

Assessment of Sources of Academic Stress and Coping Strategies Among Junior Dental Students of Preclinical Years in A Public Sector University

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ABSTRACT

Objectives: To identify the sources of stress and coping strategies among preclinical students and to compare dental environment stress, the self-perceived stress, and coping strategies scores

Methodology: A cross-sectional study was conducted in a public sector dental school of Karachi on the students of the first and the second year. Students were asked to fill in the questionnaire based on DES, PSS, and COPE scale. Sample size of 89 was calculated through OpenEpi and convenience sampling was utilized for data collection. A pilot study to validate the questionnaire was completed followed by final data collection.

Results: Data was analyzed through SPSS version 18. The number of female participants was 64 out of 89 while males were 25. The first year students were (N=44) and the rest were second year students (N=45). The Mean score for PSS for the first year was 28.06 while for the second year was 28.1. DES showed that the highest stress factors were 'Examination', 'Workload' and 'Performance Pressure' while the highest scoring COPE factors were 'religious coping', 'planning' and 'restraining thoughts'. The overall stress was higher in the second year students than in the first year students with both seeking solace in religious teachings the most. Also, female participants showed high stress scores.

Conclusion: The findings of the study support previous data that dental students suffer from constant stress and pressure to perform which may lead to mental issues and eventually burnout. Support by teachers and family could play a major part in managing their stress levels.

Key Words: Academic Success Motivation, Quality of Life, Universities, Workload

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INTRODUCTION

Stress is a commonly encountered factor that affects the mental health of students and individuals alike. Defined as any change that affects the functional ability

of a person including physical, emotional, or psychological strain. It can be an intrinsic or extrinsic factor invoking a biological response¹. In certain individuals, stress can be a motivating force but in excess it can affect the mental health negatively². It generally exceeds the capacity of an individual to respond and can potentially have adverse physical, psychological, and emotional consequences. It can make a person feel overwhelmed, fatigued, nervous, and miserable. Stress may induce changes in eating and sleeping habits, cause headaches, and may result in loss or gain of weight. In the long run, stress can exacerbate the risk of depression, anxiety, heart disease, and diabetes^{3,4}.

The variables invoking stress response of the body resulting in anxiety, tension, or fear are termed as stressors. Internal stressors include continuous thinking or certain behaviours. Usually, these thoughts originate from high expectations or one's psychological mindset, for instance, fear of heights and spiders. Other stressors

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are external factors, originating outside one's mind. These are forces that you cannot easily control. Examples include major life events, urgent deadlines, or exams^{1,5}.

Continuous high stress levels may affect focus, short- and long-term memory and decision-making capacity. These outcomes appear to be governed by the individual's assessment of the requisites and resources of a situation, the relationship between the stressor and the task, and aspects such as coping styles, locus of control, and social support⁵.

Stress can have a negative impact on physical well-being, mental health, and academic success unless it is managed aptly. Students entering higher studies frequently express that they feel stressed due to changes in living conditions, workload, responsibilities, and peer interaction. Intense stress can affect the functional capacity resulting in decrease in work effectiveness and poor academic performance. Dental school environment is highly competitive and intensive due to constant pressure to meet deadlines and maintain grades causing psychological distress to students and making them prone to anxiety and depression compared to other disciplines^{1,3,5}.

Dentistry is an exceedingly stressful profession, starting as a student and progressing into clinical practice. Elevated stress levels may have a negative influence on dental students' learning ability. Students predisposed to stressful life events also report reduced quality of life. Managing stress for dental students is crucial or else prevailing stress may lead to destructive outcomes including depression, dropping out, drug abuse, and suicidal thoughts².

Introducing successful coping strategies may help students avoid the destructive consequences of excessive stress^{5,6}. Many studies worldwide have examined perceived stress among dental students. However, our study specifically aims to assess perceived stress levels, identify key stressors, and evaluate coping mechanisms among junior dental students at a public dental school in Pakistan.

METHODOLOGY

IRB/ERC Approval:

A cross-sectional study was conducted at the Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University during the month of October 2022. Permission from the Institutional Review Board of JSMU (Ref: NO: JSMU/IRB/2022/675) was taken prior to the data collection.

All junior dental students of preclinical years (1st and 2nd year Bachelors of Dental Surgery), above 18 years of age, regardless of gender, religion, caste, creed, and socio-economic backgrounds were included in the study. While those who did not consent to participate or submitted incomplete forms were removed from the study. Sample size was calculated to be 89 out of 102 total students at 99% confidence interval through OpenEpi 3.01. The sampling technique utilized was non-randomized convenience sampling. Students were approached in their respective classes and were informed about the study objectives and aims. They were asked to participate and those who agreed were given the questionnaire. Forty-five students from the 1st year and 44 students from the 2nd year participated in the study.

We used a combination of three structured validated questionnaires 'Dental Environment Stress', 'Perceived Stress Scale', and 'COPE' to collect data. The questionnaires consisted of close-ended questions.

DES questionnaire was developed by Garbee *et al.* It appraises stressors in an undergraduate dental student's life related to academic performance, clinical practice, faculty relations, personal life issues, professional identity, and financial obligations. All the above items were evaluated except those pertaining to clinical exposure in this questionnaire because the sample included only the first- and second-year students. All participants ticked the most suitable option available with the item on a 4-point Likert scale from 'not stressful at all' to 'very stressful'. Sum of all responses was given a final score⁶.

The Perceived Stress Scale (PSS) measures the degree of stress perception⁷. The questions in the PSS evaluated feelings and thoughts during the previous month by asking the respondents to tell how often they encountered stress in a certain situation by choosing their answer from 5-point Likert scale from 'Never=0' to 'Very Often= 4'. Score was the sum of all answers. COPE Inventory: Fifteen items were selected out of 60 from the inventory and rephrased for each coping category that can be utilized by students in response to their stress. The options include 'I have not been doing this at all=1' to 'I have been doing this a lot=4' on a 4-point Likert scale, were recorded¹.

The data collected was analyzed and entered using the software IBM SPSS statistics version 26. The collected data was organized as descriptive results, and included the student's age, gender, and year of study; then these were analyzed and tabulated as frequency and percentage distribution. The mean score and SD for each of the measures under research was tabulated.

Statistical analysis was done after dividing the questionnaire into three categories: thirty stress-related items, ten-item PSS (along with the reversal of coding to the four positively stated items of 4, 5, 7, and 8), and fifteen items for coping strategies. The Mann-Whitney test was employed to determine significant differences between first- and second-year students. Differences between individual years are going to be assessed using a pairwise comparison test. Pearson's correlation and beta coefficient was calculated to compare the strength of the effect of coping strategies in relation to the perceived stress scale scores. The statistical significance (p-Value) is to be set below 0.05 (95% confidence interval).

RESULTS

Students from first- and second-year of dental school were approached to take part in the study. A total of 89 pro formas were received after filing. Out of those, 45 were from first-year students and 44 were from second-year students. The male to female ratio was 2.5 with 25 males and 64 females participating in the study. Pilot study on 10 students was done to check for the face validity of the DES, PSS, and COPE scales as we had modified the questionnaires and found them to have good face validity while the Crohn Bach's Alpha was calculated for each questionnaire separately and found to be 0.7 for PSS and COPE scale, while for DES scale it was 0.814, all showing good reliability. The data of the pilot study was included in the results.

Table 1 shows the perceived stress levels of the students from both years and also according to the gender. We found that there is only slight difference in the stress levels among the genders with the males scoring less than females. No difference was found between the scores of first-year and second-year students. Both showed high stress levels. The Mann-Whitney U test comparing perceived stress levels between 1st-year and 2nd-year BDS students yielded a U-value of 1167 which is significant to the level of 0.05 showing that there is no strong evidence of a significant difference in perceived stress levels between the compared groups.

Table 1: Self-Perceived Stress Scores According to Gender and Academic Years

S.No.	Variable		N	Mean	(S/D)
1.	Gender	Male	25	26.8	6
		Female	64	28.6	5.6
2.	Year of Study	First Year	44	28.06	6.1
		Second Year	45	28.1	5.2
3.	Mann-Whitney U (Academic Years)		89	1167 (sig.=0.145)	1167 (sig.=0.145)

Table 2 shows the different factors causing stress in students. The mean scores showed that the highest stress was from examination (mean score: 2.89 ± 0.5) followed by workload (mean score 2.74 ± 0.63) and performance pressure (mean score 2.59 ± 0.67). These scores correspond to the quite stressful category of the questionnaire.

Table 2: Stress Causing Factors from Dental School / Environment During Academic Years

S.No.	Factor	(N)	DES Mean Score (MS)	(S/D)
1.	Examination	89	2.89	0.50
2.	Workload	89	2.74	0.63
3.	Performance Pressure	89	2.59	0.67
4.	Faculty and administration	89	2.53	0.68
5.	Self-efficacy	89	2.41	0.52
6.	Peer interaction	89	1.83	0.68

Table 3 shows the coping strategies utilized by the students to cope with stress. The most commonly utilized strategy was religious coping strategies (mean score= 3.11 ± 0.92), followed by planning activities to achieve desired scores (mean score= 2.9 ± 0.90), and restraining negative thoughts (mean score= 2.74 ± 0.936).

Table 4 shows the difference between the scoring among the two academic years on DES, PSS, and COPE scale. The items showing significant differences at the level of 0.05 (marked by*) and 0.001 (marked by**) are summarized. Item 2 and 5 from DES scale showed high significance ($p=0.001$) while item 1,3,4,6 on DES and item 1, 2, and 3 from PSS showed significance of up to 0.05. No items from COPE scale showed any significant difference. All the items summarized were scored higher by the second-year students compared to the first-year students.

DISCUSSION

Dental students are under multiple kinds of stress during their academic life including financial and health related issues. Several studies have examined the stress and coping strategies of students across the academic years including their clinical training years^{1-4,6-9}. For this purpose, the widely utilized tools are DES for dental environment related stress factors, PSS for stress levels, and the COPE inventory. Our objective was to find the sources of stress from the academics; hence we included only students from the first and second year of Bachelor of Dental Surgery in our sample.

Table 3: Coping Strategies Utilized by Students

S No.	Item	Mean Score	(S/D)
1.	Implementing religious coping in my lifestyle	3.11	0.922
2.	Planning activities and prioritizing tasks	2.9	0.905
3.	Trying to restrain my thoughts	2.74	0.936
4.	Bringing humor into play as a psycho-effective technique	2.73	1.074
5.	Trying mental disengagement and diverting my mind	2.73	0.951
6.	Practicing behavioral disengagement and self-isolation	2.72	0.879
7.	Focusing on priorities and venting of emotions	2.71	0.968
8.	Practicing positive reinterpretation and growth	2.62	0.911
9.	Choosing to use the strategy of denial	2.48	0.955
10.	Employing acceptance as a behavioral coping strategy	2.48	0.854
11.	Attempting to suppress the idea of competing activities	2.45	0.905
12.	Seeking active coping	2.38	0.846
13.	Relying on substance use for distraction	2.37	0.958
14.	Making use of emotional social support	2.35	0.966
15.	Making use of instrumental social support	2.3	1.060

Table 4: Comparison of Scores Between Two Academic Years on DES, PSS, and COPE Scales

Scale	Items	Academic Year	N	Mean	SD	Sig.
DES Scale	1. Having a lecture or laboratory session immediately before my exam	1	45	2.78	1.185	0.045*
		2	44	3.25	.991	
	2. Difficulty of course work	1	45	2.62	.684	0.011*
		2	44	3.02	.762	
	3. Inadequate breaks between lectures/sessions	1	45	2.00	.953	0.030*
		2	44	2.50	1.171	
	4. Criticism about my academic performance	1	45	2.13	1.198	0.022*
		2	44	2.68	1.006	
	5. My dependencies (smoking or medication)	1	45	1.20	.588	0.008*
		2	44	1.70	1.091	
	6. Rules and regulations that I am required to follow in dental school	1	45	1.89	.982	0.010*
		2	44	2.50	1.191	
PSS Scale	1. I feel left out when my peer group discusses learnt concepts in their native languages	1	45	1.98	1.252	0.02*
		2	44	2.59	1.187	
	2. Focusing on priorities and venting of emotions	1	45	2.47	1.014	0.017*
		2	44	2.95	.861	
	3. Employing acceptance as behavioural coping strategy	1	45	2.27	.863	.015*
		2	44	2.70	.795	

Significance value marked with * are significant up to the 0.05

Since we rephrased and selected items from each questionnaire according to our need, a pilot study was conducted to validate and find out the reliability before final data collection. Once the face validity and Cronh Bach`s Alpha was calculated, questionnaires were distributed among the students. Total 89 students participated out of whom 25 were males and 64 were females. The PSS score for females was higher than

their male counterparts which is similar to the results from other studies showing gender predilection to stress^{8,9}. The PSS scores of the first-year and second-year students were similar responding to high stress levels. However, comparing these to results from studies on students of Ajman, showed higher scores in first-year than in second-year students¹⁰.

The stressors in our study were examination (MS=2.89), workload (MS=2.74) and performance pressure (MS=2.59). On comparing these top three stressors with those in the study conducted in Ajman, we found that the results were similar to ours that is the 'amount of study load' (64%), 'fear of not being able to catch up if falling behind' (60%) and 'examinations' (59.5%). While the study from India reported that their students scored 'vastness of academic curriculum' (47.7%) as the highest stressor followed by 'fear of failure or poor performance' (34.2%) and 'lack of recreation' (12.6%). All three studies supported that a major part of the stress among the dental students was from academic load and examination⁸⁻¹⁰.

The most common coping strategies utilized by our sample were 'religious coping', 'planning' followed by 'restraining thoughts', comparable to the findings from Ajman, and Poland with the highest sought strategy as 'religious coping'. It was alarming that a small percentage of students used 'substance' consumption to cope with stress. This emphasized that providing students with counselling services is necessary and the amount of workload should be decreased and distributed across the calendar year. Parents of susceptible students should be brought on board and counselled to decrease other manageable factors such as discussing their expectations or setting them too high for the individual to achieve. Stress is frequently linked to anxiety and depression that may lead to suicidal thoughts and susceptibility to follow them¹¹⁻¹⁴.

The scoring for all three scales among the two academic years showed significance in DES and PSS items. Second-year students mostly showed significantly higher scores for workload related items compared to first-year students on DES scale, while on PSS scale, second-year students scored higher than the first-years on 'I feel left out when my peer group discusses learnt concepts in their native languages', 'focusing on priorities and venting of emotions' and 'Employing acceptance as behavioral coping strategy'. No significant differences were found in COPE inventory. In comparing them to results from Ajman, 'mental disengagement', 'venting of emotions' and 'active coping' showed significant values⁸. Furthermore, when these were assessed with findings from Poland, significant differences showed between PSS and coping strategies between the first- and second-year students for the items 'venting of emotions', 'substance use', and 'suppression of activities'¹¹.

The findings of our study are supported by previous studies conducted on the factors affecting the stress levels in dental school environment and academic

workload. All studies are in support that high level of stress is the major reason behind anxiety and depression and high burnout of not only the undergraduate dental students but also the postgraduate students and practitioners alike,^{1,6,12,13,15-18}. The policy makers and curriculum designers should address this issue and provide support to students to improve the quality of education provided and to produce skilled motivated clinicians.

The current study has its own limitations including a small sample size and data from a public sector university which could affect the generalizability of results. Also, the environment and stress factors of private institutes may differ and hence the stress levels and stressors as well as the coping strategies. Hence, a multicenter study design with large sample size is required to offer a more realistic picture.

CONCLUSION

The burnout rate in dental practitioners is high across the globe. The main reason behind is the stressful dental environment causing anxiety and depression. To help the students in managing stress during their academic years, multiple steps are required including reforms in curriculum, counselling sessions along with extracurricular activities and workshops to manage stress. All this will help to provide a healthy learning environment to improve the quality of the practitioners produced and decrease the burnout rate in dentists.

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