Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

Original Article

A Cross-Sectional Study to Assess the Prevalence of Depression Among Undergraduate Medical Students at Bundelkhand Medical College, Sagar (M.P.)

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ABSTRACT

Background: Depression is a prevalent mental health disorder with significant implications for the well-being and performance of medical students, a population highly vulnerable to psychological stress due to academic, social, and emotional demands. This study aimed to assess the prevalence and severity of depression among undergraduate medical students at Bundelkhand Medical College, Sagar, Madhya Pradesh.

Methods: A descriptive cross-sectional study was conducted over four months (September–December 2023) among 100 undergraduate medical students randomly selected across all academic years. Data were collected using a semi-structured questionnaire incorporating the Beck Depression Inventory (BDI). Sociodemographic factors such as age, gender, income, academic year, and family psychiatric history were recorded. Statistical analysis was performed using SPSS software.

Results: Out of 100 participants, 64% had depression (BDI > 4), and 36% met criteria for major depressive disorder (BDI ≥ 10). Depression was significantly more prevalent in females ($p = 0.039$), with the highest severity observed among females with a family history of psychiatric illness ($p = 0.047$). Depression showed a significant decreasing trend across academic years ($p = 0.017$), with first-year students exhibiting the highest rates. Although family income and psychiatric history were not significantly associated with depression overall, income between ₹50,000–₹100,000 was linked to lower depression prevalence.

Conclusion: The study reveals a high burden of depression among medical students, especially among females and early-year students. These findings underscore the urgent need for mental health interventions, routine screening, and institutional support systems to address psychological distress in medical education settings.

Keywords: Depression, Medical students, Mental health, Beck Depression Inventory, Academic stress

Introduction: Mental health is a crucial component of overall well-being, influencing how individuals think, feel, and act, as well as how they handle stress, relate to others, and make choices[1]. Among various mental health disorders, depression stands out as a significant global concern, with substantial impacts on individuals' emotional, physical, and social functioning. According to the World Health Organization (WHO), depression affects more than 280 million people worldwide, and it is one of the leading causes of disability. Alarmingly, it often begins in adolescence or early adulthood, making young individuals, particularly students, a vulnerable group[2].

Medical students are recognized as one of the most high-risk populations for depression and other mental health disorders[3]. The rigorous academic curriculum, long hours of study and clinical work, high expectations, sleep deprivation, financial stress, and fear of failure contribute significantly to psychological stress. In India, the problem is

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

compounded by additional societal pressures, stigma associated with mental health issues, and limited access to mental health services[4]. Despite being in a health-focused environment, many medical students struggle to cope with stress, which may escalate to anxiety, burnout, or depression if unaddressed[5].

Depression among medical students not only affects their academic performance but also impairs their interpersonal relationships, quality of life, and future professional competence[6]. More concerning is the finding from various studies that a significant proportion of medical students do not seek help, largely due to stigma, fear of judgment, or lack of awareness. The consequences of untreated depression can be dire, leading to substance abuse, suicidal ideation, and even suicide in extreme cases[7].

Several studies in different parts of India and across the world have reported varying prevalence rates of depression among medical students, ranging from 20% to 60%, depending on the tools used, regional context, and the year of study of the participants[8]. These variations underscore the need for localized research to understand the magnitude of the problem in specific contexts[9]. Bundelkhand Medical College, located in Sagar, Madhya Pradesh. Understanding the prevalence and severity of depression among undergraduate medical students at Bundelkhand Medical College is vital for designing and implementing effective mental health support systems[10]. Timely identification and intervention can prevent long-term psychological consequences and help in fostering a healthier learning environment[11-12]. This study, therefore, aims to assess the prevalence and level of depression among undergraduate students in this institution using a cross-sectional study.

Methods: The study was descriptive Cross-sectional study conducted at Bundelkhand medical college Sagar M.P. during the period of 4 month from September 2023 to December 2023. Participants were undergraduate medical students from first professional, second professional, Final prof part-I & Final prof part-II. The students who did not give informed consent and those who were absent during the study period were excluded. The sample size was calculated using the following formula:

Applying Cochran's Formula:

$$\mathbf{n} = \frac{z^2 pq}{e^2}$$

Were,
n = sample size,
Z = 1.96 (at 95% confidence)
p = 35.2%[13]
q = (1-p)
e = Margin of error 10%
considering 10% Nonresponse rate
the calculated sample size was 87±8 = 95

The final sample size was rounded to 100.

Out of 100 study participants, 25 study participants were randomly selected from each group: i.e., from 1st prof, 2nd prof, Final prof Part-1 & Final prof Part-2. The recruited students were informed about the purpose of study and explained about the general instruction. Informed consent was taken prior to the study. The student was allowed to respond in their own time and privacy.

A questionnaire-based survey was carried out among the undergraduate medical students. A pre-design, semi-structured questionnaire by Beck's Depression Inventory was used for data collection. Some sociodemographic questions include age, gender, academic year, monthly family income and family history of psychiatric disorders.

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

Total Score	Depression Severity	Group
0-4	No/Minimal depression	Depression Absent
5-9	Mild depression	Depression Present
10-14	Moderate depression	
15-19	Moderately severe depression	
20-27	Severe depression	

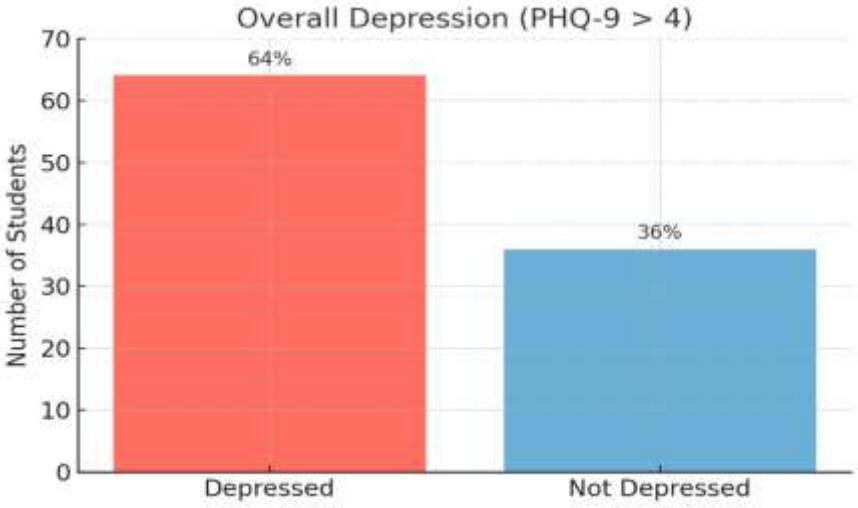
Table-I. Interpretation of Total Score.

Data were entered into Microsoft excel and analyzed using SPSS trial statistical software. Prevalence of an outcome variable along with 95 percent confidence interval was calculated. The parametric data was analyzed using mean, standard deviation and percentages while the non-parametric data was analyzed using chi-square tests.

Result: Out of 100 students, 57 (57.0%) were female and 43 (43.0%) were male. Regarding monthly family income, 27 (27.0%) students had an income of less than ₹20,000, 44 (44.0%) had between ₹20,000–₹100,000, and 29 (29.0%) had above ₹100,000. A family history of psychiatric illness was reported by 18 (18.0%) students, while 82 (82.0%) had no such history.

Based on PHQ-9 scoring, 64 (64.0%) students had depression (PHQ-9 > 4), 36 (36.0%) students were identified with major depressive disorder (PHQ-9 ≥ 10), Depression was more prevalent among females compared to males (Figure-1).

Figure 1: Overall depression in participants



Females had higher levels of moderate to severe depression. Among females with a family history of Depression, 81.0% were depressed, compared to 70.0% without such history (p = 0.047, significant), Among males, family history was not significantly associated with depression (p = 0.832).

Each academic year group had 25 students among them severity of depression showed a significant decreasing trend from 1st to final year (p = 0.017), 1st Year: Highest depression prevalence, especially among males (78.4%), 2nd Year: Highest prevalence among females (86.1%), though not statistically significant (p = 0.466), 3rd Year: More male students (61.0%) were depressed than females (54.5%), Final Year: Showed the lowest depression rates with significant difference (p = 0.009).

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

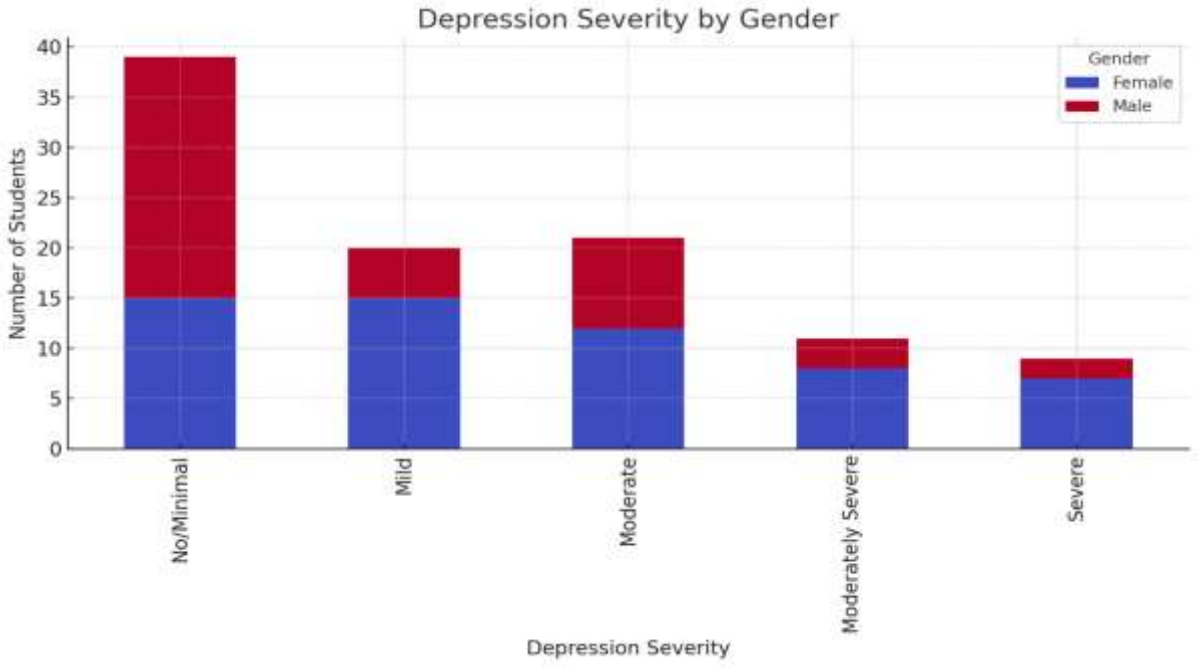


Figure 2: Distribution of depression severity by gender

No or minimal depression was more common among Male students (42%), Final year students (54.0%), Students with income ₹50,000–₹100,000 (39.6%), Those without family psychiatric history (37.7%). However, income and general family history were not significantly associated with depression ($p > 0.05$).

Table1: Relationship between Sociodemographic Characteristics and Severity of Depression (n = 100)

Sociodemographic Characteristics	No/Minimal n (%)	Mild n (%)	Moderate n (%)	Moderately Severe n (%)	Severe n (%)	Total n (%)	p-value
Gender							
Female (57.0%)	15 (15.0%)	15 (15.0%)	12 (12.0%)	8 (8.0%)	7 (7.0%)	57 (100%)	0.039
Male (43.0%)	24 (24.0%)	5 (5.0%)	9 (9.0%)	3 (3.0%)	2 (2.0%)	43 (100%)	
Academic Year							
1st Year	7 (7.0%)	7 (7.0%)	5 (5.0%)	4 (4.0%)	2 (2.0%)	25 (100%)	0.017

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

2nd Year	6 (6.0%)	7 (7.0%)	4 (4.0%)	4 (4.0%)	4 (4.0%)	25 (100%)	
Pre-final	9 (9.0%)	7 (7.0%)	5 (5.0%)	2 (2.0%)	2 (2.0%)	25 (100%)	
Final Year	10 (10.0%)	6 (6.0%)	5 (5.0%)	2 (2.0%)	2 (2.0%)	25 (100%)	
Monthly Family Income							
< ₹50,000 (20.0%)	6 (6.0%)	5 (5.0%)	5 (5.0%)	3 (3.0%)	1 (1.0%)	20 (100%)	0.059
₹50k–1L (43.0%)	18 (18.0%)	15 (15.0%)	5 (5.0%)	3 (3.0%)	2 (2.0%)	43 (100%)	
> ₹1L (37.0%)	14 (14.0%)	8 (8.0%)	8 (8.0%)	5 (5.0%)	2 (2.0%)	37 (100%)	
Family History of Psychiatric Illness							
Absent (80%)	30 (30.0%)	22 (22.0%)	14 (14.0%)	7 (7.0%)	5 (5.0%)	75 (100%)	0.126
Present (20%)	6 (6.0%)	7 (7.0%)	5 (5.0%)	4 (4.0%)	3 (3.0%)	25 (100%)	

Discussion:

The present cross-sectional study assessed the prevalence of depression and its associated sociodemographic correlates among undergraduate medical students at Bundelkhand Medical College, Sagar (M.P.). With 64% of participants showing depressive symptoms (PHQ-9 > 4) and 36% meeting criteria for major depressive disorder (PHQ-9 ≥ 10), the findings indicate a considerable psychological burden within this academic cohort. These results warrant serious attention, especially given the demanding nature of medical education and the future responsibilities of these students as healthcare providers.

The high prevalence of depression in this study aligns with findings from similar Indian and international studies. For instance, a meta-analysis by Puthran et al. (2016) reported a pooled prevalence of depression among medical students globally to be around 28%, with variability due to regional and methodological differences. Our higher prevalence may reflect contextual challenges such as academic stress, lack of mental health support, financial insecurity, and the cultural stigma associated with psychiatric illness.

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

A recent Indian study conducted by Basnet et al. (2021) in Karnataka found a prevalence of depression in medical students at 63.2%, closely mirroring our data. They cited high academic pressure and poor sleep hygiene as major contributing factors. Similarly, a study by Kumar et al. (2019) at a North Indian medical college reported that 59.1% of their participants suffered from depression, reinforcing the widespread nature of this concern within Indian medical institutions.

Gender and Depression

Gender emerged as a significant factor in our study, with females exhibiting a higher prevalence and severity of depression ($p = 0.039$). Specifically, 81% of female students with a family history of psychiatric illness experienced depression compared to 70% without such history, a statistically significant finding ($p = 0.047$). This aligns with the findings of Dyrbye et al. (2006), who demonstrated that female medical students are at increased risk for depression due to sociocultural expectations, higher emotional burden, and biological vulnerability. Further support comes from a multicentre study by **Rotenstein et al. (2016),** which showed that female students report higher emotional exhaustion and depressive symptoms than their male counterparts.

In contrast, male students in our study showed lower rates of both mild and severe depression. Similar gender disparities were found in a study by **Saravanan & Wilks (2014)** conducted in Malaysia, which reported that female students had significantly higher depressive scores, attributing it to stress from academic, familial, and social roles. The gendered impact of family history found in our study resonates with **Kendler et al. (2002),** who highlighted that the influence of genetic predisposition is often moderated by gender-specific coping mechanisms and cultural roles.

Academic Year and Depression Trends

Another key finding in our study is the significant trend of decreasing depression prevalence from first to final year ($p = 0.017$). First-year students, particularly males, showed the highest prevalence (78.4%), while final-year students exhibited the lowest. This trend supports the hypothesis that initial transition into medical education is a major stressor due to unfamiliar environments, academic overload, and social isolation.

Comparable results were reported by Ibrahim et al. (2013) in their systematic review of university students' mental health, which found first-year students at higher risk due to lack of adaptability and support systems. Likewise, a study by **Satpathy et al. (2020)** in Odisha found that 70% of first-year students had moderate to severe depression compared to only 35% of final-year students. These findings suggest that with academic progression, students may acquire coping strategies, peer support, and professional identity, contributing to psychological resilience.

However, the second-year group in our study had the highest prevalence of depression among females (86.0%), although this was not statistically significant ($p = 0.466$). This could indicate that even after initial adaptation, cumulative academic demands and stress continue to affect students variably across different years.

Income and Depression

While income did not show a statistically significant association with depression ($p = 0.059$), students from families earning ₹50,000–₹100,000 had the lowest depression prevalence. This suggests that while extreme poverty or wealth might contribute to psychological stress, middle-income students might benefit from both economic stability and motivational pressure to perform. A study by **Bayram & Bilgel (2008)** found a

ISSN: 0975-3583,0976-2833 VOL 16, ISSUE 9, 2025

significant inverse relationship between income and depression levels in university students, were financial security reduced perceived stress and risk of depressive symptoms.

Conversely, the absence of significant correlation in our study may be due to the limited income stratification within a relatively homogeneous student population. Furthermore, subjective perceptions of financial pressure may have a more profound impact on mental health than absolute income, as suggested by **Suravi et al. (2019)** in their study in West Bengal.

Family History of Psychiatric Illness

Eighteen percent of students in our study reported a positive family history of psychiatric illness. Although overall this variable was not significantly associated with depression ($p = 0.126$), it was significant when stratified by gender among females. This aligns with studies such as that by **Sullivan et al. (2000),** which found that a family history of psychiatric illness, particularly in first-degree relatives, is a strong risk factor for depression. However, the non-significance in the broader sample reflects the multifactorial etiology of depression, where genetic predisposition interacts with environmental and psychosocial stressors.

A study by **Patil et al. (2020)** in Maharashtra also observed a higher prevalence of depression among students with a positive family history, but the results were not statistically significant. This suggests that while family history is an important consideration, it may require larger sample sizes and longitudinal tracking to detect its influence more precisely.

Conclusion:

This study highlights a high prevalence of depression among medical students, with two-thirds exhibiting depressive symptoms and over one-third meeting criteria for major depressive disorder. Female students and those in their early academic years were particularly vulnerable, underscoring the role of gender and academic stress in mental health outcomes. While income and family psychiatric history did not show significant associations overall, a notable influence of family history was observed among female students. Integrating mental health education and support systems within the medical curriculum could help build resilience and reduce the psychological burden faced by future healthcare professionals.

Recommendations

The findings of this study call for institutional mental health policies, including early screening, counselling services, and stress-management programs tailored to the needs of medical students. Given the higher burden among females, targeted interventions such as gender-sensitive counselling and mentorship programs are crucial. Peer support systems, flexible academic policies, and destigmatization of mental health treatment within medical institutions should be implemented.

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