

# Comparison of prevalence of depression among medical, dental, and engineering students in Patna using Beck's Depression Inventory II: A cross-sectional study

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## ABSTRACT

**Background:** Depression, a multi-dimensional disorder adversely affects the interpersonal, social and occupational spheres of students' life. It is the 11<sup>th</sup> leading cause of global disease burden. **Aims and Objectives:** To assess the prevalence of depressive symptoms among various professional course students including medical, dental, and engineering students in Patna, Bihar. **Materials and Methods:** The present investigation was a questionnaire-based cross-sectional descriptive study. A total of 3,100 students attending government and private medical, dental, and engineering colleges in Patna were approached during the course of this study. Students were briefed about the study and questionnaire. BDI-II (Beck's Depression Inventory-II) was administered to the students and they were instructed to fill it. Beck's scores were recorded and a descriptive analysis performed. **Results:** 2798 students out of 3,100 responded positively to the survey by completely filling out the form. The overall response rate was 90.25%. The overall prevalence of depressive symptoms was found to be 47.78%. Of the three streams, students belonging to the engineering stream (40.28%) showed a maximum prevalence of depressive symptoms followed by dental (38.50%) and medical students (34.74%). **Conclusion:** Our study showed an alarming prevalence of depression among professional course seeking students. This multi-dimensional disorder continues to affect student's performance and professionalism, thus, extending its negative impact to the community at large. This may carry out later in their lives, thus leaving a long-term negative impact. Considering the high rate of depressive symptoms, establishing a unit or facility to identify or diagnose it at an early stage and providing psychological support to students is recommended.

**Keywords:** Beck's depression inventory II, dental students, depression, engineering students, medical students

## Introduction

Depression, a mental disorder characterized by loss of interest and pleasure (anhedonia), decreased energy (anergy), feelings of guilt or low self-worth, disturbed sleep and/or appetite, and

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Received: 21-02-2020

Revised: 14-03-2020

Accepted: 30-03-2020

Published: 30-06-2020

poor concentration is a major global public health problem.<sup>[1]</sup> It is the 11<sup>th</sup> leading cause of global disease burden, a noted cause of disability with an estimated global point prevalence of 4.7%.<sup>[2]</sup> Depression encompasses a wide array of emotional lows, from the mere perception of sadness to suicidal state.<sup>[3]</sup> Epidemiological studies have shown that depressive disorders are highly prevalent displaying high rates of lifetime incidence, early age onset, high chronicity, and role impairment.<sup>[4]</sup>

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**How to cite this article:** Nezam S, Golwara AK, Jha PC, Khan SA, Singh S, Tanwar AS. Comparison of prevalence of depression among medical, dental, and engineering students in Patna using Beck's Depression Inventory II: A cross-sectional study. J Family Med Prim Care 2020;9:3005-9.

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10.4103/jfmpc.jfmpc\_294\_20

Several studies have shown that the mental health aspects of university going students are considerably poorer than their counterparts in the general population, with depression being one of the most commonly encountered entities.<sup>[5,6]</sup> University going students transition from adolescence to adulthood, wherein individuals experience social and physical changes, and cognitive dissonance in emotional, behavioral, sexual, economic, academic, and social areas.<sup>[7]</sup> This may negatively impact peer or family relationships, their scholastic performance, and physical mental health in general. Moreover, individuals may pick up substance abuse habits to overcome depression or in worse conditions, propel an individual toward committing suicide.<sup>[8-10]</sup> Depression adversely affects the interpersonal, social and occupational spheres of students' life, and hence can be termed as a multi-dimensional disorder.<sup>[11]</sup>

Among young college-going adolescents, students pursuing professional degree courses appear to be exposed to relatively higher levels of mental stress compared to others. This may be attributed to factors like tough competition for a limited number of seats, high academic workload, increased duration of courses, meeting parents and teachers expectations, the vastness of the curriculum, future study concerns, poor grades in exams, lowered self-esteem, future job prospects, and achieving stable financial future.<sup>[11-13]</sup>

Primary care can be considered to be the ingress point for most people into the healthcare system and a common pathway to mental health care services. Primary care physicians are often the first ones to identify, diagnose, and initiate treatment for mental health conditions, and the choice of interventions offered by them can significantly influence the patients' quality of life.<sup>[14]</sup> The prevalence of depressive disorders in primary care has been estimated to be between 10-20% worldwide, of which around half remain undetected by doctors.<sup>[15]</sup> Thus, diagnosing these conditions at an early stage, and appropriate interventions would have a positive impact on the patients, thereby saving them emotional and physical agony.

There is a scarcity of literature comparing the mental health status of university going students in the Indian subcontinent. Moreover, most of the studies existing in the literature involve students of only one discipline. Thus, this study was undertaken to assess the prevalence of depressive symptoms among various professional course students including medical, dental and engineering students in Patna, Bihar. This study is the first of its kind since no such study with similar parameters has been done in this region.

## Materials and Methods

### Study design

The present investigation/analysis was a questionnaire-based cross-sectional descriptive study.

### Study population

The study targeted students attending government and private medical, dental, and engineering colleges in Patna, Bihar.

Undergraduate students of all academic years and both genders formed the study population. Students unwilling to participate were excluded from the study. A total of 3,100 students from different streams/specialities were approached during the course of this study.

### Data collection

The study was conducted after obtaining required institutional ethical clearances and consent was also taken from the participating students. Students were briefed about the study and questionnaire. Participation was totally on a voluntary basis. BDI-II (Becks Depression Inventory-II) was administered to the students and they were instructed to fill it. Students were instructed not to mention any personal or professional details which could reveal their identity.

BDI-II, a psychometric tool used worldwide is a 21-item self-report instrument for measuring the severity of depression with four response options ranging from 0 to 3 for each item, with a total maximum score for all items being 63.<sup>[16,17]</sup> A score of 0–13 is considered minimal, 14–19 mild, 20–28 moderate, and 29–63 is considered severe depression.<sup>[16]</sup> BDI-II Inventory was used in this study due to its remarkable features like specificity, sensitivity, high reliability, improved concurrent and content validity based on available psychometric data, which could aid in detecting depression among university students.<sup>[17,18]</sup>

The data collection lasted around six months.

### Data analysis

Becks scores were recorded and a descriptive analysis performed to compare the prevalence of depressive symptoms according to the discipline of study.

## Results

2,798 students out of 3,100 responded positively to the survey by completely filling out the form. The overall response rate was 90.25%. The overall prevalence of depressive symptoms was found to be 47.78% [Table 1]. Of the three streams, students belonging to the engineering stream (40.28%) showed a maximum prevalence of depressive symptoms followed by dental (38.50%) and medical students (34.74%) [Table 2]. When the scores were evaluated to subcategorize the depressive symptoms into mild, moderate and severe, 69.85% of the engineering students, 62.35% of dental students and 51.87% of the medical students showed mild depressive symptoms [Table 3]. Thus, a trend was observed that medical and dental students showed a higher prevalence of moderate and severe depressive symptoms, while the majority of the engineering students showed mild depressive symptoms. Table 4 shows an overall distribution of mild, moderate and severe depressive symptoms among all the individuals showing signs of depression.

## Discussion

This study was undertaken to estimate the prevalence of depressive symptoms among professional course seeking students and the results indicated an alarming outcome of 47.78%, which emphasizes the much higher prevalence of depression found amongst students when compared with 3–4% general population prevalence for this age group.<sup>[19]</sup> Of the three different professional courses that were considered in the present study, engineering students showed a higher prevalence of depressive symptoms (40.28%). This may be attributed to the fact that with the slowing economy, reduced number of job opportunities and an increasing number of graduates in this field, individuals are unsure of secured future employment. Moreover, engineering students mainly rely upon campus placements for jobs, which is on the decline in the current scenario, making it difficult for them to find good stable job opportunities, thus adding to their duress. Medical and dental students can start their own private practices after their graduation, thus providing them autonomy in comparison to their engineering counterparts.

Our study also showed that dental and medical students showed a higher prevalence of moderate and severe depressive symptoms, which could be imputed to the pressure exerted on students by their workload, clinical requirements, examinations, grades, prolonged study period, financial burden.<sup>[11]</sup> The burden of depression on medical and dental students could result in low quality of life, dropout, and ultimately suicidal ideation.<sup>[20]</sup> Thus, identifying risk factors in this group and intervention should be of priority.

**Table 1: Shows the overall prevalence of depressive symptoms among students**

Depression	Number	Percentage
Present	1337	47.78
Absent	1461	52.22
Total	2798	

**Table 2: Shows the number and percentage of students responded, depressed, and not depressed divided according to the stream of study**

Stream	Students Responded	Depressed		Not depressed
		Number	Percentage	
Medical	921	320	34.74	601
Dental	683	263	38.50	420
Engineering	1194	481	40.28	713

**Table 3: Depicts the distribution of students under the radar of mild, moderate, and severe depressive symptoms according to the stream of study**

	Mild		Moderate		Severe	
	Number	Percentage	Number	Percentage	Number	Percentage
Medical	166	51.87	114	35.62	20	6.25
Dental	164	62.35	85	32.30	14	5.30
Engineering	336	69.85	140	29.10	5	4.99

Honney *et al.* compared the levels of depression in medical and non-medical students using a comparative cross-sectional internet-based questionnaire. They reported that non-medical students showed a higher prevalence of moderate and severe depressive symptoms than their medical student peers, although medical students reported more symptoms of mild depression, and according to them the potential vulnerability factors were personal or family history of depression, point of degree entry and belonging to an ethnic minority.<sup>[19]</sup> The findings of this study were in accordance with ours. Subhashini *et al.* also reported a similar trend with 22% of medical students being depressed in comparison to 35.3% of their engineering counterparts.<sup>[21]</sup>

Chenganakkattil *et al.* compared psychological stress, depression, and anxiety among medical and engineering students, and reported an overall prevalence of depression and anxiety to be higher among medical students as compared to engineering students, a finding not in agreement with ours. They suggested factors like torturous admission protocols, portions beyond horizons, new skills to be mastered, expectations of family members, competition, and uncertainty involved about the future to be few among the background stressors.<sup>[22]</sup>

Al-Faris *et al.* compared the prevalence of depressive symptoms among health professional students and explored the association between sociodemographic factors and depressive symptoms. According to them, the overall prevalence rate of depressive symptoms was 47.0%, highest among dentistry students (51.6%), followed by medicine (46.2%), applied medical sciences (45.7%), and lowest among nursing students (44.2%). Our study showed an overall prevalence rate of depressive symptoms to be 36.34% among dental and medical students, with dental students being more affected, findings similar to the abovementioned author.<sup>[23]</sup>

Ediz *et al.* evaluated depression and anxiety levels among medical students in Turkey and reported mild and moderate levels of depression were found in 30.5% of the students while 8.5% suffered from severe and extremely severe levels of depression. On the contrary, we found 51.87% of the medical students showed mild depression, 35.62% moderate and 6.25% showed signs of severe depression. According to them, depression was more frequent among first-year students, students in the poor economic situation and those who were not satisfied with their medical education. They also found the frequency of depression and anxiety to decrease with increasing grades.<sup>[24]</sup>

**Table 4: Gives an overall distribution of individuals subcategorized into mild, moderate, and severe depression according to Beck's grading**

Beck's grading	Score range	Number	Percentage (%)
Mild	14-19	666	49.81
Moderate	20-28	339	25.35
Severe	29-63	39	2.91

Rotenstein *et al.* carried out a systemic review and meta-analysis to estimate the prevalence of depression, depressive symptoms, and suicidal ideation in medical students. The summary estimate of the prevalence of depression or depressive symptoms among medical students ranged between 9.3% and 55.9%, while that of suicidal ideation was 11.1%. The prevalence of depression among medical students in our study was found to be 34.74%, within the range given by the abovementioned authors.<sup>[25]</sup> Alvi *et al.* in a cross-sectional study reported 35.1% of medical students in Pakistan to be suffering from depression which was associated with sociodemographic and educational factors, a finding in concordance with our study.<sup>[26]</sup>

Arora *et al.* studied the prevalence of depression among undergraduate students in India and reported it to be 26.54%. They found the highest depression levels among basic science undergraduate students (34.53%) followed by engineering undergraduate students (22.82%) followed by MBBS students (18.99%) and least in dental undergraduate students (17.54%). These findings show dissimilitude to ours.<sup>[27]</sup> Sabbarwal *et al.* assessed depressive symptoms and its associated factors among clinical dental students in Bengaluru, Karnataka, India and reported the prevalence to be 49% in contrast to our 38.50%. They also found this prevalence to be higher among females and in final year students.<sup>[11]</sup>

Pham *et al.* estimated the prevalence of self-reported depression to be 15.2% among medical students in Vietnam which were significantly associated with the perceived financial burden, physical inactivity, being senior student, perceived negative influence of night shifts, and non-self-determined motivation profile.<sup>[28]</sup> Our study showed the levels to be much higher (34.74%) among medical students in Bihar, India. Ngasa *et al.* determined the prevalence and predisposing factors associated with depression among medical students in Cameroon, Central Africa and reported 30.6% to be suffering from major depressive disorders. The authors associated this high prevalence to the presence of chronic disease, major life events, female gender and being a student at the clinical level.<sup>[29]</sup> On the contrary, our study showed a prevalence of severe depressive symptoms to be 6.25%.

Naushad *et al.* approximated the prevalence of depression among pre-university students in Mangalore, Karnataka to be 79.2%, the severity of which was significantly more in older age, commerce stream pursuing male students in government colleges.<sup>[30]</sup> Ngin *et al.* explored social and behavioral factors

associated with depressive symptoms among university students in Cambodia and reported that the proportions of students with depressive and severe depressive symptoms were 50.6% and 19.6%, respectively.<sup>[31]</sup> Both of these studies show values higher than ours.

Al-Hadi Hamasha *et al.* investigated the prevalence and risk indicators of depression in undergraduate students of health-related specialties in Saudi Arabia. They reported that about 45% of students had mild to severe depression, a finding similar to ours. The significant risk indicators for depression were gender, the recent loss of family members, type of study, year of study, presence of psychological illnesses, social life and satisfaction with specialty, teaching staff, college facilities.<sup>[32]</sup> Zeng *et al.* performed a meta-analysis to summarize the prevalence of mental health problems in Chinese medical students. They reported the prevalence rate of depression, anxiety, suicidal ideation, and eating disorders to be 29%, 21%, 11%, and 2%, respectively, which was lesser in comparison to our results.<sup>[33]</sup> Kumari *et al.* determined the prevalence of stress, anxiety and depression in students of medical and engineering streams in Jammu, India and also investigated the various factors associated with them. They reported the prevalence of stress, anxiety, and depression in medical and engineering students to be 47.6%, 68.6%, 43.7% and 41.1%, 71.1%, and 40.0%, respectively. They also found that relationships with family members emerged as a significant independent predictor for all the three psychogenic factors.<sup>[34]</sup>

## Conclusion

Our study showed an alarming prevalence of depression among professional course seeking students. This multi-dimensional disorder continues to affect student's performance and professionalism, thus, extending its negative impact to the community at large. This may carry out later in their lives, thus leaving a long-term negative impact. Considering the high rate of depressive symptoms, establishing a unit or facility to identify or diagnose it at an early stage and providing psychological support to students is recommended.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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