



Assessment of Perceived Stress and Stress Predictors Among Dental Students: An Institutional-Based Study

Ranjana Garg^{1*}, Priyadarshini HR², Jing Yu Lee³, Kevin Chee Pheng Neo⁴, Mei Kei Leong⁵ and Joshua Kim Chwen Ting⁶

^{1,2,3,4,5,6}Faculty of Dentistry, SEGi University, No.9 Jalan Teknologi, Kota Damansara, Petaling Jaya, Selangor-47810, Malaysia

*ranjanagarg@segi.edu.my (Corresponding Author)

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ABSTRACT

Background: Stress is one of the most prevalent psychological conditions globally. However, healthcare students are at an increased risk of psychological distress as compared to the normal population. Medical/Dental training is considered a stressful experience for students as they face a wide range of challenges related to their lengthy curriculums, patient care, and pursuit of academic excellence.

Purpose: To assess the prevalence of perceived stress levels and associated risk factors among undergraduate dental students.

Methods: This cross-sectional study was conducted among 230 under-graduate dental students to assess their perceived stress using the modified version of the Dental Environment Stress questionnaire. Data were analyzed using SPSS 22. Descriptive statistics and chi-square tests were used. $P < 0.05$ was considered significant.

Results: Most dental students reported mild stress related to most of the academic and clinical components in the questionnaire. However, a higher percentage of pre-clinical students reported moderate and severe stress (37.5% & 14.1% respectively) as compared to clinical year students (6.8% and 1.5% respectively) with $p > 0.05$. The major risk factors causing stress were competitiveness among peers, the pressure of the assessments, and the inability to balance the clinical and academic workload.

Conclusion: Undergraduate dental students were found to be under stress due to a range of factors. The faculties need to identify and alleviate such stress among students through support systems.



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1. Introduction

Dental school is a highly demanding undertaking. Dental students' preparation to become healthcare providers might result in psychological anguish and burnout symptoms. The training is complex and challenging whereby it requires the development of a variety of clinical, theoretical, and interpersonal qualities. Students typically confront tremendous effort, manual skills, and time limits throughout their preclinical years to complete their laboratory requirements. Students in clinical years, on the other hand, are exposed to many forms of stress, and as a result, are at a larger risk of developing psychological issues. Thus, dental schools have been identified as stressful environment that frequently has a negative impact on students' academic performance, physical health, and psychological well-being (Sherina *et al.*, 2004). Stress is

the body's reaction to a change that entails a physical, mental, or emotional response that may be positive, stimulating and motivating individuals to do their best, or be negative, depressing and reduce their performance (Susan, 2011). Stress levels are found to be higher among healthcare students compared to the general population, and dentistry students are considerably more likely to experience stress compared to other medical specialties (Pau & Croucher, 2003; Murphy *et al.*, 2009). In addition to these existing stressors, studies have shown that lockdown due to COVID-19 disease and the complete shutdown of face-to-face teaching has induced more stress among dental students (Guse *et al.*, 2021) depression, anxiety, stress and perception of their current study situation during the COVID-19 pandemic among undergraduate dental and medical students. Dental schools in Malaysia

are no exception. The complete shutting down of clinics and simulation labs deprived students of their hands-on experience and skill development, leading to stress from uncertainty (Samsudin *et al.*, 2021).

Prolonged periods of stress are often linked with deleterious effects on students, like difficulty in interacting with patients, loss of productivity and other psychosocial conditions like depersonalization (Jowkar *et al.*, 2020). Hence, it is critical that stress in dental students is recognized, and necessary measures are undertaken to enhance student's psychosocial well-being and educational performance. Such data might allow dental schools to bring about modification if required, in their curriculum, and foster a healthier learning environment. Hence, this study was undertaken with the aim to assess the perceived stress levels and identify common stressors among dental students at a private university in Malaysia, during the time of a pandemic. We also aimed to explore whether the year of study and gender had any effect on those parameters.

2. Methodology

The present study was a cross-sectional study, conducted from October 2020 to December 2021, at a private dental school in Malaysia. The study was approved by the institutional ethics committee (SEGIEC/SR/FOD/31/2020-2021) and the necessary permissions and consent were obtained from the dean and the participants, respectively. The participants were 230 dental undergraduate dental students from years 1 to 5.

2.1. Survey Tool

The survey was conducted using the modified version of Dental Environment Stress (DES) adopted from (Acharya, *et al.*, 2003). The original DES questionnaire had 38 items, which assessed sources of stress related to undergraduate coursework and training in dental students. A modified version of the dental environmental stress questionnaire (DES-20) was used, involving questions that assessed the stress levels in five different aspects including academic performance, individual and institutional factors, difficulties and insecurities about their professional future, responsibilities with patients, and interpersonal relationships. Respondents were asked to rate each stressor based on their experience using a 5-point Likert scale: 1= not relevant, 2 = not stressful, 3 = slightly stressful, 4=moderately stressful and 5=very stressful. The total scores for each subject were calculated and classified as not relevant (20-35), not stressful (36-51), slightly stressful (52-67), moderately stressful (68-83) and very stressful (84-100). In addition to it, demographic information like age, gender, and year of study

of the participants was collected. The survey was designed using Google Forms and disseminated online through email and WhatsApp.

Though the questionnaire was a validated one adopted from the previous study, it was pilot tested on ten students to make sure that they understood all the items in the questionnaire. Since the participants did not have any issues with the questionnaire, no modifications were made to it.

2.2. Statistical Analysis

Data was analyzed using the SPSS version 22.0. The internal consistency of the questionnaire was tested using Cronbach's Alpha. Descriptive data were presented as counts and percentages. Fischer's exact test was used to compare the stress categories between genders and year of study. $P < 0.05$ was considered significant.

3. Results

A total of 218 dental students responded to the questionnaire with a response rate of 97.4%, among them, 74 (33.94%) were male students and 144 (66.1%) were females. About 85 (38.99%) of them were pre-clinical year students (year 1 & year 2), and 133 (61.01%) of them were clinical year students (years 3, 4, 5). Table 1 shows the demographic distribution of the participants.

Table 1: Baseline demographic characteristics of study participants.

Demographic Variables		Number	Percentage
Gender	Males	74	33.9%
	Females	144	66.1%
Year of study	1	38	17.4%
	2	47	21.5%
	3	36	16.5%
	4	51	23.3%
	5	46	21.3%
Type	Pre-clinical	85	39%
	Clinical	133	61%

Table 2 shows participants' perceived stress levels in relation to distinct items in the questionnaire. Most of the students reported moderate to severe stress due to fear of failure in exams, competition with peers, or finishing the minimum clinical requirements in time.

Table 2: Participants' perceived stress levels in relation to various items in the questionnaire.

No	Question	Not Relevant	No stress	Mild stress	Moderate Stress	Severe Stress
1	Amount of assigned workload	11 4.9%	41 18.3%	104 46.4%	58 25.9%	10 4.5%
2	Competition with classmates	32 14.3%	68 30.4%	74 33%	40 17.9%	10 4.5%
3	Examination grades	6 2.7%	40 17.9%	81 36.2%	63 28.1%	34 15.2%
4	Completion of course requirements	5 2.2%	41 18.3%	84 37.5%	62 27.7%	32 14.3%
5	Fear of failing in Exam	8 3.6%	40 17.9%	76 33.9%	51 22.8%	49 21.9%
6	Fear of being unable to keep up with workload	7 3.1%	41 18.3%	88 39.3%	45 19.2%	43 20.1%
7	Learning Environment created by Faculty	14 6.3%	91 40.6%	83 37.1%	27 12.1%	9 4%
8	Receiving criticism about work	14 6.3%	72 32.1%	88 39.3%	32 14.3%	18 8.0%
9	Difference in feedback from different instructors	14 6.3%	67 29.9%	85 37.9%	35 15.6%	23 10.3%
10	Lack of sufficient break between sessions	11 4.9%	71 31.7%	81 36.2%	42 18.8%	19 8.5%
11	Long day schedule	7 3.1%	56 25.0%	76 33.9%	55 24.5%	30 13.4%
12	Increase/Decrease in weight or appetite	36 16.1%	68 30.4%	58 25.9%	37 16.5%	25 11.2%
13	Lack of self confidence	20 8.9%	76 33.9%	65 29%	39 17.4%	24 10.7%
14	Insecurity concerning professional career	13 5.8%	61 27.2%	75 33.5%	42 18.8%	33 14.7%
15	Relationship with peers	31 13.8%	95 42.4%	61 27.2%	25 11.2%	12 5.4%
16	Multitasking with student, clinical and research work	39 17.4%	43 19.2%	82 36.6%	40 17.9%	20 8.9%
17	Working on patients with poor personal hygiene	43 19.2%	36 16.1%	83 37.1%	30 13.4%	32 14.3%
18	Inability to complete the proposed treatment plan	34 15.2%	46 20.5%	89 39.7%	38 17%	17 7.6%
19	Patients missing appointments without prior notice	49 21.9%	65 29%	74 33%	28 12.5%	8 3.6%
20	Difficulty in learning/performing clinical procedures	21 9.4%	65 29%	77 34.4%	39 17.4%	22 9.8%

Table 3 shows comparison of stress categories among males and females. Overall, majority of the participants reported Mild stress (44.5%). When stress categories were compared across gender, no significant differences were seen in

proportion of males and females in dissimilar categories of stress with $p=0.964$. An almost similar proportion was seen in all five categories.

Table 3: Comparison of stress categories among males and females

Gender	Not relevant	Not stressful	Mild stress	Moderate stress	Severe stress	Total	p-value
Males	1 (1.4%)	20 (27%)	33 (44.6%)	15 (20.3%)	5 (6.8%)	74 (100%)	0.964
Females	4 (2.8%)	40 (27.8%)	65 (45.1%)	26 (18.1%)	9 (6.3%)	144 (100%)	
Total	5 (2.3%)	60 (27.5%)	98 (45.0%)	41 (18.8%)	14 (6.4%)	218 (100%)	

Table 4 shows comparison of stress categories across different years. When stress levels were examined across different years of study, a significant difference was observed between pre-clinical and clinical year students with $p < 0.001$. A

higher percentage of pre-clinical students (37.5% & 14.1% respectively) were seen with moderate and severe stress as compared to clinical year students (6.8% and 1.5% respectively).

Table 4: Comparison of stress categories among pre-clinical and clinical year students.

Year	Not relevant	Not stressful	Mild stress	Moderate stress	Severe stress	Total	p-value
Pre-Clinical	0 (0%)	6 (7.1%)	35 (41.2%)	32 (37.6%)	12 (14.1%)	85 (100%)	<0.001
Clinical	5 (3.8%)	54 (40.6%)	63 (47.4%)	9 (6.8%)	2 (1.5%)	133 (100%)	
Total	5 (2.3%)	60 (27.5%)	99 (45.0%)	41 (18.8%)	14 (6.4%)	218 (100%)	

4. Discussion

In the last few years, enormous research has been done on investigating the levels of stress among the university students. In fact, the healthcare training has been identified as a highly stressful experience for medical students (Atta & Almilaibary, 2022). However, Schmitter and colleagues have reported that dental education is more stressful than even medical education (Schmitter *et al.*, 2008). Students in dental programs are considered among the most stressed because of the academic pressure, competitiveness, and workload (Alhadj *et al.*, 2018). This study aimed at investigating the perceived stress levels and predictors for the stress among dental students at a private university in Malaysia. In our study, we found that about 70% of the students had some form of stress either mild, moderate, or severe, towards most of the components in the questionnaire. However, more than one third of the students reported only mild stress pertaining to components related to academic and clinical areas. These areas included workload and students' inability to cope with it, long days without sufficient breaks, clinical quota completion, failing in examination and uncertainty of professional career. This may be attributed to lock down which forced the faculty to shut down all face-to-face sessions

including clinics and deprived opportunities for a hands-on exposure both in lab and clinics. Students could neither have adequate exposure to patients, nor could complete the required quota leading to lack of confidence in clinical skills, which could have led to the fear of professional career and job uncertainty in future. Studies conducted in other countries have also shown similar findings (Santabarbara *et al.*, 2021).

Nevertheless, it is good feedback for the faculty to alter the timetable, to incorporate sufficient breaks and compensate for lost clinical hours by providing extra clinical sessions and lab sessions for students to complete all their quota. Faculty can also consider blended learning where students can have a mix of online and face to face learning which can give them ample time to balance their work. It is worth noting that about 60% of the students reported stress from criticisms received from the faculty members and the variation in feedback given by different staff. A recent review has highlighted the fact that the fear of unfair grading and feedback from the clinical supervisors is the most common stressor among the dental students in the clinical years (Saad-Alshamrani & A-Alshalan, 2021). This requires serious action in the form of faculty development through training and calibration of staff in giving feedback to the

students. On the other hand, it is encouraging to know that more than 40% of the students reported that they did not have any stress pertaining to learning environment, peer relationship and competition with peers which indicates a positive learning environment. The results are in consistence with another study conducted in Malaysia where the students perceived the positive educational environment (Myint *et al.*, 2016).

Our study showed no differences in gender regarding overall perceived stress levels. This finding is contrary to the results of some studies conducted previously. Perceived stress levels were higher in females compared to males, which was universally acceptable according to Agius *et al.* (2021) and Hakami *et al.* (2021). Some of the authors suggested that it could be due to differences in males having greater acute hypothalamic-pituitary-adrenal (HPA) and autonomic response as compared to females (Verma *et al.*, 2011). According to (Basudan *et al.*, 2017), the lower stress scores in male dental students could be due to males being less expressive of their concern (Basudan *et al.*, 2017). However, a significant difference was noticed in the perceived stress levels between males and females specifically for the question pertaining to lack of sufficient breaks with long working days. About 45% of males reported mild stress as compared to 40% of females who reported that they were not stressful (data not shown).

An interesting finding in our study was that the preclinical year students (year 1 and 2) had significantly more stress as compared to clinical year students (years 3, 4, 5). This was noticed with all the components in the questionnaire where about 70% of the students in pre-clinical years had some form of stress to both academic and clinical components in questionnaire as compared to about 35% of students in clinical years. This is in contrast to a study by Hakami et al, clinical year students were found to be more stressed about clinical related issues such as patients' missed/cancelled appointments and completion of course requirements. Some of the studies have reported increased levels of perceived stress among students during the transition from preclinical to clinical years (Garde *et al.*, 2021). The major limitation of our study is that the survey responses are from one dental school only and therefore, the findings cannot be generalized to all dental students across Malaysia. According to some studies, the Covid-19 outbreak and lockdown as it is consequence have been proved to be the source of increased stress levels among dental students. However, we are not able to judge whether this stress is exclusively because of pandemic, as we do not have any data pertaining to stress among students at our faculty before the pandemic. Hence, we plan to repeat this study after few years to compare perceived stress levels during and after the lockdown.

5. Conclusion

Majority of our study participants had some form of stress pertaining to academic and clinical matters. Though the stress levels were mild in many, timely action is necessary to alleviate it. Faculties need to plan strategies to facilitate students in the form of curricular modifications, replacement of lost clinical hours and creating healthy learning environment. Blended learning could be considered to provide adequate time for self-directed learning. Also, psychological and moral support could be extended through mentoring and counseling programmes.

6. Competing Interests

No competing interests exists

7. Ethics Declaration

The study was approved by the institutional ethics committee (SEGIEC/SR/FOD/31/2020-2021).

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