

STRESS AND ITS RELIEF AMONG UNDERGRADUATE DENTAL STUDENTS IN MALAYSIA

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Abstract. This study was conducted to identify the prevalence of stress, types of stressors, consequences of stress and stress relievers among undergraduate dental students at the University of Malaya during the different years of study. A descriptive cross-sectional quantitative study was conducted using a self-administered questionnaire among Bachelor of Dental Surgery students during Years 2 to 5. A 100% response rate was obtained. The instrument asked questions about the preceding academic year. The results of the questionnaire reveal the prevalence of stress was 100%. The most common cause of stress among preclinical students was academic concerns and among clinical students was patient management and clinical performance. Physical and behavioral problems were reported as consequences of stress. Most students overcame stress by having strong interpersonal relationships.

Keywords: dental students, stress, stressors, stress reliever

INTRODUCTION

Stress is defined as “pressure or worry caused by problems in somebody’s life” (Hornby, 2010). The practice of dentistry has long been associated with high levels of occupational stress. Hermanson (1972) reported emotional illness ranked third among illnesses in dentists and Cooper *et al* (1987) reported the dental profession is the most stressful of all health professions. In Malaysia, the prevalence of stress among dentists was reported as 89.7% (Khalid, 2000). High levels of stress are associated with dental practice; it appears to begin during dental school and is mani-

festated differently during different years of study (Peker *et al*, 2009; Polychronopoulou and Divaris, 2010). Several studies have shown stress encountered during dental education is more pronounced than during medical education (Gotter *et al*, 2008; Schmitter *et al*, 2008; Murphy *et al*, 2009).

Stressors vary by individual attitude, beliefs and cultural background (Acharya, 2003). In a multi-country study of dental students’ perceived sources of stress at six dental institutions in Europe, the sources of stress varied by individual and educational/institutional factors. Spanish students were most stressed by “clinical training” and performance pressure, whereas Greek students were most stressed by “patient treatment” (Polychronopoulou and Divaris, 2009). Kumar *et al* (2009) reported the most important source of stress among Indian

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Table 1
Demographics of dental students at the University of Malaya.

	n (%)			
	Second year	Third year	Fourth year	Fifth year
Gender				
Male	22 (30.6)	24 (32.4)	13 (18.8)	16 (21.1)
Female	50 (69.4)	50 (67.6)	56 (81.2)	60 (78.9)
Ethnic group				
Malay	34 (47.2)	37 (50.0)	38 (55.1)	47 (61.8)
Chinese	37 (51.4)	35 (47.3)	25 (36.2)	20 (26.3)
Indian	1 (1.4)	2 (2.7)	6 (8.7)	9 (11.8)
Marital status				
Single	72 (100.0)	74 (100.0)	68 (98.6)	75 (98.7)
Married	0 (0.0)	0 (0.0)	1 (1.4)	1 (1.3)

dental students was the academic component of the course, especially in regard to examinations and grading. Muirhead and Locker (2008) and Morse and Uria (2007) in a study of Canadian and Fijian dental students, respectively, found the high cost of tuition was the greatest source of stress.

Stress can have detrimental effects on dental students; it has been associated with physical symptoms, psychological distress, emotional exhaustion and burn-out (Humphris *et al*, 2002; Pohlmann *et al*, 2005; Gorter *et al*, 2008). It is important for dental schools to identify stress levels among its students when planning the curriculum and working environment for dental education to create a more student-friendly, less stressful, atmosphere.

The aim of this study was to determine the prevalence, sources of, consequences of and coping mechanisms for stress among undergraduate dental students at the University of Malaya.

MATERIALS AND METHODS

A descriptive cross-sectional quan-

titative study was carried out using a self-administered questionnaire among second to fifth year Bachelor of Dental Surgery students at the University of Malaya. The University of Malaya is the oldest and largest of three dental schools in Malaysia. The questionnaire evaluated experiences during the preceding academic year. The questionnaire was adapted from the Dental Environmental Stress Questionnaire (Westerman *et al*, 1993) and was modified to include several cultural factors appropriate for Malaysian students. It was face validated by two senior academic faculty members. The questionnaire was divided into sections.

Section A consisted of questions about characteristics of the respondents, Section B identified potential stressors among students, Section C identified physical and behavioral consequences of stress, and Section D asked what students did to relieve stress.

The questionnaire was administered in the classroom. The data were cleaned before data entry. Data analysis was carried out using SPSS version 12.0.

Table 2
Stressors among respondents.

	<i>n</i> (%)			
	Second year	Third year	Fourth year	Fifth year
Amount of assigned class work	40 (55.6)	54 (73.0)	61 (88.4)	64 (84.2)
Lack of cooperation by patients in their home care	N/A	N/A	49 (71.0)	54 (71.1)
Difficulty with class work	43 (59.7)	58 (78.4)	56 (81.2)	62 (81.6)
Responsibilities for comprehensive patient care	N/A	N/A	55 (79.7)	60 (78.9)
Competition for grades	45 (62.5)	39 (52.7)	46 (66.7)	48 (63.2)
Patients arriving late or not showing up for appointment	N/A	N/A	66 (95.7)	72 (94.7)
Examinations and grading	67 (93.1)	68 (91.9)	58 (84.1)	65 (85.5)
Difficulty in learning clinical procedures	1 (1.4)	28 (37.8)	48 (69.6)	52 (68.4)
Atmosphere created by clinical faculty	16 (22.2)	24 (32.4)	53 (76.8)	60 (78.9)
Relationship with members of the opposite sex	5 (6.9)	8 (10.8)	16 (23.2)	15 (19.7)
Receiving criticism about work	25 (34.7)	42 (56.8)	52 (75.4)	48 (63.2)
Difficulty in learning precision manual skills required in preclinical and laboratory work	22 (30.6)	47 (63.5)	52 (75.4)	54 (71.1)
Lack of confidence about being a successful dental student	12 (16.7)	39 (52.7)	51 (73.9)	43 (56.6)
Lack of confidence about being a successful dentist	40 (55.6)	38 (51.4)	47 (68.1)	40 (52.6)
Lack of time for relaxation	54 (75.0)	53 (71.6)	64 (92.8)	62 (81.6)
Amount of cheating among dental students	12 (16.7)	12 (16.2)	26 (37.7)	35 (46.1)
Rules and regulations of the faculty	17 (23.6)	25 (33.8)	56 (81.2)	51 (67.1)
Working on patients with dirty mouths	N/A	N/A	46 (66.7)	44 (57.9)
Lack of home atmosphere in the living quarters	34 (47.2)	24 (32.4)	32 (46.4)	30 (39.5)
Completing examination requirements	52 (72.2)	54 (73.0)	64 (92.8)	68 (89.5)
Having children at home	N/A	N/A	1 (1.4)	0 (0.0)
Marital problems	N/A	N/A	0 (0.0)	1 (1.3)
Disparity between expectations and reality at the dental faculty	39 (54.2)	45 (60.8)	57 (82.6)	59 (77.6)
Lack of input in the decision-making process of the dental faculty	28 (38.9)	35 (47.3)	52 (75.4)	48 (63.2)
Fear of failing a course or year	66 (91.7)	63 (85.1)	66 (95.7)	68 (89.5)
Financial problems	35 (48.6)	32 (43.2)	36 (52.2)	38 (50.0)
Lack of time to do assigned school work	45 (62.5)	44 (59.5)	61 (88.4)	61 (80.3)
Forced postponement of marriage or engagement	1 (1.4)	1 (1.4)	8 (11.6)	3 (3.9)
Physical health problems	11 (15.3)	17 (23.0)	22 (31.9)	17 (22.4)
Attitudes of faculty toward women dental students	5 (6.9)	7 (9.5)	15 (21.7)	19 (25.0)
Necessity to postpone having children	N/A	N/A	1 (1.4)	1 (1.3)
Conflict with partners over career decision	3 (4.2)	4 (5.4)	19 (27.5)	21 (27.6)
Discrimination due to class, status or ethnic group	19 (26.4)	26 (35.1)	34 (49.3)	33 (43.4)
Having a dual role as a wife/mother or husband/father and a dental student	N/A	N/A	1 (1.4)	1 (1.3)
Inconsistency of feedback regarding work among different instructors	16 (22.2)	46 (62.2)	60 (87.0)	64 (84.2)

Table 2 (Continued).

	<i>n</i> (%)			
	Second year	Third year	Fourth year	Fifth year
Fear of being unable to catch up if left behind	60 (83.3)	54 (73.0)	65 (94.2)	68 (89.5)
Need to find own patients for clinical work	N/A	N/A	64 (92.8)	71 (93.4)
Uncertainty as to whether or not will be able to take an examination (completion of schedule)	33 (45.8)	43 (58.1)	64 (92.8)	72 (94.7)
Conflict with clinical partner	N/A	N/A	29 (42.0)	34 (44.7)
Distance and time needed to travel to dental faculty	32 (44.4)	34 (45.9)	25 (36.2)	20 (26.3)
Lack of social contact with student of other faculties	43 (59.7)	37 (50.0)	30 (43.5)	42 (55.3)
Non-supportive environment for extra curricular activities	45 (62.5)	34 (45.9)	33 (47.8)	40 (52.6)
Fear of sexually transmissible disease/AIDS/hepatitis B while working on patients	N/A	N/A	49 (71.0)	43 (56.6)
Lack of conducive study environment at home/living quarters/hostel	34 (47.2)	30 (40.5)	34 (49.3)	24 (31.6)
Problem based learning (PBL) sessions	53 (73.6)	53 (71.6)	53 (76.8)	46 (60.5)
Difficulty to get suitable patients	N/A	N/A	63 (91.3)	68 (89.5)

N/A, not applicable

RESULTS

A 100% response rate was obtained with the questionnaire. This study was carried out at the beginning of the academic year among second to fifth year students and it discussed experiences of the preceding academic year. Table 1 shows the demographics of the study population. Female students greatly outnumbered male students during all years. There were more ethnic Malay students than other ethnic groups for all years except among second year students where the number of Chinese students was slightly greater.

When responses were divided into either stressful or not stressful, the prevalence of stress was 100% among students in all years of study. Table 2 shows the stressors among students. Most second year students felt stressed about academic

items. Examinations and grading was the most common (93.1%), followed by fear of failing the course or year (91.7%) and fear of being unable to catch up if falling behind (83.3%). Respondents also complained about inadequate time for relaxation (75%) and problem based learning (PBL) sessions (73.6%). However, respondents were least worried about learning clinical procedures (1.4%).

Academic items was also the most quoted stressor among third year students. Besides examinations and grading (91.9%), fear of failure (85.1%), difficulty with class work (78.4%), amount of class work (73%) and completing the requirements to sit for the examination (73%) were the most common stressors.

Items related to patient management were the most common stressors among fourth year students. These included patients arriving late or not showing up

Table 3
Consequences of stress.

	<i>n</i> (%)			
	Second year	Third year	Fourth year	Fifth year
Fatigue/tiredness	68 (94.4)	71 (95.9)	68 (98.6)	71 (93.4)
Eye strain	54 (75.0)	53 (71.6)	45 (65.2)	51 (67.1)
Back pain	48 (66.7)	45 (60.8)	53 (76.8)	51 (67.1)
Headache	63 (87.5)	59 (79.7)	64 (92.8)	61 (80.3)
Sleep disturbance	61 (84.7)	58 (78.4)	60 (87.0)	62 (81.6)
Stomach disturbance	27 (37.5)	27 (36.5)	30 (43.5)	35 (46.1)
Flu/common cold	30 (41.7)	29 (39.2)	35 (50.7)	30 (39.5)
Oral ulcers	24 (33.3)	31 (41.9)	29 (42.0)	36 (47.4)
Mood alteration	68 (94.4)	72 (97.3)	67 (97.1)	72 (94.7)
Affect performance	63 (87.5)	70 (94.6)	59 (85.5)	64 (84.2)

for appointments (95.7%) and needing to find one's own patients (92.8%). Fear of failing the course or year (95.7%), fear of being unable to catch up if falling behind (94.2%) and completion of clinical and examination requirements (92.8%) also ranked among the leading stressors.

Patient management problems were the most common stressors among fifth year students. These included patients arriving late or not showing up for appointments (94.7%), needing to find one's own patients (93.4%) and difficulty finding suitable patients (89.5%). Completion of schedule (94.7%), examination requirements (89.5%), fear of being unable to catch up if falling behind (89.5%) and fear of failing a course or year (89.5%) were also of primary concern.

Students in all years rated social and gender problems as the least stressful. These included being forced to postpone marriage or commitments, conflicts with partners over career decisions and discrimination against female dental students.

The consequences of stress among students are shown in Table 3. The two most frequently mentioned consequences of stress during all years (not in order of frequency) were fatigue/tiredness (93.4% to 98.6%) and mood alteration (94.4% to 97.3%). Other frequently mentioned consequences were effect on performance (84.2% to 94.6%), headaches (79.7% to 92.8%) and sleep disturbance (78.4% to 87%). The least mentioned consequences of stress included stomach disturbances (36.5% to 46.1%), experiencing flu/common cold (39.2% to 50.7%) and development of oral ulcers (33.3% to 47.4%).

Table 4 shows what students did to relieve stress. Talking to friends was a leading stress reduction technique for students during all academic years (88.2% to 94.2%). Sleeping (74.3% to 87.0%) and talking to family members (68.9% to 80.6%) were also popular stress relievers for all academic years. Music was a popular remedy for stress reduction in second, fourth and fifth year students (78.9% to 86.1%). Watching movies was one of the most fre-

Table 4
Methods of stress reduction among dental students.

	n (%)			
	Second year	Third year	Fourth year	Fifth year
Read magazines or books	43 (59.7)	35 (47.3)	35 (50.7)	45 (59.2)
Praying/spiritual activity	45 (62.5)	53 (71.6)	53 (76.8)	51 (67.1)
Physical activity	39 (54.2)	50 (67.6)	32 (46.4)	43 (56.6)
Meditation	8 (11.1)	5 (6.8)	12 (17.4)	2 (2.6)
Listening to music/playing a musical instrument	62 (86.1)	57 (77.0)	57 (82.6)	60 (78.9)
Shopping/window shopping	41 (56.9)	43 (58.1)	33 (47.8)	46 (60.5)
Watching movies at home or at the cinema	48 (66.7)	51 (68.9)	48 (69.6)	59 (77.6)
Smoking cigarettes	1 (1.4)	3 (4.1)	1 (1.4)	5 (6.6)
Drinking alcohol	0 (0.0)	1 (1.4)	2 (2.9)	1 (1.3)
Sleeping	61 (84.7)	55 (74.3)	60 (87.0)	60 (78.9)
Spouse/girlfriend/boyfriend	21 (29.2)	25 (33.8)	30 (43.5)	24 (31.6)
Friends	65 (90.3)	69 (93.2)	65 (94.2)	67 (88.2)
Family	58 (80.6)	51 (68.9)	51 (73.9)	59 (77.6)
Lecturers/mentors/academic advisors	9 (12.5)	5 (6.8)	11 (15.9)	13 (17.1)
Professional help: doctor, psychiatrist, counselor	0 (0.0)	1 (1.4)	1 (1.4)	2 (2.6)
Other	5 (6.9)	4 (5.4)	2 (2.9)	4 (5.3)

quently mentioned stress relievers among fifth years students (77.6%). Most third and fourth year students (71.6% to 76.8%) stated praying or performing spiritual activities were important stress relievers.

A small percentage of second through fifth year students smoked cigarettes. The percentage of students who smoked was highest among fifth year students (6.6%), followed by third year students (4.1%). Only 1.4% of second and fourth year students were smokers.

The percentage of students who drank alcohol to relieve stress was also very small (0% to 2.9%). Similarly, a small percentage of students sought professional help to manage stress (fourth year=1.4% and fifth year=2.6%).

DISCUSSION

The prevalence of stress was 100%

for all years of study. The causes of stress varied by year of study with some overlap. The preclinical students (second and third year students) stated examinations, grades and fear of failing a course or year were the greatest causes of stress. This may be because the subjects studied during the preclinical years were basic medical and dental sciences which require a lot of study (Kumar *et al*, 2009). Second year students also complained about a lack of time for relaxation. Second year students who just enter university were still adjusting to the new environment of dental school which focuses on academics and performance, resulting in less time available for other activities (Hendricks *et al*, 1994). High levels of stress among second year students may be associated with frustration over their expectation of the prestige of being a dentist, without realizing the challenges along the educa-

tional pathway. They may have had little preparation for the stresses of being in dental school, thus predisposing them to increased stress.

Problem based learning (PBL) sessions were a common stressors among preclinical dental students. At the beginning students were unfamiliar with the format and style of PBL. Students might have felt incapable of expressing their opinion due to lack of experience with presentations, inadequate academic knowledge, or poor proficiency in English, the medium of communication during the PBL sessions (Heath and Macfarlane, 1999; Naidu *et al*, 2002). Asian dental students in Australian universities have difficulty in coping with PBL sessions. This may be due to the fact that students from Asian cultures are more strongly motivated by social approval than Australian students, resulting in unwillingness to argue over contentious issues (Sanders and Lushington, 2002).

Third year students also expressed concern over the difficulty and amount of class work. This is the year students are introduced to clinical procedures in the preclinical laboratory. They may face difficulties in learning clinical procedures both theoretically and practically (Newton *et al*, 1994; Bhole *et al*, 1995). The large quantity of difficult material students are required to master may cause them to feel inadequate for the task, which in turn results in the students becoming fearful about being able to complete their schedule and examination requirements on time.

Items related to patient management were the most mentioned stressors for clinical students (fourth and fifth year students), which includes patients arriving late or not coming to appointments, making it difficult for the students to get

suitable patients. Comparing fourth and fifth year students, problems with patient management were a greater cause of stress among fourth year students than fifth year students. The spike in stress levels among fourth year students points to the stress the students face when entering the clinical setting (Naidu *et al*, 2002; Kumar *et al*, 2008). Students may find difficulty in finding their own patients and applying their clinical skills to treating these patients at an early stage (Sugiura *et al*, 2005; Muirhead and Locker, 2007) while coping with the demands of the academic course load, especially those related to medical subjects. There are clinical requirements for students to fulfill before being allowed to sit for examination. Dental schools put a heavy emphasis on clinical sciences and focus on producing graduates with competent clinical skills (Divaris *et al*, 2008). Some students fear they will not be able to catch up if they fall behind or failing a course or the year.

The most frequently mentioned consequences of stress in all classes of students were fatigue/tiredness, mood alteration, effect on performance, headache and sleep disturbance. Talking to friends was the leading stress reduction technique for students in all academic years. A study by Muirhead and Locker (2008) found students who received more social support tended to have less stress; such social support can come from teachers, parents or other students. Sugiura *et al* (2005) concluded the level of stress was lower among students who engaged in regular exercise, which allowed them to develop good human relationships. Music and movies were also popular remedies for stress. Music and movies are forms of entertainment which are believed to nourish and soothe the mind, thus enabling students to relax. A study done by White

(1992) suggested listening to relaxing music helped to reduce heart rates, respiratory rates, and anxiety scores. Praying or performing spiritual activities was also a popular stress reduction technique among students, since it provides calmness and hope for a better life (Bormann *et al*, 2005).

Malaysian students wishing to study dentistry should be exposed to the nature of the profession and the study environment prior to applying to this program. This can be done by allowing potential dental students to follow along at a government dental clinic or hospital. We also recommend an entrance interview to evaluate the candidate's interest and suitability for the course.

Dental schools should collaborate with educational experts in designing and developing a curriculum structure which is more student-orientated, aimed at enhancing the students' psychological well-being whilst maintaining a focus on academic and clinical performance and producing graduates with a positive professional attitude.

The educational process for dental students at the University of Malaya has a number of features that are stressful. High levels of stress can result in a variety of physical and behavioral consequences. By identifying stressors affecting students, necessary modifications can be made to improve the quality of life of dental students. Although stressful events cannot be eliminated, appropriate measures may be undertaken to alter the students' maladaptive perceptions and reactions to those events.

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