



**LEVELS AND DETERMINANTS OF DEPRESSION, ANXIETY AND MENTAL STRESS  
AMONG UNIVERSITY STUDENTS DURING THE COVID-19 PANDEMIC IN  
BANGLADESH: A STUDY ON KHULNA UNIVERSITY STUDENTS**

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**Abstract**

Modern life has led to a significant increase in depression, anxiety, and mental stress compared to past times, especially during the COVID-19 pandemic. University students have been going through different critical psychological stresses for a variety of reasons. The study was designed to know the levels and determinants of depression, anxiety, and mental stress during COVID-19 among university students. A total of 369 students from honors second year to fourth year and masters' students at Khulna University participated in this cross-sectional web-based survey. Researchers have used convenience sampling as a technique of data collection. The levels of depression, anxiety, and mental stress were measured by Patient Health Questionnaire (PHQ-9) scale, Generalized Anxiety Disorder Assessment (GAD-7) scale and Perceived Stress scale (PSS-4). A chi-square test was performed to test the hypothesis. The findings suggest a majority of the respondents' depression, anxiety, and mental stress levels were moderate to severe. Results of the chi-square test depicted that age, gender, place of residence, lagging academically, becoming infected with COVID-19, losing tuition, and uncertainty of career persuasion were significantly associated with depression where the p-value was  $<0.05$ . On the other hand, except age and place of residence there was a significant association between demographic variables and anxiety. Income, lagging academically, infected with COVID-19, loss any tuition, and career persuasion were significantly associated with mental stress. The family, relatives, society, university, government, and other NGOs should work together and take proper initiatives to reduce depression, anxiety, and mental stress among university students.

**Keywords:** Anxiety, COVID-19, Depression, Home quarantine, Mental stress, Pandemic

**Introduction**

On March 8, 2020, the first case of a COVID-19 patient was detected in Bangladesh. To curb the spread and prevent communal transmission, like other countries around the world, Bangladesh also decided to put the country on formal lockdown starting on March 26, 2020 (Amin et al., 2020). Mental health difficulties increased drastically over the world during the coronavirus (COVID-19) pandemic. The COVID-19 pandemic has impacted the socio-economic, health, food security, natural resources, and well-being of people in Bangladesh (USAID, 2022). The COVID-19 pandemic has affected people around the world both physically and mentally. In Bangladesh, university students are also going through stress and mental health issues. Fear of COVID-19 drives them toward mental illness (Faisal et al., 2021). Inadequate practice of prevention measures and living in an urban residency were independent predictors of psychological problems among students (Tadesse et al., 2021). Aslan et al. (2020) showed that students' mental health during the pandemic was at high risk.

Economic and mental pressure among university students during COVID-19 pandemic like family pressure, unavailability of health facilities, fear of COVID-19, unemployment, no savings, economic scarcity, poverty, hopelessness, loneliness, educational delays, and uncertainty of life were the main reasons for the increase in depression, anxiety, and mental stress rate (Faisal et al., 2021). Home quarantine, communication gap, economic factors, the closing of educational institutions, online classes, and the unavailability of internet services were the causes of depression, anxiety, and mental stress (Sifat, 2020). Browning et al. (2021) studied seven state universities

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in the United States and found that all of the (2534) students were negatively affected by the pandemic in some way, and 59 percent of the students experienced high levels of psychological impact during COVID-19. Biswas & Biswas (2021) studied around 209 college and university students in India during COVID-19 and found a moderate level of anxiety. Among university students, academic delays and social support were the main concerning issue behind their anxiety levels. Financial distress, social isolation, and psychological distress were always pushed towards depression and stress (Sultana et al., 2021).

Students are more likely to feel depressed over time and spend each day out accompanied by significant psychological changes because of lower living standards, current economic hardship, and reduced availability of social and mental support during COVID-19 (Chen & Lucock, 2022). Students who are associated with income-generating activities have lost their income sources and most of them are addicted to social media, video games, and other online activities that cause serious mental illness (Lopes & Nihei, 2022).

Depressive disorder, or depression, is a common mental health condition that can happen to anyone. It is characterized by a low mood or loss of pleasure or interest in activities for long periods of time (WHO, 2024). Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes like increased blood pressure (APA, 2024). Mental stress is the pressure brought to bear on the existing mental balance or emotional equilibrium of any person; the symptoms of mental stress will most commonly be exhibited when the demands of a situation are seen as exceeding the personal resources that the individual can bring to bear on them at that moment (Encyclopedia.com, 2024). In this study, the researchers have used the definitions of WHO (2024), APA (2024), and Encyclopedia.com (2024) as the definitions of depression, anxiety, and mental stress respectively. By reviewing the above literature, it is clear that COVID-19 not only increases depression among students but also increases anxiety and mental stress levels. However, there were not enough studies on these three issues jointly in the Khulna district, Bangladesh. A thorough understanding of local dynamics on provocative issues, such as the levels and determinants of depression, anxiety, and mental stress among University students can contribute to national policy formulations for decreasing the rate of depression, anxiety, and mental stress.

## **Materials and Method**

This study was quantitative in nature. Data were collected from the students of Khulna University who belonged to the classes of 2<sup>nd</sup> Year (Hons.), 3<sup>rd</sup> Year (Hons.) 4<sup>th</sup> Year (Hons.) and Masters at the time of data collection. Researchers think that Khulna University is an ideal place for conducting a study like this. Here students come from different places with multidimensional economic and social backgrounds. Moreover, it was easy for the researchers to reach the respondents.

A cross-sectional web-based survey was conducted in this study. A cross-sectional web-based survey is a research method used to collect data from a specific population at a single point in time. In this type of survey, respondents are typically enlisted through online platforms or websites and asked to complete a questionnaire or survey online. According to Khulna University Diary (2022), there are 29 disciplines under 8 Schools at Khulna University and the number of students is 6947. Since the first-year students' average number was 50 in every discipline, researchers have excluded 1450 students from the total students of Khulna University to fulfill the selection criteria. In this study, the respondent's selection criterion was the participants must be students at Khulna University from honors second year to fourth year and masters. So, the population size was approximately 5497. A convenience sampling strategy was employed to gather data from the respondents. Each participant gave their informed consent after reading the consent of Google form, which was attached to the e-questionnaire. The participants were requested to use Messenger, Facebook, WhatsApp, personal and institutional email, to share the e-questionnaire with their friends.

The duration of data collection was from August to September 2022. The sample size was 369. Although the number of responses was 387. After completing the data collection, the raw data were processed by eliminating illogical codes, eliminating logical inconsistencies, and resolving ambiguities. Secondary data were collected from relevant books, articles, journals, newspapers, and so on. The survey questionnaire was composed of both open and close-ended questions. To assess depression, anxiety, and mental stress several scales were used. Such as the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder Assessment (GAD-7), and Perceived Stress Scale 4 (PSS-4). The PHQ-9 is a versatile tool that can be used for depression screening, diagnosis, tracking, and severity measurement. The Generalized Anxiety Disorder Assessment (GAD-7) is used to measure or assess the severity of generalized anxiety disorder which consists of seven items. The Perceived Stress Scale-4 (PSS-4) is a brief self-report tool used to evaluate psychological stress.

For quantitative analysis, IBM SPSS Statistics v25.0 was used in this study. Both descriptive and inferential statistics were used in the study. In the descriptive analysis, percent, frequency, mean, and standard deviation were applied to the description of the levels of depression, anxiety, and mental stress. Moreover, inferential statistics were also used to measure the association between dependent and independent variables.

## Results

Table 1 shows that the average score of depressive behavior of the respondents in PHQ-9 scale was 15.96 and the deviated score was 4.94. Among them, a majority (33.9%) of the respondents had faced moderately severe depressive syndrome, followed by moderate depression 28.5 percent, severe depression 27.6 percent, mild depression 8.4 percent, and minimal depression 1.6. Table 1 also demonstrates that the average score of anxiety level of the respondents on the GAD-7 scale was 12.81 and the deviated score was 4.75. About 39.6 percent of the respondents' anxiety level was moderate, about 36.9 percent of the respondent's anxiety level was severe, about 18.7 percent of the respondent's anxiety level was mild and the anxiety level of 4.9 percent of the respondents was minimal. Data also presented that the average score of mental stress of the respondents on the PSS-4 scale was 7.37 and the deviated score was 2.79. Among them, about 52.8 percent of the respondents' mental stress was at a moderate level, about 33.1 percent of the respondents' stress level was mild and about 14.1 percent of the respondents' mental stress was at a severe level.

Table 1. Respondents' depression (PHQ-9), anxiety (GAD-7) and mental stress (PSS-4) level during pandemic

Variable	N (%)	Minimum	Maximum	Mean & Std
<b>(Depression level)</b>				
None to Minimal (< 4)	6(1.6)	0	27	15.96
Mild (5 - 9)	31(8.4)			&
Moderate (10-14)	105(28.5)			4.94
Moderately Severe (15-19)	125(33.9)			
Severe (≥ 20)	102(27.6)			
Total	369(100.0)			
Variable	N (%)	Minimum	Maximum	Mean & Std
<b>(Anxiety level)</b>				
None to Minimal (< 4)	18(4.9)	0	21	12.81
Mild (5 - 9)	69(18.7)			&
Moderate (10-14)	146(39.6)			4.75
Severe (≥ 15)	136(36.9)			
Total	369(100.0)			
Variable	N (%)	Minimum	Maximum	Mean & Std
<b>(Mental stress level)</b>				
None to Minimal (< 4)	18(4.9)	0	21	12.81
Mild (5 - 9)	69(18.7)			&
Moderate (10-14)	146(39.6)			4.75
Severe (≥ 15)	136(36.9)			
Total	369(100.0)			

Note: N = Number of the respondents; Std. = Standard deviation

Source: Web-based survey, 2022.

Table 2. Depression and its determinants

Independent variables	Depression				$\chi^2$ (df)	Cramer's V	P value
	Mild	Moderate	M Severe	Severe			
<b>Age</b>							
19 to 21	3(7.9)	12(31.6)	16(42.1)	7(18.4)	16.202 <sup>b</sup> (6)	0.146	0.015
22 to 24	15(5.4)	42(15.1)	110(39.6)	111(39.9)			
25 to 27	0(0.0)	15(28.3)	20(37.7)	18(34.0)			
<b>Gender</b>							
Female	16(8.9)	48(26.1)	80(43.3)	39(21.7)	17.302 <sup>b</sup> (9)	0.139	0.011
Male	21(11.4)	57(29.9)	45(24.2)	63(34.2)			
<b>Place of Resident</b>							
Rural	10(7.6)	35(26.7)	35(26.7)	51(38.9)	18.857 <sup>a</sup> (3)	0.226	0.000
Urban	8(3.4)	34(14.3)	111(46.6)	85(35.7)			
<b>Monthly Income</b>							
≤ to 30,000	7(9.5)	35(36.5)	72(77.2)	81(71.9)	10.780 <sup>a</sup> (6)	0.121	0.095
30,001 to 60,000	8(7.0)	26(26.9)	67(57.0)	43(53.1)			
60,001 to ≥	3(1.5)	8(5.6)	7(9.5)	12(11.9)			
<b>Lagging Academically</b>							
No	4(22.2)	15(21.7)	37(25.3)	14(10.3)	11.718 <sup>b</sup> (3)	0.173	0.012
Yes	14(4.7)	54(18.1)	109(36.5)	122(40.8)			
<b>Affected by COVID-19</b>							
No	18(8.2)	48(21.9)	84(38.4)	69(31.5)	19.696 <sup>a</sup> (3)	0.231	0.000
Yes	0(0.0)	21(17.0)	62(41.3)	67(44.7)			
<b>Lost any tuition or job</b>							
No	8(3.9)	51(24.6)	86(41.5)	62(30.0)	16.451 <sup>a</sup> (3)	0.211	0.001
Yes	10(6.2)	18(11.1)	60(37.0)	74(45.7)			
<b>Career persuasion</b>							
Fear of not getting job opportunity	2(3.1)	13(20.3)	15(23.4)	34(53.1)	36.294 <sup>a</sup> (9)	0.181	0.000
Lack of preparation materials	5(12.5)	11(27.5)	16(40.0)	8(20.0)			
Psychologically broken	2(20.0)	12(11.8)	37(36.3)	51(50.0)			
Uncertainty	9(5.5)	33(20.2)	78(47.9)	43(26.4)			

Notes; a = Chi-square, b = Fishers Exact test,  $\chi^2$  = Pearson chi-square; df = Degrees of freedom; \* Significance level at 5%  
 Source: Web-based survey, 2022.

The findings of table 2 reveal that age ( $p < 0.015$ ), gender ( $p < 0.011$ ), place of residence ( $p < 0.000$ ), academic lagging during the pandemic ( $p < 0.012$ ), affected by COVID-19 disease ( $p < 0.000$ ), lost tuition ( $p < 0.001$ ) and career persuasion ( $p < 0.000$ ) were significantly associated with depressive behavior among the respondents. On the contrary, the income of the respondents' family during the pandemic was not significantly associated with depression in the study area  $\chi^2(6, N=369) = 10.78, p < 0.095$ , with Cramer's V coefficient of 0.121.

Table 3. Anxiety-disorder and its determinants

Independent variables	Anxiety				$\chi^2$ (df)	Cramer's V	P value
	None to Minimal	Mild	Moderate	Severe			
<b>Age</b>							
19 to 21	7(18.4)	17(44.7)	7(18.4)	7(18.4)	6.001 <sup>a</sup> (4)	0.199	0.090
22 to 24	26(27.9)	68(24.5)	109(39.2)	75(27.0)			
25 to 27	4(7.5)	20(37.7)	9(17.0)	20(37.7)			
<b>Gender</b>							
Female	7(3.9)	25(13.9)	86(46.7)	67(35.6)	17.302 <sup>b</sup> (9)	0.139	0.011
Male	11(5.4)	44(23.9)	61(32.1)	72(38.6)			
<b>Monthly Income</b>							
≤ to 30,000	7(3.6)	35(17.9)	72(36.9)	81(41.5)	11.225 <sup>b</sup> (6)	0.121	0.095
30,001 to 60,000	8(5.6)	26(18.1)	67(46.5)	43(29.9)			
60,001 to ≥	3(10.0)	8(26.7)	7(23.3)	12(40.0)			
<b>Lagging Academically</b>							
No	4(5.7)	15(21.24)	37(52.9)	14(20.0)	11.718 <sup>b</sup> (3)	0.173	0.012
Yes	14(4.7)	54(18.1)	109(36.5)	122(40.8)			
<b>Affected by COVID-19</b>							
No	18(8.2)	48(21.9)	84(38.4)	69(31.5)	19.696 <sup>a</sup> (3)	0.231	0.000
Yes	0(0.0)	21(14.0)	62(41.3)	67(44.7)			
<b>Lost any tuition or job</b>							
No	8(3.9)	51(24.6)	86(41.5)	62(30.0)	16.451 <sup>a</sup> (3)	0.211	0.001
Yes	10(6.2)	18(11.1)	60(37.0)	74(45.7)			
<b>Career persuasion</b>							
Fear of not getting job opportunity	2(3.1)	13(20.3)	15(23.4)	34(53.1)	36.279 <sup>a</sup> (9)	0.181	0.000
Lack of preparation materials	5(12.5)	11(27.5)	16(40.0)	8(20.0)			
Psychologically broken	2(2.0)	12(11.8)	37(36.3)	51(50.0)			
Uncertainty	9(5.5)	33(20.2)	78(47.9)	43(26.6)			

Notes; a = Chi-square, b = Fishers Exact test;  $\chi^2$  = Pearson chi-square; df = Degrees of freedom; \* Significance level at 5%  
Source: Web-based survey, 2022.

The presented data in table 3 show that gender ( $p < 0.011$ ), academic lagging during pandemic ( $p < 0.012$ ), affected by COVID-19 disease ( $p < 0.000$ ), lost tuition ( $p < 0.001$ ) and career persuasion ( $p < 0.000$ ) were significantly associated with anxiety disorder among the respondents. On the contrary, the respondents' age ( $p < 0.090$ ) and income of the respondents' family ( $p < 0.095$ ) had no significant relationship with anxiety disorder.

Table 4. Mental stress and its determinants

Independent variables	Perceived Stress Scale			$\chi^2$ (df)	Cramer's V	P value
	Mild	Moderate	Sever			
<b>Age</b>						
19 to 21	15(39.5)	19(50.0)	4(10.5)	6.001 <sup>a</sup> (4)	0.199	0.090
22 to 24	91(32.7)	142(51.1)	45(51.1)			
25 to 27	16(30.2)	34(64.2)	3(5.7)			
<b>Gender</b>						
Female	65(36.1)	103(55.4)	27(14.4)	3.366 <sup>b</sup> (6)	0.587	0.080
Male	57(30.4)	89(49.4)	26(14.1)			
<b>Income</b>						
≤ to 30,000	68(34.9)	97(49.7)	30(15.4)	23.772 <sup>b</sup> (4)	0.159	0.001
30,001 to 60,000	54(37.5)	72(50.0)	18(12.5)			
60,001 to ≥	0(0.0)	26(86.7)	4(13.3)			
<b>Lagging Academically</b>						
No	30(42.9)	25(35.7)	15(21.4)	10.604 <sup>a</sup> (2)	0.170	0.005
Yes	92(30.8)	170(30.8)	37(12.4)			
<b>Affected by COVID-19 Pandemic</b>						
No	80(36.5)	113(51.6)	26(11.9)	4.002 <sup>a</sup> (2)	0.135	0.010
Yes	42(28.0)	82(54.7)	26(17.3)			
<b>Lost any Tuition or job</b>						
No	84(68.4)	97(91.4)	26(29.2)	12.041 <sup>a</sup> (2)	0.181	0.002
Yes	38(53.6)	98(85.6)	26(22.8)			
<b>Problem Faced About Career persuasion</b>						
Fear of not getting job opportunity	17(26.6)	35(54.7)	12(18.8)	13.180 <sup>a</sup> (6)	0.134	0.040
Lack of preparation materials	17(42.5)	20(50.0)	3(7.5)			
Psychologically broken	24(23.5)	58(56.9)	20(19.6)			
Uncertainty	64(39.3)	82(50.3)	17(10.4)			

Notes: a = Chi-square, b = Fishers Exact test;  $\chi^2$  = Pearson chi-square; df = Degrees of freedom; \* Significance level at 5%  
 Source: Web-based survey, 2022.

The data in table 4 demonstrate that income of the respondents' family during pandemic ( $p < 0.001$ ), academic lagging during pandemic ( $p < 0.005$ ), affected by COVID-19 disease ( $p < 0.010$ ), lost tuition ( $p < 0.002$ ) and career persuasion ( $p < 0.040$ ) were significantly associated with the mental stress among the respondents. But age ( $p < 0.090$ ) and gender ( $p < 0.080$ ) of the respondents had no significant relationship with mental stress.

### Discussion

Several authors in their study found that place of residence was an important determinant of depression. The urban students were more depressed than rural students (Yeasmin et al., 2020). Sujana et al. (2020) also found that depression, anxiety, and mental stress level was higher among urban students due to social isolation and home quarantine during COVID-19. The current study resembles those studies. Because in the present study, 35.5 percent of the respondents lived in rural areas and 64.5 percent lived in urban areas and the researchers found a significant association between place of residence during the pandemic and depression.

During the pandemic days, everyone's daily life was changed (Akat & Karataş, 2020). In the present study, the majority (49.3%) of the respondents lived in their own homes, 35.5 percent of the respondents were in the university hall and the rest (15.2%) of the respondents were in mess rooms before the pandemic. But when the pandemic began, all educational institutions were shut down and a majority of the students who lived in the university hall and mess room went back to their own houses. It was evident from the present study that the majority (48.8%) of the respondents' families appreciate their staying home during the pandemic and the majority (42.3%) of relatives showed cooperative reaction but a UK study showed the reflections of parents during the pandemic both higher educated and uneducated parents were not cooperative. Most of the uneducated and lower-

class families did not appreciate their children staying home and several times they were aggressive with their children. For that reason, the students have suffered a higher level of mental disorder (Abdellatif & Gatto, 2020).

The present study demonstrates that the majority (81.0%) were lagging academically during the pandemic. This result reveals the study of Dutta and Smita (2020). They found that it would be intense pressure on the students to finish the course materials at the time of the pandemic crisis. Therefore, they felt that the primary goals of the academic career might not be achieved. It was evident from the present study that a majority of the respondents lost their tuition during the COVID-19 pandemic. Several studies show that pupils with lower incomes or part-time workers are most affected by job losses or income reduction caused by the coronavirus (Parker et al., 2020).

Several studies show that most of the students were depressed and worried about their online learning process because of poor internet facilities, the high cost of internet packages, and a lack of technological knowledge. Students also lose hope because of their families' financial crises (India Today, 2021). Both students and teachers expressed some mental and physical health problems of online classes such as back problems, eye strain, dry eyes, headaches, etc. (Idris et al., 2021). Here in this present study, 43.9 percent of the respondents lost their tuition during the pandemic. The majority (80.8%) faced problems in attaining online classes. And for that reason, around 72.6 percent of the respondents wouldn't cover their educational backwardness which was created during the first wave of the pandemic. The findings of the present study also indicate that 58.3 percent of the respondents faced physical problems during or after the online classes. Moreover, a majority (69.1%) of the respondents faced psychological problems with the online learning process during the pandemic.

In this study, the measurement scale of depression, anxiety, and mental stress was Patient Health Questionnaire-9 (PHQ-9) scale, Generalized Anxiety Disorder Assessment (GAD-7) scale, and Perceived Stress Scale (PSS-4) respectively. Social isolation and home quarantine may be a potential indicator in the relationship between university students' depression, anxiety, and mental stress levels and the COVID-19 pandemic, implying that the causal component of controllability may play a partial mediating function between the effects of the COVID-19 pandemic and its duration (Thakur, 2020). The present study roughly explained that 33.9 percent of the respondents felt a moderately severe level of depression and 27.6 percent felt a severe level of depression, whereas 39.6 percent of the respondents were at a moderate level of anxiety disorder and 36.9 percent were at a severe level of anxiety disorder. Furthermore, the presented data also showed that 52.8 percent of the respondents had examined moderate levels of mental stress, and the rest 14.1 percent of the respondents had severe levels of mental stress. Biswas et al. (2022) conducted a study among Bangladeshi university students and found that 15 percent of the students had moderately severe depression, whereas 18.1 percent were severely suffering from anxiety.

The current study found a statistically significant association between the socio-demographic variables with depression, anxiety, and mental stress. On the contrary, Zheng et al. (2021) found no significant association between some socio-demographic variables (including gender, ethnicity, study major, and monthly family income) and psychological problems.

## Conclusion

The economic and social development of a nation does not lie only in education but in the mental health condition of the students too. In this study, a large percentage of the respondents had been suffering from moderate to severe levels of depression, anxiety, and mental stress symptoms during the COVID-19 pandemic. The global crisis and fear of the pandemic are already over. But the depression, anxiety, and mental stress among university students were not eradicated. In this study, different demographic variables were the determinants of depression, anxiety, and mental stress. So, the researchers think this study will help the policymakers to take some steps to mitigate these problems. The family, relatives, society, government, and other NGOs should work together and take proper initiatives and support them in any kind of difficulties to minimize these problems. Besides, the government and universities should arrange mental health counseling services among university students for better output.

## Conflict of Interest

None of the authors present any conflicts of interest.

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