

## Assessment of Perceived Stress and Stressors During Covid-19 Era Among Dental Students at Lincoln University, Malaysia.

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### Abstract

**Objective:** To evaluate the efficacy of high intensity interval training (HIIT) in university students to improve their level of burnout. The students involved in the study are medical and allied health students pursuing the course of physiotherapy, dental and pharmacy courses.

**Materials and methods:** A total of 145 participants were screened for their level of burnout with Maslach burnout inventory and their general mental wellbeing was assessed with GHQ 12. Out of which 62 students exhibit mild to moderate burnout. There was drop of 2 students. The study was continued with 60 participants. These were randomly allocated to 2 groups using stratified random sampling using lottery method. The intervention group was HIIT group and the other was control group. The intervention group was given a HIIT program for 6 weeks, 5 days/week. And control group was given education with the help of a pamphlet.

**Results:** The study analyzed burnout and general health for participants before and after the intervention. Burnout was evaluated using its three variables occupational exhaustion (OE), depersonalization (DP), and personal accomplishment (PA). There was significant improvement in all variables within the two groups. OE, DP and GHQ showed more significant increment in intervention group as compared to control group, whereas PA showed a significant decrement in intervention group than control group.

**Conclusion:** A six-week high intensity interval training program was given to medical students and it was compared with exercise education only. The results strongly suggest the use of HIIT to alleviate the symptoms of burnout

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### Introduction

Students' stress is a major concern for dental educators. According to a study conducted in 2008, increased stress may lead to a decrease in performance of students, which may lead to attrition or failure [1]. There is a significant expense involved in training healthcare professionals; therefore, attrition has a substantial financial impact as well as hindering the well-being of students [2]. Polychronopoulou et. al suggested that dental undergraduates are constantly stressed as they need to be competent in academic, clinical aspects and interpersonal skills. They concluded that these mentioned perceived stress factors varied significantly between students from different institutions and were closely linked to gender, level of study, class size, type of curriculum and educational fees [1,3].

Based on numerous studies at various dental schools internationally have reported that students' highest stressors have related to academic factors including examinations and grades, and assigned workload [1,3-7]. The factors "completing academic requirements" and "examinations and assessments" in particular were marked as highly stressful by students. This is not surprising as the assessments and academic requirements in higher education are necessarily stressful due to their high stakes nature and dentistry is known to be a particularly challenging academic field [6].

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### Keywords

Stress, Stressors, COVID 19, Occupational exhaustion, Depersonalization, Personal accomplishment, Health.

Questions 1 – 4 Demographic Data:	
Question 1: What year group are you currently enrolled in?	
Question 2: What is your gender?	
Question 3: What is your race?	
Question 4: What is your age range?	
For Question 5- 37 to indicate how stressful the student is finding each item this year on a scale of 1-5: 1= not at all stressful, 2= somewhat stressful, 3= quite stressful, 4= very stressful, 5= extremely stressful	
Academic Domain	Mean Score
Question 5: Amount of assigned classwork	2.5
Question 6: Difficulty of assigned classwork	2.7
Question 7: Competition for grades	3.0
Question 8: Examinations and grades	3.4
Question 9: Completing academic course requirements	3.6
Question 10: Fear of failing course or year	4.1
Question 11: Lack of time to complete assigned school-work	3.3
Question 12: Fear of being unable to catch up if behind	3.7
Clinical and Patient Related Domain	Mean Score
Question 13: Completing clinical course requirements	3.8
Question 14: Difficulty learning clinical procedures	3.2
Question 15: Difficulty in learning precision manual skills required in preclinical and laboratory work	3.3
Question 16: General clinical environment	3.5
Question 17: Responsibility for providing comprehensive patient care	3.0
Question 18: Patients' co-operation in their home-care	2.8
Question 19: Patients being late or not showing up for their appointments	3.4
Question 20: Working on patients with dirty mouths	2.8
Environmental Domain	Mean Score

**Table 1: List of domains and questions used in DES, and the mean score of stress for each**

and dentistry is known to be a particularly challenging academic field [6].

Several methods have been used in assessing psychological stress among dental students, but the most commonly used method is Dental Environment Stress questionnaire originally developed by Garbee [8]. The original English version contains 38 items divided between seven factors. Several modified versions of the DES, with various numbers of items and factors, have been developed and implemented. Dental Environment Stress was measured by events, experiences or stimuli originating from the environments that are able to cause stress [9].

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the Perceived Stress Scale. The Perceived Stress Scale (PSS) is a tool developed in 1983 to measure the extent and/or severity of self-reported appraisal of the stressors effect on respondent's life. It has been found to have adequate validity and reliability in various demographics of the population [10]. The PSS demonstrated good internal consistency with Cronbach's alpha from 0.84 to 0.86 and had been found to be a reliable psychometric measure of perceived stress [11].

To date, several studies have been conducted related to the mental health impact of COVID-19 on persons involved in dental practice. However, there is no previous studies conducted among the dental students in Lincoln University College (LUC). The aim of this

study is to measure the stress levels and perceived sources and factors affecting stress, and determine the association between gender, academic year, age, and ethnicity with level of stress and the factors affecting stress among dental students in LUC.

### Methodology

#### Study Design

This study is a cross-sectional study conducted at the Faculty of Dentistry, Lincoln University College (LUC) during the 2nd semester of the academic year 2022. It targets dental students from first to fifth year in the Faculty of Dentistry, Lincoln University College, Malaysia.

#### Data Collection Tools

Data collection has been carried out from May 2022 to September 2022. Informed consent has been given to participants who have decided to volunteer in this study via Google Forms. They were requested to fill in their demographics, Modified Dental Environmental Stress (DES) questionnaire (containing 6 domains and 37 questions) adopted from Grade et al 2021. 10-item Perceived Stress Scale questionnaire (PSS-10) was also used to measure perceived stress accurately, and was adopted from Cohen et al, 1983 [12]. The total duration to complete took about 10 minutes. The questions included in this study are listed in Tables 1 and 2. The questionnaire responses for each section were based on a 5-point Likert scale as described in Tables 1 and 2.

The data were collected using Google Forms ( Google Inc. USA). The link was shared with the students at LUC Dental School using email. A consent form was obtained, and all participants' details were protected by encryption 'password protection', whereby only the research team has an access to it. This is to ensure the privacy and confidentiality of participants.

#### Data Analysis

Data analysis was conducted using Microsoft Excel (Microsoft Corporation, U.S.A) and SPSS software version 27 (IBM Corporation, U.S.A) for data analysis. Sample t-test and One Way ANOVA were used to investigate regarding the association between stress and Gender, Academic Year, and Ethnicity of the participants.

### Results

A total number of 94 out of 104 students (90.4% response rate) from the Faculty of Dentistry, Lincoln University College have voluntarily participated in this study. Their ages ranged from 20 to 28 years old. Female respondents marked a higher number at 73.4% compared to male respondents at 26.6%. Year 5 students contributed the highest number of respondents compared to students in Year 1 to Year 4. Based on race, a majority of respondents was from the Malay ethnic group, at 73.4%, followed by the Chinese ethnic group,

For each question choose from the following alternatives:  
0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

- 1) In the last month, how often have you been upset because of something that happened to you?
- 2) In the last month, how often have you felt that you were unable to cope with all that life was throwing at you?
- 3) In the last month, how often have you felt nervous and stressed?
- 4) In the last month, how often have you felt confident about your ability to handle whatever comes your way?
- 5) In the last month, how often have you felt that things were going your way?
- 6) In the last month, how often have you found that you could not cope with all that life was throwing at you?
- 7) In the last month, how often have you been able to control irritations in your life?
- 8) In the last month, how often have you felt that you were on top of things?
- 9) In the last month, how often have you been angered because of things that were not your fault?
- 10) In the last month, how often have you felt difficulties were piling up on you?

**Table 2: List of questions used in PSS-10.**

Variables		PSS-10 Mean Score
Gender*	Male (25)	22.92
	Female (69)	23.52
Year of Study**	Year 1 (8)	21.37
	Year 2 (8)	21.75
	Year 3 (11)	22.82
	Year 4 (21)	23.24
	Year 5 (46)	24.17
Race**	Malay (69)	23.16
	Chinese (16)	23.69
	Indian (5)	22.8
	Others (4)	26.25

\* Sample t-test was used to investigate the association

\*\* One-Way ANOVA was used to investigate the association

**Table 3: Score obtained from PSS-10 in association to Gender, Year of study, and Race.**

at 16%, and the Indian ethnic group, at 5% and 4% of other races (Table 3).

The mean score for PSS-10 was 23.36, which falls under Moderate Stress. 73 participants were recorded in moderate stress with the highest percentage of 76.8%, followed by 21 participants with high stress with 22.1% and only 1 participant rated low stress at 1.1%. Female students, Year 5 students, and students from other ethnic group recorded insignificantly higher scores compared to other groups (Table 3).

Regarding DES scores, the students responded with highest scores in Academic, Clinical, and Environmental Domains. The highest stressor for the students was “Fear of failing course or year” (mean

score: 4.1), followed by “Completing clinical requirement” (mean score: 3.8), and “Fear of being unable to catch up if behind” (mean score: 3.7). The students were also found to be stressed with other factors such as “Completing academic course requirements”, “General clinical environment”, “Rules and regulations of the school”, and “Inconsistency of feedback from different teachers” (Table 1).

On the contrary, the students were least stressed with Personal Domain. The least stressing factors were “Conflict with partner or family over career decision” (mean score: 2.1), “Problems in living/home environment” (mean score: 2.3), and “Personal relationship problems” (Mean score: 2.4).

### Discussion

Several studies conducted previously have reported that dentistry evoked considerable stress on dental students [13]. This study was conducted to discuss and compare the stress levels and the stressors of the dental students with the previous studies that have been conducted using the Perceived Stress Scale (PSS-10) and the modified Dental Environment Stress (DES) questionnaire.

According to a study conducted amongst dentists and dental students of Latin American and Caribbean during the mandatory social isolation due to COVID-19 pandemic, it was found that the mean PSS-14 score was 24.76. On the other hand, the mean score for dental students was 26.81 which was higher compared to the dentist [14]. In this study, the mean PSS-10 score was 23.36 which includes only dental students which means that it is lower compared to the study conducted by León-Manco et al which might be due to cultural and ethnic differences, or usage of different PSS version [14]. Based on León-Manco et al, remote strategies during the pandemic caused the dental students to have new academic responsibilities which evoked the stress level of the students [14].

Moreover, a study was conducted in India to compare the perceived stress level between medical and dental students found that the mean PSS-10 score for medical students was 16.74 while the dental students was 18.23 [15].

According to a study conducted amongst the dental students in Universiti Sains Malaysia, the mean PSS-10 score was 21.2. The mean score was higher in the clinical students compared to the pre-clinical years. The evidence from the research conducted by Saddki et al suggested that the dental students in Malaysia experience more stress compared to dental students in other countries [16]. A study conducted during the COVID-19 pandemic amongst university students in Saudi Arabia using the Arabic version of PSS-10 showed that 86.7% of the participants had moderate to high stress levels [17]. Similarly, this study also found that the majority of the students experienced moderate stress levels. These psychological responses during the social distancing period can be due to fear of getting infected by COVID-19 and getting close family

members infected and also lack of interpersonal communication.

A few studies utilizing modified DES were conducted at various dental schools. Those studies reported that the highest stressors were related to academic factors [1,4,5,18]. In the current study conducted, it was found that the academic factors were the main contributing factors to stress, consistent with the previous studies' findings.

Most students in this study scored 5 - Extremely stressful for the item "Fear of failing course or year". Compared to a study conducted amongst Indian dental students, fear of failing course or year was one of the six highest stressors in the pre-clinical years [1]. In addition to that, the study conducted in Chilean and Argentinean dental schools found that the top stressor in both schools is "fear of failing a course or year [6].

Babar and colleagues conducted a study utilizing modified DES in Malaysia. Babar found that the main stressors felt by dental students are academic concerns, which is consistent with past research. The item "Fear of failing a course" was ranked as the most stressful item across all professional years, and this study showed similar findings. These findings may aid in better strategizing, allowing students to handle academic life-related pressures [19]. Similarly, when various components of academic stress were examined, it was discovered that senior (final year) students exhibited the most stress in all academic-related things, which could be an indication of the pressure to graduate while facing the challenges of professional life.

Another item that the dental students in this study marked as extremely stressful was "Rules and regulations of the school". This finding is also consistent with the findings from the previous study that reports "Rules and regulations of the faculty" as one of the top stressors in clinical years' students [1]. Similarly, a study by Al-Sowygh found that "Faculty and administration" was among the highest stressor compared to other factors. This factor is related to the stressor "Rules and regulations" as both are related to the management of the dental faculty. Conversely, "Rules and regulations of the school" was ranked as the least stressor amongst the Chilean and Argentinian dental students [6].

An additional notable finding from this study was that Personal Issues subscale were the lowest stressors which is parallel with the study conducted by Garde et al [18]. In addition, the study conducted by Kumar et al also found that personal factors were the lowest stressors amongst the Indian dental students. However, this item was scored mostly as the top stressor amongst Chilean and Argentinian dental students [6].

- Psychological stress among dental students at the University of Jordan. *J Dent Educ* 2011;75:1107–14.
- Al-Sowygh ZH. Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia. *Saudi Dent J* 2013;25:97–105. <https://doi.org/10.1016/j.sdentj.2013.05.002>.

Financial resources was one of the top stressful items among the dental students in India [13]. This is consistent with the study conducted by Fonseca et al, as "Financial responsibilities" was ranked as one of the top stressor among the dental students [6]. With regard to this study, financial concerns were "somewhat stressful" to the majority of the students. Only 12.8% of the students felt extremely stressful dealing with this stressor.

According to a cross-sectional study conducted among Malaysian students, mean stress levels increased from year one to year five . In all issues, fifth-year students were much more stressed than first-year students [19]. The findings were comparable to those found in this study.

However, when items were evaluated by gender, significant variances were discovered by Babar and colleagues, in which female students reported higher levels of stress than male students in all categories [19]. Similar findings were reported by Kumar's study [1]. On the contrary, other published studies discovered no difference in stress levels between genders [13,20]. Based on this current study, there was no significant difference in perceived stress between genders. Females may report more stress because of how they respond to stressful events, whereas males are less expressive of their concerns.

#### Conclusion

This study found that majority of students felt in Moderate Stress category. Compared to previous studies, the stress level of students has decreased after commencement of Hybrid-Teaching mode rather than Online-Teaching mode, but it is still higher than pre-COVID 19 era. This indicates that COVID 19 increased stress level of dental students.

The students were also found to be mostly stressed due to "Fear to fail in completing the course or year" and "Completing clinical requirements". There was no significant difference in stress among different gender, academic year, or ethnic groups.

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