

# Dental Students' Educational Environment and Perceived Stress: The University of Malaya Experience

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## Abstract

**Background:** An equitable and positive learning environment fosters deep self-directed learning in students and, consequently, good practice in their profession. Although demotivating weaknesses may lead to repeated day-to-day stress with a cascade of deleterious consequences at both personal and professional levels, a possible relationship between these parameters has not been reported. This study was undertaken to determine the relationship between students' perceptions of their educational environment and their stress levels.

**Methods:** Sixty-one first year students at the Dental Faculty, University of Malaya, Malaysia participated. The Dundee Ready Education Environment Measure (DREEM) was used to determine educational environment while self-rated perceived stress level was measured by the Depression Anxiety Stress Scale (DASS).

**Results:** Most students (62.39%) showed positive perceptions for the total and five domains of DREEM. The highest percentage was observed for "Students perception of learning" (64.04%) while the lowest was for "Students' social self-perception" (60.32%). At the same time, 61% of students showed high perceived stress levels. However, this was not associated with their DREEM scores.

**Conclusion:** Although a positive perception of their educational environment was found, minor corrective measures need to be implemented. Furthermore, longitudinal studies on an annual basis would provide useful input for strategic planning purposes.

**Keywords:** Dental, students, educational measurement, psychological stress, Malaysia

## Introduction

Dental education is very complex and has a unique milieu in which students are expected to acquire academic and clinical competencies as well as interpersonal skills. As such, it is regarded as a demanding and challenging field. The learning environment of medical, including dental, education itself may be perceived as a prevailing stressful situation which encourages competition rather than cooperation between learners (1–3). As a potentially important determinant of students' success, academically as well as professionally, interest in and concern for students' perception of their educational environment/climate have grown in recent years. In fact, studies carried out in this area of medical education have demonstrated that this particular perception has a significant impact on students' academic achievements, satisfaction and success (4, 5). As such, assessment of the educational environment is critically important towards effective management of learning developments and changes within the health professions. In

terms of assessment tool, the Dundee Ready Education Environment Measure (DREEM) was developed as a measure of educational climate (6). Since then, DREEM has been used extensively worldwide, including in Malaysia (7), and produced global readings and diagnostic analyse of undergraduate educational environments in health profession institutes.

The concept of stress has been also widely discussed in relation to dental education. In various studies, the prevalence of perceived stress levels was reported to be relatively high among dental undergraduate students (8). Furthermore, this high perceived stress was found to have deleterious consequences on the students, both personally as well as academically, for example, alcohol and drug abuse (9–11), development of alarming symptoms of psychological distress and burnout (12–14), mental health problems such as anxiety, depression (11, 13, 15) and suicidal tendency. These deleterious consequences have included suicidal attempts in their later profession (16–18). In addition, it was evident that the stress has a negative impact on students' professional

effectiveness, especially in their academic performance (19–20).

Thus, it is important for educators to recognise possible stressors in the field of dental education. In this regard, earlier studies have addressed the three main categories of stressors: academic pressures, social issues and financial problems (7, 21–23). However, the possibility of the educational environment as a source of stress amongst the undergraduate dental students has not been explored. In fact, not many studies have been done in Malaysia on students' perception of their educational environment in the area of medical education (24–28), dental education (29) and health sciences (30, 31). To fill this gap, this study was carried out to determine the students' perception of educational environment and its possible relationship with self-perceived stress levels.

## Methods

This cross-sectional study was carried out at the Faculty of Dentistry, University of Malaya, Malaysia. The study was approved by the Medical Ethics Committee of the University Malaya Medical Centre.

All first year dental students of the 2011–2012 academic session were invited to participate in the study. Out of a total of 71 first year students in the 2011–2012 cohort, 61 participated and completed the questionnaire (response rate of 85.9%). The DASS and DREEM questionnaires were distributed to students during one of the tutorial sessions in the second semester, following a brief explanation of the objectives of the study. The importance of and voluntary participation in the study was explained as well as the anonymity of the questionnaires. The respondents were asked to complete the questionnaires which were immediately collected by their respective tutors.

### *DREEM questionnaire*

The 50-item DREEM questionnaire in the English language was used as a measure of students' perception on educational environment. It is a generic, reliable, and validated inventory and has shown to be culturally independent (6). Each item is scored using a five-point Likert scale ranging from 0 = strongly disagree, 1 = disagree, 2 = unsure, 3 = agree to 4 = strongly agree. Nine negative items are scored in reverse order. The DREEM has a total possible maximum score of 200 indicating an ideal educational environment

as perceived by the student and a minimum score of 0 showing a seriously poor outcome. A guide for interpreting the overall score is as follows:

- 0–50 : Very poor
- 51–100 : Plenty of problems
- 101–150 : More positive than negative
- 151–200 : Excellent

The DREEM not only provides a total environment score but also measures five domains or subscales of students' perceptions of a given institution's environment, as follows:

<i>Subscales</i>	<i>Items</i>	<i>Max Score</i>
Students' Perception of Learning (PoL)	12	48
Students' Perception of Teaching (PoT)	11	44
Students' Academic Self-perceptions (ASP)	8	32
Students' Perception of Atmosphere (PoA)	12	48
Students' Social Self-perception (SSP)	7	28

### *DASS questionnaire*

The self-rated perceived stress level was measured by a validated, modified 21-item Depression Anxiety Stress Scale questionnaire (DASS). A bilingual version (English and Bahasa Malaysia) of the DASS was provided. This questionnaire was developed by Lovibond and Lovibond (32) and was subsequently translated into Bahasa Malaysia and validated (33). The DASS is designed to assess the negative emotional states of depression, anxiety and stress. As the aim of the present study was to access perceived stress level, only the score for the stress self-report scale was considered. The stress scores were determined by calculating the summation of scores for relevant items in the stress domain. Moreover, the severity of stress was rated based on stress score categories interpreted by Lovibond and Lovibond (32).

### *Statistical analysis*

The resulting scores for total DREEM inventory and its subscales were interpreted using the guide proposed by McAleer and Roff (34). For analysis of self-perceived stress levels,

the frequency occurrences of numbers (%) of student's responses to individual items in the DASS stress scales were calculated. The severity of DASS scores was also categorized according to Lovibond and Lovibond (21). Statistical analysis was carried out using Microsoft Excel and expressed as mean and standard deviation (SD), and percentage of maximal scores.

To investigate the possible association between students' perception of educational environment and self-perceived stress scores, Pearson correlations were performed using GraphPad Prism version 5.01 with  $p$  less than 0.05 considered statistically significant.

## Results

The mean and SD scores for the total and five essential domains of the DREEM inventory are shown in Table 1. Out of the total maximum DREEM score of 200, the total mean score obtained in this study was 124.77 (SD 16.35). The scores for the individual domains were analysed and expressed as a percentage because of the different maximum score for each domain.

The responses of the dental students to the individual DASS stress scale are shown in Table 2.

The mean perceived stress score in the study population was 17.02 (SD 7.43). The degree of severity of perceived stress levels are shown in Table 3. According to Lovibond and Lovibond's categorisation (32), 39% of students had normal stress levels, while the others reported experiencing a higher stress level, 13% of whom were under severe and extremely severe stressful conditions.

Correlations between the students' perception, based on the total and each subscales of DREEM, and their perceived self-stress scores are shown in Figure 1. No significant correlation was found between perceived stress levels and either total ( $r = -0.16, p = 0.211$ ) or individual domains of DREEM score: PoL ( $r = -0.14, p = 0.268$ ), PoT ( $r = -0.13, p = 0.323$ ), ASP ( $r = -0.11, p = 0.391$ ), PoA ( $r = -0.11, p = 0.386$ ) and SSP ( $r = -0.17, p = 0.191$ ), respectively.

**Table 1:** The mean (SD) for the total and five essential domains of DREEM

Domains of DREEM	Max scores	Mean (SD)	Percentage of max scores
Total overall DREEM	200	124.77 (16.35)	62.39
Students' Perception of Learning (PoL)	48	30.74 (4.89)	64.04
Students' Perception of Teaching (PoT)	44	26.97 (3.14)	61.30
Students' Academic Self-perceptions (ASP)	32	19.39 (4.55)	60.59
Students' Perception of Atmosphere (PoA)	48	30.31 (6.67)	63.15
Students' Social Self-perception (SSP)	28	16.89 (2.52)	60.32

**Table 2:** The students' responses to stress domain of the self-perceived stress questionnaire (DASS) ( $n = 61$ )

Statement	Never $n$ (%)	Sometimes $n$ (%)	Moderate $n$ (%)	Most $n$ (%)
I found it hard to wind down	16 (26.23)	30 (49.18)	13 (21.31)	2 (3.28)
I tended to over-react to situations	16 (26.23)	24 (39.34)	18 (29.51)	3 (4.92)
I felt that I was using a lot of nervous energy	11 (18.03)	26 (42.62)	19 (31.15)	5 (8.20)
I found myself getting agitated	10 (16.39)	32 (52.46)	16 (26.23)	3 (4.92)
I found it difficult to relax	16 (26.23)	31 (50.82)	8 (13.11)	6 (9.84)
I was intolerant of anything that kept me from getting on with what I was doing	13 (21.31)	27 (44.26)	15 (24.59)	6 (9.84)
I felt that I was rather touchy	7 (11.47)	22 (36.07)	22 (36.07)	10 (16.39)

## Discussion

Students’ perception of educational environment is crucial in education as it contributes towards their personal development, psychosomatic and social well-being, and, consequently, their future professional life. As there are no reported data on Malaysia’s dental educational environment in relation to students’ perceived stress, we conducted a study to determine this relationship on first year dental students at the University of Malaya. This 2011–2012 cohort of students was the first group since the Faculty of Dentistry started in 1971 to follow an integrated dental curriculum. Since the cohort sampled in this study had not been exposed to clinical teaching, we could not determine the stress of the clinical component which, thus, limits the scope of our study. The study was conducted during the second semester because by that time, it was expected that the students would have had sufficient experience with their current

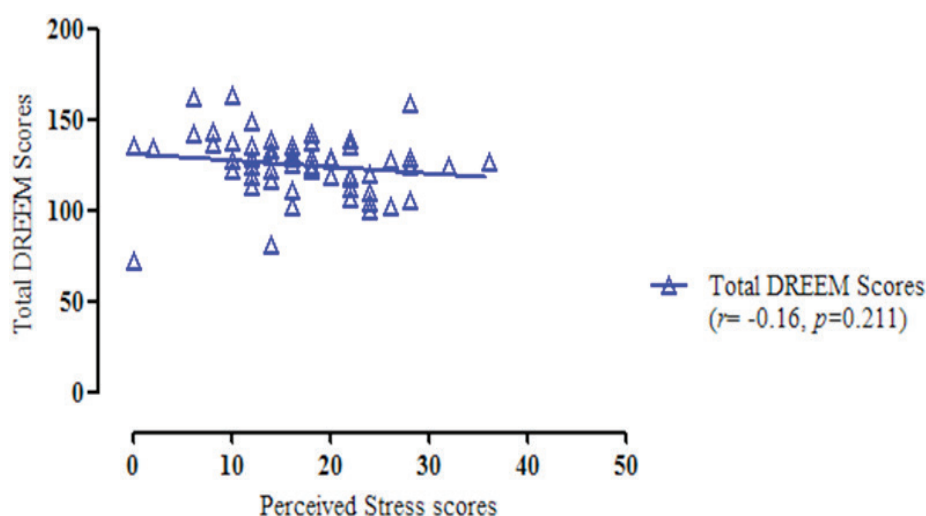
environment to make actual reflections on it. The study achieved a response rate of 85.92% which is acceptable for voluntary-based participation.

In this study, we used the DREEM inventory to assess the educational environment. The DREEM questionnaire provided an overview of the overall opinions of the students as well as in the five essential domains of the educational environment. There is no published or established cut-off value for an acceptable DREEM inventory score. The total score obtained from this study, 124.77 (62.39% of maximal score) was higher than the scores obtained from dental institutions in Pakistani (35) and Germany (36) with a score of 115.06 and 122.95, respectively. However, our scores were slightly lower than the scores obtained from one dental school in the United Kingdom (143.58) (37).

In comparison with the reported results of studies on medical education environments in Malaysia, our score is almost similar to scores obtained from the Management and Science

**Table 3:** The perceived stress levels of students based on DASS severity ratings

Stress level	Stress scores	No. of students (n = 61)	% of students
Normal	0–14	24	39.34
Mild	15–18	14	22.95
Moderate	19–25	15	24.59
Severe	26–33	7	11.48
Extremely severe	34+	1	1.64



**Figure 1:** Correlation between DREEM – total and self-perceived stress scores (DASS) among dental students (n = 61)

University (125.3) (27), Universiti Sultan Zainal Abidin (128.2) (28) and Universiti Sains Malaysia reported in 2013 (128.36) (26). However, it is higher than the findings from Universiti Sains Malaysia 2010 report (117.9) (25). In contrast, our score is slightly lower than the score reported from a study done at the International Medical University (133) (24). Moreover, as compared to reports from allied health institutions, our score is slightly higher than that from nursing school of International Islamic University Malaysia (120.12) (30) and lower than scores of the two physiotherapy schools (132.84) (31). Nevertheless, the predominant positive perception of our students is indicative of an equitable and acceptable learning environment, assuring the quality of the recently implemented "student-centered" dental curriculum.

To better understand the weaknesses and the strengths of the educational environment, the mean scores of the five essential domains and corresponding items of DREEM were further interpreted in accordance with McAleer and Roff (34). The students showed "*a more positive perception*" of their learning with the highest percentage of 30.74 (64.04% of maximal scores). In addition, the students from our study perceived "*moving in the right direction*" (26.97, 61.29% of maximal scores) for the teachers; "*feeling more on the positive side*" (19.39, 60.59% of maximal scores) for their academic self-perception; "*a more positive attitude*" (30.31, 63.15% of maximal scores) towards their atmosphere and "*not too bad*" (16.89, 60.32% of maximal scores) for their social self-perception. Even though our students had a relatively more positive perception in all subscales of DREEM, academic self-perception and social self-perception were found to be the two lowest scoring domains. These findings suggest possible difficulties for first year students to adapt to the completely different 'student-centered' learning and teaching environment from their previous traditional "teacher-centered" secondary education. It may also indicate the lack of a good support system for these students. It should be noted that the "student-centered integrated curriculum" was introduced in the Dental Faculty of the University of Malaya in 2011. With no previous data on students' perception of their educational environment, it was not possible to compare the differences, if any, between the two curricula. Although the students had an overall positive perception on their educational environment, the analysis of the individual DREEM domains indicates that

curriculum planners as well as administrators need to establish a social and academic support system for the students.

The perceived stress levels of the students were also assessed using the DASS questionnaire. Widely used in research and clinical settings, this questionnaire is designed to assess the current state or change in state over time on the three dimensions of depression, anxiety and stress. It has acceptable reliability and validity, and normative data are available for the general adult population (38). The stress scale is constructed to measure the sensitivity levels of chronic and nervous arousals, difficulties in relaxation, feeling of being upset/ agitated, and irritability or over-reactivity and impatience. The mean perceived stress level of students in this study was 17.02, and this finding of high perceived stress levels is consistent with other reports (8, 9–18, 29). In fact, the severity of stress experienced by this cohort was quite alarming. Only 39.34% of the students reported normal stress levels. Almost half (47.54%) reported mild and moderate stress levels while 13.12% had severe and extremely severe stress levels. Upon further analysis, it was found out that a majority of the students, i.e., 88.53% and 73.77% of students reported feeling irritable ("*I felt that I was rather touchy*") and over-reactive ("*I tended to over-react to situations*"), respectively. In addition, most (83.61%) of the students felt that they were easily upset and agitated ("*I found myself getting agitated*"), 81.97% had nervous arousal ("*I felt that I was using a lot of nervous energy*"), 78.69% were impatient ("*I was intolerant of anything that kept me from getting on with what I was doing*") and 73.77% found difficulty in relaxing ("*I found it hard to wind down*"; "*I found it difficult to relax*"). Since the DASS focuses only on the severity of stress levels, the sources of stress were not identified in this study. However, a report from the same institution found that the 100% prevalence of stress for students in years 2 to 5 were accounted for by common factors such as academic concerns, patient management and clinical performance (29).

In our study, the correlations between the total and individual subscales of DREEM and perceived stress levels showed negative trends but were not statistically significant. Nevertheless, the negative direction of the correlations between these parameters suggests possible impact and importance of students' perception of educational environment on their perceived stress levels. One

of the limitations of using a self-administered questionnaire to assess the learning environment is that respondents are confined to answering specific questions. That is, the questionnaire may not capture other important parameters which may have strong associations with the social and physical environments. Notably, the assessment tools used in this study did not include the state of student's finances, a factor which could contribute to stress levels. Although most of the students are sponsored by government or private foundations so their tuition fees are paid for, they may still have problems with their daily expenses and/or keeping up with their financially better-off peers. There are also other limitations in this present study. The cross sectional study design does not provide any evidence of the direction of relationships between variables along their undergraduate training and professional life. As the study population was small and limited to first year medical students, these findings can not be generalised to the other year groups of dental students. Further studies need to be carried out to address these limitations.

## Conclusions

Based on our findings, it is clear that the first-year at the Dental Faculty of the University of Malaya presents a high level of stress for some students. Despite this, first-year students generally have positive perceptions of the educational environment. However, our study also revealed weaknesses particularly in academic self-perception and social self-perception skills. These low scores call for institutional remedial actions at faculty as well as at higher administrative levels to ensure an ideal educational environment. In addition, the sources of students' perceived stress need to be identified. Therefore, we strongly recommend that longitudinal studies on this cohort be carried out on an annual basis to provide further valuable input for strategic planning purposes.

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## Conflict of Interest

None.

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## Author's Contributions

Conception and design: KM, HSZ, RH, RI  
Analysis and interpretation of data: KM, HSZ  
Drafting of the article: KM, HSZ  
Critical revision of the article for important intellectual content: RH, RI  
Final approval of the article: RH, RI  
Statistical expertise: KM, HSZ  
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