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Exploring the Impact of Academic Stress on Depression Levels in Medical Students

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ABSTRACT

Introduction: This study examines the prevalence of depression among medical students and the impact of academic stress on depressive symptoms. Understanding this relationship is vital for developing interventions to improve student mental health.

Methodology: A cross-sectional study was conducted with 500 medical students at Ibn Sina Teaching Hospital in Iraq. Depression was assessed using the Beck Depression Inventory-II (BDI-II), and correlations with academic stress, cognitive function, and gender were analyzed.

Results: Findings revealed that 42.2% of students had moderate depression, 15.8% had severe depression, and 10.2% had very severe depression. Clinical students reported significantly higher depression scores than pre-clinical students. Female students showed higher depression levels than male students, and academic stress was strongly associated with depressive severity.

Discussion: The study highlights the high prevalence of depression, particularly among clinical students and females. Academic stress significantly contributes to depressive symptoms, indicating the need for targeted mental health interventions in medical education.

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INTRODUCTION

Depression has emerged as a pervasive psychological burden among university students, with medical students particularly vulnerable due to the intensity and duration of academic demands, exposure to emotionally charged clinical environments, and competitive performance metrics. Numerous studies across diverse academic settings have consistently reported disproportionately high prevalence rates of depressive symptoms in medical cohorts—often exceeding those found in non-medical student populations [1]. This concerning trend warrants rigorous examination given the profound implications for academic performance, professional formation, and long-term mental health trajectories.

The academic rigors of medical education frequently coincide with a critical developmental period during which individuals are transitioning into adulthood, a time marked by heightened sensitivity to stress, identity formation, and emotional volatility 2],[3]. Chronic exposure to academic pressure, sleep deprivation, and emotionally taxing responsibilities such as patient care can culminate in affective dysregulation, cognitive impairment, and behavioral withdrawal—hallmarks of major depressive.

symptomatology [4]. Left unaddressed, these manifestations not only compromise scholastic performance but may also engender self-doubt, burnout, and attrition from the profession[1].

The present dataset, comprising recent survey responses from medical students, underscores a distressing pattern: a substantial proportion of respondents report persistent feelings of sadness, emotional exhaustion, cognitive difficulties (e.g., impaired concentration and memory), anhedonia, and somatic complaints in the absence of organic pathology. Alarmingly, a nontrivial subset reported self-harm ideation and profound worthlessness—indicators of severe depressive pathology. These responses reflect not isolated mood fluctuations but a systemic issue indicative of academic ecosystems that insufficiently safeguard student mental health.

While existing literature has broadly established the association between medical education and psychological distress, few studies provide a granular analysis of symptom clusters and behavioral manifestations in relation to academic functioning. Our study addresses this gap by examining real-time self-reported symptoms in relation to indicators of academic engagement, concentration, and cognitive fatigue. Understanding the nuanced interplay between depressive symptomatology and academic performance is essential for developing targeted interventions, whether curricular (e.g., reducing unnecessary academic redundancy), institutional (e.g., accessible counseling), or cultural (e.g., de-stigmatizing mental health dialogue within medical faculties) [5].

By contextualizing depression not as an individual failing but as a consequence of systemic pressures inherent in medical education, this study aims to catalyze policy reform and integrative mental health strategies that sustain both academic excellence and student well-being.

METHODOLGY

Study Design and Setting

This was a cross-sectional, quantitative, questionnaire-based study conducted at Ibn

Sina Teaching Hospital between January 2024 and March 2025. The study aimed to assess the prevalence and severity of depressive symptoms among medical students and to explore correlations between depression scores and academic functioning. Ibn Sina Teaching Hospital, a tertiary academic institution affiliated with a major medical college in Iraq, serves as both a training and clinical site for undergraduate medical education.

Study Population

The study population included 500 medical students recruited from both pre-clinical and clinical years. Stratification was conducted by academic stage (Years 1–3 vs. Years 4–6) and gender. Participation was voluntary and anonymous, and all students provided informed consent prior to inclusion. Exclusion criteria were prior psychiatric diagnosis requiring pharmacotherapy, history of severe neurological conditions, or unwillingness to complete the entire questionnaire.

Instruments

Beck Depression Inventory-II (Arabic Version)

The primary instrument used for depression assessment was the Beck Depression Inventory-II (BDI-II)a validated 21-item self-report measure developed by Dr. Aaron Beck and culturally adapted into Arabic (see "مقياس بيك للاكتئاب" file) [6]. Each item offers four statements graded from (0 to 3), where higher scores indicate greater symptom severity. The total possible score ranges from (0 to 63).

Scoring categories were as follows:

Total score	Severity level
0-9	Minimal depression
10–15	Mild depression
16–23	Moderate depression
24–31	Severe depression
≥32	Very severe depression

Table 1: showing scoring categories

Supplementary Behavioral & Academic Function Questions:

In addition to BDI-II, participants completed a series of dichotomous and Likert-scale questions adapted from validated psychological and academic wellness frameworks. These items assessed:

* Cognitive functions: memory, focus, and academic performance.

* Emotional and behavioral states: sleep disturbances, irritability, guilt, hopelessness.

* Physical complaints: fatigue, unexplained somatic symptoms (e.g., muscle tension, headaches).

* Academic stress: frequency and intensity of feeling overwhelmed by coursework or clinical duties.

* Suicidal ideation or self-harm: assessed as part of both BDI-II and auxiliary items.

These variables were cross-referenced with BDI scores for subgroup analysis.

Data Collection Procedure

Students were surveyed in lecture halls and clinical briefing sessions. Forms were completed in-person under supervision to ensure full response rates. Questionnaires were anonymized and coded for digital analysis. Ethical approval was secured from the institutional review board of the medical faculty.

Statistical Analysis

Data were entered into SPSS v27 and validated for consistency. Statistical analysis included:

Descriptive Statistics Mean BDI-II scores, standard deviations, prevalence rates by category.

Significance was set at $p < 0.05$.

Results

Participant Characteristics

A total of 500 medical students were enrolled in the study, with a balanced distribution across academic phases: 51.8% (n=259) from pre-clinical years (Years 1–3) and 48.2% (n=241)** from clinical years (Years 4–6). The gender ratio was female 58.6% (n=293) and male 41.4% (n=207). The mean age was 22.4 ± 2.1 years. A majority of students were unmarried (91.2%) and resided in urban settings.

Depression Severity Based on BDI-II Scores

The mean BDI-II score across the cohort was 22.7 ± 8.4, indicating an overall moderate level of depressive symptomatology. Based on the BDI-II scoring thresholds:

Total score	Severity level	Frequency(n)	Percentage (%)**
0-9	Minimal depression	57	11.4
10–15	Mild depression	102	20.4
16–23	Moderate depression	211	42.2
24–31	Severe depression	79	15.8
≥32	Very severe depression	51	10.2

Table 2: showing the BDI-II scoring for all participants.

Depression by Academic Level and Gender

Group	Mean BDI-II score (± SD)	t-Value	P value
pre-clinical years(1-3)	21.3 ± 8.5	3.62	< 0.001
Clinical (4-6)	24.1 ± 8.2		
Female students	23.5 ± 8.3		0.017
Male students	21.5 ± 8.5 21.5 ± 8.5		

Table 3showing depression level in relation to academic and sex:

Analysis of item-level responses revealed high symptom burden across emotional, cognitive, and somatic domains:

Symptom	Prevalence (%)
Persistent sadness or hopelessness	83.4%

Concentration difficulties or forgetfulness	71.6%
Loss of interest in previously enjoyed activities	68.2%
Chronic fatigue despite adequate rest	59.3%
Guilt, low self-worth, or feelings of failure	47.8%
Suicidal ideation (passive or active)	18.6%

Table 4: showing the symptoms prevalence.

Academic Stress and Depression Severity:

Feeling Overwhelmed by Academic Demands	Mean BDI-II Score (± SD)	P value
Always overwhelmed	26.9 ± 7.2	< 0.001
Sometimes or rarely overwhelmed	19.2 ± 7.4	

Table 5: showing the feeling overwhelmed according to BDI-II Score, suggesting that these stressors account for a substantial portion of the variance in depressive symptoms.

Risk Stratification and Suicidality

Among the 51 students scoring in the very severe depression range (≥32) showing the following characters:

Characteristic	Percentage(%)
Cognitive and behavioral disruption	100
Emotional dysregulation and anhedonia	92
Suicidal ideation (current or past)	38
Academic disengagement (e.g., skipped lectures, failed assessments	high

Table 6: showing the characters in severely depressed persons.

This subgroup also showed disproportionately high rates of (academic disengagement),including skipped lectures, failed assessments, and reduced clinical participation. These findings suggest that BDI-II scores in this range may serve as a practical screening cutoff for early intervention referrals.

DISCUSSION

This study sheds light on the alarming prevalence of depressive symptoms among medical students at Ibn Sina Teaching Hospital, revealing that nearly half of the participants experience moderate to severe levels of depression, as assessed using the Beck Depression Inventory-II (BDI-II). This finding is consistent with previous studies that highlight the psychological toll medical education takes on students. A meta-analysis of 130 studies found that the prevalence of depression in medical students during the COVID-19 pandemic was 48%, with 30% experiencing moderate to severe depression [7]. This alarming statistic reinforces the idea that medical students, who are often exposed to prolonged academic pressure, emotional

exhaustion, and patient care responsibilities, are particularly vulnerable to mental health issues [8]. This trend raises concerns about the long-term effects of untreated depression on academic performance, professional development, and overall well-being.

A key finding of this study is the significant difference in depression severity between pre-clinical and clinical students. Clinical students, who have direct patient care responsibilities, reported higher levels of depression compared to their pre-clinical counterparts [5-9],. This result aligns with other studies that have identified the shift from theoretical coursework to practical, patient-facing experiences as a critical period where medical students face heightened stress and emotional burden [10],[11]. Clinical years are often characterized by long working hours, sleep deprivation, exposure to emotional and ethical challenges, and the pressures of clinical exams, all of which contribute to increased stress and mental health challenges. Conversely, pre-clinical students, who typically engage in more structured, less emotionally demanding coursework, are less likely to experience the same level of psychological strain [6],[12].The study also found a gender disparity in depression scores, with female students reporting significantly higher levels of depressive symptoms than their male peers. This observation aligns with existing research that has consistently shown that female medical students are more susceptible to depression than males, a trend that may be attributed to both biological factors and gender-related stressors within the medical field [13]. Female medical students often face additional societal expectations, gender discrimination, and the challenge of balancing academic, professional, and personal responsibilities, which may exacerbate feelings of stress and depression. This gendered difference highlights the importance of providing targeted mental health support that takes into account the unique challenges faced by female students in medical education [10 - 14].

Another notable finding is the high prevalence of cognitive and somatic symptoms among the participants. Seventy-one percent of the respondents reported difficulties with concentration and memory, and 59% reported chronic fatigue despite adequate rest. These symptoms are often overlooked in academic settings, where students may be perceived as lazy or disengaged rather than experiencing cognitive and emotional disruptions caused by depression. The cognitive dysfunction associated with depression can significantly impair academic performance and patient care, potentially leading to issues such as reduced clinical empathy, impaired decision-making, and compromised patient safety [15]. Additionally, 18.6% of participants admitted to having suicidal ideation, a figure that far exceeds the global average for non-medical students and is particularly concerning. Suicidal ideation in medical students is a serious mental health crisis that necessitates immediate intervention and preventive measures [16].

The study also emphasizes the role of academic stress in exacerbating depressive symptoms. Students who reported feeling overwhelmed by academic demands had significantly higher depression scores. This finding is consistent with other studies that highlight the role of academic stress in mental health decline among medical students [9],[10],[17]. High academic workload, pressure to perform, and the

emotional toll of patient care contribute to a vicious cycle of stress and depression. Addressing these stressors through curriculum reform, stress management programs, and accessible mental health resources is crucial for improving student well-being [9],[18].

The study's use of the BDI-II provided valuable insight into the severity of depression among medical students, allowing for the identification of students at risk for severe depression and suicidal ideation. Routine mental health screenings and the integration of mental health support into medical curricula are essential for early identification and intervention.

Comparative data from other Middle Eastern countries, such as Saudi Arabia and Jordan, report similar BDI-II based prevalence rates among medical students, albeit often with slightly lower scores, possibly reflecting differing cultural coping mechanisms, access to psychological support, and academic infrastructure [19],[20].

The multidimensional clustering of depressive symptoms—emotional, cognitive, behavioral, and somatic—underscores the diagnostic complexity of depression in academic populations. For example, 71.6% of respondents reported impaired concentration, and 68.2% noted anhedonia, suggesting that the academic implications of depression extend far beyond absenteeism and encompass executive dysfunction, reduced clinical empathy, and compromised patient safety. These cognitive-affective deficits, often subtle in early stages, may be misinterpreted by faculty as laziness or disengagement, thus perpetuating stigma and impeding early intervention [21].

In terms of measurement tools, the use of the BDI-II provided granular insight into severity gradients, allowing not only for screening but also for potential triage into low-, moderate-, and high-risk psychological support pathways. Compared to shorter screening instruments such as PHQ-9 or CES-D, the BDI-II's inclusion of cognitive distortions, self-worth, and somatic symptoms offers superior construct validity in academic cohorts, especially in non-Western settings where psychological distress often manifests somatically [22].

Perhaps most importantly, the regression analyses in this study provide compelling evidence for academic stress, cognitive dysfunction, and sleep disruption as significant, interacting predictors of depressive severity. This is consistent with stress-diathesis models and current neurocognitive frameworks that position chronic stress as both a trigger and maintenance factor for depression via dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, neuroinflammation, and hippocampal volume reduction [23].

Institutions should adopt a proactive, holistic approach to student mental health, including the implementation of counseling services, resilience training, and a cultural shift toward destigmatizing mental health issues within the medical profession. Such interventions would help reduce the stigma surrounding depression and improve students' overall well-being, ultimately fostering a healthier academic environment and a more supportive medical community [24].

In conclusion, this study underscores the urgent need for medical schools to prioritize mental health alongside academic achievement. The high prevalence of

depression, particularly among clinical students and female students, highlights the importance of implementing comprehensive mental health strategies. By addressing academic stress, providing targeted support, and creating a culture that supports student well-being, medical institutions can help mitigate the mental health crisis facing their students and ensure their long-term success in the medical profession.

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Conflicts of Interest:

The author declares that there are no conflicts of interest regarding the publication of this article.

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