

Original Research Article

Assessment of depression among medical students during COVID-19 in a southern state of India

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ABSTRACT

Background: The COVID-19 lockdown has caused increased psychological disturbances among the student community. Medical students are susceptible to mental stressors and thus more likely to be affected by the pandemic. The aim of the study was to determine the prevalence of depression, anxiety and stress in medical students during the COVID-19 lockdown in Kerala along with the associated socio-demographic factors.

Methods: A web-based cross-sectional study was conducted among medical students during COVID-19 lockdown in a southern state of India. Collected data included socio-demographic details and depression, anxiety and stress scale-21 (DASS-21). Chi square test was used to determine the association of depression, anxiety and stress with the socio-demographic factors.

Results: A total of 760 students were invited to partake in this study. 702 satisfied the inclusion criteria and completed the evaluation, giving a response rate of 92.4%. Among the participants 67.4% were female and 32.6% were males. Prevalence of depression, anxiety and stress among medical students were 55.1%, 33.2% and 29.4% respectively. It was found that both male and female students experienced the same levels of depression ($p=0.533$) during the pandemic. Students studying in private self-financing medical colleges experienced more anxiety compared to students at government medical college ($p=0.008$) during the pandemic. It was also observed that prevalence of depression (58.4%) was highest among first year medical students.

Conclusions: The study revealed that depression, anxiety and stress were prevalent in majority of medical students during the pandemic.

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

INTRODUCTION

COVID-19 is a pandemic with the first cluster being reported in November 2019 in Wuhan, China.¹ In the next few months, the infection spread reached its peak and on 11 March 2020 it was finally declared a pandemic. With over 49,666,502 cases reported globally and 1.3 million deaths, the disease has spread across the globe.² Following the declaration of a pandemic, many countries went into

complete lockdown with strict measures to prevent the spread of infection like quarantine, social distancing, facial masks, sanitizers, isolation came into place.³

The first case of COVID-19 in India was reported on 25 January 2020 in a medical student who returned from Wuhan, China. The number of cases started rising and on 24 March 2020 a nationwide lockdown was imposed.

Since the nation came to a standstill post the implementation of lockdown, the way of life of the population has become different. Social distancing and closure of common places of gathering has led to the disruption of the lifestyle of the population. Among people in Kerala, one of the most affected groups is the student population. College students are always at a higher risk of psychological disturbances with the hectic syllabus, deadlines, exams, lack of employment and placement for the newly graduated being a few of the problems that they encounter.

The lockdown has brought about a change in the method of medical education, causing concern and worry among medical students.⁴ The change to online learning and lack of clinical exposure and peer interaction are stressors triggering psychological distress in medical students. There has been scant data in literature pertaining to mental health of medical students in Kerala during COVID-19.

Kerala was chosen because the state was recognized for its proactive measures in containing and management of the COVID-19 pandemic by researchers and medical faculty nationally and internationally.⁵ It has also shown similar efficiency in tracing and containment during the Nipah virus outbreak in 2018 and the isolated case in 2019.⁶ Kerala also has significantly better demographics concerning education, health and human development index compared to the rest of the country as per the report of UNDP India in the last census.⁷

Assessments of depression, anxiety and stress have been done on medical students previously in a few countries, which gave significant results indicating its prevalence. A study in Karachi, Pakistan with 312 final year medical students using DASS-21 reported moderate to severe depression, anxiety and stress respectively as 57.6%, 74%, and 57.7% among participants.⁸

During the COVID-19 lockdown, research done in China among 933 medical students, reported 17.1% reported anxiety and 25.3% reported depression symptoms.¹² Research during COVID-19 in Bangladesh on 3122 university students using DASS-21 found the prevalence of depression, anxiety and stress as 62.9%, 63.6% and 58.6% respectively.¹³

Within India, few studies were conducted to survey depression and anxiety in medical and university students during COVID-19. In Maharashtra, a study on 250 1st year MBBS students using DASS-21 gave the prevalence as 17.20%, 15.80% and 10.80% for depression, anxiety and stress, respectively.¹⁴ Another study on 113 medical students and junior doctors in Varanasi using GAD-7 and PHQ-9 showed a prevalence of severe anxiety and severe depression as 9.8% and 7.3%.¹⁵

A similar study on anxiety and depression was done in Tamil Nadu during the lockdown.¹⁶ It used the general anxiety disorder-7 (GAD-7) scale to assess anxiety and the

centre for epidemiology studies for depression (CESD) scale to assess levels of depression. The prevalence of anxiety was 75.5% and depression was 74.6% with females reporting more symptoms of anxiety and depression than males.

Since the implementation of lockdown was sudden, there was a break in all academic activities. Colleges were shut down and new methods of education like online classes were introduced.¹⁷ Since students are new to this it takes time to grow accustomed to it. A part of medical education focuses on clinical rotations and case presentations. The absence of these practices can hamper the ability of students to actively learn information. Clinical medicine is more of a practical experience and its absence would cause sufficient worry in students.¹⁸

A global pandemic would create new stressors to students like the risk of catching an infection and the health of a loved one. There have been studies that indicate the relationship between intolerance of uncertainty, psychiatric disorders like depression and anxiety and the fear of COVID-19.²⁰ Due to the social distancing norms most students are confined to their homes and have very less social interaction. Loss of social connections and friendships over time coupled with dissatisfaction in social and psychological support are associated with depression in adolescence and emerging adulthood.²¹ Coupled with academic stressors and the general macabre associated with the pandemic, students are prone to develop serious mental health issues.

Therefore, using a cross-sectional study, we have aimed to assess the depression, anxiety and stress among undergraduate medical students in Kerala during the COVID-19 pandemic.

METHODS

Study design, study setting and duration of the study

A web-based cross-sectional study was conducted comprising first, second, third and final year medical students studying in Kerala's medical colleges. There are a total of 21 medical colleges in Kerala, including both government and self-financed colleges. All the batches from all medical colleges were included and represented this study population.

We excluded the students who did not consent to undertake the questionnaire and were diagnosed with depression or anxiety before implementing the COVID-19 lockdown in Kerala.

Since all colleges and universities are closed due to the COVID-19 lockdown, students were all at their home stations, did convenient sampling was done based on access to laptops and smartphones and availability of dependable internet connection.

From a previous study done by Nihmath et al the prevalence of depression (above and equal to moderate depression) was found to be 44.5%.¹⁶ Based on these figures with 95% confidence and 10% allowable error, the minimum calculated sample size comes to 480.

Our study plans to include at least 528 students considering a 10% non-responsive rate. Data were collected commencing 8 October 2020 and concluded by 22 October 2020 for a period of 2 weeks.

Procedure

Due to the current lockdown situation, we gave out the questionnaires as google forms. The links were shared via social media platforms like whatsapp and via email to the students.

The questionnaire consisted of three parts: semi-structured and self-related survey questionnaire containing informed consent, questions regarding demographic details; DASS-21 items, developed by Lovibond SH and Lovibond PF (1995), is a set of three self-report scales intended to gauge the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content, scored 0-3.²³ Validity and reliability of DASS-21 have been confirmed by several previous studies.²⁴ Grading of severity of depression, anxiety and stress is shown in Table 1; a question to gather motives that might have caused a sense of apprehension during the COVID-19 lockdown.

The data collection process took two weeks. The collected data will be entered in microsoft excel and analyzed using IBM-SPSS social-21 software.

Table 1: The severity of depression, anxiety and stress increase with an increase in the score (Lovibond and Lovibond 1995).

Score	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+

Variables

Demographic details

Questions included were age, gender, the college they are studying at, year of study of the participants and also if they were previously diagnosed with depression or anxiety.

DASS

We used DASS-21 to assess the depression of the participants, along with anxiety and stress were also found. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content, scored 0-3. To calculate the final score, the scores calculated on DASS-21 was multiplied by 2. The severity of depression, anxiety and stress increases with an increase in the score (Table 1).²³

Statistical data analysis

Data analysis was done using IBM-SPSS-21 software. The frequency of students experiencing different degrees of depression, anxiety and stress was found. Pearson chi square test was used to determine the association of depression, anxiety and stress with the socio-demographic factors. Confidence interval of 95% and significance level

of 0.05 was taken. P value of less than 0.05 was considered statistically significant.

RESULTS

A total of 760 students were invited to partake in this study. Out of which, 702 satisfied the inclusion criteria of this study and completed the valuation, giving a response rate of 92.4%. Baseline characteristics of the participants are described in Table 2.

Out of the 702 participants, 67.4% were females and 32.6% were males. The average age of 21.4 years. The participants included were medical students from Kerala irrespective of the year of study. 31.4% of the participants were students studying in government medical colleges and 65.9% were studying in private self-financing medical colleges.

Table 3 illustrates the percentage of students with different levels of depression, anxiety and stress. On calculating the DASS-21 score for depression, 45% of participant's mental state was normal and depression was scored as 17.4% mild, 24.3% moderate, 6.7% severe and 6.6% extremely severe. Similarly, on calculating the DASS-21 score for anxiety, 66.7% of participant's mental state was normal and anxiety was scored as 9.5% mild, 15.5% moderate, 4.4% severe and 3.9% extremely severe and for

stress, 70.6% of participant’s mental state was normal and stress was scored as 14.4% mild, 8.5% moderate, 4.1% severe and 2.4% extremely severe.

It is observed from Table 4 that 58.4% (122) and 41.7% (87) of 1st year medical students and 57.8% (89) and 37.6% (58) of 2nd year medical students experienced signs of depression and anxiety, respectively.

It is observed from Figure 1, that depression levels were recorded high (mild to extremely severe 55.1%) among medical students compared to anxiety and stress during the pandemic.

The percentage of female students experiencing mild to extremely severe levels of depression, anxiety and stress

are higher compared to the male students (depression 56%, >52.8%, anxiety 34.5%, >31%, stress 30.5%, >27.1%). However, there is no significant difference between male and female students affected by depression (p=0.533), anxiety (p=0.410) and stress (p=0.775) during the pandemic.

The percentage of students studying in a private self-financing medical college experiencing mild to extremely severe levels of anxiety is higher compared to the students studying in government medical colleges (33.5%, >33%). A significant difference is found (p=0.008), implying students studying in private self-financing medical colleges experiences more anxiety compared students at government medical college during the pandemic.

Table 2: Baseline characteristics (n=702).

Variables	Number of students	Mean/Percentage
Age (in years)	702	21.4
Gender		
Male	229	32.6
Female	473	67.4
Type of college		
Government	239	34.1
Private self-financing	463	65.9
Year of study		
1st	209	29.8
2nd	154	21.9
3rd	184	26.2
4th	155	22.1
Supplementary batch		
Yes	69	9.8
No	633	90.2

Table 3: Depression, anxiety and stress among medical students during the COVID-19 pandemic.

	Number of students	Percentage (%)
Depression		
Normal	316	45.0
Mild	122	17.4
Moderate	171	24.4
Severe	47	6.7
Extremely severe	46	6.6
Anxiety		
Normal	468	66.7
Mild	67	9.5
Moderate	109	15.5
Severe	31	4.4
Extremely severe	27	3.8
Stress		
Normal	496	70.7
Mild	101	14.4
Moderate	60	8.5
Severe	29	4.1
Extremely severe	16	2.3

Table 4: Depression and anxiety in different years of study.

Variables	1st year (%)	2nd year (%)	3rd year (%)	4th year (%)
Depression	58.4	57.8	50.6	53
Anxiety	41.7	37.6	26.6	25.8

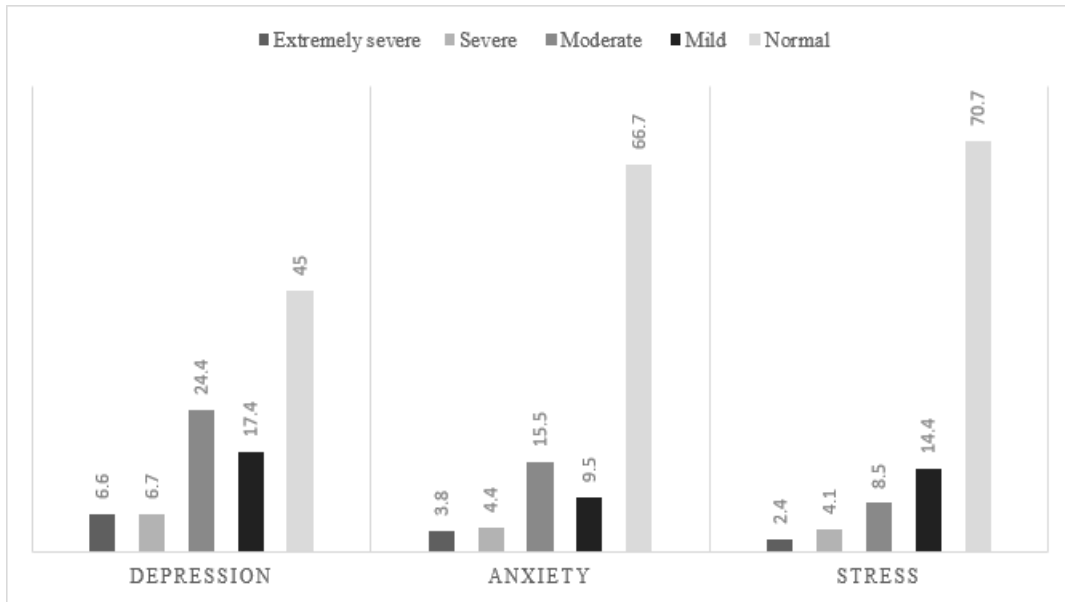


Figure 1: Graph representing levels of depression, anxiety and stress among medical students during COVID-19 pandemic.

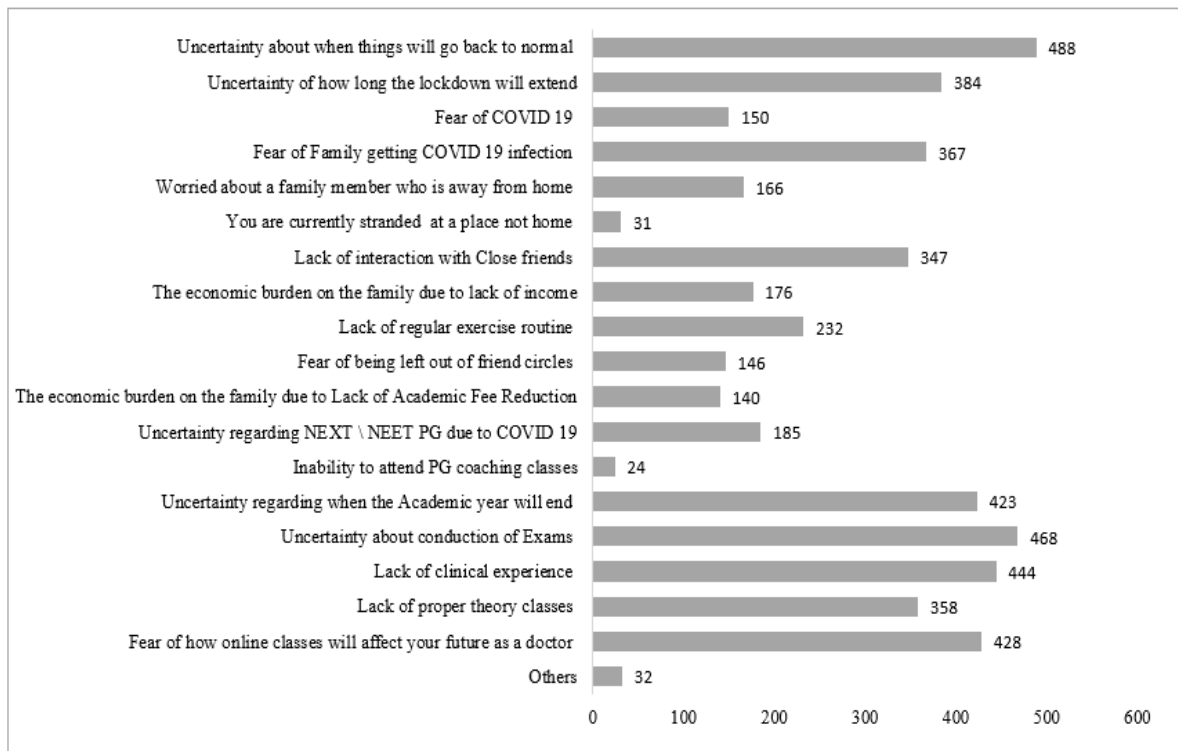


Figure 2: Causes of uneasiness.

A significant difference is found ($p=0.048$) between students of supplementary batch and students of the regular batch and anxiety. Implying that, students of supplementary batch experience more anxiety compared to students of regular batch during the pandemic.

DISCUSSION

This study was conducted during the lockdown after COVID-19 was declared a pandemic by the WHO. All educational institutions were physically closed and teaching only happened online or through assignments for all students including undergraduate medical students. Although the hiatus from college was initially welcomed, the extended periods of lockdown caused mental distress in medical students around the world. The potential reasons for increased anxiety and mental distress reported were inability to focus on studies at home, fear of upcoming exams, lack of interaction with friends and worries related to COVID-19 infection, among others. The study found that depression, anxiety and stress were present in various levels of severity among medical students of Kerala.

The findings of our study were consistent with mental health assessments done during previous infectious epidemics focused on students. A study was done on 763 university students of Hong Kong during the severe acute respiratory syndrome (SARS) epidemic in 2003. It used Zung's self-rating anxiety scale and a perceived stress scale showed increased anxiety and stress in respondents.^{9,10} A UK-based study during the H1N1 outbreak in 2009-2010, using anxiety sensitivity index -3 (ASI-3) and DASS 21 also showed increased levels of depression, anxiety and stress concerning news media and use of hand sanitizers among 315 university students.¹¹

Even though the percentage of female students experiencing moderate to extremely severe depression, anxiety and stress is higher compared to male students in this study, there is no significant difference. Implying that both males and females underwent similar levels of depression, anxiety and stress. Similar results were found in a study done by Rehman et al (depression $p=0.90$, anxiety $p=0.50$, stress $p=0.46$).²⁵ This could be due to the present lockdown and the fear of getting infected with COVID-19 are so inescapable, that similar experiences of distress are evident regardless of gender. However, in a study done by Nihmath et al have shown significant differences in depression and anxiety between genders.¹⁶

This study found that levels of anxiety were significantly increased in medical students of private medical colleges than students of government medical colleges during the lockdown. Similar higher anxiety scores were found in medical students in the private sector of Karachi, Pakistan and Nigeria.^{8,26} This could be due to pressure of studies and passing exams, higher amount of fees paid by the students, increased pressure from parents, as well as pressure of living up to the expectations of the family.

Many of the students were also staying away from their families.

This study reveals that students of supplementary batch experienced more anxiety than the ones in the regular batch. This could be due to the fact that supplementary batch students are behind their counterparts in academic activities because of a 6 month gap imposed by the medical education regulatory authorities in India. There was a significant delay and change in the exam timetable due to COVID-19 restrictions. This could have further extended the academic gap, leading to apprehension in students over the completion of their course. This could have increased uncertainty leading to resultant anxiety. The supplementary batch had additional clinical postings before the exams to compensate for classes lost. So, fear of catching COVID-19 during clinical rotations and while attending the exams (which were held offline) could have added to their anxiety. This is strengthened by the study done by Nakhostin-Ansari et al where it was found that higher level of anxiety was present in medical students who continued their high-risk clinical postings during the pandemic.²⁷

The qualitative data analysis done on our study showed the following findings to be noteworthy (as shown in Figure 2). Uncertainty about when things will go back to normal (488 responses); uncertainty about the conduct of exam (468 responses); lack of clinical experience (444 responses); fear of how online classes will affect your future as a doctor (428 responses); uncertainty regarding when the academic year will end (423 responses).

Limitations

The snowball sampling strategy was initiated within the social network of the participants and may at times not be representative of the general population. All the data was collected via an online questionnaire. Hence dependability and legitimacy of the responses may have limitations.

CONCLUSION

In this study, we found that the presence of depression, anxiety and stress was prevalent among medical students. There was no significant difference in the prevalence of these factors among males and females during the lockdown due to the pandemic. Increased levels of anxiety were found among students at private self-financing medical colleges. Levels of anxiety were also increased among students belonging to the supplementary batches than the regular batches.

It was also established that depression, anxiety and stress were co-existing and related to each other among the medical students. It needs to be identified and addressed early with counselling and ensuring that the students have space for leisure in their routine.

This study emphasizes the importance of mental health in the life of medical students. There is a need for improvement in mental health coping strategies to help students face their challenges better in crises similar to COVID-19 pandemic. This will strengthen them psychologically during their course of study and professional lives later on. It will be prudent to mention that the institutes have to impart appropriate education and take necessary measures to achieve this.

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