4.64	0.0057
Stress (22.73±6.49)	18.33±2.81	25.24±6.68	0.0001

*p value<0.05=Statistically significant

Gender wise distribution showed that 50 (48.08%) male medical students and 54 (51.92%) female medical students were found to have suffered from anxiety. Moderate anxiety was found to be more common (45.79%) affliction. Among these 49 medical students, 23 (46.94%) and 26 (53.06%) were male and female medical students, respectively. Out of 215 medical students, 148 (68.84%) medical students did not suffer from stress while 67 (31.16%) medical students were found to be stressed. Gender wise distribution of these 67 medical students was 25 (37.31%) male medical students and 42 (62.69%) female medical students. The majority (41.79%) of these 67 medical students were found to be suffering from mild stress. Gender wise distribution showed that a higher percentage (18, 72%) of male medical students were suffering from mild stress. The majority (35.71%) of 42 female medical students were reported to be experiencing moderate stress. Whereas, only 8 (19.05%) female medical students were reported to have extremely severe anxiety, while no male medical student was found to be suffering from extremely severe anxiety in this study (Table 4). Out of 215 medical students, 190 (88.37%) medical students stated their studies have been affected and that their test performance might worsen as a consequence. As a response, 119 (55.34%) medical students were displeased with their COVID-19 duty during the pandemic. Due to the potential risk of spreading infection, 173 (80.37%) medical students avoided socialising with friends and family members while performing their COVID-19 duty. COVID-19's high infection rate and mortality ratio created panic in the general public as well as HCPs. As a result, 116 (53.95%) medical students endured social stigma as members of the healthcare system. All these results show a depressive impact on medical students during COVID-19 duty.

Table 4: Gender based severity assessment of depression, anxiety and stress among all medical students.

Severity grades	Total medical students N (%)	Male medical students N (%)	Female medical students N (%)
Depression			
Normal	128 (59.53)	96 (44.65)	32 (14.88)
Mild	23 (10.70)	14 (6.51)	9 (4.19)
Moderate	35 (16.28)	17 (7.91)	18 (8.37)
Severe	15 (6.98)	3 (1.40)	12 (5.58)
Extremely severe	14 (6.51)	2 (0.93)	12 (5.58)
Anxiety			
Normal	111 (51.63)	82 (38.14)	29 (13.49)
Mild	31 (14.42)	17 (7.91)	14 (6.51)
Moderate	49 (22.79)	23 (10.70)	26 (12.09)
Severe	17 (7.91)	7 (3.25)	10 (4.65)
Extremely severe	7 (3.25)	3 (1.39)	4 (1.86)
Stress			
Normal	148 (68.84)	107 (49.77)	41 (19.07)
Mild	28 (13.02)	18 (8.37)	10 (4.65)
Moderate	21 (9.77)	6 (2.79)	15 (6.98)
Severe	10 (4.65)	1 (0.46)	9 (4.19)
Extremely severe	8 (3.72)	0	8 (3.72)
Total	215 (100)	132 (61.40)	83 (38.60)

Dehydration, pain, rashes, and skin infection, among many other factors agitated 158 (73.48%) medical students during COVID-19 duty. These factors had an impact on the level of stress. For COVID-19 infection prevention, 159 (73.95%) medical students were taking immune booster medications or home remedies. In additionally, 178 (82.79%) medical students were found to be seeking and gathering information regarding COVID-19. This indicates that COVID-19 anxiety was present among medical students. As a prophylactic measure, 58 (26.98%), 58 (26.98%), and 18 (8.37%) medical students were found to be taking allopathic, ayurvedic, and homoeopathic medicine, respectively. Immuno-booster medication was found to be taking by 159 (73.95%) medical students. A total of 44 (20.47%) medical students started practicing Yoga to improve immunity during pandemic. Asides medications, 92 (42.79%) and 97 (45.12%) medical students began taking home remedies and steam inhalation, respectively. This shows that medical students were keen to take various precautionary measures to prevent COVID-19 infection while performing COVID-19 duties. As COVID-19 had been a burgeoning disease, HCPs as well as the general population were keen to gain knowledge regarding COVID-19 such as symptoms, infection rate, morbidity ratio, pharmacotherapy, and preventive care. The majority (64.65%) of medical students managed to get information of COVID-19 from social media. Further to that, COVID-19 information was obtained by medical students from medical journals (33.49%) and government advisory (17.67%). Medical students also get information regarding COVID-19 from their friends (25.12%) and family members (18.14%). In our study, the majority (76.28%) of medical students felt respected by society and were proud to be a "corona warrior". A higher (57.21%) percentage of medical students anticipated that the routine life will return soon. Furthermore, the majority (67.91%) of medical students were willing to receive the COVID-19 vaccine. Even in the face of adversity, the majority of medical students were found to be optimistic about the future (Table 5).

Table 5: Answer of questions regarding COVID-19 duty by all medical students.

Questions	Yes N (%)	No N (%)
Is COVID-19 duty enjoyable?	96 (44.65)	119 (55.35)
Will study and exam performance be hampered?	190 (88.37)	25 (11.63)
Will taking precautions prevent COVID-19 infection?	125 (58.14)	90 (41.86)
Do you avoid socializing with friends & family members?	173 (80.47)	42 (19.53)
Do you face social stigma?	116 (53.95)	99 (46.05)
Do you get irritated because of side effects of wearing PPE kit?	158 (73.49)	57 (26.51)
Are you taking any immune-booster drugs or home remedies?	159 (73.95)	56 (26.05)
Do you search and try to read information regarding COVID-19?	178 (82.79)	37 (17.21)
Are you proud to be covid warrior?	164 (76.28)	51 (23.72)
Do you think normal life return soon?	123 (57.21)	92 (42.79)
Are you open to take COVID-19 vaccine?	146 (67.91)	69 (32.09)

DISCUSSION

During the COVID-19 pandemic, the majority of the population was found to be suffering from a negative psychological condition (depression, anxiety and stress) in the world. When compared to the general population, medical students are an especially susceptible population to negative psychological conditions such as depression, anxiety, and stress.[6] Medical students were more prone to depression, anxiety, and stress because of the pressure of their academic demands, the COVID-19 duties, their frequent separation from their family members, and the lack of enough relaxation during the COVID-19 pandemic. In our research study, occurrence of depression, anxiety and stress was 40.46%, 49.37% and 30.69%, respectively. Majority of medical students

experienced anxiety (49.37 %) followed by depression (40.46 %) during COVID-19 duty. According to a study by Preti et al the prevalence of depression, anxiety, and stress among health care workers ranged from 27.5% to 50.7% before the outbreak of covid, and in the same group during the pandemic, an increase of prevalence was noted (50.4% to 50.7%).[8] Our study found that a higher proportion of medical students had moderate depression (16.58%), moderate anxiety (14.42%), and mild stress (13.02%) during COVID-19 duty. Similar results were obtained in a study by Mathew et al where higher percentage of medical students had moderate depression (24.4%), moderate anxiety (15.5%), and mild stress (14.4%) during COVID-19 lockdown.[9] In a study of a similar nature by Cao et al in Chinese undergraduate students, mild anxiety (21.3%) was reported.[10] According to research by Abdulghani et al a higher (30.9%) percentage of medical students experienced mild stress during the COVID-19 epidemic in Saudi Arabia.[11] Whereas, in a Himachal Pradesh study conducted by Rana et al 48%, 74%, and 32% of medical students were found to be suffering from depression, anxiety, and stress, respectively as a result of the COVID-19 outbreak, which is higher as compared to our study.[12] Natalia et al study identified a higher prevalence of stress (44.6%) compared to depression (18.6%). While in our study depression was found to be more than stress. The occurrence of anxiety (47.6%) was almost similar in both the studies.[13] This finding of low cumulative stress level in our study population may be because our study population comprised of both undergraduate students as well as postgraduate students.[14] Nayak et al study had occurrence of depression, anxiety and stress 42.28%, 56.2% and 17.67%, respectively in health care worker at Trinidad & Tobago, which is similar to the finding of our study.[15] In our study population occurrence of depression (23.72%), anxiety (25.12%) and stress (19.53%) in female medical students was higher as compared to male medical students. Similarly in a study done by Vala et al a higher percentage of female medical students were suffering from depression (9.20%), anxiety (9.60%) and stress (5.60%) than male medical students.[16] In a study by Soltan et al higher prevalence of depression (66%), anxiety (67.3%) and stress (69%) were seen in female medical students during COVID-19 lockdown at Egyptian medical college.[17] This finding may be because females are more likely than male to experience more caring responsibilities and worry more about the safety of family and friends. Additionally, the lack of socialization intensified their psychological inflictions.[18] In our research study, majority of female medical students were found to suffering from moderate depression (21.67%), moderate anxiety (31.33%) and moderate stress (18.07%). Whereas, Rana et al study had higher proportion of female medical students suffering from moderate depression (38%) and moderate anxiety (44%) but mild stress (67%).[12] In our study, a higher proportion of male medical students had moderate depression (12.88%), moderate anxiety (17.42%), and mild stress (13.64%) during COVID-19 duty. In the study by Rana et al male medical students showed moderate depression (39%) but had severe anxiety (31%), and moderate stress (16%).[12] The severity grade of anxiety and stress were less in our study because we included postgraduate medical students who are better trained than undergraduate students at handling such situations. The severity grade of anxiety and stress may have been higher in Rana et al study as the study population comprised of only first year medical students.[12]

Conversely, a study done by Rehman et al found that male and female medical students did not significantly differ in their severity scores for depression, anxiety, and stress in COVID-19 pandemic.[19] Our study population was obtaining information on COVID-19 mainly through social media (64.65%), medical journals (33.49%), from friends (25.12%), from government advisory (17.67%) and from family members (18.14%). While in Khasawneh et al study found that the most of time medical students obtained their information from NGOs (38.9%), social media (37.8%), news (35.7%) and google (35.0%).[20] In our survey, only 69 (32.09 %) medical students were opposed to the COVID-19 vaccination. While research in six Chinese medical colleges by Gao et al revealed that 58.2% of doctors were hesitant to take the COVID-19 vaccine.[21] Extensive monitoring of depression, anxiety, and stress among medical students is essential for the rapid diagnosis and improved care of psychological problems observed during the difficult times of corona pandemic.

Limitations

Limitations of current study were; We do not have pre covid base line data of similar kind for the same subjects, therefore, we cannot opine if our findings are due to COVID-19, pre-existing condition or exaggeration of pre-existing condition. Our study population is small, as we have included only one medical college. So, these finding cannot be extrapolated to a larger population. Exaggeration or underestimation of a question's response by medical students may also lead to subjective bias in the research data.

CONCLUSION

We observed a higher occurrence of depression, anxiety, and stress among medical students while performing their COVID-19 duty in a pandemic. Medical students played a significant role in the COVID-19 pandemic. Their psychological wellbeing is also important for optimum healthcare provided to the patient. Therefore, measures should be taken to ensure the psychological wellbeing of medical students.

ACKNOWLEDGEMENTS

The researchers express heartfelt gratitude to the medical students who have participated in this online research study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Halvadia DR, Bhavsar HJ, Suthar KM, Dumra GH, Patel MJ. Occurrence of depression, anxiety and stress among medical students working during COVID Pandemic. Int J Basic Clin Pharmacol 2022;11:615-20.