

Original Article***Prevalence and Severity of Depression, Anxiety and Stress among Third-Year Medical Students: A Cross-Sectional Study in Public and Private Medical Colleges of Dhaka, Bangladesh***

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For Correspondence*Abstract**

Background: Depression, anxiety, and stress are common mental health challenges among medical students worldwide, with higher prevalence reported compared to their non-medical peers. In Bangladesh, few comparative studies have explored differences between public and private institutions.

Objective: To assess the prevalence and severity of depression, anxiety, and stress among third-year MBBS students in selected government and private medical colleges in Dhaka, Bangladesh, and to identify associated socio-demographic and institutional factors.

Methods: A cross-sectional study was conducted among 398 third-year students from four medical colleges using the validated Bangla version of the Depression, Anxiety, and Stress Scale (DASS-21). Data were analyzed using descriptive statistics, chi-square tests, and Fisher's exact tests, with $p < 0.05$ considered significant.

Results: Overall, 64.1% of students experienced depression, 71.9% anxiety, and 61.6% stress. Extremely severe anxiety was reported by 32.4% of respondents, and 24.4% experienced extremely severe depression. Nearly half (48.7%) reported all three conditions concurrently. Students from government colleges reported higher prevalence of depression (61.2%) and stress (61.2%) compared to private colleges. Hostel residence and parental influence in choosing medicine were significantly associated with higher depression levels, while stress was more prevalent among Bangladeshi nationals compared to foreign students. Ragging was significantly associated with stress, whereas non-involvement in politics correlated with higher psychological morbidity.

Conclusion: The study reveals an alarming burden of psychological distress among Bangladeshi medical students, particularly in government institutions. Interventions addressing academic workload, family support, and institutional culture are urgently needed to safeguard future physicians' mental health.

Keywords: Depression, Anxiety, Stress, Severity, Bangladesh.

Introduction

Mental health disorders, particularly depression, anxiety, and stress, are increasingly recognized as critical public health issues worldwide. According to the World Health Organization (WHO), over 350 million people of all ages suffer from depression globally, and approximately 800,000 people die each year due to suicide, making it one of the leading causes of death among young adults¹. Depression alone is predicted to become the leading cause of disease burden by 2030². Anxiety disorders are equally prevalent, with the World Mental Health Survey reporting that about 1 in 20 people experience an episode of depression or anxiety in a given year³. These alarming figures highlight the growing mental health crisis, particularly among young populations engaged in stressful educational and professional environments.

Medical education is globally recognized as one of the most stressful academic tracks, demanding long study hours, immense workload, and persistent academic pressure. Previous studies have shown that up to 40–50% of medical students suffer from some form of psychological distress, including depression, anxiety, and stress^{4,5}. Unlike non-medical students, medical students face additional burdens such as competitive examinations, continuous assessments, transition from pre-clinical to clinical training, and the pressure of future professional responsibilities. These stressors not only impact their academic performance but also negatively affect their physical health, psychosocial well-being, and overall quality of life^{6,7}.

In Bangladesh, the situation mirrors global trends. A comparative study found that 54% of medical students experienced significant stress, with higher levels observed during the third year when students begin clinical training alongside academic coursework⁸. Another study in Dhaka Medical College revealed that nearly one-fourth (24.9%) of students were suffering from severe psychological distress⁹. Similarly,¹⁰ reported that 64.8% of students in a public medical college experienced anxiety, while Hossain and Wahab¹¹ observed that 40.8% of private medical college students reported mild to moderate depressive symptoms. National-level data also show a worrying trend: WHO estimates that 4.1% of Bangladesh's population (≈6.4 million people) suffer from depression and 4.4% (≈6.9 million people) from anxiety disorders, together accounting for more than 11% of years lived with disability¹².

The implications of these findings are profound. Psychological distress among medical students not only compromises academic performance but also jeopardizes their long-term professional development, increasing the risk of burnout, suicidal ideation, and attrition from the medical workforce^{13,14}. Despite multiple studies, there remains limited comparative evidence between government and private medical institutions in Bangladesh, particularly concerning how socio-demographic and institutional factors contribute to depression, anxiety, and stress levels. Understanding these variations is crucial for designing effective mental health interventions tailored to local contexts.

Therefore, the present study was undertaken to assess the prevalence of depression, anxiety, and stress among third-year MBBS students in selected public and private medical colleges of Bangladesh. The study further aimed to examine the association of these psychological disorders with socio-demographic and institutional factors. By identifying the patterns and determinants of psychological distress, this research seeks to provide evidence-based recommendations for policymakers and educators to develop supportive mental health programs and ensure the well-being of future healthcare professionals.

Methodology

An observational cross-sectional study was conducted over a one-year period from January 2022 to December 2022 to assess the prevalence of depression, anxiety, and stress among 3rd-year medical students. The study was carried out in four purposively selected medical colleges in Dhaka, Bangladesh. These included two public institutions—Dhaka Medical College and Sir Salimullah Medical College—and two private institutions—Dhaka Community Medical College and Dr. Sirajul Islam Medical College. The study population comprised both male and female 3rd-year medical students. Inclusion criteria were willingness to participate and being a 3rd-year student, while students who were sick or having any illness at the time of data collection were excluded. The required sample size was calculated using the formula $n = z^2pq/d^2$, based on a prevalence rate of 66.5% (from Alim et al., 2017), resulting in a final sample size of 398 students after accounting for a 20% non-response rate. Participants were selected using a simple random sampling method.

Data collection was carried out using a structured, pretested, self-administered questionnaire, along with

the Depression Anxiety Stress Scale (DASS-21). The DASS-21 is a reliable and validated psychological tool, which includes 21 items divided into three subscales: depression, anxiety, and stress—each with seven items. The Bangla-translated and validated version of DASS-21 was used for local relevance. Participants were instructed to rate each item based on their experience during the previous week using a 4-point Likert scale (0–3), and scores were multiplied by two to align with the standard DASS interpretation guidelines. The results were then categorized into five severity levels: normal, mild, moderate, severe, and extremely severe.

Data were collected in classroom settings with prior permission from college authorities, with the assistance of both faculty and students. All data were checked, cleaned, and entered into SPSS version 24. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the study population. Comparative analysis was conducted using chi-square tests and Fisher’s exact tests where necessary, with a significance level set at $p < 0.05$. Ethical approval for the study was obtained from the Ethical Review Committee of Dhaka Medical College,

and informed written consent was secured from all participants. Confidentiality and voluntary participation were strictly maintained throughout the research process.

Results

A total of 398 medical students participated in this study, providing comprehensive data on socio-demographic characteristics and psychological health indicators. The analysis focused on the prevalence, severity, and associated factors of depression, anxiety, and stress, as measured by the Depression, Anxiety, and Stress Scale (DASS-21). Descriptive statistics were first used to outline the socio-demographic profile of the respondents, followed by an assessment of the mean, median, and distribution of psychological symptoms. The severity levels of depression, anxiety, and stress were then explored to identify the extent of psychological burden within the study group. Finally, associations between psychological outcomes and key socio-demographic, motivational, and institutional variables were examined to highlight potential risk and protective factors.

Table I: Socio demographic distribution of participants.

Age group (years)	Frequency	Percentage
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	5.025
Unmarried	378	94.95

The socio-demographic profile of the respondents indicates that the majority of participants were within the 22–23 years age group, accounting for over half of the sample (57.5%), while the mean age was approximately 22 years. The gender distribution was nearly equal, with a slight predominance of females (53%) compared to males (47%). Most students were Muslims (84.9%), reflecting the religious composition of the study population, followed by a smaller proportion of Hindus (12.8%), with Buddhists and Christians representing less than 2% each. With regard to living arrangements, nearly two-thirds of the students (64.1%) resided in hostels, while about one-third (31.2%) lived with their families, and a minority reported staying in rented accommodation or with relatives. In terms of marital status, almost all participants (95%) were unmarried, consistent with the young age profile of the study group. Collectively, these findings highlight that the study population predominantly consisted of young, unmarried medical students living in hostel environments, which may have implications for their psychosocial well-being.

Information regarding depression, anxiety and stress status of students

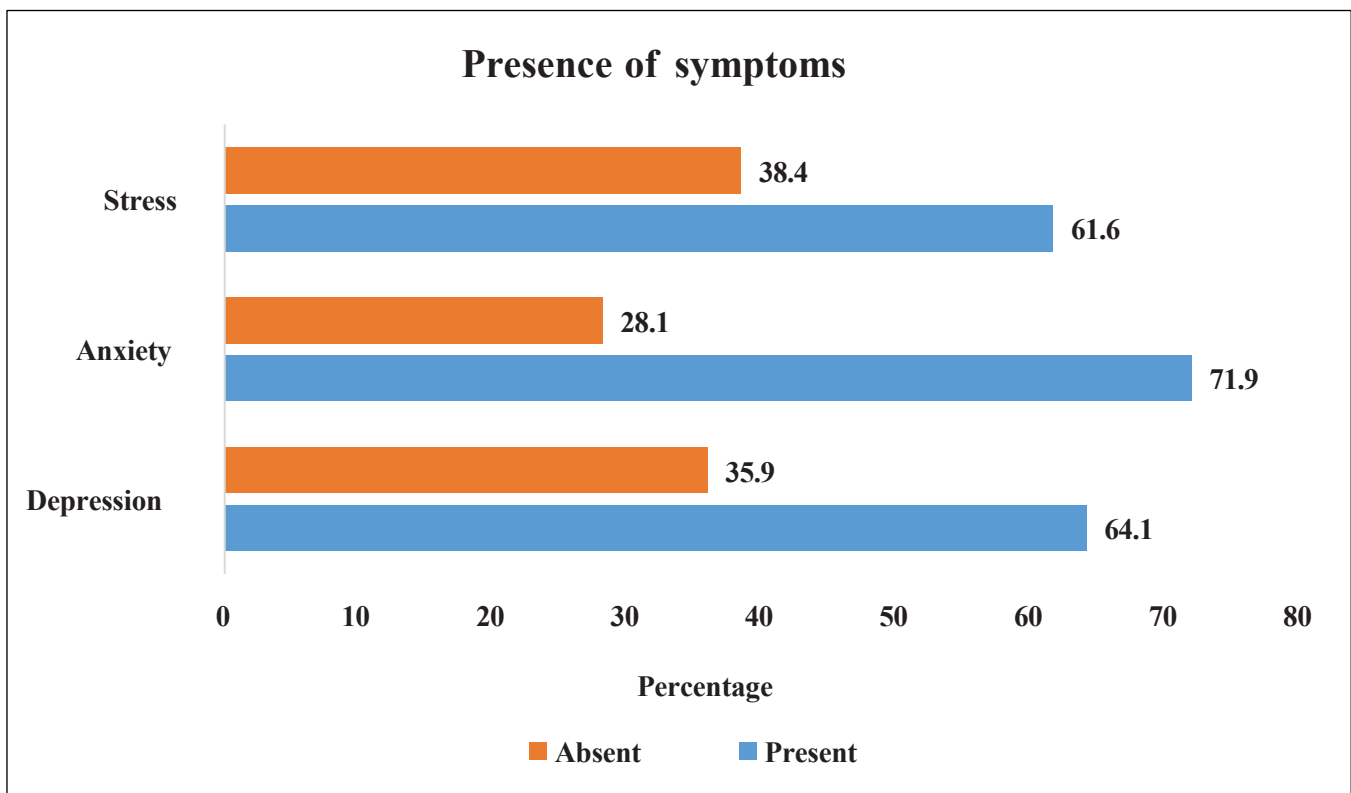


Figure 1: Presence of symptoms of depression, anxiety and stress among the students (n=398)

The findings from Figure 1 reveal a high burden of psychological distress among the medical students, with considerable proportions reporting symptoms of depression, anxiety, and stress. These results underscore the magnitude of mental health challenges within this academic group, suggesting that psychological morbidity is widespread rather than isolated to a few individuals. Anxiety was the most commonly reported condition, with 71.9% of students experiencing symptoms, followed by depression at 64.1%, and stress at 61.6%. Conversely, 35.9% of students reported no symptoms of depression, 28.1% had no symptoms of anxiety, and 38.4% were free from stress. These results highlight that more than half of the participants experienced each form of psychological distress, with anxiety emerging as the most widespread issue. The data suggest that psychological well-being is a significant concern for medical students, warranting targeted interventions and mental health support systems within academic settings.

Table II: Mean and median value of depression, anxiety and stress according to DASS score

	Mean ± SD	Median (IQR)
Depression	17.29±14.67	16(6 -26)
Anxiety	15.44±11.30	14(6 -24)
Stress	19.36±11.25	18(10 -28)

The mean Depression, Anxiety, and Stress Scale (DASS) scores suggest that stress was the most prominent psychological burden, with a mean score of 19.36 compared to 17.29 for depression and 15.44 for anxiety. Although the median scores were closely aligned with the means, indicating a relatively symmetrical distribution, the large standard deviations and wide interquartile ranges point to substantial variability across the sample. This indicates that while some students reported minimal symptoms, a significant proportion experienced much higher levels of psychological distress. Stress, in particular, appeared to be more uniformly distributed across the population, while depression and anxiety showed greater heterogeneity. These findings suggest that although all three domains are prevalent, stress may represent a more common and evenly experienced challenge among the students, while depression and anxiety disproportionately affect certain subgroups.

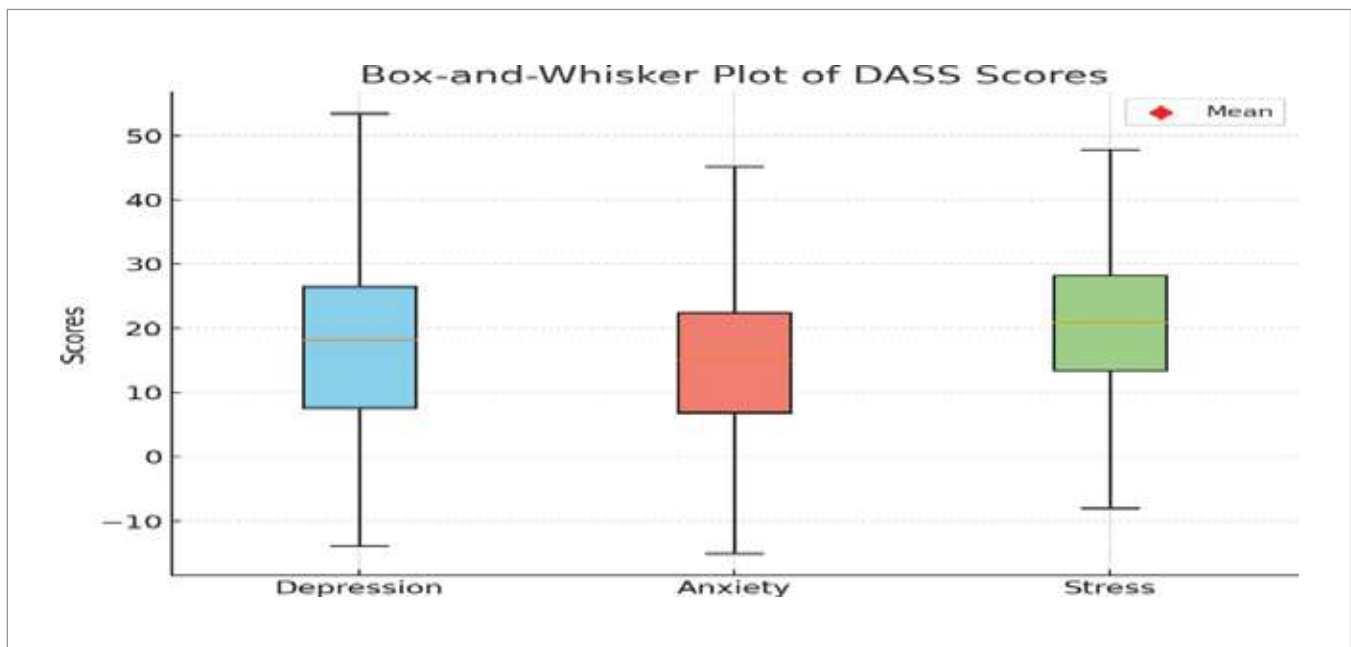


Figure 2: Depression, Anxiety, and Stress Scale (DASS) scores illustrated in the combined and box-and-whisker plots

Comparison of mean and median values, illustrated in the combined and box-and-whisker plots, indicates that central tendency measures were relatively close across all three domains, suggesting broadly symmetrical distributions. However, the large standard deviations and wide interquartile ranges reflect substantial heterogeneity, with a subset of participants experiencing markedly elevated symptoms. In particular, stress scores were consistently higher than depression and anxiety, indicating that stress may represent a more uniformly distributed burden within the study population.

Table III: Severity of depression, anxiety and stress of participants (n=398)

Severity	Depression N(%)	Anxiety N(%)	Stress N(%)
Normal	143 (35.9%)	112 (28.1%)	153 (38.4%)
Mild	38 (9.5%)	24 (6.0%)	50 (12.6%)
Moderate	81 (20.4%)	94 (23.6%)	76 (19.1%)
Severe	39 (9.8%)	39 (9.8%)	59 (14.8%)
Extremely severe	97 (24.4%)	129 (32.4%)	60 (15.1%)

The severity analysis provides further insight into the psychological burden faced by the students. More than one-third of participants reported normal scores across depression (35.9%), anxiety (28.1%), and stress (38.4%). However, a striking finding was that nearly one in four students (24.4%) experienced extremely severe depression, and almost one-third (32.4%) reported extremely severe anxiety. Stress, although also common, was comparatively less severe, with 15.1% of participants classified as extremely severe. These results highlight that while stress is widespread, anxiety appears to be the most intense and prevalent mental health problem in this cohort, with depression falling in between. This pattern suggests that medical students are particularly vulnerable to heightened levels of anxiety, which may stem from academic pressures, uncertainty about the future, and social stressors inherent to medical training.

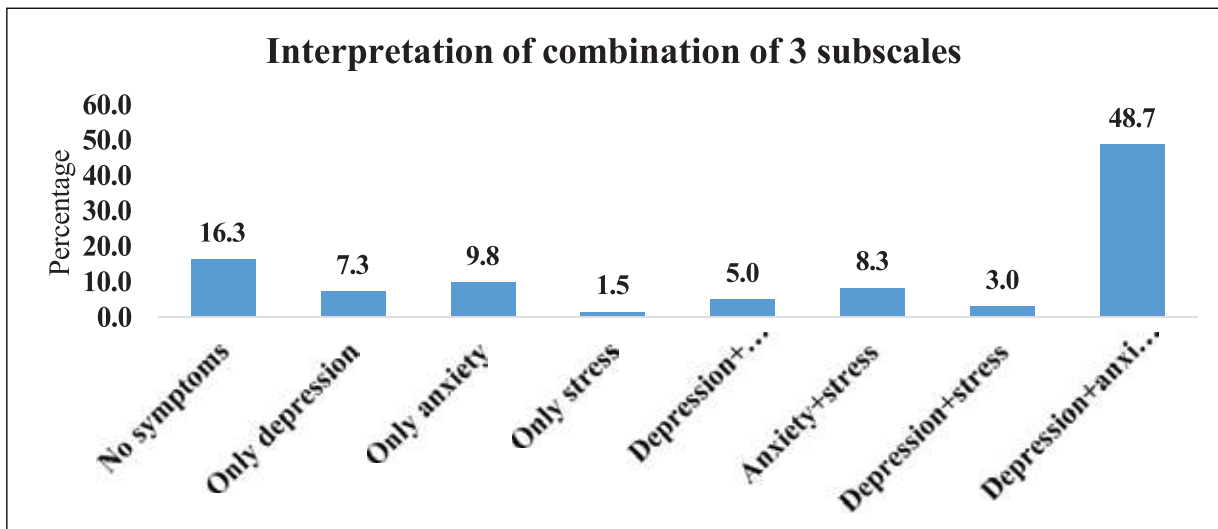


Figure 3: Interpretation of combination of depression, anxiety & stress of DASS (n=398)

The combined interpretation of depression, anxiety, and stress demonstrates that many students experienced overlapping conditions rather than isolated disorders. The chart highlights the coexistence of depression, anxiety, and stress symptoms among medical students. Nearly half of the participants (48.7%) experienced all three conditions simultaneously, underscoring a very high level of comorbidity. In contrast, only 16.3% of students reported no psychological symptoms at all. Among single conditions, anxiety alone (9.8%) was slightly more common than depression alone (7.3%) or stress alone (1.5%). A smaller proportion reported dual combinations such as anxiety with stress (8.3%), depression with anxiety (5%), or depression with stress (3%).

These findings reveal that psychological distress among medical students is rarely isolated; instead, depression, anxiety, and stress frequently overlap, compounding their impact on students' overall mental health. The high proportion of students experiencing multiple conditions simultaneously suggests the need for holistic and integrated mental health interventions rather than targeting individual conditions in isolation.

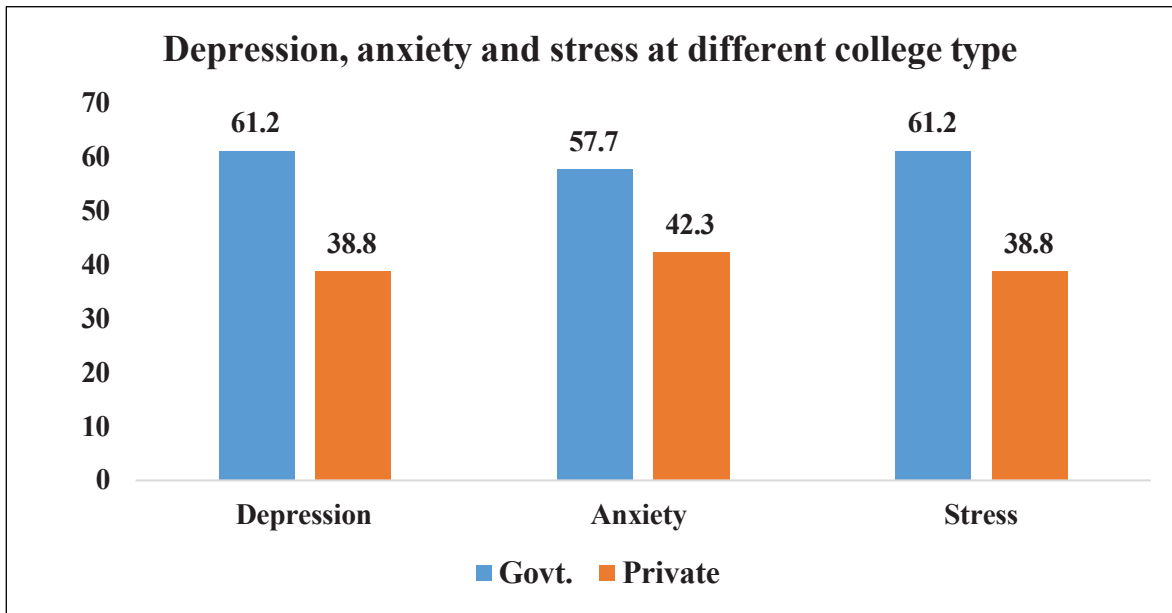


Figure 4: Depression, anxiety and stress among the students at government and private medical college (n=398)

The comparative analysis between government and private medical college students revealed variations in the prevalence of depression, anxiety, and stress. It reveals that students in government colleges experience significantly higher levels of psychological distress compared to those in private institutions. Specifically, 61.2% of government college students report symptoms of both depression and stress, while only 38.8% of private college students report the same. When it comes to anxiety, 57.7% of Government College students are affected, compared to 42.3% in private colleges.

Table IV: Association between residence, country name and motivation for MBBS study with anxiety (n=398)

Variables	Anxiety n (%)		p value*
	Yes n=286	No n=112	
Residence			0.120**
With family	98(34.3)	26(23.2)	
Hostel	174(60.8)	81(72.3)	
Rented house	13(4.5)	5(4.5)	
Relative house	1(0.3)	0	
Name of country			0.279**
Bangladesh	241(84.3)	97(86.6)	
Nepal	5(1.7)	5(4.5)	
India	32(11.2)	10(8.9)	
Sri Lanka	4(1.4)	0	
Others	4(1.4)	0	
Motivation to study MBBS			0.535*
Own interest	175(61.2)	74(66.1)	
Parental influence	93(32.5)	30(26.8)	
Random choice	18(6.3)	8(7.1)	

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

Unlike depression, the presence of anxiety did not show any significant association with residence, country of origin, or motivation for studying medicine. This indicates that anxiety among the students may be more generalized and influenced by broader factors such as academic workload, examination pressures, and uncertainty about career prospects, rather than specific demographic or motivational variables. The widespread nature of anxiety within the sample suggests that it is a pervasive problem affecting students across different backgrounds equally.

Table V: Association between residence, country name and motivation for MBBS study with stress (n=398)

Variables	Stress		p value*
	n (%)		
	Yes n=245	No n=153	
Residence			0.364**
With family	83(33.9)	41(26.8)	
Hostel	151(61.6)	104(68)	
Rented house	10(4.1)	8(5.2)	
Relative house	1(0.4)	0	
Name of country			0.001 **
Bangladesh	213(86.9)	125(81.7)	
Nepal	1(0.4)	9(5.9)	
India	23(9.4)	19(12.4)	
Sri Lanka	4(1.6)	0	
Others	4(1.6)	0	
Motivation to study MBBS			0.229*
Own interest	148(60.4)	101(66)	
Parental influence	83(33.9)	40(26.1)	
Random choice	14(5.7)	12(7.8)	

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

In the case of stress, nationality/ country of origin was found to be a significant factor, with Bangladeshi students experiencing higher stress levels compared to their peers from other countries. This finding may reflect contextual or systemic pressures unique to the Bangladeshi medical education system, such as competitive examinations, heavy academic workload, and institutional challenges. In contrast, neither residence nor motivation to study medicine showed a significant relationship with stress, indicating that stress may be driven more by systemic and contextual pressures rather than individual choices or living arrangements.

Table VI: Relationship among depression, anxiety and stress with political involvement and facing ragging (n=398)

Institutional factors	Depression		Anxiety		Stress	
	n (%)	*p value	n (%)	*p value	n (%)	*p value
Not involve in politics	245 (82.8%)	<0.001	246 (83.1%)	<0.001	218 (73.6%)	<0.001
Faced ragging	40 (15.7%)	0.067	44 (15.4%)	0.070	43 (17.6%)	0.002

*Chi-square test was done

Institutional influences such as political involvement and ragging were also examined in relation to psychological health. Students not involved in politics were significantly more likely to report depression, anxiety, and stress, suggesting that active engagement in extracurricular or social activities might provide a sense of belonging and support, thereby buffering against psychological distress. Meanwhile, ragging was significantly associated with stress but not with depression or anxiety. This suggests that while ragging may not always trigger persistent depressive or anxious symptoms, it acts as a direct stressor that disrupts students’ sense of safety and well-being within the academic environment.

Discussion

This study highlights a high prevalence of depression, anxiety, and stress among medical students, with anxiety emerging as the most severe and widespread condition. More than half of the participants reported moderate to extremely severe levels of psychological morbidity, findings that align with previous studies conducted among medical students in South Asia and globally ^{15,16}. The results reinforce the growing recognition that medical education exerts significant psychological pressure on students, often leading to high levels of distress.

The present study found that stress was the most prominent psychological burden among students, with a mean DASS-21 score of 19.36, compared to 17.29 for depression and 15.44 for anxiety. The close alignment between mean and median scores suggests symmetrical distributions, but the large standard deviations and interquartile ranges indicate considerable variability in symptom severity across the sample. This pattern suggests that while some students reported minimal symptoms, a significant subset experienced elevated psychological distress. Notably, stress appeared to be more uniformly distributed among participants,

whereas depression and anxiety showed greater heterogeneity, potentially affecting specific subgroups more intensely. These findings align with previous studies. For example, a study in Pakistan reported similar DASS-21 means for stress (19.02), anxiety (18.24), and depression (15.08), with stress and anxiety notably prevalent at moderate to extremely severe levels ¹⁷. A Chinese university sample reported lower stress prevalence overall (12%), though mild stress affected nearly half of students (47.9%), indicating stress as a common but variably experienced burden ¹⁸. Additionally, research among secondary school girls in Saudi Arabia revealed high rates of anxiety (66.2%), stress (52.5%), and depression (41.5%), suggesting interlinked but variable burdens of psychological distress ¹⁹. In a UAE sample, female students showed even higher stress levels (M = 22.61), with academic year also significantly influencing DASS scores ²⁰. Collectively, these studies reinforce the current findings—stress is both common and relatively evenly experienced, while depression and anxiety may be more sensitive to individual or contextual differences. This underlines the need for a dual-approach: population-level strategies for stress management and targeted interventions for students at greater risk of depression and anxiety.

The severity distribution warrants particular concern. Nearly one-third of students experienced extremely severe anxiety, consistent with prior reports indicating that anxiety is often the most pronounced symptom among medical trainees ²¹. Stress, while prevalent, was less frequently at extreme levels, suggesting that students perceive stress as a common but manageable experience, whereas anxiety more often escalates to clinically significant levels. The observed comorbidity between depression, anxiety, and stress also mirrors earlier findings, underscoring the interconnectedness of these conditions and the need for integrated interventions ²².

Our results also highlight important socio-demographic and motivational influences. Students residing in hostels reported higher levels of depression than those living with family, suggesting that family presence and support may act as protective factors. Similarly, those who pursued medicine due to parental influence rather than personal interest were more likely to experience depression. This finding is consistent with self-determination theory, which emphasizes that intrinsic motivation enhances resilience, while external pressures may contribute to psychological burden ²³.

The comparative analysis between government and private medical college students revealed notable differences in the prevalence of depression, anxiety, and stress. Government college students reported significantly higher levels of psychological distress, with 61.2% experiencing symptoms of both depression and stress, compared to only 38.8% among their peers in private colleges. Similarly, 57.7% of government college students reported anxiety, versus 42.3% in private institutions. These disparities suggest that students in government colleges may face heightened mental health challenges. Several possible factors could explain this trend, including greater academic pressure, limited access to mental health resources, financial stress, larger class sizes, or less personalized support environments typically found in public institutions. Previous studies have echoed similar findings, where students from government-funded institutions exhibited higher stress due to resource constraints and academic competition ^{24,25}. The data strongly underscores the need for targeted mental health interventions in government colleges, such as accessible counseling services, stress-reduction workshops, and academic support systems, to mitigate the emotional burden experienced by these students. Addressing these

disparities is critical to promoting equitable well-being across diverse educational settings.

Interestingly, anxiety was not significantly associated with residence, nationality, or motivation, suggesting that it may be a more generalized response to the academic environment and workload. Stress, however, was significantly higher among Bangladeshi students compared to international peers, potentially reflecting contextual factors such as educational system demands, cultural expectations, and competitive academic environments.

Institutional factors were also important. Non-involvement in politics was associated with greater psychological distress, a counterintuitive finding that may indicate that political engagement provides students with social networks, a sense of agency, and emotional outlets that help buffer against distress. Ragging was significantly associated with stress, which is consistent with literature linking hazing practices to trauma, reduced academic performance, and increased psychological morbidity ²⁶.

The differences between government and private medical colleges further underscore the role of institutional context. Prior studies suggest that differences in teaching methods, workload, and support structures may influence students' mental health ²⁷. Our findings align with this, highlighting the need for institution-specific strategies to address psychological morbidity.

Overall, this study contributes to the growing body of evidence on mental health in medical students, particularly in the South Asian context. The high burden of anxiety, the role of motivation and residence, and the influence of institutional factors highlight the multifaceted nature of psychological distress. Interventions should therefore be comprehensive, addressing individual coping mechanisms, family and peer support, institutional culture, and broader systemic pressures.

Conclusion

The study reveals an alarming burden of psychological distress among Bangladeshi medical students, particularly in government institutions. Interventions addressing academic workload, family support, and institutional culture are urgently needed to safeguard future physicians' mental health.

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