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Original Research Article

The prevalence of anxiety and depression among MBBS students in the medical colleges in Thrissur district, Kerala during the shutdown of colleges due to the COVID-19 pandemic

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ABSTRACT

Background: The medical students of India, who are already facing psychological challenges due to their existing study system will be much more significantly affected, including their academics and social interactions, because of the lockdown due to the COVID-19 pandemic. The aim of this study was to find the prevalence and determinants of anxiety and depression among MBBS students due to this.
Methods: This was a cross sectional study and the setting were two medical colleges in Thrissur district, Kerala namely, Government Medical College and Amala Institute of Medical Sciences. The study subjects were the students undergoing MBBS course in these two medical colleges and the data was collected between July and December, 2020. The sample size was calculated as 200. Hospital anxiety and depression scale (HADS) questionnaire and attitude towards mental illness scale (AMI) questionnaire was used to obtain data along with relevant sociodemographic details. Stratified random sampling was used.
Results: 26.2% and 13.1% of the participants had abnormal scores for anxiety and depression respectively. Out of all the participants that underwent isolation, 71.4% and 61.9% of them had abnormal scores for anxiety and depression respectively. Out of all the participants whose residential area had been a containment zone, 68% had normal score for depression. A minority of participants (8%, 3.3%) had unfavourable responses regarding their attitude towards mental illnesses.
Conclusions: Our study established a significant prevalence of anxiety and depression among the participants and these results may be generalised to all Indian medical students. This study also showed that their attitude towards mental illness were not appropriate.

Keywords: Anxiety, Depression, Attitude, Mental illness, Medical students, Lockdown

INTRODUCTION

Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest. The common features of all depressive disorders are sadness, emptiness, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function.[1] Depression is a widespread chronic medical illness that can affect thoughts, mood, and physical health. It is characterized by low mood, lack of energy, sadness, insomnia, and an inability to enjoy life.[2]

Anxiety is defined as an abnormal and overwhelming sense of apprehension and fear often marked by physical signs (such as tension, sweating, and increased pulse rate), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it.[3] Anxiety disorders differ from normal feelings of nervousness or anxiousness and involve excessive fear or

anxiety. Anxiety disorders are the most common of mental disorders and affect nearly 30% of adults at some point in their lives.[4]

The global prevalence of depression among medical students was recently estimated to be 28.0% and that of anxiety was estimated to be 33.8%.[5,6] A high prevalence of anxiety and depression among medical students has been reported worldwide.[7] An increased prevalence compared with age-matched peers in general population and with non-medical students has been reported in the literature.[7]

A number of personal and institutional factors may contribute to the worsening of medical students' mental health. Medical schools sometimes provide a toxic psychological environment where academic pressure, workload, financial hardships, sleep deprivation are stressors factors.[8] Depression and anxiety symptoms carry impairment to medical students, including poor academic performance, dropouts, substance abuse and suicide. Moreover, poor mental health is a predictor of later distress in the physician.[8] Medical students' attitude toward mental illness may be varying among different societies and cultures.[9] It may affect their health seeking behaviour.

In order to curb the spread of COVID-19 in the country, the Government of India announced a nationwide lockdown on the evening of 24 March 2020.[10] Kerala went into an early shut down of its educational institutions compared to other parts of India.[11] The medical colleges along with other educational institutions in Kerala closed down in early weeks of March 2020 with no certainty of reopening.[12]

The prolonged duration of the lockdown might have affected the mental health of the medical students among the student body. Multiple studies conducted in various medical colleges around the world have concluded that a substantial proportion of medical students suffered significant levels of Anxiety, Stress and Depression caused due to the COVID-19 lockdown period.[13-17] Studies also claim that there is a female predominance to this issue.[18,19] Fear of contracting COVID-19 infection, concerns about family members' health, overwhelming amount of information present on social media and quarantine, self-isolation and social distancing norms have all been found to be negatively impacting the mental health of medical students.[13,20-25]

Despite the initiation of alternative teaching methods like online classes, the apprehension of these students on various matters like effectiveness of the alternative teaching methods, conduct of examinations, and completion of the course could be on the rise. A study conducted among Caribbean medical students found out that alternative teaching methods are not considered effective compared to physical offline classes.[26] Multiple studies concluded that completion of their course, future studies, and employment were a major concern among medical students.[20,23,24]

So, its pivotal to assess the mental health of the medical students their knowledge of mental illnesses during these testing times and hopefully support the findings of the previously conducted studies in order to raise awareness towards the mental health of medical students and the whole student body in general. The evidence thus generated can also be used to create supportive mental health care institutional structures for medical students.

Through this study, we aimed to find the prevalence of anxiety and depression among MBBS students in the medical colleges in Thrissur district, Kerala during the shutdown of colleges due to the COVID-19 pandemic, to find the determinants of anxiety and depression among MBBS students in the medical colleges in Thrissur district and to ascertain the attitude of medical students towards mental health.

METHODS

This study was designed as a cross sectional study and the setting were the two medical colleges in Thrissur district in Kerala namely, Government Medical College, Thrissur and Amala Institute of Medical Sciences, Thrissur. The study population were the first year to final year students in these two medical colleges and the study subjects were the students undergoing MBBS course in these two medical colleges in Thrissur district. The exclusion criteria were those who are not willing to give consent and the house surgeons/interns.

The sample size was calculated using the formula given,

$$Sample\ size = \frac{4PQ}{I^2}.$$

Prevalence of anxiety among medical students in India was estimated to be 34.5%.[27] It was calculated by the formula given below,

$$Prevalence\ of\ anxiety = \frac{4 \times 34.5 \times 65.5}{6.9 \times 6.9} = 190.$$

The final sample size was fixed as 200. The sampling technique used was stratified random sampling with the year of admission and gender used as the strata.

Self-administered validated questionnaires were used as the data collection technique. HADS and misconceptions and social restriction domain of the attitude towards mental illness scale (AMI) was used to obtain data.

The HADS is a 14-item measure designed to assess anxiety and depression symptoms in medical patients, with emphasis on reducing the impact of physical illness on the total score.[28] Although the term hospital in its title might suggest that it was only valid in such a setting but many studies conducted throughout the world have confirmed that it was valid whenever used in community settings. The HADS consisted of two subscales: anxiety and

depression. Each item was rated on a four point scale, giving maximum scores of 21 for anxiety and depression each. Scores of 11 or more on either subscale are considered to be a significant case of psychological morbidity, while scores of 8-10 represent borderline case and scores of 0-7 represent normal case.[29]

The original AMI questionnaire had 27 items in total and it was developed by the UK department of health, based on the 40-item community AMI.[30] Few elements from the misconceptions and social restriction domain of the questionnaire were used in this study to measure the participant's attitudes towards mental illness.[31] The items were rated on a 4-point scale ranging from 1=strongly agree, 2=agree, 3=disagree and 4=strongly disagree.

Data regarding various relevant sociodemographic features were collected. In addition to HADS and AMI questions, additional information such as age and gender of the participants, type of college, education and occupation of parents, whether the parents are working abroad, and whether the pandemic has affected their occupations were also collected. The data for the study was collected between July 2020 and December 2020.

For analysis the data was entered into an excel sheet. Categorical variables were expressed as proportions and quantitative variables were expressed as mean and standard deviation. The statistical test of significance used were Chi square test for categorical variables and students t test for quantitative variables. Non parametric tests were used for skewed distributions. Analysis of data was done using appropriate statistical software.

Institutional ethics committee clearance was obtained. Informed consent was obtained from the participants. Confidentiality was ensured and maintained throughout the study.

RESULTS

There was a total of 275 study participants in the study. Of the total 275 study participants, 101 (36.7) were male and 174 (63.3) were female (Table 1). The mean age of the study participants was 21.16 with a standard deviation of 1.49. the maximum age of the study participant was 30 and the minimum was 18. Median age was 21. Medical students from government and private medical colleges were part of the study; 140 (50.9%) study participants were from government institutions and 135 (49.1%) study participants were from private institutions. Students who sought admission for medical degree in the four consecutive years from 2016 to 2019 were part of the study.

Of the total 275 students, 74 (26.9%) gained admission in the year 2016. The number of study participants who gained admission in the years 2017, 2018, and 2019 were 54 (19.6%), 59 (21.5%), 88 (32%). We enquired about the educational status of the parents of the study participants. Majority of the study participants' fathers were graduates (107, 38.9%) or post graduates (98, 35.6%).

Table 1: Characteristics of the study participants (n=275).

Variable and category	Frequency (N)	Percentage (%)
Gender		
Male	101	36.7
Female	174	63.3
Type of college		
Government	140	50.9
Private	135	49.1
Year of admission		
2016	74	26.9
2017	54	19.6
2018	59	21.5
2019	88	32
Education of father		
Lower primary	3	1.1
Upper primary	9	3.3
High School	32	11.6
Pre-degree/plus two	37	13.5
Degree	107	38.9
Post-graduation and above	87	31.6
Education of mother		
Lower primary	3	1.1
Upper primary	6	2.2
High school	23	8.4
Pre-degree/plus two	35	12.7
Degree	110	40.0
Post-graduation and above	98	35.6
Occupation of father		
Professional	110	40
Semi professional	24	8.7
Arithmetic skill jobs	80	29.1
Skilled worker	15	5.5
Semiskilled worker	12	4.4
Unskilled worker	3	1.1
Unemployed	31	11.3
Occupation of mother		
Professional	45	16.4
Semi professional	42	15.3
Arithmetic skill jobs	53	19.3
Skilled worker	4	1.5
Semiskilled worker	0	0
Unskilled worker	1	0.4
Unemployed	130	47.3
Father/mother working abroad		
Yes	51	18.5
No	224	81.5
Whether parent or sibling is a health care worker		
Yes	50	18.2
No	225	81.8

Among the study participants, 51 (18.5%) had any of the parents working abroad. Among these 51 study participants who had any of the parents working abroad, 8 reported that their parents had to return home permanently on account of the COVID-19 pandemic.

Among the total 275 study subjects, 50 (18,2%) study subjects had a sibling or parent who was a health care worker.

Among the total study participants 7.6% (21) reported that any of their parents lost job as a result of the COVID-19 pandemic and 7.6% (21) gives history of undergoing isolation after becoming a primary contact of a COVID-19 case. Of the total study participants 109 (39.6%) reported that their place was had been a hotspot/containment zone. One study participant gives history of contracting the disease and 4 (1.5%) study subjects gives history of parents/siblings contracting COVID-19 (Table 2).

Sixty-four (23,3%) of the study participants worried that their parents might lose job due to the pandemic. There were 220 (80%) study participants who worried about the possible delay in completion of your MBBS course on account of the pandemic. Many of them (191, 69.5%) worried that the pandemic might affect your career badly (Table 2).

Majority (217, 78.9%) were worried about the inability to meet your collegemates on account of the suspension of regular academic classes. Contracting the COVID-19 disease was a source of worry for only 127 (46.2%) students but lion share of students (222, 80.7%) were worried about the possibility of their family members contracting the disease. The possible rescheduling of exams; the transition to online classes; the financial constraints to pay tuition fees were a source of worry for 173 (62,9%); 175 (63.6%); 113 (41.1%) study participants respectively (Table 2).

We used hospital anxiety and depression scale to assess anxiety and depression levels of the study participants. Analysing the anxiety scores of the study participants; 72 (26.2%) had scores of 11 and above making them possible cases of anxiety disorder. Participants with a score ranging from 8 to 10 were classified as borderline case and 64 (23.3%) students were identified as borderline cases of anxiety. 139 (50.5%) students had normal scores (Table 3).

Looking into the depression scores obtained on hospital anxiety and depression scale, 36 (13.1%) cases of depression were identified. Borderline cases of depression constituted 25.8% (71) of the study subjects. Among the total study subjects, 168 (61.1%) had normal scores for depression (Table 3).

The factors that might be associated with abnormal scores on HADS scale for anxiety and depression were looked into. Study subjects with a score of 8 and above were treated as having abnormal scores for depression and anxiety on HADS scale.

The fact the study participant had to undergo isolation after becoming a primary contact of a COVID-19 case was associated with abnormal anxiety score on HADS scale, as indicated by the p value of 0.04. Of the total 21 study participants who had underwent isolation 15 (71.4%) had abnormal scores for anxiety (Table 4).

"Had to undergo isolation after becoming primary contact of a COVID-19 case", "place of residence had been a hotspot/containment zone" were the factors associated with abnormal HADS score for depression. Among the 21 study participants who had underwent isolation, 13 (61.9) had abnormal scores for depression. Of the 166 study participants who reported that their area of residence had been a hot spot/containment zone, majority 113 (68%) had normal HADS score for depression (Table 5).

Majority of the study participants either disagreed (182, 66.2%) or strongly disagreed (89, 32.4%) with the statement that mental hospitals are the only means of treating people with mental illness while a minority (4, 1.5%) strongly agreed with the statement. Among the whole study participants 61.8% (170) and 36.7% (101) disagreed and strongly disagreed with the statement *"anyone with a history of mental problems should be excluded from the public/civil service."* When posed with the statement *"one of the main causes of mental illness is a lack of self-discipline and will-power"*, strong agreement was shown by 22 (8%) of the study participants; 206 (74.9%) and 47 (17.1%) study participants disagreed and strongly disagreed with the statement. Strong agreement was shown by a minority of the students (9, 3.3%) to the statement "there is something about people with mental illness that makes it easy to identify them from normal people." Rest of the students either disagreed (220, 80%) or strongly disagreed (46, 16.7%) with the comment. The comment *"People with mental illness should not be given any responsibility"* raised strong disagreement from 77 (28%) study participants and disagreement from 195 (70.9%) study participants (Table 6).

Table 2: COVID-19 pandemic experience of the study participants (n=275).

Variable	Frequency (N)	Percentage (%)
Any of the parents losing job as a result of the pandemic	21	7.6
Had to undergo isolation after becoming primary contact of a COVID-19 case	21	7.6
Your place of residence had been a hotspot/containment zone	109	39.6
Have history of contracting COVID-19 disease	1	0.4

Continued.

Variable	Frequency (N)	Percentage (%)
Parents/siblings have history of contracting COVID-19 disease	4	1.5
Worried that parents might lose job due to the pandemic	64	23.3
Worried about the possible delay in completion of your MBBS course on account of the pandemic	220	80
Worried that the pandemic might affect your career badly	191	69.5
Worried about the inability to meet your collegemates	217	78.9
Worried about contracting the COVID-19 disease	127	46.2
Worried about the possibility of their family members contracting the disease	222	80.7
Worried about the rescheduling of exams	173	62.9
Worried about the transition to online classes	175	63.6
Worried about the financial constraints to pay tuition fees	113	41.1

Table 3: The categorisation of study participants based on the HADS.

Type of disease and category	Frequency	Percentage
Anxiety		
Normal	139	50.5
Borderline case	64	23.3
Case	72	26.2
Depression		
Normal	168	61.1
Borderline case	71	25.8
Case	36	13.1

Table 4: Factors associated with an abnormal score for anxiety on HADS scale.

Parameters	Abnormal score for anxiety on HADS scale	Normal score for anxiety on HAD scale	P value*
	N (%)	N (%)	
Male gender	45 (44.6)	56 (55.4)	0.13
Studying in a private college	68 (50.4)	67 (49.6)	0.81
Any of the parents working abroad	26 (51.0)	25 (49.0)	0.47
Had to return from abroad permanently as a result of COVID-19 pandemic	6 (75.0)	2 (25)	0.17
Parent or sibling being a health care worker	19 (38.0)	31 (62)	0.09
Any of the parents losing job as a result of the pandemic	14 (66.7)	7 (33.3)	0.16
Had to undergo isolation after becoming primary contact of a COVID-19 case	15 (71.4)	6 (28.6)	0.04#
Your place of residence had not been a hotspot/containment zone	75 (45.2)	91 (54.8)	0.81
Have history of contracting COVID-19 disease	0	1 (100)	1
Parents/siblings have history of contracting COVID-19 disease	1 (25.0)	3 (75)	0.62

*Chi square test, #significant p value

Table 5: Factors associated with an abnormal score for depression on HADS scale.

Parameters	Abnormal score for depression on HADS scale	Normal score for depression on HAD scale	P value*
	N (%)	N (%)	
Male gender	38 (37.6)	63 (62.4)	0.42
Studying in a private college	79 (58.5)	56 (41.5)	0.23
Any of the parents working abroad	23 (45.1)	28 (54.9)	0.34

Continued.

Parameters	Abnormal score for depression on HADS scale	Normal score for depression on HAD scale	P value*
	N (%)	N (%)	
Had to return from abroad permanently as a result of COVID-19 pandemic	4 (50)	4 (50)	0.38
Parent or sibling being a health care worker	14 (28.0)	36 (72)	0.11
Any of the parents losing job as a result of the pandemic	11 (52.4)	10 (47.6)	0.14
Had to undergo isolation after becoming primary contact of a COVID-19 case	13 (61.9)	8 (38.1)	0.04#
Your place of residence had been a hotspot/containment zone	53 (31.9)	113 (68)	0.01#
Have history of contracting COVID-19 disease	0	1 (100)	1
Parents/siblings have history of contracting COVID-19 disease	0	4 (100)	0.67

*Chi square test, #significant p value

Table 6: Attitude of the study participants towards mental illness (frequency is provided along with row percentages given in brackets).

Item	Strongly agree	Agree	Disagree	Strongly disagree
	N (%)	N (%)	N (%)	N (%)
Mental hospitals are the only means of treating people with mental illnesses	4 (1.5)	0	182 (66.2)	89 (32.4)
Anyone with a history of mental problems should be excluded from the public/civil service	4 (1.5)	0	170 (61.8)	101 (36.7)
One of the main causes of mental illness is a lack of self-discipline and will-power	22 (8)	0	206 (74.9)	47 (17.1)
There is something about people with mental illness that makes it easy to identify them from normal people	9 (3.3)	0	220 (80)	46 (16.7)
People with mental illness should not be given any responsibility	3 (1.1)	0	195 (70.9)	77 (28)

DISCUSSION

Various studies conducted all over the world, during the pre-pandemic period, had demonstrated that there was a significant prevalence of anxiety and depression among medical students.[5,6,14,16,27] A very recent study, in terms of the COVID-19 pandemic, conducted by Quek et al in the month of February of 2019 found out that the prevalence of anxiety among medical students was around 33.8%.[6] A review article on the same subject showed that the pooled prevalence rate of depression, from 16 studies, was 39.2% and the pooled prevalence rate of anxiety, from four studies, was 34.5%, conducted in the year 2017.[27]

The prevalence of anxiety and depression in medical students during the pandemic was assessed in some countries and various parts of India and these studies demonstrated a high prevalence for both anxiety and.[18,20,22,24,32,33] The study conducted in the Institute of Medical Sciences, Banaras Hindu University, Varanasi in April 2020 showed prevalence of anxiety and depression among 9.8% and 7.3% of the participants which was relatively low compared to our study and other studies.[19]

Our study was able to conclude that anxiety and depression was prevalent in the medical student fraternity. We were able to find that 26.2% of the participants had abnormal scores for anxiety, making them possible cases of anxiety disorder and 13.1% of the participants had abnormal scores for depression, making them possible cases of depression. The study conducted by Vala et al demonstrated similar prevalence of depression in medical students compared to our study.[17]

The studies conducted elsewhere showed that the female gender, worry about contracting the disease, concerns about families and friends, concerns about the future of studies, clinical skills and experience, effectiveness of alternate teaching methods and disturbed interpersonal relationships had a negative impact on the mental health of the medical students that participated, all of which can be compared to this study.

Majority of these studies were conducted in the early months of the lockdown whereas our study was conducted relatively later. Thus, it can be assumed that the lower prevalence of anxiety and depression among our participants could be due to the timing of data collection. As the time had passed, majority of students might have started coping with psychological distress induced by the lockdown. A lot of the uncertainties that were present during the initial phase of the lockdown regarding the conduct and effectiveness of classes, exams, coping with the alternative teaching methods and staying away from colleagues, etc would have settled.

We were also able to identify that out of all the participants that underwent isolation, 71.4% of them had abnormal HADS scores for anxiety and 61.9% of them had abnormal HADS scores for depression. Similar to our findings, a study conducted by Lyons et al showed that 42% of the participants had concerns about being in self isolation during the COVID-19 pandemic.[20] Also, out of all the participants who reported that their area of residence had been a hot spot/containment zone, 68% had normal HADS score for depression, which was found to be significant.

There have been studies conducted among medical students regarding their knowledge and attitude towards mental illnesses and have established unsatisfactory conclusions regarding the same.[34,35] The AMI questionnaire has been used in many settings to assess the attitude of medical students towards mental illnesses, and these studies have generally showed that majority of the students showcase a favourable and ideal attitude whereas there is still a minority of students whose attitude towards mental illnesses are unfavourable.[36–39]

8% of the study participants showed strong agreement when posed with the statement “one of the main causes of mental illness is a lack of self-discipline and will-power” and 3.3% showed strong agreement to the statement “there is something about people with mental illness that makes it easy to identify them from normal people.”

Studies comparing the prevalence of anxiety and depression before and after the pandemic has concluded that there has been a significant increase in prevalence of the same among medical students.[22]

Our study has been able to establish a significant prevalence of anxiety and depression among the population that participated and these results can be generalised to all the medical students of the Kerala State and to that of India to an extent. This study also showed that the attitude towards mental illness were not appropriate according to standardised assessment tools, which needs rectification in ways of effective and practical mental health awareness programs.

There could be a few limitations of the study. Few of the participants might have been forced to give socially acceptable responses. Another major factor that needs to be looked into, but unfortunately is a very tedious process, is the effect of alcohol, tobacco and other drug use among these students and its effect on their mental health.

Concerned authorities including the institution, university and the government need to look into the matter of the mental wellbeing of these medical students as they are the future of the health sector of the country who will play a very crucial role in the proper functioning of the health system, especially in testing times like these, where the mental as well as the physical health of the medical professionals needs to be in good state, which will ultimately reflect on that of the patients.

CONCLUSION

Our study established a significant prevalence of anxiety and depression among the participants and these results may be generalised to all Indian medical students. This study also showed that their attitude towards mental illness were not appropriate.

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