

LEVEL OF DEPRESSION, ANXIETY, AND STRESS STATUS AMONG THE MEDICAL STUDENTS IN SELECTED MEDICAL COLLEGES IN BANGLADESH

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ABSTRACT

Introduction: Medical students are the future backbone of the medical fraternity and the healthcare system in Bangladesh. Medical college is recognized as a highly stressful environment that can negatively affect academic performance and mental well-being. Due to academic pressure and environmental changes, many students experience depression, anxiety, and stress—often beginning in the third year when they transition to clinical training. This study thus assessed the presence of depression, anxiety, and stress among the 3rd year medical students in selected medical colleges in Bangladesh. **Methods:** This cross-sectional study was conducted among 398 medical students of selected Medical Colleges from January 2022 to December 2022. The validated Depression, Anxiety, and Stress Scales-21 was utilized to assess depression, anxiety, and stress among the study participants selected by Simple Random Sampling. **Results:** The mean age of the study participants was 21.96±1.09 years. Students unsatisfied with the college environment were significantly more likely to report depression (77.9%), anxiety (80.8%), and stress (69.7%) ($p < 0.001$ for all). Dissatisfaction with hostel environment was also significantly associated with all three mental health conditions, with the highest prevalence seen in depression (76.9%). **Conclusion:** Meticulous attention must be devoted to enhancing the mental health and psychological well-being of medical students. Initiatives aimed at raising awareness, along with individualized counseling sessions grounded in motivational strategies, should be prioritized—particularly for those identified as most vulnerable. Moreover, parents and peers can serve as crucial protective factors, helping students navigate and adapt to high-stress environments.

Keywords: Depression, Anxiety, Stress, Medical students, Bangladesh.

INTRODUCTION

Medical education is widely recognized as highly demanding and intense, primarily due to the vast amount of information that must be absorbed within a limited timeframe, the continuous need for research, limited opportunities for relaxation, and the frequent examinations requiring proficiency in both basic sciences and clinical skills. Mastery of these competencies is essential, especially in situations where immediate medical intervention is necessary. The rigorous nature of this six-year program, combined with personal challenges such as family, social, or financial pressures, can significantly impact students' mental well-being. These stressors often contribute to psychological issues, including stress, anxiety, and depression (Konar, 2020). A meta-analysis by Puthran et al. (2016) highlighted the prevalence of these concerns, revealing that up to 28% of medical students globally experience depression, underscoring the widespread nature of mental health challenges within this population. The seriousness of the issue is heightened by the established link between depression and an increased risk of suicidal ideation—an association particularly pronounced within the medical profession, where suicide rates are higher than those observed in the general population (Sobowale et al., 2014). Numerous studies have reported alarmingly high rates of anxiety and depression among medical students, with prevalence reaching up to 51% in some cohorts (Dyrbye et al., 2008; Dahlin et al., 2005). When combined with academic pressures, these mental health issues can significantly impair students' quality of life and academic performance. Anxiety and depression can disrupt cognitive functioning, leading to memory issues, mental blocks, difficulty making decisions, and heightened sensitivity to criticism—all of which hinder academic success (Nechita et al., 2014). Moreover, elevated levels of psychological distress have been associated with negative outcomes such as poor quality of life, substance abuse, and even suicide [(Moffat et al., 2004; Stecker, 2004; Sarkar et al., 2017)]. Globally, reports of depression, anxiety, and stress among medical students are becoming increasingly frequent (Tomoda et al., 2000). For example, studies have found stress prevalence rates of 26% among U.S. medical students (Guthrie et al., 1995), 31.2% in the UK (Firth, 1986), 41.9% in Malaysia (Sherina et al., 2004), 94.2% in Nigeria (Oku et al., 2015), and 52.4% in Ethiopia (Melaku et al., 2015).

Depression is a complex and multifaceted disorder that places a significant burden on society, often leading to impairments in individual, social, interpersonal, and occupational functioning (Hysenbegasi et al., 2005). Anxiety, on the other hand, is characterized by an internalized sense of fear, which may stem from real or perceived threats. It is often an unconscious response to depressive tendencies and can escalate into intense fear or panic. Anxious students frequently experience difficulties with learning and problem-solving. Common psychological and physical symptoms of anxiety include trembling hands and lips, dry mouth, frequent urination, and disturbed sleep patterns (Ericson & Gardner, 1992). Stress is defined as a perceived threat that challenges an individual's well-being. When an organism's adaptive

capacity fails to meet environmental demands, it can lead to both biological and psychological disturbances (Cohen et al., 2016).

A study conducted among university students in Turkey found prevalence rates of 27.1% for depression, 47.1% for anxiety, and 27% for stress, respectively (Bayram & Bilgel, 2008). Similarly, 30% of undergraduate students in Canada were reported to experience psychological issues (Adlaf et al., 2001), while 41.9% of medical students in Malaysia were found to suffer from emotional disorders (Sidik et al., 2003). Research suggests that students in Asian countries experience higher levels of depression, anxiety, and stress compared to those in other regions. For instance, a study on medical students in India reported prevalence rates of 51.3% for depression, 66.9% for anxiety, and 53% for stress (Iqbal et al., 2015). Earlier research conducted in Pakistan also indicates a high prevalence of depression and anxiety among university students. In Bangladesh, study conducted in Khulna among first-year MBBS students by found that 54.3% had depression, 64.8% had anxiety, and 59.0% had stress whereas in another study of domestic medical students in a private college, rates were 44.8% (depression), 45.3% (anxiety), and 33.1% (stress), while overseas students had 50.3%, 52.5%, and 41.3% respectively (Alim et al., 2017; Islam et al., 2024).

Stress, anxiety, and depression may affect the personal and professional life of a medical student. Studies revealed that medical students experience a relatively high level of personal distress, with adverse consequences on academic performance, competency, professionalism, and health (Naz et al., 2017). Medical students get oriented with clinical classes in the 3rd year. They have to attend clinical classes along with their academic classes. Long study hours, sleep deprivation, and disruption of personal life are common stressors during this period. Consequently, higher rates of psychological morbidity have been reported among medical students compared to those in other disciplines (Inam, 2007; Ediz et al., 2017). Medical school depression, anxiety, and stress could lead to decreased life satisfaction, poorer academic performance, declining empathy and compassion, substance abuse, and suicidal ideation (Dyrbye et al., 2006; Tyssen et al., 2001). Failure to detect the psychological disorders among medical students might lead to increased mental illness morbidity with undesired effects throughout their careers and lives (Tyssen et al., 2001).

However, despite the growing concern, there is limited research in Bangladesh exploring the prevalence and contributing factors of psychological distress among medical students. Most available studies are small-scale, institution-specific, or lack updated data. Given the country's expanding number of medical colleges and increasing academic pressures, it is vital to generate context-specific evidence. Therefore, this study aims to assess the levels of depression, anxiety, and stress among medical students in Bangladesh and explore their association with sociodemographic characteristics to inform future preventive and support strategies.

METHODS

This study utilized an Observational type of cross-sectional research design to assess the levels of depression, anxiety, and stress among medical students. The study was conducted at four medical colleges, namely Dhaka Medical College, Dhaka; Sir Salimullah Medical College, Dhaka; Dhaka Community Medical College, Moghbazar, Dhaka, and Dr.Sirajul Islam Medical College, Dhaka. The study was conducted from January 2022 to December 2022. The study population consisted of both male and female third-year MBBS students. Inclusion criteria were enrollment in the third-year MBBS program, willingness to provide informed consent, and presence during the data collection period. Exclusion criteria included students with a known psychiatric diagnosis currently receiving treatment, as well as those who submitted incomplete or improperly filled questionnaires. A stratified random sampling method was employed to select participants. The sample size was calculated using a standard formula for cross-sectional studies, based on an estimated prevalence of 66.5% for mental health issues reported by Alim M. et al. (2017), with a 95% confidence level and a 5% margin of error, resulting in a total sample size of 398.

Data was collected with the collaborative help of students and teachers, with the permission of the authority. A questionnaire was distributed to students in class settings and filled up by students. All data were entered, checked, and scrutinized by the principal investigator for the following standard procedure. The Depression, Anxiety, and Stress Scale - 21 Items (DASS-21) was used as the primary instrument. It is a validated self-report questionnaire designed to measure the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. The DASS-21 has been widely validated in various populations, including students, and shows high internal consistency: Depression (Cronbach's alpha ≈ 0.91); Anxiety ($\alpha \approx 0.84$), and Stress ($\alpha \approx 0.90$). After the collection of all the required data, the data were checked, verified for consistency, and tabulated using the SPSS 24 software. Exploratory data analysis was carried out to describe the study population. Socio-demographic characteristics, clinical, and laboratory parameters were reported. Continuous data were expressed as mean and standard deviation, and categorical data were expressed as frequency and percentage. Comparisons were assessed by the student chi-square test for continuous and categorical variables, respectively. Fisher's Exact test was done in case of more than 25% expected count, less than 5%. A probability (p) value of <0.05 was considered statistically significant. Prior to the study of the protocol was approved by the Research Review Committee (RRC) of the Department of Community Medicine of Dhaka Medical College. After that, formal ethical clearance was taken from the Ethical Review Committee (ERC) of Dhaka Medical College.

RESULTS

This cross-sectional study was conducted among third-year medical students in four selected medical colleges in Bangladesh. Two were public medical colleges, and the other two were private medical colleges.

The majority of participants (57.5%) were aged between 22 and 23, with a mean age of approximately 22. Females slightly outnumbered males (53% vs. 47%). Most students were Muslim (84.9%) and unmarried (94.95%). A substantial proportion (64.1%) lived in hostels, while only 31.2% resided with their families. This suggests a young, predominantly unmarried population with a high proportion of hostel dwellers, possibly contributing to psychosocial stressors.

Table 1: Socio-demographic distribution of participants.

Age group (years)	N	%
20-21	129	32.4
22-23	229	57.5
24-25	38	9.5
≥26	2	0.5
Mean ±SD	21.96±1.09SD	
Gender		
Male	187	47
Female	211	53
Religion		
Muslim	338	84.9
Hindu	51	12.8
Buddhist	7	1.8
Christian	2	0.5
Residence of the participants		
Rented house	18	4.4
Relative house	1	0.3
With family	124	31.2
Hostel	255	64.1
Marital status		
Married	20	0.05
Unmarried	378	94.95

A higher proportion of students studying in government medical colleges (59.3%) reported family support for educational expenses, compared to private medical college students (40.7%). Interestingly, a significantly greater number of self-financed students were from government institutions (95.1%), suggesting economic pressures are more prevalent among these students.

Table 2: Bearer of educational expenses of the participants

	Government medical college students N (%)	Private medical college students N (%)	Total
Family	200 (59.3%)	137 (40.7%)	337
Himself / Herself	58 (95.1%)	3 (4.9%)	61
Total	258	140	398

One-fourth (25.6%) of the students reported involvement in politics, and 13.3% experienced ragging. Less than half (47.7%) found the college environment satisfactory, and only 40.2% were satisfied with hostel conditions. These findings point to considerable dissatisfaction with institutional environments, potentially impacting mental health outcomes.

Table 3: Information related to institutional factors

Institutional Factors	Yes N (%)	No N (%)
Involve in politics	102 (25.6%)	296 (74.4%)
Facing ragging	53 (13.3%)	345 (86.7%)
College environment satisfactory	190 (47.7%)	208 (52.3%)
Hostel environment satisfactory	160 (40.2%)	238 (59.8%)

Gender and marital status did not show significant associations with depression. Religion was significantly associated with depression ($p = 0.023$), with Christians reporting none. Family type had a significant association ($p = 0.009$), where those from nuclear families experienced more depression than those from joint families. This suggests familial support structures may influence emotional well-being.

Table 4: Association between socio-demographic variables with depression

Variables	Depression n (%)		p value
	Yes n=255	No n=143	
Gender			
Male	122(47.8)	64(44.8)	0.554*
Female	133(52.2)	79(55.2)	
Religion			
Islam	216(84.7)	122(85.3)	
Hindu	32(12.5)	19(13.3)	0.023*
Buddhist	7(2.7)	0	
Christian	0	2(1.4)	
Marital status			
Married	14(5.5)	6(4.2)	0.640*
Unmarried	241(94.5)	137(95.8)	
Family type			
Nuclear type	240(94.1)	123(86)	0.009*
Joint type	15(5.9)	20(14)	

*Chi-square test was done

No significant associations were found between depression and educational expense sources, father's or mother's occupation ($p > 0.05$). This indicates that economic background or parental profession may not directly influence depression in this population.

Table 5: Association between Economic condition and the occupation of parents with depression

Variables	Depression N (%)		p value*
	Yes n=255	No n=143	
Monthly educational expenses are borne by			0.083*
Family	222(87.1)	115(80.4)	
Himself/herself	33(12.9)	28(19.6)	
Father's occupation			0.123*
Physician	10(3.9)	6(4.2)	
Teacher	62(24.3)	31(21.7)	
Service holder	88(34.5)	47(32.9)	
Business	55(21.6)	36(25.2)	
Farmer	19(7.5)	3(2.1)	
Advocate	6(2.4)	9(6.3)	
Engineer	9(3.5)	4(2.8)	
Other	6(2.4)	7(4.9)	
Mother's occupation			0.860*
Physician	6(2.4)	2(1.4)	
Teacher	42(16.5)	22(15.4)	
Service holder	9(3.5)	6(4.2)	
Housewife	190(74.5)	106(74.1)	
Other	8(3.1)	7(4.9)	

*Chi-square test was done

None of the socio-demographic variables (gender, Religion, marital status, family type) showed a statistically significant association with anxiety. However, trends indicated slightly higher anxiety in females and in nuclear families.

Table 6: Association of socio-demographic conditions with anxiety (n=398)

Variables	Anxiety N (%)		P value*
	Yes N=286	No N=112	
Gender			0.298*
Male	129(45.1)	57(50.9)	
Female	157(54.9)	55(49.1)	
Religion			
Islam	244(85.3)	94(83.9)	
Hindu	35(12.2)	16(14.3)	
Buddhist	7(2.4)	0	
Christian	0	2(1.8)	
Marital status			0.406*
Married	16(5.6)	4(3.6)	
Unmarried	270(94.4)	108(96.4)	
Family type			0.397*
Nuclear type	263(92)	100(89.3)	
Joint type	23(8)	12(10.7)	

*Chi-square test was done

No statistically significant associations were found between anxiety and educational expenses or parents' occupation. However, a higher proportion of students self-financing their education showed anxiety, and trends suggested potential influence of paternal business or maternal housewife status, although not significant.

Table 7: Association between economic condition and occupation of parents with anxiety

Variables	Anxiety N (%)		P value
	Yes N=286	No N=112	
Monthly educational expenses are borne by			0.135*
Family	247(86.4)	90(80.4)	
Himself/herself	39(13.6)	22(19.6)	
Father's occupation			0.156**
Physician	9(3.1)	7(6.3)	
Teacher	64(22.4)	29(25.9)	
Service holder	95(33.2)	40(35.7)	
Business	70(24.5)	21(18.8)	
Farmer	19(6.6)	3(2.7)	
Advocate	9(3.1)	6(5.4)	
Engineer	12(4.2)	1(0.9)	
Other	8(2.8)	5(4.5)	
Mother's occupation			0.076**
Physician	2(0.7)	6(5.4)	
Teacher	46(16.1)	18(16.1)	
Service holder	11(3.8)	4(3.6)	
Housewife	217(75.9)	79(70.5)	
Other	10(3.5)	5(4.5)	

*Chi-square test and **Fisher's Exact test were done

Gender, Religion, marital status, and family type showed no significant associations with stress. Nevertheless, students from nuclear families had marginally higher stress levels, aligning with trends observed in depression and anxiety analyses.

Table 8: Association between socio-demographic conditions with stress

Variables	Stress N (%)		P value*
	Yes N=245	No N=153	
Gender			0.470*
Male	111(45.3)	75(49)	
Female	134(54.7)	78(51)	
Religion			0.310*
Islam	214(87.3)	124(81)	
Hindu	25(10.2)	26(17)	
Buddhist	6(2.4)	1(0.7)	
Christian	0	2(1.3)	
Marital status			0.205*
Married	15(6.1)	5(3.3)	
Unmarried	230(93.9)	148(96.7)	
Family type			0.197*
Nuclear type	227(92.7)	136(88.9)	
Joint type	18(7.3)	17(11.1)	

*Chi-square test was done

No significant association was observed between stress and who bore educational costs or with fathers' or mothers' occupations. Trends did indicate higher stress levels among students with fathers in business or students who financed their own education.

Table 9: Association between economic condition and occupation of parents with stress

Variables	Stress (%)		P value*
	Yes (N=245)	No (N=153)	
Monthly educational expenses are borne by			0.466*
Family	210(85.7)	127(83)	
Himself/herself	35(14.3)	26(17)	
Father's occupation			0.306*
Physician	9(3.7)	7(4.6)	
Teacher	54(22)	39(25.5)	
Service holder	83(33.9)	52(34)	
Business	54(22)	37(24.2)	
Farmer	19(7.8)	3(2)	
Advocate	8(3.3)	7(4.6)	
Engineer	10(4.1)	3(2)	
Other	8(3.3)	5(3.3)	
Mother's occupation			0.186**
Physician	2(0.8)	6(3.9)	
Teacher	40(16.3)	24(15.7)	
Service holder	7(2.9)	8(5.2)	
Housewife	186(75.9)	110(71.9)	
Other	10(4.1)	5(3.3)	

*Chi-square test and **Fisher's Exact test were done

This table presents statistically significant associations across all outcomes: Students unsatisfied with the college environment were significantly more likely to report depression (77.9%), anxiety (80.8%), and stress (69.7%) ($p < 0.001$ for all). Dissatisfaction with hostel environment was also significantly associated with all three mental health conditions, with the highest prevalence seen in depression (76.9%) ($p < 0.05$ for all). These findings emphasize the critical role of institutional climate in student mental health.

Table 10: Relationship among depression, anxiety, and stress with satisfactory college environment and hostel environment

Institutional factors	Depression		Anxiety		Stress	
	N(%)	*P value	N (%)	*P value	N (%)	*P value
The college environment is not satisfactory	162 (77.9%)	<0.001	168 (80.8%)	<0.001	145 (69.7%)	<0.001
The hostel environment is not satisfactory	183 (76.9%)	<0.001	180 (75.6%)	0.041	156 (65.5%)	0.046

*Chi-square test was done

DISCUSSION

The mean age of the participants was 21.96 ± 1.09 SD years, where females were predominantly higher (53%) in this study, and most of the participants lived in a hostel (64.1%). According to religious believe, most were Muslims (84.9%) also followed by Hindus (12.8%), Buddhists (1.8%), and Christians (0.5%) in this study. In similar study assessed mental health problems among students, as most of them were female, aged 18–22 years old (Wang et al., 2022), yet in another study conducted in Bangladesh, mean (+SD) age of students was 18.80 (+0.907) years, where majority of them were Muslims, remaining 16.2% were Hindus and 79% were living in hostel (Alim et al., 2017).

In this study, 25.6% of students were involved in politics, 13.3% faced ragging in their medical lives, 47.7% responded that their college environment was satisfactory to them, and 40.2% were satisfied with their hostel environment. Another study by Maleku and colleagues (2021) showed that most respondents were male (63.1%), single in marital status (75.4%), and living in campus hostels (91.5%).

Family type had a significant association ($p = 0.009$), where those from nuclear families experienced more depression than those from joint families. This suggests familial support structures may influence emotional well-being. A similar report was found that students who lived in nuclear families (≤ 4 members) were more likely to suffer from depression and stress compared to students who lived in larger families (Banna

et al., 2022). Furthermore, in the study, economic background or parental profession (Father/ Mother) may not directly influence depression in this population. By contrast, some Bangladeshi university studies found no consistent association between parental occupation or household income and student depression/anxiety, implying that economic background alone may not explain mental-health differences in this population (Hossain et al., 2021).

Gender & marital status had no significant relation with depression. A similar finding is seen in a study done among students studied in the University of Dhaka, where no significant association was found between psychiatric distress and gender difference (Sherina et al., 2004). These study results also have similarity with a study done in Portuguese, where no significant difference was found between the stress level of male and female 1st year medical students (Marques et al., 2008), and also in Malaysia (Yusoff et al., 2010). In the same way, no significant gender differences for anxiety and depression were found in Pakistan (Khan et al., 2006).

Family type and Religion were statistically significant ($p = 0.009$) with depression. Most of the participants with depression had a nuclear type of family (94.1%), with one to two siblings (65.9%). Most depressive students were Muslim (84.7%). Gender- based prevalence study showed that the prevalence of anxiety, stress, and depression among males was comparatively lesser than (7.60%, 5.20%, and 6.40%, respectively) in females (9.60%, 5.60%, and 9.20%, respectively) (Vala et al., 2020). Analogous to our study, it showed that students who lived in nuclear families (≤ 4 members) were more likely to suffer from depression and stress compared to students who lived in larger families (Banna et al., 2022)

Monthly educational expense and parents' occupational status had no statistical significance with depression, anxiety, or stress according to this study. Participants with depression most commonly lived in their hostel (60.4%).

In this study, a substantially higher proportion of self-financed students were enrolled in government medical colleges (95.1%), whereas only 4.9% of students in private medical colleges financed their own education. This indicates that students in government institutions are more often responsible for bearing their own educational expenses. The financial burden of earning or managing these expenses may contribute to increased levels of depression, anxiety, and stress among these students. Similar findings were reported in a Bangladeshi study, which identified financial constraints as a major source of stress among medical students in a government medical college (Insight Journal, 2023). Another study comparing public and private institutions found that public medical students experienced higher stress levels, suggesting that institutional and economic pressures may influence mental well-being (Eva et al., 2015).

Limitation:

This study has several limitations. First, there is no available data on participants' levels of depression, anxiety, or stress prior to enrolling in the medical program. Second, the study relies on self-reported measures, which may be subject to bias. Third, the data were collected from a single center, limiting the

generalizability of the findings. Lastly, certain potentially influential factors, such as ongoing examinations, were not accounted for, even though they may have temporarily impacted the scores during the study period.

CONCLUSION

This study highlights a significant prevalence of depression, anxiety, and stress among 3rd year medical students in selected medical colleges in Bangladesh. The findings underscore the psychological burden faced by future healthcare professionals, emphasizing the urgent need for targeted mental health support within medical institutions. While the results provide valuable insights, they also call for broader, multi-center research and the inclusion of longitudinal data to better understand the underlying causes and progression of mental health issues among medical students. Implementing regular mental health assessments, counseling services, and stress management programs can play a crucial role in improving students' well-being and academic performance.

Future research should adopt multi-center and longitudinal designs better to understand the development and progression of psychological issues, while accounting for academic workload, examination periods, and socio-economic factors. Additionally, awareness campaigns and institutional policies aimed at reducing stigma can encourage students to seek help without fear, ultimately supporting both their mental health and academic performance. These measures are particularly important given the study's limitations, including reliance on self-reported data, single-center sampling, and lack of baseline mental health assessments.

Conflict of interest

The authors declare that they have no conflicts of interest.

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