Evaluation of anxiety, depression and suicidal intent in undergraduate dental students: A cross-sectional study

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Abstract

Background: There is an increasing amount of stress in undergraduate dental students leading to anxiety, depression, and suicidal attempts/suicide. **Aims:** This study aims to evaluate anxiety, depression and suicidal intent in undergraduate dental students and to find out the various areas of stress. **Materials and Methods:** A cross-sectional study was conducted using a semi-structured questionnaire (to assess academic and nonacademic areas of stress) and three scales-Hamilton scale for anxiety (HAM-A); Hamilton depression rating scale (HDRS) and Beck's Suicide Intent Scale (BSI). Descriptive statistics; Pearson's Chi-square test; Multiple ANOVA; Kruskal–Wallis test and Mann–Whitney test were used to analyze the data at the significant level of $P \leq 0.05$. **Results:** In a total of 258 dental undergraduate students, academic areas of stress that were found to be statistically significant were long teaching hours ($P = 0.002$); high workload ($P \leq 0.001$); frequency of tests ($P \leq 0.001$) and competition/fear of failure ($P = 0.009$). Lack of interest in the profession was a statistically significant nonacademic area for stress ($P \leq 0.001$). The students of first and final year reported higher anxiety (HAM-A 13.93 ± 6.908 and 16.44 ± 7.637 respectively) and depression (HDRS 14.29 ± 6.302 and 14.22 ± 5.422); whereas suicidal intent was reported almost the same throughout the study sample (BSI 5.65 ± 5.465). **Conclusion:** An increasing level of anxiety, depression and suicidal intent due to various stressors in undergraduate dental students indicate a need to modify current education system and timely help to have psychological healthy dental professionals in future.

Keywords: Academic stress, anxiety, dental students, depression, nonacademic stress, suicidal intent

Introduction

A growing body of research has reported a considerable amount of stress in undergraduate dental students even recording a 100% prevalence rate in few studies.[1,2] The phenomenon occurs almost across all years of dental education training and is prevalent indifferent countries with a different education system.[1-7] Stress is a normal response of a body to any demands while stressors are the demands and pressure that lead to stress. Stress results due to the discrepancy between excessive pressure and different types of demand and individual capacities to fulfill these demands.[8,9] Perception of stress is under the control of one's personal system of belief and attitude.[2] Distorted perceptions overemphasize our limitations and make the situation more stressful. Even stressors can vary with individual attitude, belief, and cultural background.[10]

Dental education has long been recognized as a complex and highly demanding training and hence can be one of the reasons for stress that can also persist in professional life.[2,6] Dental students are expected to achieve a high degree of diverse competencies, including theoretical knowledge, clinical practice and interpersonal skills.[9] Currently in India, undergraduate dental curriculum is covered over a period of 5 years, including 1-year compulsory internship. First 2 years mainly focus on core curriculum, including didactic or basic sciences. During third and 4th-year students are exposed to various clinical departments along with regular classes. At the end of each academic year, clinical skills and theoretical knowledge of the student is judged based on oral, written and practical examination. During the internship, students are rotated through different dental specialties in order to get clinical exposure.[11]

Academic and nonacademic stressors commonly reported in Indian dental students are examination and grades, performance pressure, managing difficult patient, poor patient co-operation, demanding nature of training, full working day, dealing with faculty and administration and parental pressure.[3,10,12,13] Persistent stressors can lead to psychological disturbance in the form of depression, anxiety

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and emotional exhaustion, loss of self-confidence, hostility, unprofessional conduct and burnout.[4,7,14,15] Paudel *et al*., 2013 reported significant negative effect of perceived stress on health in the form of fatigue, tiredness, mood alteration, sleep disturbance, back pain, headache, abdominal disturbances, oral ulcers and flu or common cold.[2] Subsequently, such disturbances in physical and mental well-being can hamper learning ability and academic performance of students.[7,16,17] Poor psychological health can also initiate thought of suicide/self-harm. Lay public and professional media usually depicted dental health professionals as a group of health-care workers with the highest suicidal rate though the evidences are less supporting.[18]

Hence, we planned this study to find out anxiety, depression and suicidal intent across all the 4 years of undergraduate dental students and identify different areas of stress in relation to academics and nonacademic surrounding.

Materials and Methods

A cross-sectional study was conducted at Maharishi Markandeshwar College of Dental Sciences and Research, Maharishi Markandeshwar University, Mullana (Ambala). Institutional Ethics Committee approval was obtained prior to the study. After obtaining informed consent, a total of 258 Bachelor of Dental Surgery (BDS) students across all 4 years of either sex were included in the study sample. Students with a history of substance dependence, psychotic disorders, and any co-morbid chronic medical illness were excluded from the study. Student's participation was completely voluntary without undue pressure. At the start of the study, principal investigator (MB) briefed all participants on aim and objectives of the study. The overall response rate from participants was good without any dropout.

A semi-structured proforma was used to assess the different areas of stress. It included sociodemographic information of the students (age, sex, marital status, family type and locality), 9 academic and 12 nonacademic areas for stress. Response for each question related to academic and nonacademic areas for stress was reported in the form of 'Yes' (1) or 'No' (0) [Appendix]. The level of anxiety, depression, and suicidal intent was evaluated using Hamilton scale for anxiety (HAM-A) for assessment of anxiety;[19] Hamilton depression rating scale (HDRS) for assessment of depression[20] and Beck's Suicide Intent Scale (BSI) for assessment of suicidal intent[21] respectively. All students from 1st year BDS to final year BDS were given the questionnaire separately year wise by MB (PI) in lecture with the prior permission of the principal and the concerned teacher. Time allocated to complete the questionnaire was 30 min. Students absent for the respective study class were not included in the study sample. The semi-structured proforma and three scales were administered at the same time.

Statistical analysis

The sociodemographic variables were computed/analyzed by calculating the mean and standard deviation for age and frequency for sex, marital status, family type and locality.

The presence or absence of academic and nonacademic areas of stress was calculated by frequency.

Means and standard deviation were determined for the score of HAM-A; HDRS; BSI scales and the total score of HAM-D, HAM-A and BSI were compared across each 4 years. For the purpose of identifying levels of anxiety and depression across different training years, HAM-A and HDRS were graded as normal, mild, moderate and severe. Pearson's Chi-square test; multiple ANOVA; Kruskal–Wallis test and Mann–Whitney test were used to analyze the data at the significant level of $P \leq 0.05$.

Results

A total of 258 undergraduate dental students were participated in the study. The students were between the ages of 18 and 22 years (overall mean age - 20.11 ± 1.426; BDS 1-18.47 ±0.775; BDS 2-19.85 ±0.718; BDS 3-20.69 ±.769; BDS 4-21.82 ±.796).

The study sample comprised of about 78% females ($n = 201$) (BDS 1 - male: 12; female 58;BDS 2 - male: 20, female 48; BDS 3 - male: 15, female 50; BDS 4 - male: 10, female 45). It was interesting to note that there was more number of female students across all the 4 years.

All students were single. Most of the students (74%) were from nuclear families (BDS 1-51; BDS 2-56; BDS 3-49; BDS 4-35). Over 85% students were from urban areas (BDS 1-61; BDS 2-58; BDS 3-59; BDS 4-42).

Table 1 shows areas of stress in relation to academic reasons. The common reasons for stress across all 4 years were long teaching hours ($P = 0.002$); high workload ($P \leq 0.001$), frequency of tests ($P \leq 0.001$) and competition/fear of failure ($P = 0.009$). Most of these academic stressors were higher for final year students.

Lack of interest in the profession ($P \leq 0.001$) and homesickness ($P = 0.13$) were the commonest nonacademic reason for stress in study subjects [Table 2].

First and the final year students reported higher level of anxiety (HAM-A 13.93 ± 6.908 and 16.44 ± 7.637 respectively) and depression (HDRS 14.29 ± 6.302 and 14.22 ± 5.422); whereas the suicidal intent was almost the same throughout the sample (BSI 5.65 ± 5.465).The mean score for HAM-A; HDRS and BSI were 13.38 ± 8.489; 12.94 ± 6.635 and 5.65 ± 5.465respectively [Table 3].

Table 1: Academic reasons for stress in study subjects across each year

Academic reasons	BDS1 (*n*=70) (%)	BDS2 (*n*=68) (%)	BDS3 (*n*=65) (%)	BDS4 (*n*=55) (%)	Total (*n*=258) (%)	*P*
Understanding the subject						
No	26 (37.1)	16 (23.5)	21 (32.3)	23 (41.8)	86 (33.3)	0.157
Yes	44 (62.9)	52 (76.5)	44 (67.7)	32 (58.2)	172 (66.7)	
Long teaching hours						
No	25 (35.7)	41 (60.3)	39 (60)	20 (36.4)	125 (48.4)	0.002*
Yes	45 (64.3)	27 (39.7)	26 (40)	35 (63.6)	133 (51.6)	
High workload						
No	21 (30)	19 (27.9)	30 (46.2)	4 (7.3)	74 (28.7)	≤0.001*
Yes	49 (70)	49 (72.1)	35 (53.8)	51 (92.7)	184 (71.3)	
Frequency of tests						
No	35 (50)	52 (76.5)	56 (86.2)	14 (25.5)	157 (60.9)	≤0.001*
Yes	35 (50)	16 (23.5)	9 (13.8)	41 (74.5)	101 (39.1)	
Teaching methods						
No	36 (51.4)	25 (36.8)	29 (44.6)	30 (54.5)	120 (46.5)	0.187
Yes	34 (48.6)	43 (63.2)	36 (55.4)	25 (45.5)	138 (53.5)	
Comparison with others						
No	37 (52.9)	47 (69.1)	34 (52.3)	30 (54.5)	148 (57.4)	0.152
Yes	33 (47.1)	21 (30.9)	31 (47.7)	25 (45.5)	110 (42.6)	
Competition/fear of failure						
No	22 (31.4)	22 (32.4)	28 (43.1)	8 (14.5)	80 (31)	0.009*
Yes	48 (68.6)	46 (67.6)	37 (56.9)	47 (85.5)	178 (69)	
Inaccessibility to teachers						
No	51 (72.9)	46 (67.6)	45 (69.2)	31 (56.4)	173 (67.1)	0.255
Yes	19 (27.1)	22 (32.4)	20 (30.8)	24 (43.6)	85 (32.9)	
Others						
No	68 (97.1)	64 (94.1)	62 (95.4)	48 (87.3)	242 (93.8)	0.129
Yes	2 (2.9)	4 (5.9)	3 (4.6)	7 (12.7)	16 (6.2)	

BDS: Bachelor of Dental Surgery, *: Statistically significant

Tables 4 and 5 show the year-wise grading of HAM-A and HDRS as normal (0–6), mild (7–17), moderate (18–24) and severe (≥24). The majority of the students have graded themselves to be mildly anxious and depressed across all years.

On comparing *P* value of HAM-A among different years of BDS, it was statistically significant for BDS 1 and BDS 2 ($P = 0.006$), BDS 2 and BDS 4 ($P \leq 0.001$) and BDS 3 and BDS 4 ($P = 0.002$) respectively. On comparing *P* value of HDRS among different years of BDS, it was statistically significant for BDS 1 and BDS 2 ($P = 0.014$), BDS 1 and BDS 3 ($P = 0.029$) and BDS 2 and BDS 4 ($P = 0.015$) and BDS 3 and BDS 4 ($P = 0.023$) respectively. No statistical significance was found for BSI scores [Table 6].

Tables 7 and 8 show the relationship between HAM-A and HAM-D with the academic and nonacademic reasons respectively, for the students reporting as "Yes" on the semi-structured proforma to assess the areas of stress.

Table 7 – Students scoring "Yes" on academic reasons – long teaching hours ($P = 0.014$ [HAM-A] and 0.40 [HAM-D]), high workload ($P = 0.018$ [HAM-A] and $P = 0.022$ [HAM-D]), comparison with others ($P = 0.001$ [HAM-A] and $P = 0.037$ [HAM-D]) and competition/fear of failure ($P = 0.001$ [HAM-A] and $P = 0.001$ [HAM-D]) shows statistically significant level of both anxiety and depression.

Table 8 – Students scoring "Yes" on nonacademic reasons – home sick ($P = 0.43$), problems with friends/class mates ($P = 0.001$), family expectations ($P = 0.39$), peer pressure ($P = 0.004$), relationship problems ($P = 0.01$) and medical/psychiatric illness ($P = 0.003$) shows statistically significant level of both HAM-A and HDRS score. Whereas the students scoring "Yes" on drugs/substance abuse ($P = 0.001$) and family expectations ($P = 0.039$) were statistically significant for HAM-A score and parameters such as lack of interest in profession ($P = 0.009$) was statistically significant in relation to HDRS score.

Table 2: Nonacademic reasons for stress in study subjects across each year

Nonacademic reasons	BDS1 (*n*=70) (%)	BDS2 (*n*=68) (%)	BDS3 (*n*=65) (%)	BDS4 (*n*=55) (%)	Total (*n*=258) (%)	*P*
Home sick						
No	42 (60)	35 (51.5)	32 (49.2)	17 (30.9)	126 (48.8)	0.013*
Yes	28 (40)	33 (48.5)	33 (50.8)	38 (69.1)	132 (51.2)	
Problems with friends/classmates						
No	50 (71.4)	49 (72.1)	40 (61.5)	30 (54.5)	169 (65.5)	0.124
Yes	20 (28.6)	19 (27.9)	25 (38.5)	25 (45.5)	89 (34.5)	
Hostel food conditions						
No	31 (44.3)	30 (44.1)	24 (36.9)	28 (50.9)	113 (43.8)	0.496
Yes	39 (55.7)	38 (55.9)	41 (63.1)	27 (49.1)	145 (56.2)	
Less recreation time						
No	22 (31.4)	28 (41.2)	27 (41.5)	20 (36.4)	97 (37.6)	0.578
Yes	48 (68.6)	40 (58.8)	38 (58.5)	35 (63.6)	161 (62.4)	
Family expectations						
No	14 (20)	20 (29.4)	20 (30.8)	21 (38.2)	75 (29.1)	0.164
Yes	56 (80)	48 (70.6)	45 (69.2)	34 (61.8)	183 (70.9)	
Peer pressure						
No	46 (65.7)	42 (61.8)	44 (67.7)	37 (67.3)	169 (65.5)	0.888
Yes	24 (34.3)	26 (38.2)	21 (32.3)	18 (32.7)	89 (34.5)	
Relationship problems						
No	56 (80)	51 (75)	44 (67.7)	36 (65.5)	187 (72.5)	0.230
Yes	14 (20)	17 (25)	21 (32.3)	19 (34.5)	71 (27.5)	
Financial						
No	58 (82.9)	56 (82.4)	53 (81.5)	43 (78.2)	210 (81.4)	0.915
Yes	12 (17.1)	12 (17.6)	12 (18.5)	12 (21.8)	48 (18.6)	
Drugs/substance abuse						
No	70 (100)	64 (94.1)	64 (98.5)	52 (94.5)	250 (96.9)	0.137
Yes	0 (0)	4 (5.9)	1 (1.5)	3 (5.5)	8 (3.1)	
Medical/psychiatric illness						
No	60 (85.7)	63 (92.6)	54 (83.1)	44 (80)	221 (85.7)	0.213
Yes	10 (14.3)	5 (7.4)	11 (16.9)	11 (20)	37 (14.3)	
Lack of interest in profession						
No	51 (72.9)	66 (97.1)	45 (69.2)	46 (83.6)	208 (80.6)	≤0.001*
Yes	19 (27.1)	2 (2.9)	20 (30.8)	9 (16.4)	50 (19.4)	
Others						
No	68 (97.1)	68 (100)	62 (95.4)	54 (98.2)	252 (97.7)	0.352
Yes	2 (2.9)	0 (0)	3 (4.6)	1 (1.8)	6 (2.3)	

BDS: Bachelor of Dental Surgery, *: Statistically significant

Discussion

Stress is a normal biological response to adverse external or internal stimulus. In some cases, stress may motivate a person to achieve exceptionally high performance both personally and professionally. However, if the compensating response is inappropriate or inadequate, the same stress can result in clinical disorders such as anxiety and depression.[14]

Findings of the current study suggest that a significant percentage of undergraduate dental students experience stress across all years of training placing them at a risk of psychological disturbances. The results of our study also support the evidence from literature demonstrating a substantial level of stress among undergraduate dental students related to various academic or nonacademic reasons.[1,2,9]

Table 3: HAM=A; HDRS; BSI (mean±SD) in study subjects

Scale	BDS1 (*n*=70)	BDS2 (*n*=68)	BDS3 (*n*=65)	BDS4 (*n*=55)	Total (mean±SD)
HAM-A	13.93±6.908	11.25±7.061	12.43±11.065	16.44±7.637	13.38±8.499
HDRS	14.29±6.302	11.60±6.486	11.82±7.652	14.22±5.422	12.94±6.635
BSI	5.64±5.267	4.56±3.739	5.89±6.399	5.18±4.838	5.65±5.465

HAM-A: Hamilton scale for anxiety; HDRS: Hamilton depression rating scale; BSI: Beck's suicide intent scale; SD: Standard deviation; BDS: Bachelor of dental surgery

Table 4: Grading of HAM-A in study subjects

Grading of HAM-A	BDS1 (*n*=70) (%)	BDS2 (*n*=68) (%)	BDS3 (*n*=65) (%)	BDS4 (*n*=55) (%)	Total (*n*=258) (%)
Normal 0-6	3 (4.28)	16 (23.52)	23 (35.38)	4 (7.27)	46 (17.82)
Mild 7-17	50 (71.42)	41 (60.29)	26 (40)	29 (52.72)	146 (56.58)
Moderate 18-24	13 (18.57)	7 (10.29)	6 (9.23)	14 (25.45)	40 (15.5)
Severe more than 24	4 (5.71)	4 (5.88)	10 (15.38)	8 (14.54)	26 (10.07)

BDS: Bachelor of dental surgery; HAM-A: Hamilton scale for anxiety

Table 5: Grading of HDRS in study subjects

Grading of HDRS	BDS1 (*n*=70) (%)	BDS2 (*n*=68) (%)	BDS3 (*n*=65) (%)	BDS4 (*n*=55) (%)	Total (*n*=258) (%)
Normal 0-6	7 (10)	14 (20.58)	19 (29.23)	4 (7.27)	44 (17.05)
Mild 7-17	45 (64.28)	41 (60.29)	34 (52.3)	35 (63.63)	155 (60.07)
Moderate 18-24	13 (18.57)	11 (16.17)	9 (13.84)	15 (27.27)	48 (18.60)
Severe more than 24	5 (7.14)	2 (2.94)	3 (4.61)	1 (1.81)	11 (4.26)

BDS: Bachelor of Dental Surgery; HDRS: Hamilton depression rating scale

Table 6: Comparison of *P* of HAM-A, HDRS and BSI among different year of BDS

Variable	BDS2	BDS3	BDS4
HAM-A			
BDS1	0.006*	0.034	0.054
BDS2	-	0.763	0.000*
BDS3	-	-	0.002*
HDRS			
BDS1	0.014	0.029	0.984
BDS2	-	0.989	0.015
BDS3	-	-	0.023
BSI			
BDS1	0.438	0.933	0.628
BDS2	-	0.677	0.697
BDS3			0.824

HAM-A: Hamilton scale for anxiety; HDRS: Hamilton depression rating scale; BSI: Beck's Suicide Intent Scale; SD: Standard deviation; BDS: Bachelor of Dental Surgery, *: Statistically significant

We identified high workload as a noteworthy academic source of stress among undergraduate dental students. This is in agreement with the findings of other studies.[2,5,9] High workload in dental students during undergraduate years is usually associated with lots of tests, too many assignments, preparation for examination, scarcity of time and expectations in both theoretical and clinical knowledge. This is followed by competition or fear of failure as a second major stress evoking factor during academic years. Al-Samadani and Al-Dharrab reported fear of failure (51.3%) as a major cause of stress in undergraduate dental student, a finding very similar to our result.[9] We also found long teaching hours and frequency of tests as other common but significant academic stressors in dental program. Most of these academic stressors were reported high for final year students. During final years, students have to spend more time on patient care to excel clinical requirements. This left very little time for them to complete an assignment or prepare for examination. Overall stress level increases as the student progress in the academic program, mainly due to transition from nonclinical to clinical setting and expectation of excellence in both academic and clinical skills.[6,7,9]

Lack of interest in the profession was reported as a commonest nonacademic reason for stress in our study. This is frequently perceived in two circumstances when students are forced to join a dental school which is not of their choice. First when meritorious students failed to enroll in medical school either due to poor ranking in the entrance examination or due to financial constraints to pay high tuition fees of private medical college.[11] Secondly, this situation occurs when parents expected their children to take admission in a highly respectable profession like dentistry. This is commonly seen in India with strong family

Table 7: Relationship of HAM-A and HAM-D score with the academic reasons

Academic reasons	*n*=258	HAM-A (%)			HAM-D (%)		
	Total number of "yes"	≤17	≥18	*P*	≤17	≥18	*P*
Understanding the subject	172	135 (78.48)	37 (21.51)	0.091	141 (81.97)	31 (18.02)	0.08
Long teaching hours	133	91 (68.42)	42 (31.57)	0.014	95 (71.42)	38 (28.57)	0.040
High Workload	184	130 (70.65)	54 (29.34)	0.018	134 (72.82)	50 (27.17)	0.022
Frequency of tests	101	73 (72.27)	28 (27.72)	0.378	72 (71.28)	29 (29.7)	0.100
Teaching methods	138	105 (76.08)	33 (23.91)	0.883	105 (76.08)	33 (23.91)	0.883
Comparison with others	110	64 (58.18)	46 (41.81)	0.001	77 (70)	33 (30)	0.037
Competition/fear of failure	178	122 (68.53)	56 (31.46)	0.001	126 (70.78)	52 (29.21)	0.001
Inaccessibility to teachers	85	58 (68.23)	27 (31.76)	0.126	59 (69.41)	26 (30.58)	0.060
Others	16	7 (43.75)	9 (56.25)	0.001	10 (62.5)	6 (37.5)	0.217

The scores were divided into two groups as ≤17 (normal and mild) and≥18 (moderate and severe). HAM-A: Hamilton scale for anxiety

Table 8: Relationship of HAM-A and HAM-D score with the nonacademic reasons

Nonacademic reasons	*n*=258	HAM-A (%)			HAM-D (%)		
	Total number of "yes"	≤17	≥18	*P*	≤17	≥18	*P*
Home sick	132	92 (69.69)	40 (30.3)	0.043	92 (69.69)	40 (30.3)	0.043
Problems with friends/classmates	89	51 (57.3)	38 (42.69)	0.001	57 (64.04)	32 (35.95)	0.001
Hostel food conditions	145	112 (77.24)	33 (22.75)	0.563	111 (76.55)	34 (23.44)	1.0
Less recreation time	161	115 (71.42)	46 (28.57)	0.075	117 (72.67)	44 (27.32)	0.49
Family expectations	183	131 (71.58)	52 (28.41)	0.039	136 (74.31)	47 (25.68)	0.194
Peer pressure	89	58 (65.16)	31 (34.83)	0.004	60 (67.41)	29 (32.58)	0.013
Relationship problems	71	45 (63.38)	26 (36.61)	0.010	45 (63.38)	26 (36.61)	0.003
Financial	48	34 (70.83)	14 (29.16)	0.462	32 (66.6)	16 (33.3)	0.087
Drugs/substance abuse	8	1 (12.5)	7 (87.5)	0.001	4 (50)	4 (50)	0.088
Medical/psychiatric illness	37	21 (56.75)	16 (43.24)	0.003	22 (59.45)	15 (40.54)	0.011
Lack of interest in profession	50	33 (66)	17 (34)	0.104	31 (62)	19 (38)	0.0009
Others	6	3 (50)	3 (50)	0.166	5 (83.3)	1 (16.6)	1.0

The scores were divided into two groups as ≤17 (normal and mild) and ≥18 (moderate and severe). HAM-A: Hamilton scale for anxiety-

values where children can't refuse their parents wish.[6] A study conducted in private dental college in India recorded greater stress among students who joined dentistry either due to parental pressure or whose career field of choice was different.[10]

Mild to moderate level of anxiety and depression was reported across all years of a dental education program. The trend of the mean score shows that that was a fall in mean score of both HAM-A and HDRS in second and third year followed by a rise again in the mean score in final year students.

Factors leading to anxiety can vary with academic years.[6] During 1st year, students are exposed to new educational environment. They may face difficulties with learning new syllabus; adjustment with new friends; adjustment with faculty and staff and new living accommodation if they are from other cities. As mentioned above, academic stressors are high in final year students. At this training level, final year students are expected to excel their clinical skills along with theoretical knowledge. These students may find difficulty in managing patient, feeling of inadequacy to complete clinical task, lack of time to complete assignment and preparation for examination, and fear of future dental career. A recent survey in Colombian dental students recorded marked increased in psychological distress level during transition from preclinical to clinical phases of training. Though our findings for 1st year students did not match with a survey, but they are in agreement for final year students.[7] When depression is evaluated at mild, moderate and severe levels, our findings are consistent with study by Reddy *et al*. for first 3 academic years. A constant stress if not recognized or left untreated can lead to depression and hence stress should not be ignored. Even early identification and management is necessary to prevent future health-related consequences.[17] Persistence of some degree of anxiety and depression can be manifestations of severe stress associated with high

workload, rising competition and feeling of failure across all academic years.

Suicidal intent was found to be almost the same throughout the study sample. Not all the previously published studies dealing with suicide rates among dentists found increased suicide risk.[22] There are no valid data suggesting dentists are more prone to suicide as usually depicted in media.[18] However, a recently conducted study by Galán *et al*. for the 1st time reported prevalence of suicidal ideation among dental students for both preclinical and clinical years.[15] This area needs to be addressed regarding an association of stress and suicidal ideation among dentists.

There is no such study which has evaluated the relationship of the areas of stress to the level of anxiety, depression and suicidal intent. In our study though the relationship appears that the students having less score on the scales of HAM-A and HAM-D show more amount of stress appears to be paradoxical to the current literature. This could be explained by the fact that the stigma associated with the psychiatric disorders have actually inhibited the students to score themselves on the rating scales but whereas they have actually shown to be in stress in different areas of academic and nonacademic reasons.

It is impractical to remove all stress provoking factors from the current dental education system. However, identifying different areas of stress help to reduce a stress level by making changes in curriculum; revising education process in consideration with both student and staff and use of resources such as counseling service.[6] Paudel *et al*. recommended that dental colleges must take help of educational expert in designing and developing student-oriented curriculum in order to reduce stress and improve psychological well-being of the student. This will help to develop professionally sound graduates with better academic and clinical performance.[2] It is equally important that parents should be advised not to force their children to join educational program that they don't like.[10]

Major drawback of a current dental education system is that there is no stress management class in regular training. Apart from standardizing current dental education, there is a need to create stress-free learning environment. Divaris *et al*. gives a concept of the ideal academic environment as one that prepares the students for their future professional life and contributes toward their personal development, psychosomatic and personal well-being.[23] Dahan and Bedos suggested implementation of two strategies to help stressed students that is, decreasing number of stressor and increasing ability to cope with stress. First strategy involved measures to minimize a number of stressors such as reducing fear of failure and workload related to examination and requirement. Increasing length of the curriculum can be one of the ways to reduce a workload on students and also help to reduce fear of failure. In implementation of this strategy, faculty members can play a crucial role by reconsidering prerequisites to pass examinations, scheduling information session between students and their seniors to share information, nurturing interpersonal relationship between students and educators and giving constructive feedback to struggling students.[8] In addition to student-oriented programs, there is a need of student advisor and counselors with faculty advising system to minimize the stress level.[2,3] Second strategy focuses on use of different coping techniques to overcome stress. In this scenario, organizing stress management and time management programs for students; discussing the importance of wellness and use of stress relievers like yoga and meditation are helpful options to reduce the stress level.[8]

Limitations of the study

However, results of our study can't be generalized as it was conducted on small sample size and at a single center. There are chances of respondent's bias as the study was based on answering questionnaire by students who could manipulate information. In addition, the current study did not record demographic and socioeconomic factors influencing stress level and psychological disturbances. Literature about suicidal ideation among dental student is somewhat controversial.

So in future, larger studies involving large sample size, conducted at various geographical centers, carried out inconsideration with other factors for psychological disturbances and suicidal ideation will be required for more substantial results. In addition, the rating scales should be used in concordance with the clinical interview at least in those students scoring high on rating scales.

Strengths of the study

This is the only study which has evaluated the relationship of the areas of stress to the level of anxiety, depression and suicidal intent.

Conclusion

Persistence of anxiety, depression and suicidal intent in undergraduate dental students due to diverse academic and nonacademic reasons suggest a need for modifying current dental education system and creating stress-free learning environment. Based on these findings, it is imperative to revise current teaching methodology, boosts interpersonal relationships, and the introduction of stress management interventions and various coping strategies to overcome stress during an undergraduate program. Further, we suggest a creation of positive academic environment as a team work of faculty, administration, educational experts and students to develop psychological healthy dental professionals who can perform better in a coming future.

Appendix: Semi-Structured Proforma used for the study

Age	
Sex	
Male	0
Female	1
Marital status	
Single	0
Married	1
Family type	
Nuclear	0
Extended/joint	1
Locality	
Urban	0
Rural	1

Questionnaire to assess the area of stress

Academic reasons	Yes (1)	No (0)
Understanding the subject		
Long teaching hours		
High workload		
Frequency of tests		
Teaching methods		
Comparison with others		
Competition/fear of failure		
Inaccessibility to teachers		
Others (specify)		

Nonacademic reasons	Yes (1)	No (0)
Home sick		
Problems with friends/classmates		
Hostel food conditions		
Less recreation time		
Family expectations		
Peer pressure		
Relationship problems		
Financial		
Drugs/substance abuse		
Medical/psychiatric illness		
No interest in profession		
Others (specify)		

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