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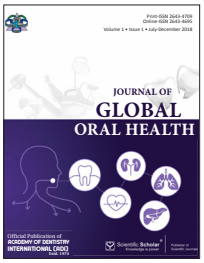

Research Article

Prevalence of depressive symptoms and associated factors among dental students: A cross sectional study

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ABSTRACT

Background: Depression is a common mental health problem which affects all strata of life. As a result of the increase in competitiveness, there is a need to pay attention toward the presence and level of depression among students.

Aim: The aim of the study was to assess the depressive symptoms and its associated factors among clinical dental students in Bengaluru city.

Settings and Design: A cross-sectional study was conducted among third and final years dental students (n = 200) randomly selected from four dental colleges in Bengaluru city.

Materials and Methods: A self-administered questionnaire was used to assess depressive symptoms using Beck's Depression Inventory.

Statistical Analysis Used: Association of depression with non-academic and academic factors was assessed using the Chi-square test. Student's t-test was used to compare mean depression scores among study years. $P < 0.05$ was considered as significant.

Results: The prevalence of depression was found to be 49%. Significantly higher proportion of females (57.0%) had depression compared to males (43.0%) ($P = 0.04$). Mean depression score was higher among final year dental students (16.10 ± 9.76) compared to third year (13.77 ± 6.85) ($P = 0.05$). Level of severity of depression was significantly associated with the year of study ($P < 0.001$). Among non-academic and academic factors; the problem with friends, medical illness, and lack of interest in the course, fear of failure, respectively, was significantly associated with depression.

Conclusion: Depression was evident considerably among dental students. The prevalence of depression was higher among females and final year students.

Keywords: Academic factors, Dental students, Depression, Prevalence, Stress

INTRODUCTION

Depression adversely affects interpersonal, social, and occupational spheres of student's life. The problem is treatable and modifiable, as managing depression has been shown to improve academic performance. Depression affects a significant proportion of the health profession's students. It was found that students who suffer from both anxiety and depression are more likely to have poor academic performance. Therefore, student's mental health figures among the top priorities of universities throughout the world.[1] Problems related to depression include an increased risk of medical misjudgments due to illness and stress.[2]

Many academic factors such as a high workload, the long duration of academic days, and a high number of examinations, and future study concerns have been reported to be behind medical and dental students' poor psychological health. Furthermore, performance pressure to do well in studies due to their desire to satisfy the value of helping others, attain prestigious jobs, and achieve a stable financial future is a significant contributor to the problem.[3]

Poor grade in the exam, decrease self-esteem and prompt reduction in time spent on recreational activity are some of the reasons for depression among students. The resulting isolation and negative self-image may increase the risk of depressive symptoms. Among dental students, issues such as exams, fear of falling behind in coursework, shortage of clinical time, and career uncertainty are common sources of stress. Stress levels tend to increase with each successive year of study and have been associated with higher levels of psychological distress.[4]

Studies have explored stress, anxiety, and mental well-being of dental students. Most of these studies focus on students in later periods of their curriculum at university and reflect only the already existing deteriorations in psychological status. Few studies have reported depressive symptoms and associated factors among dental students. Hence, the study was conducted to assess the prevalence of depressive symptoms and associated factors among clinical dental students in Bengaluru city.

MATERIALS AND METHODS

A cross-sectional study was conducted among 200 third and final years' of undergraduate dental students in Bengaluru city from August to September 2017. Ethical clearance was obtained from the Institutional Ethical Committee. Necessary permission was obtained from the authorities of dental colleges included in the study. Written informed consent was obtained from the study participants after explaining the purpose of the study. This study was conducted in accordance with declaration of Helsinki.

A pilot study was conducted among 25 dental students in one of the dental colleges to calculate the sample size and to check the feasibility of the study. Based on the findings of pilot study, prevalence of depression as 68%, statistical power of 80%, 95% confidence interval, and 10% margin of error; a sample of 200 students was included in the study.

For the present study content validation of Beck's Depression Inventory-II (BDI-II) was done by three subject experts in the Department of Public Health Dentistry. The questionnaire was modified and 20 items were retained. Internal consistency was found to be good (Cronbach's alpha = 0.88). List of dental colleges was obtained from the website of Rajiv Gandhi University of Health Sciences, Bengaluru.[5] Based on simple random sampling, four dental colleges participated in the study. Dental students present on the day of study were included in the study.

Study tool consisted of demographic profile, BDI, and non-academic and academic factors. Demographic profile consisted of age, gender, and the year of study. Beck's BDI-II is a 21-item questionnaire with four responses ranging from 0 to 3 for each item. A score of 1–10 is considered normal ups and downs, 11–16 mild, 17–20 borderline, 21–30 moderate, 31–40 severe depression, and over 40 extreme depression.[1,6] Non-academic factors were family expectations, hostel stay, problem with friends, financial problems, less recreation time, drug/substance abuse, and medical/psychiatric illness. Academic factors were interest in the course, understanding the subject, workload, peer pressure, comparison with others, and fear of failure.[7,8] Responses to the questions were recorded as yes, no, sometimes/don't know/can't say.

Data were collected in respective dental colleges during working hours. Participants were requested to complete the pro forma, which took about 15–20 min. All the forms were collected the same day and checked for completeness. The response rate was 100%.

The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were performed. Chi-square test, student's *t*-test, and logistic regression analysis were used to compare the prevalence of depressive symptoms according to age, gender, and study year. For analysis, age was dichotomized as ≤20 and >20 years. Scores were dichotomized for non-academic and academic factors (≤15 and >15) and an overall score for associated factors (≤31 and >31). Weightage was assigned to the responses for associated factors based on their proximity to depression, and mean scores were calculated and compared. $P < 0.05$ (confidence interval of 95%) was considered as statistically significant.

RESULTS

A study was conducted among 100 each third and final years' of undergraduate students. Age ranged from 19 to 25 years (mean age: 20.76 ± 0.83 years). Proportion of females (57%) was higher than males (43%) ($P = 0.32$). Prevalence of depression was found to be 49% in this study.

A statistically significant association was found between depression and problems with friends, the presence of medical illness, lack of interest in the course, and fear of failure [Table 1]. There was no statistically significant difference

Table 1: Association between non-academic, academic factors, and depression.

Associated factors	Depression		*P* value	Odds ratio (95% CI)	*P* value
	Absent *n* (%)	Present *n* (%)			
Non-academic factors					
Family expectations are more					
No	26 (13.0)	21 (10.5)	0.51	1.25 (0.65–2.42)	0.50
Yes	76 (38.0)	77 (38.5)			
Do you stay in hostel					
No	45 (22.5)	48 (24.0)	0.57	0.82 (0.47–1.43)	0.49
Yes	57 (28.5)	50 (25.0)			
I feel homesick					
No	69 (34.5)	65 (32.5)	0.88	1.06 (0.59–1.91)	0.84
Yes	33 (16.5)	33 (16.5)			
I do not like hostel food					
No	62 (31.0)	59 (29.5)	1.00	1.02 (0.58–1.81)	0.93
Yes	40 (20.0)	39 (19.5)			
I am having problems with friends					
No	84 (42.0)	65 (32.5)	0.02*	2.37 (1.22–4.58)	0.01*
Yes	18 (9.0)	33 (16.5)			
I am facing financial problems					
No	54 (27.0)	42 (21.0)	0.16	1.50 (0.86–2.62)	0.15
Yes	48 (24.0)	56 (28.0)			
I get less recreation time					
No	40 (20.0)	29 (15.5)	0.18	1.53 (0.85–2.76)	0.15
Yes	62 (31.0)	69 (34.5)			
I am facing the problem of drug substance abuse					
No	97 (48.5)	90 (45.0)	0.40	1.72 (0.54–5.46)	0.35
Yes	5 (2.5)	8 (4.0)			
I am facing medical illness					
No	80 (40.0)	53 (26.5)	<0.001*	3.08 (1.66–5.72)	<0.001*
Yes	22 (11.5)	45 (22.5)			
I am facing psychiatric illness					
No	93 (46.5)	82 (41.0)	0.13	2.02 (0.84–4.80)	0.11
Yes	9 (4.5)	16 (8.0)			
Yes	60 (30.0)	86 (43.0)			
Academic factors					
How do you rate your performance in last exam					
No	80 (40.0)	22 (11.0)	0.74	1.18 (0.61-2.28)	0.62
Yes	74 (37.0)	24 (12.0)			
I lack interest in this course					
No	70 (35.0)	44 (22.0)	0.001*	2.68 (1.51-4.78)	0.001*
Yes	32 (16.0)	54 (27.0)			
I have difficulty understanding subjects					
No	49 (24.5)	41 (20.5)	0.39	1.28 (0.73-2.24)	0.38
Yes	53 (26.5)	57 (28.5)			
Work load is very high					
No	18 (9.0)	13 (6.5)	0.44	1.40 (0.65-3.04)	0.39
Yes	84 (42.0)	85 (42.5)			
Peer pressure is high					
No	57 (28.5)	42 (21.0)	0.05	1.69 (0.96-2.95)	0.06
Yes	45 (22.5)	56 (28.0)			
I don't like comparison with other students					
No	14 (7.0)	10 (5.0)	0.52	1.40 (0.59-3.32)	0.44
Yes	88 (44.0)	88 (44.0)			
I am having fear of failure					
No	42 (21.0)	12 (6.0)	<0.001*	5.02 (2.44-10.3)	<0.001*
Yes	60 (30.0)	86 (43.0)			

Table 2: Distribution of study participants according to demographic factors, year of study, and depression.

Variables (*n*=200)	Depression			Total	Odds ratio (95% CI)	*P* value
	Beck's depression inventory score (Mean±SD)*	Absent *n* (%)	Present *n* (%)			
Age						
≤20	14.06±7.25	40 (51.9)	37 (48.1)	77 (38.5)	1.06 (0.60–1.88)	0.83
>20	15.48±9.18	62 (50.4)	61 (49.6)	123 (61.5)		
Gender						
Male	14.65±8.72	51 (59.3)	35 (40.7)	86 (43.0)	1.80 (1.02–3.17)	0.04
Female	15.15±8.36	51 (44.7)	63 (55.3)	114 (57.0)		
Study year						
Third year	13.77±6.86	59 (59.0)	41 (41.0)	100 (50.0)	1.91 (1.08–3.34)	0.02
Final year	16.10±9.76	43 (43.0)	57 (57.0)	100 (50.0)		

*P>0.05

Table 3: Distribution of study participants according to associated factors and depression.

Variables (*n*=200)	Depression			Odds ratio (95% CI)	*P* value
	Beck's depression inventory score (Mean±SD)*	Absent *n* (%)	Present *n* (%)		
Non-academic					
≤15	14.01±7.64	80 (57.1)	60 (42.9)	2.30 (1.24–4.29)	0.01
>15	17.22±9.76	22 (36.7)	38 (63.3)		
P value*	0.01				
Academic					
≤15	13.52±9.00	59 (62.1)	36 (37.9)	2.36 (1.34–4.17)	0.003
>15	16.29±7.71	43 (40.9)	62 (59.1)		
P value*	0.02				
Overall score					
≤31	13.18±7.41	84 (60.9)	54 (39.1)	3.80 (1.99–7.25)	<0.001
>31	18.95±9.26	18 (29.0)	44 (71.0)		
P value*	<0.001				

between mean BDI scores with respect to age, gender, and study year. Females [OR = 1.80, P = 0.04] and final year students [OR = 1.91, P = 0.02] were more likely to have depression and the association was statistically significant [Table 2].

Mean BDI score was found to be significantly higher among those who had scored more than 15 non-academic (P = 0.01), academic factors (P = 0.02), and more than 31 overall score for factors associated to depression (P < 0.001). Overall the association was also found to be statistically significant for factors associated with depression [OR=3.80 (P < 0.001)] as well as non-academic (P = 0.01) and academic factors (P = 0.003) [Table 3].

Overall there was a statistically significant difference between age groups for associated factors (P < 0.001) and for academic factors only (P < 0.001). Mean overall score for associated factors was found to be significantly higher among final year students (P = 0.01), whereas those with depression had significantly higher mean score for non-academic (P = 0.005), academic (P < 0.001), and overall score for associated factors (P < 0.001). There was no statistically significant difference between the overall mean score for associated factors among males and females (P = 0.25).

Level of depression varied across demographic factors and year of study wherein significant difference was noted for gender (P = 0.04) and year of study (P < 0.001) [Table 4]. Level of depression differed according to associated factors for depression wherein significant difference was noted overall (P < 0.001) as well as non-academic factors (P = 0.04) [Table 5]. A statistically significant weak to moderate positive correlation was found among BDI scores and non-academic (r = 0.27, P < 0.001), academic (r = 0.30, P < 0.001), and overall score (r = 0.37, P < 0.001) for associated factors.

DISCUSSION

Pursuing a professional degree is generally viewed as a positive experience with new opportunities. However, sometimes it involves demanding situation such as adaptation to a new environment, different lifestyle, and responsibilities. These

Table 4: Distribution of study subjects based on demographic factors, year of study, and level of depression.

Variables (*n*=200)	Level of depression				*P* value
	Mild *n* (%)	Borderline clinical *n* (%)	Moderate *n* (%)	Severe *n* (%)	
Age					
≤20	40 (51.9)	33 (42.8)	2 (2.5)	2 (2.5)	0.05
>20	62 (50.4)	44 (29.0)	6 (4.8)	11 (8.8)	
Gender					
Male	51 (59.3)	24 (27.9)	5 (5.8)	6 (7.0)	0.04
Female	51 (44.7)	53 (46.5)	3 (2.6)	7 (6.2)	
Study year					
Third year	59 (59.0)	36 (36.0)	2 (2.0)	3 (3.0)	0.02
Final year	43 (43.0)	39 (39.0)	8 (8.0)	10 (10.0)	

Table 5: Distribution of study subjects based on associated factors and level of depression.

Variables (*n*=200)	Level of depression				*P* value
	Mild *n* (%)	Borderline clinical *n* (%)	Moderate *n* (%)	Severe *n* (%)	
Non-academic					
≤15	80 (57.1)	49 (35.0)	5 (3.6)	6 (4.3)	0.04
>15	22 (36.7)	28 (46.7)	3 (5.0)	7 (11.6)	
Academic					
≤15	59 (62.1)	28 (29.5)	2 (2.1)	6 (6.3)	0.06
>15	43 (40.9)	49 (46.7)	6 (5.7)	7 (6.7)	
Overall score					
≤31	84 (60.9)	47 (34.0)	3 (2.2)	4 (2.9)	<0.001
>31	18 (29.0)	30 (48.4)	5 (8.1)	9 (14.5)	

situations may produce a high stress level that supports the onset of psychological problems.[9]

In the present study, age of study participants ranged from 19 to 25 years mean being 20.76 ± 0.83 years which was similar to few studies[8,10] and less than other studies.[1,11-13] Majority of students (61.5%) were aged more than 20 years. Proportions of female students (57.0%) were more than males, which were similar to most of the studies in previous literature (45.7%–78.0%).[3,7,8,10,11,12,14]

Prevalence of depression was found to be 49% in the current study, which was similar to the prevalence as reported in previous literature (51.6%)[1,4] and (55.9%).[7] The high levels of depression could be attributed to the pressure exerted on students during dental education by their workload, clinical requirements, examinations, and grades.

Students may experience dissatisfaction studying for a career in which they are not interested.[7] High exam stress and future employment could be the reasons for the higher prevalence of depressive symptoms in the students.[1] In this study, factors associated with depression were assessed. Those are having problems with friends, facing medical illness, lacking interest in the course and having a fear of failure had higher odds of reporting depression. These findings were similar to studies done by Bathla *et al*. and Peker *et al*. where high workload, lack of interest in the course, fear of failure, and less time for recreational activity were found to be significant predictors of depression.[8,12]

Age showed statistical significance with respect to factors associated with depression, while extent and severity did not vary with age. Students with higher age had higher mean BDI scores and were more likely to have depression. A study done by Astill *et al*. reported a higher prevalence of depression among study participants aged 21 years or more.[15]

Gender had a significant role in the extent and level of depression. Female students had higher mean BDI scores and were more likely to have depression. Studies have reported higher prevalence and severity of depression among females.[1,13,15] These findings could be due to the fact that females are more likely to articulate their worries and emotions. On the contrary, one study reported a higher prevalence of depression among males.[12]

Year of the study was found to be a significant factor with respect to factors associated with depression extent and severity. Final year students had higher mean BDI scores and were more likely to have depression. A similarly a higher proportion of final year students with depression was reported in studies done by Peker *et al*. and Prinz *et al*.[12,16] Higher levels of depression with an increase in study year can be attributed to stressors that arise as students progress through dental schools such as patient factors and worries about the future and job opportunities.[7]

Regarding factors associated with depression, significantly higher mean BDI score was observed among students who

scored higher for non-academic and academic factors. Furthermore, those who scored higher for associated factors were significantly more likely to have depression as expressed by odds ratio. The overall mean score for associated factors was higher among those aged more than 20 years, males, higher study year and having depression, but there was no significant difference between males and females.

Prevalence of moderate to severe depression in the present study was similar to a study[7] whereas lower than others.[10,17] Regarding the level of depression, the higher level was found among those aged more than 20 years. Although the prevalence of depression was found to be higher among females; the proportion of males with moderate to severe levels of depression was more compared to females. The proportion of final year students with a higher level of depression was more than third-year students which is similar to a study by Bathla *et al*. whereas another study by Alfaris *et al*. found a higher level of depression among third-year students.

Non-academic and academic factors individually and overall were significantly affecting the presence of depression, whereas non-academic factors alone and overall, both the factors combined were significantly affecting the level of depression. Students with higher scores for non-academic and academic factors were found to exhibit higher levels of depression. Furthermore, a positive correlation was observed between scores for associated factors and mean BDI score suggestive of a relationship between various factors related to students academics and other environment.

The strength of the study is the use of BDI-II, which is widely applied and is high reliability and improved concurrent and content validity based on available psychometric evidence.[6] One of the limitations of the study is that cross-sectional study design does not allow for assessment of changes in psychological changes over time. Bias inherent in the questionnaire studies may be present. Further longitudinal studies are recommended to find out differences in the prevalence of depressive symptoms among the students of the different disciplines and whether it is due to the innate nature of the curriculum or due to the type of environment in which they study. At the student level, whether students' study skills, their resilience or coping skills are associated with the presence of depression needs exploration too.

Depression continues to affect student's performance after graduation in quality of patient care and professionalism hence extending its negative impact to the community at large. Considering the high rate of depressive symptom, establishing a unit or facility to provide psychological support to students is recommended. Use of group setting to deal with depression is recommended as it helps in reducing feelings of isolation. It is important that administrators understand the importance of student activities and organizations to overall student well-being. Another approach would be through the use of psychological service providers within the academic environment through collaboration with university counseling services.

CONCLUSION

Overall high prevalence of depression was observed. Gender, year of study and certain non-academic and academic factors influenced the severity and extent of depression. Increased attention needs to be directed to the psychological well-being of dental students as it is an important aspect of their overall health. Addressing students' mental health should be put among the top priorities of educational institutes throughout the world.

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Conflicts of interest

There are no conflicts of interest.

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