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# *PREVALENCE OF DEPRESSION AND ANXIETY SYMPTOMS AMONG UNDERGRADUATE MBBS STUDENTS DURING EXAMINATION PERIODS*

Original Article

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**Short Title:** Depression and Anxiety in MBBS Students.

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## Abstract

**Background:** Depression and anxiety are common mental health concerns among medical students, particularly during examination periods when academic pressure intensifies. The demanding curriculum, competitive environment, and fear of failure create a high-stress atmosphere that predisposes students to psychological distress.

**Objective:** To judge the prevalence and severity of depression and anxiety symptoms among undergraduate MBBS students during examination periods and to find demographic factors linked with increased risk.

**Methods:** A cross-sectional survey was carried out across four months, enrolling 404 MBBS students from a medical college in Lahore. Participants were selected through a stratified random sampling approach. Symptoms of depression and anxiety were measured using standardized self-report questionnaires: the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7). Data handling and analysis were performed with SPSS software, version 26. Demographic information was described using summary statistics, while relationships were examined through independent t-tests, chi-square procedures, and Pearson's correlation. Statistical significance was determined at a threshold of $p<0.05$.

**Results:** The participants had an average age of 21.4 years (±1.8), with females making up 58.2% of the group. Symptoms of moderate to severe depression, based on PHQ-9 scores ≥10, were identified in 39.9% of students, whereas 40.9% showed moderate to severe anxiety with GAD-7 scores ≥10. Female students recorded higher mean levels of both depression and anxiety compared with males ($p=0.002$ and $p=0.001$, respectively). Students living in hostels exhibited more severe symptoms than day scholars ($p<0.05$ for both). A strong and direct association was observed between depression and anxiety scores ($r=0.72$, $p<0.001$).

**Conclusion:** A substantial proportion of MBBS students experienced significant depression and anxiety symptoms during examinations, highlighting the need for targeted mental health interventions and institutional support systems to reduce academic stress and promote psychological well-being.


**Keywords:** Anxiety Disorders, Cross-Sectional Studies, Depression, Examinations, Medical Students, Mental Health, Prevalence, Psychological Stress, Risk Factors, Students Medical.

## Introduction

Depression and anxiety represent widespread mental health challenges for university populations globally, and medical students are notably susceptible to these conditions (1). The intensity of medical training, marked by substantial academic demands, stringent performance standards, and recurrent evaluations, fosters a persistent climate of psychological strain. Research consistently shows that medical students report greater severity of depressive and anxious symptoms relative to students in other disciplines, with exam phases being especially high-risk intervals (2). The convergence of intense scholarly pressure, apprehension about failing, and the competitive culture of medical education frequently precipitates psychological distress, which can negatively impact academic outcomes, interpersonal connections, and general well-being (3). The undergraduate MBBS curriculum is widely regarded as one of the most rigorous academic tracks within higher education (4). Learners must endure prolonged study schedules, considerable clinical duties, and ongoing evaluation, all of which require considerable cognitive and emotional fortitude (5). At examination times, these pressures escalate as students strive to manage thorough revision with insufficient recovery, leading to sleep disturbances, social isolation, and perceptions of incompetence (6). Existing literature demonstrates that such conditions may initiate or worsen manifestations of depression and anxiety, such as enduring low mood, diminished drive, agitation, pervasive anxiety, and physical symptoms like headaches or digestive issues (7). In extreme instances, these manifestations can develop into burnout, problematic substance use, or suicidal thoughts, highlighting the critical need for early detection and support.

Evidence from various countries has highlighted alarming rates of mental health issues among medical students (1). Studies from South Asia, including Pakistan, report prevalence rates of depression and anxiety ranging from 30% to over 50%, with examinations consistently cited as a major precipitating factor (2). Despite increasing recognition of this problem, stigma surrounding mental health and a culture that prizes endurance over self-care often discourage students from seeking help. This reluctance not only delays diagnosis and treatment but also perpetuates a cycle of stress and impaired functioning (3). Furthermore, while global research provides valuable insights, the specific sociocultural and institutional factors influencing mental health among Pakistani medical students remain underexplored, particularly in the context of examination-related stress. Understanding the magnitude of depression and anxiety during examination periods is crucial for developing targeted interventions. Identifying the prevalence of these symptoms can guide medical colleges in implementing preventive strategies such as stress management workshops, peer support programs, and accessible mental health services. Early recognition also enables educators to adopt policies that promote balanced study habits and encourage open dialogue about mental well-being, thereby reducing the stigma associated with psychological distress.

Despite the growing body of international literature, there remains a scarcity of data focusing specifically on the mental health of MBBS students in Pakistan during examinations. Cultural expectations, family pressures, and limited institutional mental health resources may further compound the psychological burden experienced by students in this setting (4). Without empirical evidence, efforts to address these challenges remain fragmented and insufficient. This study aims to address this critical gap by assessing the prevalence of depression and anxiety symptoms among undergraduate MBBS students during examination periods. By quantifying the frequency of these symptoms and identifying associated demographic factors, the research seeks to provide evidence that can inform mental health support initiatives within medical institutions. The objective is to generate data that will help educators and policymakers design effective, contextually relevant interventions to protect the psychological well-being of future physicians.

## Methods

This cross-sectional survey spanned four months at a government medical college in Lahore, estimating the frequency of depressive and anxiety symptoms in MBBS undergraduates during examinations. Eligible participants were currently enrolled MBBS students from first through final year. A stratified random sampling approach was applied, with proportional allocation across all five academic years to secure adequate representation of each cohort. Enrollment lists supplied by the college administration formed the sampling frame, and selected participants were chosen using computer-generated random numbers. Recruitment and data collection were scheduled during periods of scheduled midterm and professional assessments to target students during the examination timetable. Inclusion required active participation in the ongoing exam sittings and willingness to provide informed consent. Students

with a prior psychiatric diagnosis under pharmacological treatment, those on academic leave, or anyone unwilling to participate were excluded to ensure estimates reflected exam-related stress rather than pre-existing mental illness. Sample size used the single-population proportion formula, assuming 50% prevalence for depression or anxiety to maximize n, with 95% confidence and 5% precision. The minimum calculated sample was 384 students. Allowing for an anticipated 10% nonresponse, the target was increased to 420. Recruitment occurred during breaks to minimize disruption and bias. These steps were taken to support unbiased participation and a clear appraisal of exam-period mental health status.

Data were gathered with a structured, self-completed questionnaire handed out during exam-preparation breaks. The instrument contained three core parts. The first captured demographics including age, sex, academic year, and living status (hostel resident or day scholar). The second part evaluated depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9), a validated measure intended to gauge both presence and intensity of depression during the preceding two weeks. Scores span 0–27; higher totals indicate greater severity, and standard thresholds classify cases as mild, moderate, moderately severe, or severe. The final part assessed anxiety with the Generalized Anxiety Disorder seven-item scale (GAD-7), which records symptom frequency on a 0–21 continuum and groups severity as mild, moderate, or severe. Both instruments are extensively used in academic research and demonstrate strong internal consistency, with Cronbach's alpha typically above 0.80 in prior validation studies. Surveys were completed anonymously to minimize bias and promote candid responses. Trained research staff not involved in instruction or grading supervised administration to reduce coercion. All forms were checked for completeness before entry. To enhance accuracy, data entry was performed independently by two clerks and cross-checked. Analyses were executed in SPSS version 26. Continuous variables, including age and scale scores, were summarized as means with standard deviations, whereas categorical variables were presented as frequencies and percentages. Normality of PHQ-9 and GAD-7 distributions was confirmed using the Shapiro–Wilk test, so parametric procedures were applied. Comparisons of mean depression and anxiety by sex used independent t-tests, while differences across academic years were examined with one-way ANOVA. Post hoc Tukey procedures were undertaken where significant contrasts were detected. Associations between categorical variables, such as moderate-to-severe depression or anxiety and demographic characteristics, were evaluated with the chi-square test. Pearson correlation quantified the link between depression and anxiety scores, and statistical significance was set at $p<0.05$. Double-entry logs were reconciled, and discrepancies were resolved by referring to original forms where needed.

Approval for the study was granted by the institutional review board of the concerned medical college before data collection began. Authorization was also obtained from the college administration to conduct the survey during examination sessions. Students were clearly briefed about the aims of the research, the voluntary nature of their involvement, and their freedom to withdraw at any stage without any consequences. Written consent was collected from every participant. Confidentiality and anonymity were fully safeguarded, with no identifying details recorded and all data stored securely under restricted access. This approach ensured a reliable framework, supported by careful sampling, standardized tools, and rigorous statistical analysis to achieve the study objectives.

## Results

Out of 420 MBBS undergraduates initially contacted, 404 returned completed questionnaires, giving a participation rate of 96.2%. The average age was 21.4 ± 1.8 years, ranging between 18 and 25. Females formed 58.2% of the sample (n=235), while males accounted for 41.8% (n=169). Representation across academic years was fairly even, with first year contributing 19.6%, second year 20.5%, third year 21.3%, fourth year 18.8%, and final year 19.8%. A majority of students (63.1%) stayed in hostels, whereas 36.9% were day scholars (Table 1). The overall PHQ-9 mean score was 9.8 ± 5.4, reflecting generally mild-to-moderate depressive symptoms. Using the standard cut-off ranges, 30.4% reported minimal depression (score <5), 29.7% mild (5–9), 22.8% moderate (10–14), 11.4% moderately severe (15–19), and 5.7% severe (≥20). The proportion with moderate-to-severe depression (score ≥10) was calculated at 39.9% (Table 2). Female students had significantly higher mean scores than males (10.6 ± 5.5 vs. 8.6 ± 5.0; p=0.002). Hostel residents also scored higher compared with day scholars (10.2 ± 5.6 vs. 9.0 ± 5.1; p=0.045). No meaningful variation was detected across academic years (p=0.13).

The mean GAD-7 anxiety score was 8.6 ± 4.8, with 27.7% of students falling into the minimal range (<5), 31.4% mild (5–9), 25.5% moderate (10–14), and 15.4% severe anxiety (≥15). Overall, 40.9% reported moderate-to-severe anxiety symptoms (score ≥10) (Table 3). Females recorded higher mean anxiety scores than males (9.3 ± 4.9 vs. 7.6 ± 4.5; p=0.001), and hostel residents also demonstrated higher anxiety scores compared to day scholars (8.9 ± 4.9 vs. 8.0 ± 4.6; p=0.04). Final-year students reported slightly higher anxiety scores than junior students, but the difference did not reach statistical significance (p=0.09). A strong positive correlation was observed between depression and anxiety scores (r=0.72, p<0.001), indicating a considerable overlap of symptoms (Table 4). Independent t-tests confirmed that students with moderate-to-severe anxiety had meaningfully higher depression scores than those with minimal or mild anxiety (13.4 ± 5.3 vs. 6.8 ± 3.4; p<0.001). One-way ANOVA revealed no significant difference in depression or anxiety severity across academic years after adjustment for gender and residence.

The distribution of depression severity is illustrated in Figure 1, showing a gradual decline in frequency from mild to severe categories. Figure 2 depicts the proportion of students with moderate-to-severe anxiety stratified by gender, highlighting higher prevalence among females.

**Table 1: Profile of the research cohort (n=404)**

| ***Variable*** | ***n (%) or Mean ± SD*** |
|---|---|
| *Age (years)* | 21.4 ± 1.8 |
| *Gender (Female/Male)* | 235 (58.2) / 169 (41.8) |
| *Academic year* | |
| • *First year* | 79 (19.6) |
| • *Second year* | 83 (20.5) |
| • *Third year* | 86 (21.3) |
| • *Fourth year* | 76 (18.8) |
| • *Final year* | 80 (19.8) |
| *Residence (Hostel/Day)* | 255 (63.1) / 149 (36.9) |

**Table 2: Distribution of depression severity (PHQ-9)**

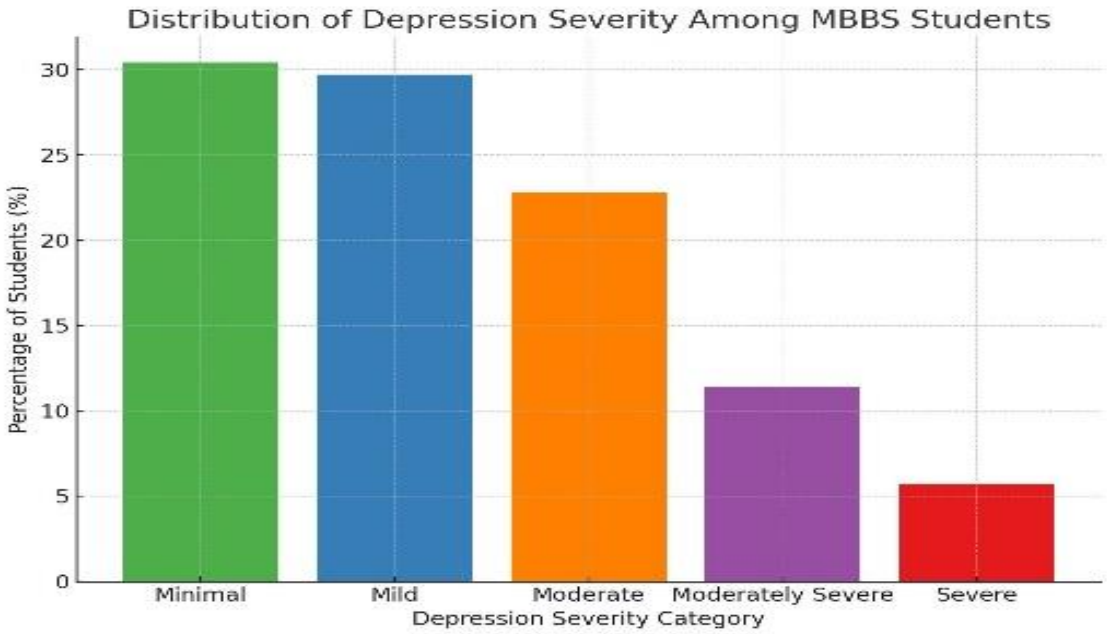
| ***Category*** | ***Score Range*** | ***n (%)*** |
|---|---|---|
| *Minimal* | <5 | 123 (30.4) |
| *Mild* | 5–9 | 120 (29.7) |
| *Moderate* | 10–14 | 92 (22.8) |
| *Moderately severe* | 15–19 | 46 (11.4) |
| *Severe* | ≥20 | 23 (5.7) |

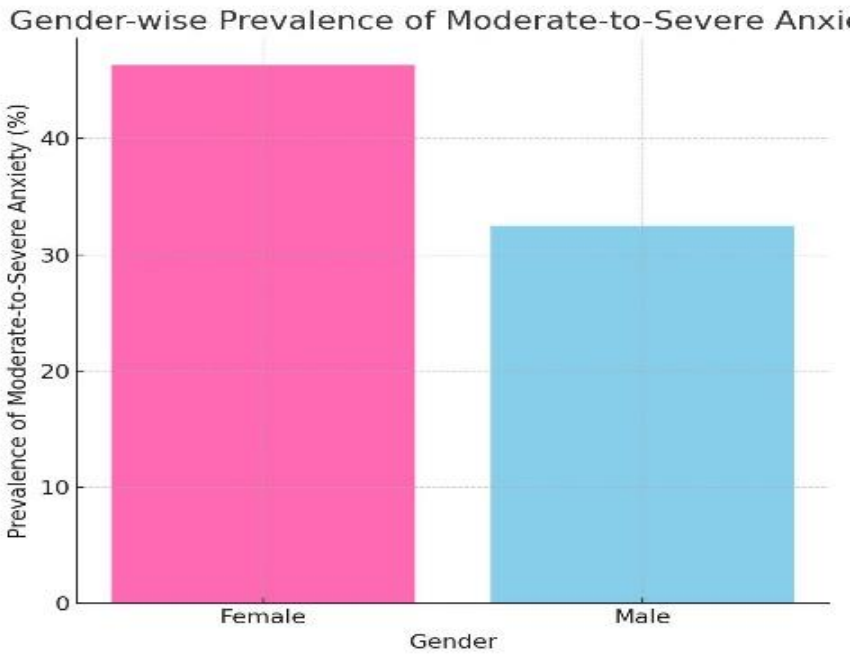
**Table 3: Distribution of anxiety severity (GAD-7)**

| *Category* | *Score Range* | *n (%)* |
|---|---|---|
| *Minimal* | <5 | 112 (27.7) |
| *Mild* | 5–9 | 127 (31.4) |
| *Moderate* | 10–14 | 103 (25.5) |
| *Severe* | ≥15 | 62 (15.4) |

**Table 4: Correlation between depression and anxiety scores**

| *Variable Pair* | *Pearson r* | *p-value* |
|---|---|---|
| *PHQ-9 vs. GAD-7 scores* | 0.72 | <0.001 |






## Discussion

The findings of this study revealed a substantial burden of depression and anxiety among undergraduate MBBS students during examination periods, with nearly 40% experiencing moderate-to-severe symptoms of both conditions (5). These results align with international evidence indicating that medical students are particularly vulnerable to psychological distress due to intense academic demands, competitive environments, and frequent high-stakes assessments (6). Studies conducted in South Asia and other regions have reported comparable prevalence rates, supporting the view that examination stress is a key contributor to mental health problems in this population (7). The higher mean scores of depression and anxiety observed among females and hostel residents further reflect patterns documented in previous literature, where gender-related psychosocial factors, separation from family support systems, and greater social isolation have been identified as significant stressors (8). The coexistence of depression and anxiety in this cohort, demonstrated by a strong positive correlation between PHQ-9 and GAD-7 scores, underscores the interrelated nature of these conditions. Similar overlap has been reported in other studies, where shared risk factors such as sleep deprivation, performance anxiety, and fear of academic failure have been shown to amplify emotional distress (9). The association of moderate-to-severe symptoms with female gender mirrors global trends that attribute increased vulnerability to a combination of biological susceptibility, hormonal influences, and sociocultural expectations (10). Hostel residence as a predictor of higher scores suggests that the absence of familial emotional support and the pressure of adapting to an independent living environment may exacerbate stress during examinations.

These findings carry important implications for medical education. High rates of depression and anxiety not only compromise the well-being of students but may also impair cognitive performance, clinical decision-making, and professional development (11). Persistent psychological distress can lead to burnout, substance misuse, and suicidal ideation, all of which pose serious risks to future healthcare professionals and, indirectly, to patient care. By documenting the extent of the problem in a local context, this study provides evidence to support institutional reforms aimed at promoting mental health awareness, enhancing access to counseling services, and integrating stress management programs into medical curricula (12). Early screening during high-stress periods such as examinations could enable timely interventions and reduce the progression of symptoms to more severe disorders. The study possesses notable strengths, including a robust sample size, high response rate, and use of validated screening instruments (PHQ-9 and GAD-7), which enhance the reliability and generalizability of the findings (13). The focus on examination periods

allowed for the assessment of mental health at a critical time of academic pressure, thereby capturing the acute effects of stress that may otherwise be underestimated in routine assessments. Additionally, the inclusion of both demographic and psychosocial variables enabled exploration of key risk factors relevant to this population.

However, certain limitations must be acknowledged. The cross-sectional design precludes the establishment of causal relationships and limits the ability to determine whether symptoms were pre-existing or induced by examinations. Reliance on self-administered questionnaires introduces the possibility of reporting bias, particularly given the stigma associated with mental illness that may lead to underreporting of symptoms (14). The study was conducted in a single medical college, which may limit external validity and restrict comparisons across different institutional settings or geographic regions. Moreover, the lack of longitudinal follow-up prevents assessment of symptom persistence beyond the examination period (15). Future research incorporating multicenter designs, qualitative assessments, and longitudinal follow-up would provide deeper insights into the dynamics of stress and mental health among medical students. Despite these limitations, the results highlight an urgent need for preventive strategies and structural changes within medical education. Incorporating mental health support services, offering confidential counseling, and fostering an environment that normalizes help-seeking behavior can mitigate the negative impact of academic stress. Faculty training to identify at-risk students, peer support networks, and curricular modifications to reduce excessive workload are practical measures that institutions can adopt to protect the psychological well-being of future physicians.

## Conclusion

The study revealed considerable levels of depression and anxiety among MBBS students during exam periods, with being female and living in hostels emerging as key risk factors. Results highlight the urgent importance of proactive mental health support, regular psychological screening, and student-centered educational strategies aimed at protecting well-being and enhancing academic achievement.

## AUTHOR CONTRIBUTIONS

| Author | Contribution |
|---|---|
| Hafsa Malik | Designed the study, performed data collection and analysis, and prepared the manuscript. Approved the final draft for submission. |
| Musab Bin Zubair | Contributed to study design, data acquisition, interpretation of findings, and performed critical review and editing of the manuscript. Approved the final draft for submission. |

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