Assessment of Perceived Stress among Dental Students in India- A Cross-sectional Study

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Abstract-
Introduction: Dentistry is considered as a highly demanding and stress oriented profession. Elevated stress levels due to prolonged workload may precipitate fatigue declining student performance. The aim of the present study was to assess the Perceived sources of stress among first year dental undergraduate students at a private institution in India and to investigate whether specific stressors were related to age and gender.
Materials and methods: It was a Descriptive, Epidemiological, Institution based Cross-sectional study. A modified dental environment stress (DES) questionnaire was administered to 84 First year dental students to assess the levels of stress.
Results: The first major stressor for all the students was lack of time for relaxation with a mean score of 2.35 (SD 0.85) followed by examination and grades, Lack of time to do assigned college work, Full working day, Late ending time and Fear of unable to catch up if getting behind the work. Amongst the six highest stressors in each year, four were Workload related. There was a significant difference in stress perception in the "Other" category between genders with a predilection for males. In the category "Self Efficacy beliefs", the stress perception of students from Nuclear family was significantly greater than that of Joint family. (p<0.05)
Conclusion: The primary sources of stress as perceived by 84 students at one private dental school in India were increased workload and Performance pressure. This study would contribute to enhance students' stress-bearing skills and help in deciding future course of action through counselling and psychiatric support systems.

Key Words: **First year BDS students, Questionnaire based study, Modified Dental Environment Stress (DES) Questionnaire.**

I. INTRODUCTION

Stress is a psychological or physiological imbalance resulting due to the disparity between situational demand and the individual's ability and motivation to meet those needs. It is better defined as the body's response to any real or imagined event perceived as requiring some adaptive response and/or producing strain [1] Stress is usually an emotional discrepancy which may be due to various reasons such as financial issues, job selections, social status, level of education, competition with colleagues and family problems. [2]High-stress levels may even impair the immune system function [3]

Among all the health care professions, dentistry is considered as a highly demanding and stress oriented profession.[4]Dental students have to face the additional stress of study in addition to the stress related to dentistry as a profession. Moreover, increasing stress may result in declining student performance. Some sources of stress include changes in sleeping habits, lack of holidays, irregular eating habits, increased workload and new responsibilities [6]. Elevated stress levels due to prolonged workload may precipitate long- term work-related exhaustion.

Over the past three decades, there is an increase in the stress reported among medical students from all over the world.[8,9] A study from Seth G.S. Medical College in Mumbai showed that 73% of the medical students participated in the study had stress[10] Like medical students, dental students also are prone to develop stress because of the vast syllabus and other academic activities, social and personal issues. Many studies are reported in various parts of the world,[11] but studies from dental colleges from India are less.[12,13] A study conducted by Chilukuriet al. from Tamil Nadu revealed a high prevalence of stress among dental students whereas another study conducted at Raichur, Karnataka, showed a prevalence rate of 29.5% only.[12]

Although studies have been conducted on medical and dental undergraduates to evaluate the causes of stress. However, to our knowledge no study has been reported on perceived sources and factors affecting stress among Eastern Indian dental students. In this study, we aimed to identify the potential sources of stress of the 1st year undergraduate students of the private dental institution. This can further lead to enhance students' stress-bearing skills and also may help to prevent student burnout.

II. OBJECTIVES

i.   To assess the Perceived sources of stress among first year dental students.
ii.   To assess the prevalence of stress among 1st year dental students.
iii.   To investigate whether specific stressors were related to age and gender.

III. MATERIALS & METHODS

Ethical Clearance: Study commenced after obtaining the ethical clearance from Institutional Ethics Committee of Medical College, Kolkata. Written Permission was also obtained from the authorities of Kusum Devi Sunderlal Dugar Jain Dental College & Hospital, Kolkata

Study Type: Descriptive, Epidemiological, Institution based

Study Design: Cross-sectional.

Study Area: The study was conducted at Kusum Devi Sunderlal Dugar Jain Dental College & Hospital, Kolkata

Study Period: Total study duration was 3 months. (September 2023- November 2023)

Study Population: The study population was all the First year Dental (BDS) students, who got admission at Kusum Devi Sunderlal Dugar Jain Dental College & Hospital, Kolkata, in 2023-24 session.
Inclusion Criteria:
1. All First year Undergraduate BDS students enrolled in Kusum Devi Sunderlal Dugar Jain Dental College & Hospital in 2023-24 session.
2. Those who gave written consent for participation.

Exclusion Criteria:
1.   Those who could not be approached for data collection
2.   Those who would not give consent.
3.   Students who were already diagnosed with depression and taking treatment for any Psychiatric condition.

Sample Size: The total number of 1st year BDS students enrolled in Kusum Devi Sunderlal Dugar Jain Dental College & Hospital was102. Out of them, 84 participated in the study.

Sampling Design: Complete enumeration was done.[17]

Study Tool: Stress was measured using a modified dental environment stress (DES) questionnaire [16] which consists of 38 questions that are applicable to the Indian dental education background. [Fig: 1]
The questionnaire was divided into two parts. First part comprised of demographic information like age and gender, type of family and Choice of Admission (Whether Dental was their first choice or not). The second part of the questionnaire was based on stress aggravating factors. The categories were- self-efficacy beliefs, Faculty and administration, Workload, Preclinical and clinical training, Performance pressure and Other. Questions related to clinical training 3, 4, 10, 16, 18, 19, 25, 26, 27, 28, 29 and 38 were excluded from the questionnaire administered to non-clinical First year students.

Self-efficacy beliefs
1 Lack of confidence to be a successful dental student
2 Lack of confidence to be a successful dentist
3 Completing clinical requirements
4 Fear of not having possibility to pursue a postgraduate dental education programme
5 Lack of confidence in own decision making
6 Fear of failing a course or a year

| 7 Difficulty in understanding lecture materials |
| 8 Language barrier |
| 9 Fear of unable to catch up if getting behind the work |
| **Faculty and administration** |
| *10 Atmosphere created by clinical supervisors* |
| 11 Receiving criticism from supervisors about academic or clinical work |
| 12 Amount of cheating in dental faculty |
| 13 Rules and regulations of the faculty |
| 14 Approachability of teaching staff |
| 15 Expectation of dental faculty and what in reality it is like |
| *16 Availability of supervisors in clinic* |
| 17 Attitudes of faculty towards women dental students |
| *18 Shortage of allocated clinical time* |
| *19 Differences in opinion between clinical staff concerning patient treatment* |
| **Workload** |
| 20 Amount of work assigned |
| 21 Full working day |
| 22 Lack of time for relaxation |
| 23 Lack of time to do assigned college work |
| 24 Late ending time |
| **Patient treatment** |
| *25 Lack of cooperation by patient in their home care* |
| *26 Responsibilities for comprehensive patient care* |
| *27 Patients being late or not showing for their appointments* |
| *28 Working on patients with dirty mouths* |
| **Preclinical and clinical training** |
| *29 Difficulty in learning clinical procedures* |
| 30 Difficulty in learning precision manual skills required for preclinical and laboratory work |
| **Performance pressure** |
| 31 Competition with peers for grades |

32 Examination and grades
Other
33 Relation with members of the opposite sex
34 Difficult home/ hostel environment in which to study
35 Fear of unemployment after graduation
36 Financial resources
37 Personal physical health
38 Availability of laboratory technicians

Figure: 1 Modified dental environment stress (DES) questionnaire

Questions in the italics were excluded from the questionnaire administered
The response for each question was based on a Likert-type scale with response options of 1– not stressful, 2 – slightly stressful, 3 – moderately stressful and 4 – severely stressful.

 Data collection and interpretation: The study was conducted during the middle of the academic year 2023-2024. Questionnaires were distributed by the authors during one lecture for with prior permission from the Dean of the institution and the aims of the study were explained. The time allocated for completion of the questionnaire was 15 minutes. The questionnaire was distributed and submitted anonymously for assuring confidentiality to the students. All participants took part in the study voluntarily and no incentives were used for the respondents. Students who could not be approached for data collection after three attempts were excluded from the study.

IV.STATISTICAL ANALYSIS
The data was entered and analyzed using SPSS (statistical package for the social sciences) statistical software 22 version. Means and standard deviations were determined for stress scores of individuals for each item and used to compare the genders. Students' t-test (unpaired) was used for two group comparisons like gender difference. A p value of less than 0.05 was considered statistically significant. Descriptive statistics and Chi square test were used to determine the significant differences.

V. RESULT
- 	Out of a total of 102 students, 84 participated in the study for a participation rate of 82.35%.
- 	.Mean age of all the participants was 21.06 ± 3.26 years. Out of them Mean age of male participants was 21.47 ± 4.65 years, while Mean age of female participants was 20.72 ± 1.26 years.

Table 1 : Distribution of participants according to gender

	Frequency	**Percent**
Male	38	45.1
Female	46	54.9
Total	84	100

- 	45.1% of the participants were Male and 54.9% were female.[Table 1]

Table 2: Distribution of participants according to type of family

	Frequency	**Percent**
Nuclear	72	85.7
Joint	12	14.3
Total	84	100.0

- 	Most (85.7%) of the students belonged to Nuclear family. [Table 2]

Table 3: Distribution of participants according to Choice of Admission (1st choice Dental or not)

	Frequency	Percent
1st	20	23.8
2nd	64	76.2
Total	84	100.0

- Maximum students (76.2%) opted for Dentistry as 2nd choice of admission after Medicine. [Table 3]

Table 4: Overall Modified Dental Environment Stress (DES) Questionnaire Score among the Participants:

DES Questionnaire	Score Mean ±SD
Self-efficacy beliefs	**11.94±2.58**
1 Lack of confidence to be a successful dental student	1.77± 0.7
2 Lack of confidence to be a successful dentist	1.81±0.67
5 Lack of confidence in own decision making	1.65±0.75
6 Fear of failing a course or a year	1.80±0.77
7 Difficulty in understanding lecture materials	1.5±0.61
8 Language barrier	1.35±0.63
9 Fear of unable to catch up if getting behind the work	*2.06±0.83*
Faculty and administration	**9.39±2.79**
11 Receiving criticism from supervisors about academic or clinical work	1.82±0.81
12 Amount of cheating in dental faculty	1.43±0.66
13 Rules and regulations of the faculty	1.68±0.93
14 Approachability of teaching staff	1.39±0.62
15 Expectation of dental faculty and what in reality it is like	1.76±0.82
17 Attitudes of faculty towards women dental students	1.31±0.6
Workload	**10.67±2.76**
20 Amount of work assigned	1.93±0.76
21 Full working day	*2.12±0.83*
22 Lack of time for relaxation	*2.35±0.85*
23 Lack of time to do assigned college work	*2.2±0.85*
24 Late ending time	*2.07±0.83*
Preclinical and clinical training	**1.87±0.77**
30 Difficulty in learning precision manual skills required for preclinical and laboratory work	1.87±0.77
Performance pressure	**4.26±1.53**
31 Competition with peers for grades	2.02±0.88
32 Examination and grades	*2.24±0.82*
Other	**9.86±2.2**
33 Relation with members of the opposite sex	1.32±0.62
34 Difficult home/ hostel environment in which to study	1.51±0.72
35 Fear of unemployment after graduation	2.02±0.93
36 Financial resources	1.93±0.72
37 Personal physical health	1.58±0.7
38 Availability of laboratory technicians	1.49±0.67
Total	**47.80 ± 8.51**

- Questionnaire in italics are top six stressors among students.

The first major stressor for all the students was lack of time for relaxation with a mean score of 2.35± 0.85 followed by examination and grades (2.24±0.82), Lack of time to do assigned college work (2.2±0.85), Full working day

(2.12±0.83), Late ending time (2.07±0.83) and Fear of unable to catch up if getting behind the work (2.06±0.83). [Table 4]

Table 5: Mean scores of perceived sources of stress: differences between Male and Female

Category	Mean score among Male (N=38)	Mean score among Females (N=46)	t(df)	p value	CI
Self-efficacy beliefs	12.08 ±2.88	11.83 ±2.33	0.44 (82)	0.66	-0.88-1.38
Faculty and administration	9.63 ±2.57	9.2 ± 2.97	0.7 (82)	0.49	-0.79- 1.65
Workload	10.74± 2.82	10.61 ±2.74	0.214(82)	0.831	-1.08-1.34
Preclinical and clinical training	1.92 ± 0.85	1.83 ± 0.71	0.53(82)	0.6	-0.25 - 0.43
Performance pressure	4.03 ± 1.62	4.46± 1.44	1.29(87)	0.2	-1.09 - 0.23
Other	10.32 ±2.36	9.48 ±1.2	2.108(82)	**0.03**	0.05-1.63
Total	48.71 ± 8.72	47.39 ±8.56	0.698(82)	0.49	-2.44 – 5.08

- It was observed that Male students had significantly higher stress score in the Other category than Females. (p=0.03) [Table 5]

Table 6: Mean scores of perceived sources of stress: differences between Students belonging to Joint and Nuclear Family

Category	Mean score among Students of Joint Family (N=12)	Mean score among Students of Nuclear Family (N=72)	t(df)	p value	CI
Self-efficacy beliefs	9.75 ±1.36	12.3 ±2.56	3.36 (82)	**0.0012**	-4.06-1.04
Faculty and administration	9.83 ±2.33	9.32 ± 2.87	0.58 (82)	0.56	-1.23- 2.25
Workload	11.33± 3.85	10.56 ±2.55	0.89(82)	0.37	-0.94-2.48
Preclinical and clinical training	2.17 ± 1.11	1.82 ± 0.7	1.46(82)	0.15	-0.13 - 0.83
Performance pressure	4.67 ± 1.72	4.19± 1.5	1.01(82)	0.32	-0.47 – 1.42
Other	10.67 ±2.27	9.72 ±2.17	1.4(82)	0.17	-0.4-2.3
Total	48.42 ± 8.99	47.92 ±7.41	0.21(82)	0.83	-4.24 – 5.24

- It was observed that among students who belonged to Nuclear family, had significantly higher stress score in the category of Self Efficacy beliefs than those belonging to Joint family (p=0.0012) [Table 6]

Table 7: Mean scores of perceived sources of stress: differences between choice of Admission of Students (1st choice of Admission Dental or not)

Category	Mean score among Students with 1st Choice (N=20)	Mean score among Students with 2nd Choice (N=64)	t(df)	p value	CI
Self-efficacy beliefs	12.1±2.59	11.89 ±2.57	0.32 (82)	0.75	-1.1-1.52
Faculty and	9.7 ±2.52	9.3 ± 2.86	0.56 (82)	0.58	-1.1- 1.82

administration					
Workload	11.2± 3.32	10.5 ±2.45	1.02(82)	0.31	-0.66-2.06
Preclinical and clinical training	2.05 ± 0.94	1.81 ± 0.7	1.23(82)	0.22	-0.15 - 0.63
Performance pressure	4.1 ± 1.71	4.31± 1.47	0.54(82)	0.59	-0.99 – 0.57
Other	10.4 ±2.33	9.69 ±2.13	1.4(82)	0.17	-0.4-2.3
Total	49.55 ± 8.86	47.5 ±8.47	1.27(82)	0.21	-0.4 – 1.82

- Difference in Stress perception was not significant between Students with 1st Choice as Dentistry and Students with 2nd Choice as Dentistry after Medicine. [Table 7]

Modified Dental Environment Stress Score was divided in to two groups where < mean Score (47.9) was Determined as low stress and more than equal to mean score was determined as high stress and Chi square test were used to determine the significant differences between the two groups.

Table 8: Association between contributing variables and Modified Dental Environment Stress Score

		Modified Dental Environment Stress Score		χ^2 value (df)	p value
		Low Stress < Mean score (<47.9)	High Stress ≥ Mean Score (≥47.9)		
Age	≤ 20 Years	20 52.6%	18 47.4%	0.576 (1)	0.45
	> 20 Years	28 60.9%	18 39.1%		
Gender	Male	21 55.3%	17 44.7%	.1 (1)	0.75
	Female	27 58.7%	19 41.3%		
Choice of Admission	1st	7 35%	13 65%	2.36 (1)	0.12
	2nd	35 54.69%	29 45.31%		
Family	Nuclear	31 43.1%	41 56.9%	9.87 (1)	**.005**
	Joint	11 91.7%	1 8.3%		

- Among all the students, 48(57.14%) were in the low stress group, while 36(42.86%) were in the high stress group
- Among students aged less or equal to 20 yrs, 20 (52.6%) were in the low stress group, while 18 (47.4%) were in the high stress group.
- Among male students, 21 (55.3%) were in Low stress group, whereas 16(44.7%) were in high stress group.
- Among Female students, 27 (58.7%) were in Low stress group, whereas 19(41.3%) were in high stress group
- It was also observed that among students who belonged to Nuclear family, 31 (43.1%) were in Low stress group, whereas 41(56.9%) were in high stress group. In case of students who belonged to Joint family, 11 (91.7%) were in Low stress group, whereas 1(8.3%) were in high stress group. So students belonging to nuclear family were found to perceive significantly greater stress than those of Joint family. (p=0.005). [Table 8]

VI. DISCUSSION

In our study, total 36 (42.86%) students were in the High stress group, out of which 43.2% were Males and 40% Females. In a study conducted among 273 students of a dental college in Telangana using Kessler 10 Psychological Distress instrument, 58% were having stress.[11] On the other hand, in a study conducted among dental students at Raichur, the prevalence of stress was found to be only 29.5% [14]

The main aim of the present study was to identify the perceived sources of stress amongst Indian dental undergraduate students that may provide administrators an opportunity to be proactive in their approach to students and to modify the teaching curriculum to be more conducive to the students.

Study conducted by Sekhonet al in India found that most commonly observed factors of academic stress includes marks in exams (95%), not enough time between the exams (94%) and fear of failure (90.5%).[15]

Study conducted by Ishaqueel al in Rawalpindi city of Pakistan described that the most common stress among dental students was the fear of failing in annual exams along with huge syllabus. [16]

In this study the first major stressor for all the students was lack of time for relaxation which is in accordance with previous findings. However a mean score of 2.35 (SD 0.85) is very low when compared with studies from the USA, Singapore, Australia and Jordan where the mean scores were 3.22, 3.14, 3.34 and 3.49 respectively. Students in earlier years tended to have higher levels of stress when compared with later years on items related to academic performance supported by previous studies [17-20].

In our study 4 of the six highest stressors were related to Workload. This was similar to a previous study based in Karnataka.[21]

In our study male students reported higher stress scores in the overall problem score than females, especially in the 'Other' category of the DES questionnaire (p=0.03). A comparable trend was observed by Acharya [21] in his survey on Indian dental students. Although some studies showed reverse trends as well [22]

It was also seen that students from nuclear family (85.7%) experienced more stress than those of joint family (14.7%) in the 'Self Efficacy Beliefs' category (p=0.0012). The cause may be the underlying beliefs and cultural systems that differs between a Joint and a Nuclear family. That may be also why in our study it was also observed that among students who belonged to Nuclear family 56.9% were in high stress group, whereas in case of Joint family, only 8.3% were in high stress group. So students belonging to nuclear family were found to perceive greater stress than those of Joint family. (p=0.005)

In our study most of the students (76.2%) chose Dentistry as the second choice, after Medicine as the first choice although no statistical significance about them perceiving higher stress was obtained. Previous research has shown that students whose first choice was medicine showed higher stress levels than those whose first choice was dentistry.[23]

It was noted that stress due to financial concerns was low in this study. This can be explained by the fact that the government largely subsidizes dental education, and parents finance their children's education, which mostly spares the student anxiety about financial resources.

VII. CONCLUSIONS

The primary sources of stress as perceived by dental students were lack of time for relaxation, examination and grades, Lack of time to do assigned college work, Full working day, Late ending time and Fear of unable to catch up if getting behind the work. In the present study, males expressed higher levels of stress compared to females, so a stress management program should be conceived with special attention towards male dental students.

It was also observed that students from Nuclear family expressed higher levels of stress compared to those from Joint family, so inquiry and insight of socio-economic and family life of the students will give better understanding in handling the stress.

Moreover, 4 of the top 6 stressors were related to performance pressure and workload. It appears there is a need for the establishment of student advisors and counsellors combined with a faculty advising system in addition to student-oriented programs.

Future research is recommended with a greater sample size to look at these variables longitudinally at different time of the academic year and also across all the Professional years to try and achieve a better understanding of the evolution of stress through the dental curriculum.

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