Emotional Well-being of Future Physicians: A Study on Depression, Anxiety, Stress and Its Correlation with Academic Performance among Medical Students in Northern India

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Abstract

Introduction: Medical education is known for its demanding nature and intense academic pressures, often leading to elevated levels of psychological distress among students. Depression, anxiety, and stress are commonly reported mental health concerns that may adversely impact academic performance. This study aimed to assess the prevalence and severity of these psychological parameters among MBBS students and examine their correlation with academic functioning.

Materials and Methods: A descriptive cross-sectional study was conducted over 18 months at a tertiary care teaching hospital in Sitapur, Uttar Pradesh. A total of 384 MBBS students from all academic years were enrolled using convenient cluster sampling. Data were collected through a self-administered questionnaire including a semi-structured socio-demographic proforma, the DASS-42 for assessing depression, anxiety, and stress, and the Academic Performance Scale (APS). Diagnoses were clinically validated using ICD-10 criteria. Statistical analysis was performed using SPSS v26, employing chi-square tests and multivariate logistic regression.

Results: The prevalence of depression, anxiety, and stress among participants was found to be 32.0%, 38.0%, and 45.0%, respectively. Severity analysis revealed that a significant proportion of students experienced moderate to extremely severe symptoms. A statistically significant inverse relationship was observed between the severity of depression, anxiety, and stress and academic performance ($p < 0.001$ for depression, $p = 0.001$ for anxiety, and $p = 0.003$ for stress). Logistic regression identified moderate to severe depression (AOR: 2.63), anxiety (AOR: 2.35), and stress (AOR: 1.92) as independent predictors of poor academic outcomes.

Conclusion : A substantial proportion of MBBS students suffer from psychological distress, which significantly affects their academic performance. These findings underscore the need for routine mental health screening, accessible counseling services, and structured wellness programs within medical institutions to promote emotional resilience and academic success.

Keywords: Medical students, Depression, Anxiety, Stress, Academic performance, DASS-42, ICD-10, Undergraduate mental health

Introduction

The correlation between academic performance and emotional well-being among medical students in Northern India is multifaceted, with emotional intelligence (EI) emerging as a key influencing factor. EI is known to enhance emotional awareness, social competence, and relationship management—attributes essential for thriving in the high-pressure environment of medical education. Studies have demonstrated that higher EI is often associated with better academic performance among medical students, as it promotes improved coping mechanisms and adaptive behavior in challenging academic settings[1,2]. However, this association is not always linear. While some research supports a direct positive correlation between EI and academic achievement, other studies suggest that EI primarily affects psychological well-being, which indirectly influences academic outcomes[3,4].

Emotional states such as anxiety and depression are also widely prevalent among medical students and have been shown to impair cognitive performance, memory, and motivation, thereby negatively impacting academic success[5,6]. Several studies have reported a significant portion of medical students suffering from emotional distress, which correlates with poor academic performance[5,6]. Furthermore, the overall quality of life—particularly mental health and emotional balance—among medical students is often lower than that of the general population. Poor quality of life has been linked to both academic underachievement and an elevated risk of burnout[7-9].

Gender disparities in emotional intelligence and burnout have also been observed. For instance, female medical students have been shown to experience higher rates

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of emotional exhaustion and burnout, which may adversely affect their academic outcomes[9]. These findings have important implications for medical education. There is a growing recognition of the need for targeted interventions to enhance EI and provide mental health support. Structured programs that incorporate emotional regulation, resilience training, and stress management have shown promise in improving both academic performance and emotional well-being[8,10].

In conclusion, integrating EI training and psychological support services within the medical curriculum could serve as a protective factor, helping students better manage the emotional demands of medical training and achieve optimal academic outcomes.

Study Design and Setting

This study employed a descriptive cross-sectional design to assess the prevalence and severity of depression, anxiety, and stress among MBBS students and to evaluate their correlation with academic performance. The research was conducted at the Hind Institute of Medical Sciences (HIMS), Ataria, Sitapur—a tertiary care teaching hospital in Uttar Pradesh, India. The study duration spanned 18 months, including 12 months allocated for data collection and 6 months for data analysis and manuscript preparation. Ethical approval was obtained from the Institutional Ethics Committee of Hind Institute of Medical Sciences before initiating the study.

Study Population and Sampling

The study population comprised undergraduate MBBS students from all four academic years (I to IV) enrolled at Hind Institute of Medical Sciences (HIMS), Sitapur. A total of 384 students were included using a convenient cluster sampling. The sample size was calculated using Cochran's formula for absolute error-based sampling, as referenced by Karthik et al. (2022). Inclusion criteria encompassed all male and female MBBS students who had been enrolled for at least six months and provided informed written consent. Students were excluded if they declined participation, had joined the institution within the past six months, had a known history of psychiatric illness or substance abuse, or were experiencing any physical illness during the study period, to avoid potential confounding factors.

Data Collection Tools and Instruments

Data were collected using a structured, self-administered questionnaire comprising three components: a semi-structured proforma to record socio-demographic and personal details; the Depression Anxiety and Stress Scale-42 (DASS-42), a validated tool to assess the severity of depression, anxiety, and stress; and the Academic Performance Scale (APS), an 8-item standardized Likert-scale instrument evaluating academic behaviors such as motivation, preparedness, and time management, with scores categorized into five performance levels. To ensure clinical accuracy, diagnoses of depression and anxiety were confirmed using ICD-10 criteria by two qualified psychiatrists. Eligible students from all academic years were invited to participate voluntarily after providing written informed consent. Questionnaires were provided in English or Hindi according to student preference, and data collection was conducted during academic hours with strict confidentiality to encourage honest responses and high participation.

Statistical Analysis

Collected data were first entered into Microsoft Excel for initial sorting and then analyzed using IBM SPSS Statistics version 26. Descriptive statistics such as frequencies, percentages, means, and standard deviations were computed to describe the socio-demographic and psychological characteristics of the participants. Inferential statistics included the Chi-square test to assess associations between categorical variables, such as severity of depression, anxiety, and stress, with academic performance categories. Independent t-tests and one-way ANOVA were used to compare mean differences across various groups. Further, multiple logistic regression analysis was conducted to identify independent predictors of poor academic performance, and results were expressed as adjusted odds ratios (AORs) with 95% confidence intervals (CI). A p-value less than 0.05 was considered statistically significant.

RESULT

Table 1: Academic Performance Distribution of MBBS Students (N = 384)

Academic Performance Category	Frequency (n)	Percentage (%)
Excellent	50	13.0%
Good	75	19.5%
Moderate	105	27.3%
Poor	90	23.4%
Failing	64	16.7%

This table illustrates the distribution of academic performance among 384 MBBS students as assessed by the Academic Performance Scale (APS). The most common performance category was Moderate (27.3%), followed by Poor (23.4%) and Good (19.5%). Notably, only 13.0% of students were categorized as Excellent, while 16.7% were classified in the Failing category. These results highlight a significant proportion of students performing below optimal academic standards, underscoring the potential influence of underlying psychological distress and lifestyle-related factors such as stress, sleep issues, and mental health challenges. The academic burden typical of medical education may contribute to these suboptimal outcomes, indicating the need for institutional strategies to support academic engagement and psychological resilience.

Table 2: Prevalence of Depression, Anxiety, and Stress Among Medical Students (N = 384)

Variable	Total (N = 384) (%)
Depression	123 (32.0%)
Anxiety	146 (38.0%)
Stress	173 (45.0%)

This table presents the overall prevalence of depression, anxiety, and stress symptoms among the study participants. Depression was present in 32.0% of students, anxiety in 38.0%, and stress in 45.0%, making stress the most frequently reported psychological concern. These findings reflect a considerable emotional burden among medical students, many of whom experience overlapping symptoms of mental distress. The high prevalence suggests a need for urgent attention toward integrating mental health screening, psychoeducational programs, and accessible counseling services within medical institutions. The emotional well-being of students is essential not only for academic success but also for the development of future competent healthcare professionals.

Table 3: Severity Distribution of Depression, Anxiety, and Stress Using DASS-42 (N = 384)

Severity Level	Depression (%)	Anxiety (%)	Stress (%)
Normal	68.0	62.0	55.0
Mild	13.26	12.23	12.0
Moderate	16.14	15.36	18.0
Severe	1.82	7.55	8.3
Extremely Severe	0.78	2.86	6.7

Table 4: Correlation Between Severity of Depression and Academic Performance Among MBBS Students (N = 384)

Severity Level	Excellent (n=50)	Good (n=75)	Moderate (n=105)	Poor (n=90)	Failing (n=64)	$\chi^2 = 29.8$ $p < 0.001$)
Normal (n=261)	35 (70.0%)	40 (53.3%)	85 (81.0%)	60 (66.7%)	41	
Mild (n=51)	10 (20.0%)	20 (26.7%)	10 (9.5%)	8 (8.9%)	3 (4.7%)	
Moderate (n=62)	4 (8.0%)	10 (13.3%)	5 (4.8%)	20 (22.2%)	23	
Severe (n=7)	1 (2.0%)	3 (4.0%)	3 (2.9%)	0 (0%)	0 (0%)	
Extremely Severe (n=3)	0 (0%)	2 (2.7%)	2 (1.9%)	2 (2.2%)	2 (3.1%)	

This table reveals a statistically significant relationship between the severity of depression and academic performance ($\chi^2 = 29.8$, $p < 0.001$). Students with normal depression levels showed superior academic performance, with 70% scoring Excellent and 81% falling in the Moderate academic category. As depression severity increased, the academic performance declined proportionately. For instance, 35.9% of students with moderate depression fell in the Failing category, while those with severe or extremely severe depression had almost no representation in the Excellent group. These findings strongly support that depressive symptoms adversely affect cognitive functioning, learning motivation, and academic productivity. The data advocates for early mental health intervention, regular psychological screenings, and support systems within medical colleges.

Table 5: Correlation Between Severity of Anxiety and Academic Performance Among MBBS Students (N = 384)

Severity Level	Excellent (n=50)	Good (n=75)	Moderate (n=105)	Poor (n=90)	Failing (n=64)	($\chi^2 = 25.4$ $p = 0.001$)
Normal (n=238)	30 (60.0%)	45 (60.0%)	80 (76.2%)	55 (61.1%)	28	
Mild (n=47)	10 (20.0%)	10 (13.3%)	10 (9.5%)	10 (11.1%)	7	
Moderate (n=59)	5 (10.0%)	8 (10.7%)	7 (6.7%)	15 (16.7%)	24	
Severe (n=29)	4 (8.0%)	7 (9.3%)	5 (4.8%)	7 (7.8%)	6 (9.4%)	
Extremely Severe (n=11)	1 (2.0%)	5 (6.7%)	3 (2.9%)	3 (3.3%)	5 (7.8%)	

This table highlights a statistically significant inverse correlation between the severity of anxiety and academic performance ($\chi^2 = 25.4$, $p = 0.001$). A majority of students with normal anxiety levels demonstrated good or excellent academic results, whereas those with moderate to extremely severe anxiety were more frequently represented in the Poor and Failing categories. Specifically, 37.5% of students with moderate anxiety and 7.8% with extremely severe anxiety performed poorly, indicating a clear deterioration of academic performance as anxiety levels rise. The results underscore the cognitive impairments and reduced academic focus associated with increased anxiety, emphasizing the importance of campus mental health resources, early intervention strategies, and stress management programs tailored for medical students.

Table 6: Correlation Between Severity of Stress and Academic Performance Among MBBS Students (N = 384)

Severity Level	Excellent (n=50)	Good (n=75)	Moderate (n=105)	Poor (n=90)	Failing (n=64)	($\chi^2 = 21.2$ $p = 0.003$)
Normal (n=211)	30 (60.0%)	40 (53.3%)	65 (61.9%)	50 (55.6%)	26	
Mild (n=46)	10 (20.0%)	15 (20.0%)	15 (14.3%)	4 (4.4%)	2 (3.1%)	
Moderate (n=69)	5 (10.0%)	10 (13.3%)	10 (9.5%)	15 (16.7%)	29	
Severe (n=32)	3 (6.0%)	7 (9.3%)	8 (7.6%)	11 (12.2%)	13	
Extremely Severe (n=26)	2 (4.0%)	3 (4.0%)	7 (6.7%)	10 (11.1%)	12	

This table depicts the relationship between stress severity and academic performance, revealing a statistically significant inverse association ($\chi^2 = 21.2$, $p = 0.003$). Students with normal stress levels were more likely to achieve higher academic performance, including 60% in the Excellent category. Conversely, students experiencing moderate to extremely severe stress showed disproportionately higher representation in the Poor and Failing performance categories. Notably, 45.3% of those with moderate stress and nearly one-third of those with extremely severe stress were in the Failing category. These findings confirm that escalating levels of stress negatively affect academic productivity, concentration, and motivation. They emphasize the urgent need for institutional measures such as stress-reduction workshops, structured mentoring, and emotional resilience training to mitigate the academic toll of unmanaged stress.

Table 7: Predictors of Poor Academic Performance Among MBBS Students – Multiple Regression Analysis (N = 384)

Predictor Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Moderate to Severe Depression	2.63	1.49 – 4.65	<0.001
Moderate to Severe Anxiety	2.35	1.38 – 4.01	0.002
Moderate to Severe Stress	1.92	1.14 – 3.24	0.015

This table summarizes the results of a multivariate logistic regression analysis identifying independent predictors of poor academic performance among MBBS students. The analysis indicates that moderate to severe depression (AOR: 2.63, $p < 0.001$), moderate to severe anxiety (AOR: 2.35, $p = 0.002$), and moderate to severe stress (AOR: 1.92, $p = 0.015$) were all significantly associated with poor academic outcomes. These findings underscore that psychological distress is not only prevalent but also a strong determinant of academic underachievement. Institutions must prioritize early detection and targeted interventions for students at risk to support both their mental health and academic success.

DISCUSSION

The present study highlights a concerning prevalence of psychological distress among MBBS students, with 32.0% screening positive for depression, 38.0% for anxiety, and 45.0% for stress. These findings suggest that a substantial proportion of medical undergraduates are experiencing emotional and behavioral disturbances during their education. This high burden of psychological morbidity aligns with findings from Bansal et al. in North India, who reported similar levels of depression (28%) and anxiety (36%), along with notable rates of internet addiction[11]. Internationally, a meta-analysis by Rotenstein et al. corroborates these trends, reporting a pooled prevalence of 27.2% for depression among medical students and a notable 11.1% experiencing suicidal ideation[12].

However, there are contrasting results within the Indian context. Chaudhary et al. in South India reported lower rates of depression (16%) and anxiety (19%), attributing the better outcomes to institutional initiatives like yoga sessions, mentorship, and stress-relief workshops[13]. Similar observations were made by Henning et al. in Europe, where German medical students demonstrated lower stress levels (25%) and better sleep hygiene, likely due to structured academic frameworks and early mental health interventions[14].

In terms of symptom severity, while most students in the current study were within the normal range (68% for depression, 62% for anxiety, and 55% for stress), a considerable portion exhibited mild to extremely severe symptoms. Specifically, 16.1% reported moderate depression, 15.4% had moderate anxiety, and 18.0% showed moderate stress. An additional 10–15% fell into severe to extremely severe categories across all three domains. These figures are in close agreement with Reddy et al., who reported moderate to severe levels of depression, anxiety, and stress in 17%, 12%, and 14% of their medical student cohort, respectively[15]. Similar trends were also seen in studies by Jain et al. [16] and Paul et al. [17], especially among students in their clinical years, who reported higher emotional strain. However, studies by Thakkar et al. [18] in Gujarat and Kaur et al. [19] in Punjab observed fewer students with severe symptoms, a difference potentially attributed to stronger student support systems, early academic orientation, and accessible mental health resources.

The present study also found a statistically significant inverse relationship between psychological distress and academic performance. Among students with normal depression scores, 70% achieved excellent academic outcomes. In contrast, moderate to severe depression was strongly associated with poor and failing academic performance, with 35.9% of students with moderate depression and 3.1% with extremely severe depression scoring in the failing range. These results resonate with findings from Singh et al.[20] and Rani et al.[21], who found that students with moderate to severe depressive symptoms had significantly lower academic scores, possibly due to impaired concentration, reduced motivation, and memory issues. Similarly, Thomas et al. [22] reported that depression negatively affected attendance and test performance, particularly in pre-clinical years. Although Prasad et al. [23] and Chew-Graham et al. [24] found no strong correlation, they suggested that some students might mask distress through high-achieving behavior or benefit from external academic support.

A similar inverse pattern was observed between anxiety and academic performance. Students with normal anxiety levels fared better, with 60% achieving excellent or good performance. Those with moderate to extremely severe anxiety were overrepresented in the failing category, with 37.5% of students with moderate anxiety falling into this group. This is consistent with studies by Dube et al. [25] and Kumar et al. [26], who linked higher anxiety levels to reduced academic achievement and poor sleep quality. Joshi et al. [27] further supported this link, noting poor concentration and participation in students with elevated anxiety. Owens et al.'s meta-analysis from the UK also emphasized that academic performance suffers as anxiety increases, particularly among students in health-related courses[28]. In contrast, Rajesh et al. [29] and Cassady & Johnson [30] proposed that low to moderate anxiety might enhance performance, referencing the Yerkes-Dodson Law, which suggests that mild anxiety can serve as a motivating factor. However, our data show that once anxiety becomes moderate or severe, its impact is predominantly

negative.

The relationship between stress and academic performance mirrored the above findings. Students with normal stress levels had better academic outcomes, while those with moderate to extremely severe stress performed poorly. Notably, nearly 30% of students with extremely severe stress were in the failing group. These results are supported by Sreeramareddy et al. [31], who found that high stress levels were associated with poor sleep, emotional exhaustion, and declining academic scores. Verma et al. [32] and Banerjee et al. [33] echoed similar findings, reporting reduced class attendance, concentration, and clinical efficiency in highly stressed students. Internationally, Dahlin et al. [34] observed that stressed Swedish students experienced more academic setbacks and burnout. Nonetheless, some studies, such as those by Sarkar et al. [35] and Yusoff et al. [36], noted that mild to moderate stress could serve as an academic motivator, provided students had access to strong coping mechanisms and support.

In conclusion, this study reinforces the existing body of evidence indicating that depression, anxiety, and stress are prevalent among medical students and are significantly associated with academic underperformance. While some level of stress or anxiety may be normal or even beneficial, elevated levels—especially when moderate to severe—clearly interfere with academic success. These findings call for urgent implementation of comprehensive mental health screening, peer support systems, and wellness programs tailored to the unique pressures of medical education.

Conclusion

This study reveals a high prevalence of depression, anxiety, and stress among MBBS students in Northern India, with significant negative correlations between the severity of psychological distress and academic performance. Moderate to severe levels of depression, anxiety, and stress were identified as strong independent predictors of poor academic outcomes. These findings underscore the urgent need for regular mental health screening, accessible counseling services, and institutional wellness initiatives to support the emotional well-being and academic success of future physicians.

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