

Anxiety and Depression among Medical Students of Karachi During the Covid-19 Pandemic

Sannia Perwaiz Iqbal, Navaid Siddiqui, Faryal Gul, Sajid Abbass Jaffri

ABSTRACT

Objective: To determine the prevalence of anxiety and depression among medical students of Bahria University Health Sciences (BUHS)

Study Design and Setting: Cross-Sectional survey conducted from January to June 2021 at BUHS, Karachi

Methodology: Two hundred and sixty one medical students (79 male and 182 female), were assessed for anxiety and depression using Generalised Anxiety Disorder 7 (GAD-7) and Patient Health Questionnaire 9 (PHQ-9) respectively. Chi Square test was used to check the association of anxiety and depression with gender and year of study. P-value =0.05 was considered significant.

Results: Out of 261 participants, 76.8% of medical students had anxiety. Among them 21.1% had mild, 24.5% had moderate and 27.2% had severe anxiety. 83.5% of students had depression, of which 24.9% met the criteria for mild, 20.7% for moderate, 21.1% for moderate-severe and 16.9% students for severe depression. Chi Square test indicated significant associations between anxiety and gender, with 29.7% of female students having severe anxiety as compared to 21.5% of male students; and between depression and gender, with 24.1% male students having moderate depression as compared to 19.2% of female students.

Both depression and anxiety were more prevalent among first year students with 31.7% students having depression and 27.5% having anxiety.

Conclusion: Anxiety and depression were more prevalent among first year students with anxiety being more prevalent in female and depression being more prevalent in male students.

Keywords: Anxiety, COVID-19, depression, medical students, pandemic,

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INTRODUCTION:

The COVID-19 pandemic has had a profound impact on healthcare systems. During the COVID-19 pandemic, psychiatric symptoms such as anxiety and depression have afflicted many people worldwide. A meta-analysis found the prevalence of anxiety in the general population to be

31.9 % and of depression to be 33.7% as a result of the COVID-19 pandemic.¹ Apart from the general public, certain populations are more susceptible to mental health problems during the pandemic which include the healthcare workers, college/ university students, people having suffered financial loss or loss of loved one due to the pandemic, and people with pre-existing mental health conditions.²

Evidence emerged from all over the world, suggesting that the pandemic has triggered a wave of mental health issues among the younger population, with anxiety and depression becoming increasingly more prevalent among university students.

Studies show that the prevalence of stress, anxiety and depression among the student population was especially high during the pandemic. Medical students are particularly more prone to developing mental health disorders, the commonest of which are anxiety and depression. Quek et al reported a 33.8% global prevalence of anxiety among medical students.³ In another meta-analysis, the overall prevalence of depression among medical students was estimated to be 27.2%.⁴

Anxiety and depression are significant mental health

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conditions, common among medical students in Pakistan. However, very few students seek treatment, owing to the stigma related to mental health illness. A study from Pakistan found depression to be present in 37.46% among medical students with 14% of the students having with moderate to severe depression and 19% with having moderate to severe anxiety.⁵ Another study conducted in Pakistan to assess the impact of COVID-19 on the mental health of university students, reported that around 34% of the students were suffering from anxiety whereas 45% were suffering from depression.⁶

Study from Bangladesh reported 44% of university students were suffering from severe anxiety while 48% suffered from moderate anxiety during the pandemic.⁷ According to a study from the USA, during the COVID-19 pandemic major depressive disorder was prevalent among 35% of university students while generalized anxiety disorder was prevalent among 39% of university students.⁸ A study conducted in China reported that 24.9% of the medical college students (aged 19–25 years) were experiencing heightened anxiety during the COVID-19 pandemic.⁹

During the recent pandemic, it can be expected that the mental health of our medical students has also been adversely affected. The first step to take here is to recognize these illnesses among our student population so that timely mental health support interventions can be offered. As the pandemic continues, it is imperative to recognize its impact on the mental health of our students and offer early interventions. The purpose of this study was to screen our medical students for depression and anxiety during the COVID-19 pandemic, so that these disorders could be promptly recognized and appropriate treatment could be offered along with ongoing strengthened mental and psychosocial support.

METHODOLOGY:

This study was conducted at the Bahria University Health Sciences, Karachi from January 2021 to July 2021 after obtaining ethical approval from the institutional review board committee. (Ref: ERC 37/2021).

The study design was a cross-sectional survey. Sample size was determined by the WHO software for sample size calculation. From literature review, we found that the prevalence of anxiety among university students during the COVID-19 pandemic was 34%.⁷ Therefore, with 5% margin of error at 95% confidence level the sample size came out to be 261 participants. Our inclusion criteria was both male and female medical students (MBBS), from 1st, 2nd, 3rd, 4th and 5th year, who gave their consent to participate in the study. Students from dental and physical therapy department were excluded from the study. We approached 261 medical students through non-probability convenience sampling to participate in the study after explaining the purpose of this study and obtaining their informed consent. The questionnaire of the study was self-administered and

comprised of three sections. The student's demographic details and questions regarding their experience of the COVID-19 pandemic were included in section one. Section two included the Generalized anxiety disorder scale (GAD-7)¹⁰ and Section three included the Patient health questionnaire (PHQ-9).¹¹ Both GAD-7 and PHQ-9 are validated screening tools for anxiety and depression, respectively. Anxiety symptoms in our study were assessed using the seven-item Generalized Anxiety Disorder (GAD-7; range 0–21). The severity of symptoms of anxiety is interpreted as normal (0–4), mild (5–9), moderate (10–14), and severe (15–21) anxiety.¹⁰ Depressive symptoms were assessed using the nine-item Patient Health Questionnaire (PHQ-9).¹¹ The total score range is 0–27 and is interpreted as normal (0–4), mild (5–9), moderate (10–14), moderately severe (15–21) and severe (22–27) depression. Data were entered and analyzed in SPSS[®] version 23. Frequencies with percentages were reported for baseline characteristics of students, while means with standard deviation were the parameters provided for age, GAD-7 and PHQ-9 scores. Pearson Chi Square test was used to check the association of anxiety and depression with gender and year of study. P-values less than 0.05 were considered statistically significant. Bar diagram and pie chart were also used to give graphical presentation of GAD-7 and PHQ-9 outcomes respectively.

RESULTS:

In the present study there were two hundred and sixty-one (261) students of which 69.7% were females. On average, 46% students participated from first year of medicine. Mean age of students was 21.02 (SD=±2.1) years. Out of all the recruited students, 77.4% students agreed that the COVID-19 pandemic had affected their mental health, 5% had suffered from COVID-19 symptoms, 10.7% had history of testing positive for COVID-19. Moreover, 4.2% had tested positive for COVID-19 antibodies, 58.2% reported that someone close to them had been infected with COVID-19, 27.2% of the students reported that someone close to them had died due to the COVID-19 illness, and 8.4% reported having had direct contact with someone who became infected with COVID-19. Regarding prior history, 21.1% said they had history of being diagnosed with depression or anxiety disorder, while 5% had prior history of smoking. (Table-1)

In the present study, 76.8% students were diagnosed with anxiety, and among them 21.1% (n= 55) had mild, 24.5% had moderate and 27.2% were found to have severe level of anxiety. The mean score of GAD-7 was 10.0 (SD=±6.47) units on average.

Graphical representation GAD-7 outcomes is indicated by the Pie chart diagram given below.

Figure 1. Pie chart given below indicates the graphical representation. In our study, 83.5% students were diagnosed with depression and among them 24.9% were suffering from mild depression, 20.7% were suffering from moderate

depression, 21.1% suffered from moderate to severe depression while 16.9% students were found to have severe depression. The mean PHQ-9 score of students was 11.98 (SD=±6.95) units on average.

Figure 2. Bar chart diagram given below indicates the outcomes of PHQ-9. The association of anxiety and depression with respect to gender is reported in Table-2.

In our study, among male students, 21.5% were found to have severe anxiety, 13.9% had moderate anxiety and 19.1% had mild anxiety. With regards to depression, mild depression was found in 21.5%, moderate depression in 24.1%, moderately severe depression in 8.9% and severe depression in 13.9% of male students respectively.

Among female students, 29.7% were suffering from severe anxiety, 29.1% were suffering from moderate, while 22% had mild anxiety. Regarding depression among female students, 26.4% had mild depression, 19.2% had moderate depression, 26.4% had moderately-severe, while 18.1% had severe depression. Pearson Chi Square test showed significant association of anxiety and depression with gender with $p < 0.01$

The association of anxiety and depression with respect to students' year of study is reported in Table-3. According to the findings, 27.5% students from 1st year, 19.2% of students from 2nd year, 11.8% from 3rd year, 17.6% from 4th year and 14.1% from 5th year were suffering from mild anxiety. 21.7% students from 1st year, 38.5% of students from 2nd year, 17.6% from 3rd year, 17.6% from 4th year and 20.6% from 5th year were suffering from mild anxiety, 27.5% students from 1st year, 19.2% of students from 2nd year, 11.8% from

3rd year, 17.6% from 4th year and 28.1% from 5th year were suffering from moderate anxiety, whereas 15.8% from 1st year, 34.6% from 2nd year, 17.6% from 3rd year, 20.6% from 4th year, and 28.1% from 5th year were found to have severe anxiety. A significant association was observed between anxiety and year of study. ($p=0.008$).

Similarly, in the first year of medicine, there were 31.7% students whereas 7.7% students from 2nd year, 29.4% from 3rd year, 23.5% from 4th year and 18.8% students from 5th year suffering from mild depression. 17.5% students from 1st year, 26.9% of students from 2nd year, 23.5% from 3rd year, 17.6% from 4th year and 23.4% from 5th year were suffering from moderate depression. Moderate-severe depression was found in 13.3% students from 1st year, 42.3% from 2nd year, 23.5% from 3rd year, 20.6% from 4th year, and 26.6% from 5th year were found to have severe anxiety. 13.3% students from 1st year, 19.2% of students from 2nd year, 11.8% from 3rd year, 20.6% from 4th year and 28.1% from 5th year were suffering from severe depression. 13.3% from 1st year, 15.4% from 2nd year, 5.9% from 3rd year, 20.6% from 4th year, and 21.9% from 5th year were found to have severe depression. Pearson Chi Square test showed a significant association of depression with year of study ($p=0.012$).

DISCUSSION:

The COVID-19 pandemic affected millions of people across the globe, especially healthcare workers and doctors in training, bearing the burden of affected patients and sustaining themselves during these difficult times. Our study sheds light on how the COVID-19 pandemic has negatively

Table 1: Baseline Characteristics of Studied Samples (n=261)

Characteristics		n	%
Gender	Male	79	30.3
	Female	182	69.7
Year of Study	1st year	120	46.0
	2nd year	26	10.0
	3rd year	17	6.5
	4th year	34	13.0
	5th year	64	24.5
Age (years)	Mean (±SD)	21.02	SD= ±2.1
Has your mental health been affected by the COVID-19 pandemic?	Yes	202	77.4
Do you currently suffer from any COVID-19 symptoms?	Yes	13	5.0
Have you ever tested positive for COVID-19?	Yes	28	10.7
Have you ever tested positive for COVID-19 antibodies?	Yes	11	4.2
Has someone close to you been infected with COVID- 19?	Yes	152	58.2
Has a person close to you died in the course of a COVID-19 disease?	Yes	71	27.2
Have any of the people with whom you had direct contact in the past two weeks become infected with COVID-19?	Yes	22	8.4
Have you ever been diagnosed by a doctor or therapist with depression or anxiety disorder?	Yes	55	21.1
Do you smoke?	Yes	13	5.0

Figure 1: Anxiety Using GAD-7

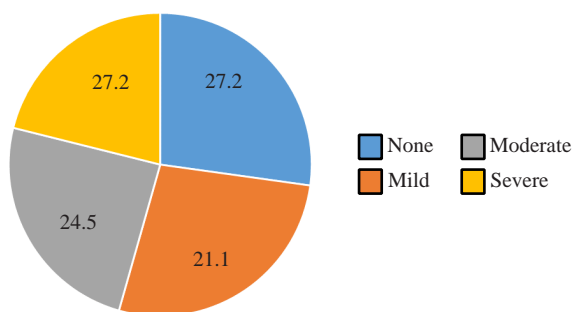


Figure 2: Depression using PHQ-9

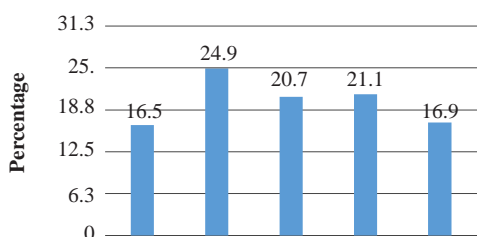


Table 2: Association of Depression and Anxiety with Gender

Outcomes		Male		Female		p-value
Anxiety	None	36	(45.6)	35	(19.2)	<0.01*
	Mild	15	(19.0)	40	(22.0)	
	Moderate	11	(13.9)	53	(29.1)	
	Severe	17	(21.5)	54	(29.7)	
Depression	None (0 - 4)	25	(31.6)	18	(9.9)	<0.01*
	Mild (5 - 9)	17	(21.5)	48	(26.4)	
	Moderate (10 - 14)	19	(24.1)	35	(19.2)	
	Moderately severe (15 - 19)	7	(8.9)	48	(26.4)	
	Severe (20 - 27)	11	(13.9)	33	(18.1)	

*p<0.05 was considered significant using Pearson Chi Square test

Table 3: Association of Anxiety and Depression with year of Study

Outcomes		Year of Study										p-value
		1 st Year		2 nd Year		3 rd Year		4 th Year		5 th Year		
		n	%	n	%	n	%	n	%	n	%	
Anxiety	None	42	35.0	2	7.7	6	35.3	7	20.6	14	21.9	0.008*
	Mild	33	27.5	5	19.2	2	11.8	6	17.6	9	14.1	
	Moderate	26	21.7	10	38.5	3	17.6	7	20.6	18	28.1	
	Severe	19	15.8	9	34.6	6	35.3	14	41.2	23	35.9	
Depression	None (score 0 - 4)	29	24.2	2	7.7	3	17.6	3	8.8	6	9.4	0.012*
	Mild (5 - 9)	38	31.7	2	7.7	5	29.4	8	23.5	12	18.8	
	Moderate (10 - 14)	21	17.5	7	26.9	4	23.5	7	20.6	15	23.4	
	Moderate-severe (15 - 19)	16	13.3	11	42.3	4	23.5	7	20.6	17	26.6	
	Severe (20 - 27)	16	13.3	4	15.4	1	5.9	9	26.5	14	21.9	

*p<0.05 was considered significant using Pearson Chi Square test

impacted the mental health of our medical student population.

The reported prevalence of anxiety and depression in our study was 76.8% and 83.5%, respectively. Similar studies carried out in Pakistan and all over the world also reported high prevalence of anxiety and depression during the COVID-19 pandemic among medical students.¹¹⁻¹⁵

Imran N et al, conducted a study among medical students of Pakistan and reported that 48.6% and 48.1%, were suffering from anxiety and depression, respectively. Alarming, 8% of students had even thought of committing suicide. Female medical students, and those with a prior history of anxiety and depression were found to be more at risk.¹²

Halperin et al conducted a study across 40 US medical colleges and found that during the initial wave of the

pandemic, 30.6% students suffered from anxiety while 24.3% were suffering from depression. They also concluded that these results were significantly higher for anxiety and depression during the pandemic when compared to earlier studies carried out among medical students.¹³

In an Iranian study, 38.1% prevalence of mild to severe anxiety and 27.6% prevalence of depression among medical students was reported. Female gender, lower grade point average (GPA) and having a past history of COVID-19 illness were related to higher rates of anxiety and depression among the student population.¹⁴

In a Jordanian study, the most concerning scenario for majority of medical students (66%) was the fear of infecting their family members as a result of higher risk of exposure of medical students to the disease. Students also expressed

significant distress regarding their tuition fee payment, owing to the reduction of income sources as a result of the financial impact of the pandemic. Others had found adapting to new online teaching methods to be quite challenging, thus expressed significant worry and felt lacking behind their peers, an additional contributor to their stress and worry. A vast majority of students (73.1%) reported that they could not exercise or attend any physical fitness sessions during the pandemic, which has long been considered the most effective non-pharmacological therapy among students to alleviate negative emotions. Students reported to practicing their hobbies, using social media apps, video chats, and cooking as ways to possibly counter their stress and worry.¹⁵

Saddik et al, found heightened anxiety among medical students and non-medical university female students of United Arab Emirates during the COVID-19 pandemic which significantly decreased for both groups after switching to online learning.¹⁶

Our study results showed that anxiety was more prevalent among female students as 29.7% of female students had severe anxiety as compared to 21.5% of male students with severe anxiety ($P<0.01$).

These findings are in agreement with many studies in which female gender was associated with higher anxiety rates.¹⁵

On the other hand, depression was found to be more prevalent among male students with 24.1% male students suffering from moderate depression compared opposed to 19.2% of female students ($P<0.01$). These findings are in agreement with Gao et al¹⁷, but opposing results have also been reported in some studies who reported female students to be more depressed.¹²⁻¹⁵

Higher anxiety and depression rates was seen among first year medical students in our study.

These findings are in line with the results of similar studies, who also reported pre-clinical students to be more anxious and depressed during the pandemic.¹²⁻¹⁵

In another study conducted in Pakistan, excessive social media usage was associated with higher prevalence of depression reporting that more than three-fourths (69%) of medical students were suffering from depression. Medical students belonging to middle and lower socioeconomic class had higher odds of screening positive for depression. Physical inactivity, obesity, comorbidities and multiple chronic diseases, disturbed sleeping and dietary habits, female gender, smoking, substance abuse, inability to cope with online learning and to social restrictions imposed by higher authorities, fear and uncertainty during the lockdown, were factors positively related to greater depression among students.¹⁸

According to a recent meta-analysis, the major risk factors of depression in medical students during the pandemic were young age, being female, being junior or preclinical student,

having experienced COVID-19, academic stress, poor social support, loneliness, past history of psychiatric or physical disorders, financial distress, low physical activity, and problematic internet or smartphone use.¹⁹

Evidence suggests that medical students are already at higher risk of developing short- and long-term mental health problems as compared to the general public. However, this psycho-social impact is vastly under-reported²⁰

The mental health consequences of the COVID-19 pandemic are a cause of great concern and require timely intervention to prevent any adverse long-lasting effects on the mental health of our medical students. Psychologically distressing symptoms such as anxiety and depression can adversely affect the thinking capacity and the clinical decision making process among medical students who are our future health care professionals. Moreover, extensive scrutiny and speculations by social media platforms impose further pressure upon the healthcare workers. Strengthened mental health support should be provided to all students, staff healthcare workers to better cater to their own, their family and professional needs. Health policy-makers also need to take effective measures to control and prevent mental health problems among those involved in diagnosing and treating patients with COVID-19.

The present study is among the few studies that have been carried out to assess depression and anxiety during the COVID-19 pandemic among medical students in Pakistan. After the study, small group sessions were carried out for medical students during their clinical rotation to discuss various strategies in combating anxiety and depression during this pandemic. In the session students shared their own experience of the COVID-19 pandemic, the difficulties they faced during the lockdown, and how it drastically affected their mental health. Mental health of students who had tested positive or had family members afflicted with COVID-19 were found to be most severely affected during this period. Many students shared that they had turned to religion and found it comforting with their measures they took and how it changed their lives. Students were asked to give feedback after the session. Majority of the students found the session to have a beneficial impact on their knowledge and attitudes regarding good mental health. However, our study has some limitations. The study is limited to only one medical university in Karachi so the findings may not be truly representative of all medical students in Pakistan. Another limitation is the small sample size of the study.

CONCLUSION:

The prevalence of anxiety (76%) and depression (83%) amid the pandemic were high among medical students. Both were more prevalent among first year students with anxiety being more prevalent in female students and depression being more prevalent in male students. This warrants the

consideration of easily accessible low-intensity mental health interventions during and beyond this pandemic.

Authors Contribution:

Sannia Perwaiz Iqbal: Conceived the research project and designed the manuscript. Also helped in data collection and prepared the manuscript for publication
Navaid Siddiqui: Helped design the questionnaire, assisted in data collection and analysis
Faryal Gul: Assisted in data collection
Sajid Abbass Jaffri: Helped guide the research proposal and approved the final manuscript.

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