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Quick Response Code:



Website:
www.jehp.net

DOI:
10.4103/jehp.jehp_1273_21

Assessment of the psychological impact of COVID-19 pandemic on undergraduate medical students in India

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Received: 28-08-2021
Accepted: 13-12-2021
Published: 29-07-2022

Abstract:

BACKGROUND: Medical students who are prone to psychological stress due to their overburdened curriculum, are at an increased risk of getting adversely affected by the pandemic. The present study was planned to assess the anxiety level among undergraduate medical students across the country using generalized anxiety disorder scale (GAD-7).

MATERIALS AND METHODS: In this online survey, anonymous data was collected through Google forms from undergraduate students from all the phases of MBBS course across the country from August 15, 2020, to October 15, 2020. Section I collected various demographic information, section II included GAD-7 questionnaire for assessing anxiety and section III had open-ended questions about their impending fear, uncertainties, and apprehensions. The data was expressed in percentage and association among the variables was determined using Chi-square test. Thematic analysis of the open-ended responses was done.

RESULTS: Among the sample of 1208 students, 81% were from urban areas. During the pandemic, 77% were residing with their parents and 71% parents having stable jobs. Eighty percent students had no relative diagnosed with COVID-19, whereas 52% students had family members with comorbidity. The GAP score showed mild, moderate, and severe anxiety in 27, 24, and 16% students, respectively. Anxiety was significantly associated with rural setting and with COVID-19 positive or comorbid family member ($P < 0.05$). Open ended responses revealed that majority of the students were finding it difficult to cope with the academic stress at home but still did not want to join back.

CONCLUSION: With such a high incidence of anxiety among medical students, it is pertinent to safeguard the mental health and implement efficient approaches to upkeep the scholastic, physical, emotional, and professional well-being of medical students during such vulnerable times.

Keywords:

Anxiety, COVID-19, generalized anxiety disorder-7, medical students, psychological stress

Introduction

The rampant spread of novel coronavirus (COVID-19) all over India. The outbreak of COVID-19 pandemic prompted the Indian government to impose lockdown all over country. Except some essential services, all facilities including academic institutions were closed sine die

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till further order.^[1] The high infectivity and fatality rates associated with COVID-19 triggered universal psychosocial effects. Disruptions to the daily routine made people feel anxious and unsafe, which needed special attention.^[2,3] It has been found that students of pursuing professional training are prone to psychological stress, anxiety, and depression.^[4] The medical students reportedly have the highest rates

How to cite this article: Shreevastava AK, Mavai M, Mittal PS, Verma R, Kaur D, Bhandari B. Assessment of the psychological impact of COVID-19 pandemic on undergraduate medical students in India. *J Edu Health Promot* 2022;11:214.

of burnout, anxiety, distress, and depression, even in the absence of pandemic.^[5]

The pandemic per se and in addition uncertainty about re-opening of the medical colleges/institutions, resumption of onsite teaching activities also affected the mental status of medical students adversely. Approaching examinations added to the existing confusion and agony. An increase in the rate of suicide among general public and students due to mental instability was an alarming situation caused by this pandemic.^[6,7] The generalized anxiety disorder-7 (GAD-7) scale is easy-to-use self-administered questionnaire being used as a screening tool and severity measure for GAD.^[8] The GAD-7 is a 7-item questionnaire that is found to be 70%–90% sensitive and 80%–90% specific across various anxiety disorders.^[9] Keeping in mind the increased psychological effects of the pandemic on students, the current study was planned to assess the anxiety level among undergraduate medical students using GAD-7.

Materials and Methods

Study design and setting

Cross-sectional study in the form of Online survey from 15th August 2020 to 15th October 2020 across the Indian subcontinent.

Study participants and sampling

Undergraduate students from all the phases of MBBS course across the country. The method followed for sampling was snowball type of convenient sampling method.

Inclusion criteria

Undergraduate medical student who gave consent and were residents of India.

Exclusion criteria

Medical undergraduate students with history of any psychiatric illness.

Data collection tool and technique

As part of the study, an anonymous online survey was conducted through Google form (Google LLC, Mountain View, CA). The link of the survey was shared through WhatsApp (Facebook, Inc., Menlo Park, CA) and e-mails. At the beginning of the form, a section on informed consent where the respondent was given the option to opt out of the survey at any time was given. The purpose of the survey was outlined; the voluntary nature of participation and the anonymity of the survey were also mentioned. This anonymous method of survey collection was chosen to encourage student participation. The survey responses were collected online and made available to the authors in a non-identifiable form.

The survey had three sections

Section I collected the demographic information like their gender, medical college location, setting (urban/rural), the source of family income (salaried/business), and information about any family member/relative diagnosed with COVID-19 and history of comorbidity among family members. The students were also inquired about the history of any psychiatric illness.

Section II had a prevalidated 7-item questionnaire, the GAD scale, GAD-7, in which scores of 0, 1, 2, and 3 is given to categories of “not at all,” “several days,” “more than half the days,” and “nearly every day,” respectively, for each item. Total score is calculated by adding together the scores for the seven questions. GAD-7 scale is a 7-item anxiety scale used for rapid screening for the presence of a clinically significant anxiety disorder, especially in outpatient settings.^[8,10] However diagnosis of GAD should not be made based on GAD-7 scores alone.

The final score ranges from 0 to 21, which could be classified as:

0–4 - Minimal Anxiety; 5–9 - Mild Anxiety; 10–14 - Moderate Anxiety; 15–21 - Severe Anxiety.

A score of 10 or greater indicates that further evaluation is required.

Section III included some open-ended questions enquiring about their impending fear, uncertainties about their classes and examinations and apprehension of joining after opening of institution.

Data analysis

The quantitative and qualitative analysis of the data was carried out. Quantitative analysis was done using Microsoft excel software and GraphPad Prism 5 (GraphPad Software Inc., San Diego, CA, USA). Data were expressed in percentage. Univariate analysis between anxiety and other characteristics was done using Chi-square test. For the qualitative analysis, the responses to the open-ended questions were reviewed, and thematically analyzed by two of the investigators (BB, RV). The findings were clustered according to the chosen themes and codes were identified.

Ethical consideration

The study was conducted after obtaining ethical clearance from the Institutional Ethics Medical Committee (GIMS/IEC/HR/EFR/2020/04).

Results

Total 1208 responses were received from almost all the states and Union territories of Indian subcontinent within

the stipulated time. Table 1 shows the demographic and other characteristics of the participants.

Among the sample of 1208 students, 52% ($n = 632$) were women. Majority of medical students (42%, $n = 508$) were from phase-1 MBBS course, with 60% ($n = 724$) respondents studying in medical colleges located in North India. Eighty-one percent ($n = 978$) students were from urban areas. During the pandemic, 77% ($n = 930$) were residing with their parents and 71% ($n = 862$) parents had stable jobs. Most participants (80%, $n = 962$) had no relative or known person diagnosed with COVID-19. However, 52% ($n = 625$) students had any of their family members with comorbidity.

Table 2 shows the responses of the participants on the items of the GAD-7 scale.

Anxiety was observed in 812 students. The anxiety level among medical students ($n = 1208$) is shown in Table 3.

Table 4 shows the relationship between the various characteristics of students and anxiety during COVID-19 pandemic. It was observed that anxiety among medical students was significantly associated with rural setting, with COVID-19 positive or comorbid family member.

Through open ended questions, the students were asked about their apprehensions and uncertainties on joining back their respective institute/college after lockdown is over. Based on their responses, three themes were identified – fear and worry related to COVID-19 (COVID-19 scare), uncertainties about the classes/examinations and lack of clinical exposure and no apprehensions. Table 5 shows the theme, core ideas

Table 1: Demographic and other characteristics of the participants (n=1208)

Demographic parameter	Categories	n (%)
Gender	Male	576 (48)
	Female	632 (52)
Zone where medical college is located	North India	724 (60)
	South India	304 (25)
	Central India	74 (6)
	Eastern India	38 (3)
	Western India	68 (6)
	MBBS phase	Phase I
	Phase II	304 (25)
	Phase III, part 1	176 (15)
	Phase III, part 2	220 (18)
Place of residence	Rural	230 (19)
	Urban	978 (81)
Occupation of parent	Salaried (Government)	518 (43)
	Salaried (private)	344 (28)
	Business	346 (29)
Living with parents	Yes	930 (77)
	No	278 (23)
Relative or known person diagnosed with COVID-19	Yes	246 (20)
	No	962 (80)
Family member with preexisting chronic disease	Yes	625 (52)
	No	583 (48)

Table 2: The Generalized Anxiety Disorder-7 Scale

Items	The students were asked, "Over the last 2 weeks, how often have you been bothered by the following problems?"			
	Not at all (0), n (%)	Several days (1), n (%)	Over half the days (2), n (%)	Nearly every day (3), n (%)
Feeling nervous, anxious, or on edge	286 (23.7)	534 (44.2)	190 (15.7)	198 (16.4)
Not being able to stop or control worrying	332 (27.5)	498 (41.2)	198 (16.4)	180 (14.9)
Worrying too much about different things	266 (22)	438 (36.3)	246 (20.4)	258 (21.4)
Trouble relaxing	396 (32.8)	478 (39.6)	174 (14.4)	160 (13.2)
Being so restless that it's hard to sit still	550 (45.5)	358 (29.6)	160 (13.2)	140 (11.6)
Becoming easily annoyed or irritable	266 (22)	464 (38.4)	210 (17.4)	268 (22.2)
Feeling afraid as if something awful might happen	300 (24.8)	438 (36.3)	238 (19.7)	232 (19.2)

Responses for each item. Within bracket values are in percentage

and some of the excerpts from the responses to open ended questions.

Discussion

Numerous studies have highlighted psychological effects of COVID-19^[11,12] but little literature is available on its psychological impact on medical students. However, anxiety and other psychological effects are very much expected among medical students due to the prevailing circumstances and by the policies executed to restrain the spread of the disease. Additionally, the stress of medical education makes them more prone to develop anxiety disorders, particularly during early phase of medical school.^[2,13] It has also been observed that pandemics like severe acute respiratory syndrome severe acute respiratory syndrome, Ebola etc., have invariably affected the physical and mental wellbeing of students.^[14] The current study was planned to investigate the anxiety level among medical students, taking into consideration, the explicit sources of anxiety perceived by these students during the crisis. In the current study, we observed anxiety in 67% of medical students, with 27% showing mild, 24% moderate and 16% severe signs of anxiety. The possible reasons for such a high prevalence of anxiety could be changes in their daily routines and lifestyles, lockdown restraints, educational interruptions and the disease itself.^[14] Lack of interpersonal communications with

friend and relatives could also be a cause of increased anxiety.^[15] In general, the medical students have exhibited to be the most distressed group of students, leading to serious consequences like depression and anxiety.^[16-19]

Similar to this study, other researchers also reported increased anxiety among medical students due to COVID-19 pandemic. Around one-fourths and half of the students reported anxiety as per the surveys by Cao *et al.*, and Saddik *et al.*, 2020, respectively.^[20-22] In a recently published survey, stress was reported in 72% of medical students.^[23] However, in other non-university students, anxiety was found to be much low. According to Chinna *et al.*, 2021, moderate to severe anxiety was reported only in 19% Indian students.^[24]

In the current study, we investigated the association of anxiety levels of medical students with their place of residence, source of parental income, and cohabitation with the parents. Association with existing comorbidity and COVID-19 positive cases in family members was also studied. The analysis of our result suggested that anxiety level is strongly associated with the place of residence, history of comorbidity among family members and COVID-19 positive cases in the family.

The students living in rural areas were significantly more anxious than students living in urban areas. Poor Internet connectivity and less-availability of learning resource could be the factors influencing the anxiety level in students residing in rural areas. Additionally lack of better health care facilities and poor hygienic conditions may also contribute to the cause of anxiety.^[22] Similar to our findings, Cao *et al.*, 2020 also observed significant

Table 3: Anxiety level in the respondents

Anxiety level	n (%)
Normal/minimal	397 (33)
Mild	323 (26.7)
Moderate	294 (24.3)
Severe	194 (16)

Table 4: Demographic characteristics of participants who had anxiety

Demographic characteristics	Categories	GAD		χ^2 (df, n)	P
		score>4 (n)	score<4 (n)		
MBBS phase	Phase I	345	163	χ^2 (3, 1208)=0.31	0.95
	Phase II	204	100		
	Phase III, part 1	116	60		
	Phase III, part 2	150	70		
Place of residence	Rural	162	60	χ^2 (1, 1208)=4.01	0.043*
	Urban	650	336		
Occupation of parents	Salaried (Government)	354	164	χ^2 (2, 1208)=4.52	0.104
	Salaried (private)	216	128		
	Business	242	104		
Living with parents	Yes	664	208	χ^2 (1, 1208)=0.80	0.37
	No	264	72		
Relative or known person diagnosed with COVID-19	Yes	198	48	χ^2 (1, 1208)=24.68	<0.00001*
	No	614	348		
Family member with pre-existing chronic disease	Yes	452	172	χ^2 (1, 1208)=15.95	<0.00006*
	No	360	224		

*Signifies significant difference (P<0.05). Association between anxiety and various demographic profile was estimated using Chi-square test. GAD=Generalized anxiety disorder

Table 5: Responses to open-ended questions and their analysis

Themes	Core ideas	Representative comments
COVID-19 scare	Risk of getting infected Spreading infections to others Worry about maintaining proper social distancing	“What will happen if college starts and my batch mates including me get infected and spread the infection?” “I am afraid of crowd and cannot gather the courage to go back to my college” “Opening colleges will spread the disease further” “What measures would the college take to maintain social distancing?” “I am afraid of catching the infection as there are many asymptomatic positive people around” “COVID-19 may go rampant in the college” “I am worried about my grand-parents and parents health”
Apprehensions about academic activity and examinations	High academic stress Impending examinations Lack of concentration during online classes while at home	“College might not be safe but due to insufficient preparation at home, I want to go back to my hostel” “Academic stress is too high and I am unable to study at home” “Exams if conducted should be analyzed leniently” “I am always worried about practical, logbooks, assignments etc.” “I don’t know how delayed our session will be. Online exams should be conducted” “Please promote us to 3 rd year; we have been in 2 nd year for almost 2 years now. We will study for the next session with our full force and potential”
Worries about lack of practical/clinical exposure	Nonconduction of practical No clinical postings	“I don’t know how we will gain practical knowledge without attending on-site sessions” “Gaining practical knowledge is important” “We are not in touch with the patients, how will we learn clinical skills?” “I think I will not be able to become a good doctor if this condition prevails☹”

Core ideas that emerged in response to the open-ended question about the “apprehensions and uncertainties on joining back their institute/college after lockdown is over” and representative comments from the students

association between anxiety and place of residence in college students.^[20]

As per the findings of this study, the source of family income and cohabitation with parents had no significant effects on anxiety levels of the students. This is contrary to the report by Cao *et al.*, which showed significant association between the two.^[20] It is believed that the stability of family income and living with parents has positive impact on students’ psychology.^[25] However, the result of this study is quite unexpected, as it did not show any significant association between anxiety level and cohabitation with parents and parental income. Availability of social media kept the students connected with their family and friends. The parents might not have expressed and shared their financial problems with their children, to avoid psychological and economic pressure. These could be the possible reasons for non-significant association among these factors and anxiety.

The result of our study showed a significant association between COVID-19 positive family member and anxiety. The high contagiousness of the virus risking others in the family, fear of losing their loved ones and the associated stigma could be the cause of anxiety.^[5] Additionally isolation of the infected person and quarantine of contacts could be independent risk factors for anxiety.^[14]

Comorbidity in family members was also significantly related to the students’ anxiety during this pandemic. Increased mortality in comorbid COVID-19 patients is a matter of concern for all.^[10] Diversion of all medical resources to COVID patients resulted in lack of proper attention to other comorbid non-COVID patients. Patients with chronic comorbid conditions like diabetes mellitus, cardiac diseases, chronic renal failure etc., need regular follow-up in hospital that become problematic and raise the chances of deterioration. All these factors were responsible for anxiety within medical students, as they better understand the consequences.

In response to the open ended question on apprehensions on joining back, some of the students didn’t want to go back to their hostel as they felt the conditions prevailing in the hostel may not be favorable to curtail the spread of infection. They were apprehensive about their hostel stay once they return back. Students were worried about getting infected and of spreading the infection to others. Most of the students felt that they are not able to cope with the academic stress as online teaching is not sufficient to cover the syllabus and studying at home is a difficult task. They were worried about their assignments, record books and wanted postponement of the exams. If exams occur, they should be marked leniently. Students want colleges to open for exams and shut down again.” Students in early year of MBBS were

concerned about the practical classes; whereas students in late semesters were worried about the lack of clinical exposure. However some students were quite relaxed and were missing their college lives and wanted to go back to their colleges at the earliest.

Strengths and limitations

The study covered the undergraduate students from medical colleges located in all the zones of Indian subcontinent; this was the strength of the study. Use of validated questionnaire for anxiety made it more reliable. However the study was limited by self reported bias. Only anxiety was measured, we could have measured other stress related psychological effects and depression among the students owing to the pandemic.

Conclusion

In the study, anxiety was reported in 67% of medical students, ranging from mild to moderate intensity. Students residing in rural area reported higher incidence of anxiety as compared to those living in urban area. The anxiety status in medical students was not related to the source of family income and cohabitation with parents. However, having a relative or an acquaintance infected with COVID-19 and comorbidity in any of the family members were independent risk factors for experienced anxiety. The stakeholders must be aware of the psychological stress the medical students are going through during this tough time and safeguard their mental health. It is recommended to implement efficient approaches to upkeep the scholastic, physical, emotional, and professional well being of medical students during such vulnerable times. The students may engage more often in physical exercise; keep themselves busy in activities of their interest and should practice mindfulness and meditation.

Acknowledgment and ethical moral code

We acknowledge the students who participated in the online survey. The study was conducted after obtaining Ethical approval from the Institutional ethics committee wide letter no. GIMS/IEC/HR/2020/15 dated 08.08.2020.

Financial support sponsorship

Nil.

Conflicts of interest

There are conflicts of interest.

References

1. Available from: https://www.mha.gov.in/sites/default/files/PR_NationalLockdown_26032020_0.pdf. [Last assessed on 2020 Nov 2020].
2. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian J Psychiatry* 2020;51:102083.
3. Usher K, Bhullar N, Jackson D. Life in the pandemic: Social isolation and mental health. *J Clin Nurs* 2020;29:2756-7.
4. AcBehera S, Paluri SS, Mishra A. Mental health status of students pursuing professional training: A questionnaire-based study. *J Edu Health Promot* 2021;10:399.
5. Natalia D, Syakurah RA. Mental health state in medical students during COVID-19 pandemic. *J Edu Health Promot* 2021;10:208.
6. Balachandran AK, Alagarsamy S, Mehroliya S. Hike in student suicides – Consequence of online classes? *Asian J Psychiatr* 2020;54:102438.
7. Lathabhavan R, Griffiths M. First case of student suicide in India due to the COVID-19 education crisis: A brief report and preventive measures. *Asian J Psychiatr* 2020;53:102202.
8. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: The GAD-7. *Arch Intern Med* 2006;166:1092-7.
9. Swinson RP. The GAD-7 scale was accurate for diagnosing generalised anxiety disorder. *Evid Based Med* 2006;11:184.
10. Rutter LA, Brown TA. Psychometric properties of the Generalized Anxiety Disorder Scale-7 (GAD-7) in outpatients with anxiety and mood disorders. *J Psychopathol Behav Assess* 2017;39:140-6.
11. Duan L, Zhu G. Psychological interventions for people affected by the COVID-19 epidemic. *Lancet Psychiatry* 2020;7:300-2.
12. Shah K, Kamrai D, Mekala H, Mann B, Desai K, Patel RS. Focus on mental health during the coronavirus (COVID-19) pandemic: Applying learnings from the past outbreaks. *Cureus* 2020;12:e7405.
13. Brenneisen Mayer F, Souza Santos I, Silveira PS, Itaiqui Lopes MH, de Souza AR, Campos EP, *et al.* Factors associated to depression and anxiety in medical students: A multicenter study. *BMC Med Educ* 2016;16:282.
14. Wang C, Zhao H. The impact of COVID-19 on anxiety in Chinese university students. *Front Psychol* 2020;11:1168.
15. Xiao C. A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems: Structured letter therapy. *Psychiatry Investig* 2020;17:175-6.
16. Sherina MS, Rampal L, Kaneson N. Psychological stress among undergraduate medical students. *Med J Malaysia* 2004;59:207-11.
17. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: Causes, consequences, and proposed solutions. *Mayo Clin Proc* 2005;80:1613-22.
18. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med* 2006;81:354-73.
19. Quek TT, Tam WW, Tran BX, Zhang M, Zhang Z, Ho CS, *et al.* The global prevalence of anxiety among medical students: A meta-analysis. *Int J Environ Res Public Health* 2019;16:2735.
20. Cao W, Fang Z, Hou G, Han M, Xu X, Dong J, *et al.* The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res* 2020;287:112934.
21. Saddik B, Hussein A, Sharif-Askari FS, Kheder W, Temsah MH, Koutaich RA, *et al.* Increased levels of anxiety among medical and non-medical university students during the COVID-19 pandemic in the United Arab Emirates. *Risk Manag Healthc Policy* 2020;13:2395-406.
22. Sundaraswamy VG, Thimizarasan R, Lalal RH, Sundarasamy VG, Thamizharasan R, Lalan RH. Psychological impact of COVID-19 on medical college students. *Eur J Mol Clin Med* 2020;7:435-43.
23. Naaz A, Saad M. A cross sectional study to estimate the psychological stress level in medical students during COVID-19

- pandemic. *Public Health Rev Int J Public Health Res* 2021;8:01-6.
24. Chinna K, Sundarassen S, Khoshaim HB, Kamaludin K, Nurunnabi M, Baloch GM, *et al.* Psychological impact of COVID-19 and lock down measures: An online cross-sectional multicounty study on Asian university students. *PLoS One* 2021;16:e0253059.
 25. Tang B, Bragazzi NL, Li Q, Tang S, Xiao Y, Wu J. An updated estimation of the risk of transmission of the novel coronavirus (2019-nCov). *Infect Dis Model* 2020;5:248-55.