

Perceived stressors of oral hygiene students in the dental environment

N A Gordon,¹ DipOH, BA, MPH, Dip Adult Education; C A Rayner,¹ DipOH, BA Hons, MA; V J Wilson,² BChD, MChD; K Crombie,³ Dip Diagnostic Radiography, HDE, MSc Dent; A B Shaikh,⁴ BChD, MSc Dent, MChD; S Yasin-Harnekar,⁵ BChD, MSc Dent, PDD

¹ Department of Oral Hygiene, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa

² Department of Restorative Dentistry, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa

³ Department of Diagnostics and Radiology, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa

⁴ Department of Orthodontics, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa

⁵ Department of Paediatric Dentistry, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa

Corresponding author: C A Rayner (crayner@uwc.ac.za)

Background. University students are exposed to a multitude of stressors that may impact on their performance. The nature of health sciences education generally involves early engagement with patients and communities, which may add to the stressors inherent to university life. There is sparse information on stressors in the oral hygiene educational environment.

Objective. To determine perceived stressors and the level of burnout among oral hygiene students at the University of the Western Cape, Cape Town, South Africa.

Method. A descriptive, cross-sectional study design was used. The study sample included all students in the Bachelor of Oral Health (BOH) degree during 2012 ($N=89$). A self-administered questionnaire was used to gather data. Three parameters were measured, i.e. (i) demographic characteristics; (ii) perceived sources of stress, using a modified Dental Environment Stress (DES) questionnaire; and (iii) burnout, using the Maslach Burnout Inventory (MBI).

Results. Respondents were mostly female (74%) and primarily in the 18 - 25-year age group (92%). First- and 2nd-year students identified fear of failing and study load as major stressors. Stressors related to a lack of basic needs were identified as major stressors by 25% of 1st-year students. Third-year students identified clinical quotas, supervision and patients being late as major stressors. MBI scores indicated that students were not at risk for burnout; however, most students (66.2%) scored high on emotional exhaustion (EE).

Conclusion. Oral hygiene students identified stressors in their learning environment. There was a progressive increase in EE across academic years. The results suggest that interventions should be tailored for specific academic year groups.

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Stress is part of daily life and may be the stimulus for individual achievement. Therefore, stress can serve as a motivational factor for students to perform at their peak or reduce their level of effectiveness.^[1] Individuals experience stress to a greater or lesser degree, depending on their perception of the demands in their environment and the resources to cope with these demands.^[2]

University entry for students is a transitional period, as they are exposed to a multitude of changes in their personal, social and academic environment. Conditions and events inherent to university life induce experiences of stress, which may lead to difficulty in adjusting to this new environment.^[3] The health sciences educational milieu is unique, as students are exposed to further stressors such as early engagement with patients and communities. Stress among students in various disciplines in the health sciences is well documented.^[1,4-21] However, the literature on stressors among students and qualified dental hygienists is sparse.^[7,14,20-22]

Sources of environmental stress among dental students have been identified and quantified by means of the Dental Environment Stress (DES) questionnaire.^[4,5] Stressors identified include the learning environment, fear of failure, heavy workload, difficulty in dealing with patients, performing non-reversible procedures in a confined space, difficulty in dealing with transitions in curricula and difficult relationships with academic staff. Gorter *et al.*^[11] suggested that stress among dental students has been

reported at length and that it would currently be more useful to focus on interventions to address this concern.

Long-term exposure to stress in the learning and working environment may result in burnout,^[23] also referred to as a syndrome found among professionals doing 'service work'.^[24] Burnout includes the domains of emotional exhaustion (EE), becoming emotionally exhausted; depersonalisation (DP), the development of a negative, cynical attitude to patients; and a sense of diminished personal accomplishment (PA), evaluating oneself and one's own accomplishments negatively. Roberts and Ellingson^[20] reported that signs and symptoms of burnout include 'emotional, cognitive, behavioural and physical aspects'. These may be seen as loss of humour, a persistent sense of failure, anger, resentment and bitterness, postponement of contact with patients, constant feeling of tiredness, increased use of sick leave, rigid thinking, and difficulty concentrating.^[25] Although burnout has not been reported as being prevalent, EE, the key dimension of burnout, has been reported among students and professionals in the dental field.^[7,11,14,15,23,26]

There are no published reports on stress among South African (SA) oral hygiene students. As qualifications in both oral hygiene and dentistry are offered at the Faculty of Dentistry, University of the Western Cape (UWC), Cape Town, SA, it would be premature to develop student interventions without identifying the stressors and their effect.

The objective of this study was to determine perceived stressors and the level of burnout among oral hygiene students at UWC.

Methods

Study design

A descriptive, cross-sectional study design was used.

Study population

All students registered for the 3-year Bachelor of Oral Health (BOH) programme during 2012 were included ($N=89$).

Instrument and data collection

Data were collected by means of a self-administered questionnaire. The following three parameters were measured: (i) demographic characteristics; (ii) perceived sources of stress, using a modified DES questionnaire; and (iii) burnout, using the Maslach Burnout Inventory (MBI). The DES^[4] and MBI^[24] questionnaires are validated instruments. Demographic characteristics included home language as a proxy of ethnicity, in view of the 11 official languages in SA.

The DES consisted of 79 statements categorised into the following areas of study: study environment ($n=27$), theoretical aspects ($n=14$), preclinical aspects ($n=13$), and clinical aspects ($n=25$). Students were asked to respond to each statement by indicating whether it posed 'no problem', 'a small problem' or 'a huge problem' that might interfere with their studies. The following statements were added to suit the local context: discrimination due to race, nationality, gender or social class; transport to the university; accommodation; safety; and having enough food to eat.

The MBI consisted of 22 statements. Each statement was scored on a 7-point Likert scale ranging from 0 ('never' experienced) to 6 (experienced 'every day'). The MBI was divided into three subscales, i.e. EE, PA and DP. Statements in the MBI were adapted to include 'other students or people'. This was in view of the teaching methodologies that encompass engagement with students and communities throughout the programme.

The questionnaire was piloted with 10 students to assure validity, and modified accordingly. It was distributed to students for completion in their classrooms. Completed questionnaires were submitted to the researchers. The study was conducted at the end of the first semester.

Data analysis

Data were entered and analysed using descriptive statistics (IBM SPSS Statistics for Windows, Version 21.0, USA: IBM Corp.). Frequency distributions were used to identify stressors posing a 'huge problem' to students. The MBI manual^[24] was used to categorise the student groups into high, average and low risk for burnout. Burnout is indicated in high scores of EE (≥ 27) and DP (≥ 10) and low scores of PA (≥ 40) in the Human Services Survey (MBI HSS).^[24]

Ethical considerations

Ethical approval was obtained from the Faculty of Dentistry and University Research and Ethics committees, UWC. Prior to distributing the questionnaires, students were informed verbally and in writing of the purpose of the study. Informed consent was obtained.

Results

Demographics

The response rate was 85%. Respondents were mostly female (74%) and primarily in the 18 - 25-year age group (92%). Six of the 11 official languages

were reported as home languages, with 38% having English, the medium of education at the university, as their home language.

More than half (58%) resided in the Western Cape – the province where UWC is located; 76% had attended public schools and 24% private schools; 47% lived with families and the remainder stayed in university residences (30%) or private residences (17%).

Student response to the DES statements

Table 1 illustrates the top five stressors reported as a 'huge problem' for each category of the DES. The 'study environment' scored lowest overall of the four categories. Only 3rd-year students completed the clinical category and the majority experienced this as a 'huge problem'.

Table 2 illustrates the top five stressors by year group, indicating that stressors vary across the academic years. First- and 2nd-year students identified the theoretical aspect of their studies as most stressful, whereas the 3rd-year group reported the clinical category as most stressful.

Table 1. The top five perceived stressors in each category of the DES

Perceived stressors	Responses to a 'huge problem', %
Study environment	
1. Fear of being unemployed in future	48
2. Lack of time for relaxation	37
3. Neglect of personal life	36
4. Treated as being immature	36
5. Lack of confidence to be a successful hygienist	34
Theoretical problems	
1. Heavy study load	65
2. Fear of failing a module or year	64
3. Overloaded feeling due to the large number of modules in the programme	61
4. Having a lecture or clinic before a scheduled assessment	52
5. Lack of self-motivation to study	36
Preclinical problems (BOH II and III)	
1. Fear of making mistakes	61
2. Lack of time to practise preclinical procedures	59
3. Limited co-operation from laboratory technicians/staff	54
4. Meeting preclinical requirements	51
5. Number of supervisors in relation to students; inconsistency between supervisors	46
Clinical problems (BOH III only)	
1. Number of assigned quotas	95
2. Number of clinical supervisors in relation to number of students	74
3. Fear of being criticised	74
4. Patients being late/missing appointment	74
5. Fear of being unable to catch up with clinical requirements	74

Table 2. Top five perceived stressors of the DES per year group

Study year	Potential stressor	Frequency, %
BOH I	Fear of failing a module	61
	Overloaded feeling due to large number of modules	55
	Heavy study load	52
	Fear of being unemployed in the future	44
	Having financial responsibilities	38
BOH II	Heavy study load	91
	Overloaded feeling due to large number of modules	82
	Fear of failing a module or year	77
	Having a lecture before an assessment	68
	Fear of making mistakes	66
BOH III	Number of assigned clinical quotas	95
	Number of clinical supervisors in relation to students	74
	Fear of being criticised by supervisors	74
	Patients being late/missing appointments	74
	Fear of being unable to catch up with clinical requirements	74

Although not in the top five stressors, the statements added to the DES questionnaire to suit the local context indicated the following: 1st-year students reported transport (29%) and safety (27%) to and from the university, accommodation (29%), not being able to study in their living environment (24%) and not having enough to eat (24%) as a 'huge problem'. Discrimination due to race, nationality, gender or social class was reported as a 'huge problem' by 2nd-year (32%) and 3rd-year (37%) students.

Student response to the MBI

Table 3 shows overall means and standard deviations for EE, PA and DP. The mean and standard deviations for individual statements were ranked in descending order. Statements referring to 'self' were reportedly experienced more frequently in EE ('I feel used up at the end of my day at university') and DP ('I worry that my studies are hardening me emotionally') subscales.

Table 4 shows the categorisation of year groups according to their risk for burnout. The means and standard deviations of the MBI score for each subscale and the percentage of students in the respective year group are indicated. Most (66.2%) students scored high on EE, the key dimension for burnout. However, there were significant differences between the three year groups ($p=0.039$). In terms of burnout, 1st-year scores were seen as 'indicative of engagement with work', with 76.5% of the class scoring high on PA and 14.7% scoring average on EE. Second-year scores were high on EE and DP but average on PA, suggesting a risk for burnout. Third-year scores showed a reversal on the DP and PA scores; yet, EE remained high.

There was no significance in student demographics and EE, DP and PA. There was considerable variation in student experiences in the academic year groups, as seen by the percentage of students in each category.

Discussion

Demographic characteristics

Oral hygiene is a predominantly female-orientated profession globally.^[27] The gender distribution in this study is indicative of a changing student

Table 3. The Maslach Burnout Inventory

Statements describing student feelings	Mean (SD)
Emotional exhaustion	3.28 (1.75)
1. I feel used up/worn out at the end of a day at university	4.25 (1.53)
2. I feel emotionally drained/exhausted from my studies	4.24 (1.56)
3. I feel fatigued/tired when I get up in the morning and have to face another day at university	4.11 (1.63)
4. I feel frustrated by my studies	3.96 (1.65)
5. I feel burnt out from my studies	3.86 (1.65)
6. I feel that I am working too hard on my studies	3.01 (1.94)
7. I feel that I am at the end of my rope	2.32 (2.23)
8. Interacting with people all day is really a strain for me	1.96 (1.84)
9. Interacting with people directly puts too much stress on me	1.85 (1.74)
Depersonalisation	1.29 (1.58)
1. I worry that my studies are hardening me emotionally	2.53 (2.19)
2. I have become more callous/uncaring towards people since I started my studies	1.35 (1.82)
3. I feel that I treat some patients and other students as if they were impersonal objects	0.99 (1.35)
4. I don't really care what happens to some patients and other students	0.93 (1.44)
5. I feel that patients and other students blame me for some of their problems	0.65 (1.12)
Personal achievement	3.71 (1.66)
1. I feel I'm positively influencing other people's lives through my studies	4.18 (1.46)
2. I can easily create a relaxed atmosphere with my patients and other students	4.17 (1.63)
3. I can easily understand how my patients and other students feel about things	3.93 (1.67)
4. I feel exhilarated/inspired after working closely with my patients and other students	3.77 (1.68)
5. I deal very effectively with the problems of my patients and other students	3.70 (1.73)
6. I have accomplished many worthwhile things in my studies	3.68 (1.70)
7. In my studies, I deal with emotional problems very calmly	3.47 (1.74)
8. I feel very energetic	2.85 (1.70)

profile, with more males entering the profession. Further diversity of the study population is evident in the home language distribution and schooling background.

Bojuwoye^[3] reported that factors associated with financial difficulties, demands of the university environment and administrative processes were experienced as stressful by 1st-year university students. The current study suggests that 1st-year oral hygiene students may experience similar stressors. Reports of discrimination due to race, nationality or gender as a 'huge problem' are cause for concern and warrant further enquiry. The decision to include additional stressors to the DES was supported by the results, suggesting that a validated tool should be adapted to the local context to accommodate the social, cultural, economic and historical factors.

Table 4. Categorisation of MBI subscales by student year group, BOH

MBI subscales	Overall score	1st year	2nd year	3rd year
EE category	High	Average	High	High
EE score	29.04 (11.00)	25.79 (10.56)	33.09 (10.10)	30.16 (11.51)
% within group	66.2	14.7	81	63.2
DP category	Average	Low	High	Average
DP score	6.28 (5.24)	5.14 (4.97)	8.13 (4.86)	6.15 (5.77)
% within group	27.8	56.3	36.4	27.8
PA category	High	High	Average	High
PA score	28.89 (8.23)	29.02 (10.05)	26.44 (6.35)	31.47 (5.66)
% within group	76	76.5	13.6	63.2

Student response to the DES statements

There were a number of similarities between the top stressors identified in this study and those in the international literature.^[1,3-5,9,10,12,13,16,17] The study load, financial responsibilities, patients being late or missing appointments, and fear of being unable to catch up with clinical requirements were also noted among US dental hygiene students.^[20] At least two stressors in the top five of each component of the DES questionnaire posing a 'huge problem' in this study were also reported by Saudi Arabian dental students.^[4] These stressors were: lack of time for relaxation, being treated as immature, study load, feeling overloaded due to the large number of modules in the programme, lack of time to practise a preclinical procedure, number of supervisors in relation to students, inconsistency between supervisors, fear of being criticised, and patients being late or missing appointments (Table 1). Fijian dental students also reported the following stressors: feeling overloaded, fear of failure, criticism from clinical supervisors in the presence of patients, amount of assigned work, financial resources, and fear of unemployment after graduation.^[12] Of concern is that stressors identified by Garbee *et al.*^[11] in 1980 are still reported in the current literature and were also found in our study. Considering that the stressors were known, the authors questioned whether demands by departments were realistic and in the interest of students or whether departments competed for students' time.^[1] Stressors in the abovementioned studies could be categorised as student, staff, curriculum and/or educational system related. It may be expedient to use categories to guide universities to the type and level of intervention required for a less stressful dental environment.

Final-year oral hygiene students reported significantly higher ($p < 0.01$) stress levels than 1st-year students in three DES items, i.e. atmosphere created by clinical faculty, lack of input into decision-

making processes at the faculty and inconsistency of feedback between different instructors.^[20] A number of items identified were also noted by students in the current study. The authors questioned whether different experiences to stressors between class years were a result of changing demands of the programme or the unique personality of a class.^[20] The results of this study did not indicate a lack of input into decision-making processes at university as a 'huge problem', contrary to those reported by Roberts and Ellingson.^[20] A possible explanation is that UWC students have representation on faculty structures.

The manner in which stress is defined by the researcher informs the research approach and ultimately the answers gained. Hamill,^[28] in a qualitative study of student nurses' perceptions of stress, used Cox's interactionist model of stress. This model advocates that 'stress should not be seen as either a stimulus or a set of responses but rather a person's interpretation of the significance of a threatening event (the stimulus) and his or her resources to cope with it (the response)'. The DES and MBI questionnaires are quantitative instruments and may not be useful on their own. Future studies using these instruments should consider using a mixed-method approach, where qualitative aspects are included to allow for clarification and elaboration of student experiences.

Polychronopoulou and Divaris^[16] grouped stressors into seven categories to facilitate targeted interventions. These are self-efficacy beliefs, faculty and administration, workload, patient treatment, clinical training, performance pressure, and other. A substantial number of stressors identified by students in this study were in the 'self-efficacy beliefs' category, suggesting that further enquiry may be needed. In considering interventions, programmes may also have

limited control over stressors, such as patient co-operation,^[20] also identified as a stressor in this study. In such instances student stress can be reduced through training to develop interpersonal relationships with patients to foster understanding of the patient's life context and so improve co-operation.^[20]

Longitudinal studies have been suggested to better the understanding of stressors identified and to monitor at-risk students to inform appropriate interventions.^[11,12,21,23,29] This position is supported by the current study in view of stressors appearing to vary across the academic years.

Response to the MBI

The scores for each subscale of the MBI show a trend (Table 3), with statements referring to 'engagement with others' reported at a lower frequency on the EE and DP subscales and at a higher frequency on the PA subscales. This observation suggests that students may feel better about themselves when interacting with others, which supports the view that early engagement with patients is 'protective' in terms of stress and burnout.^[19] The opposite, where engagement with 'self' was reported at a higher frequency on EE and a lower frequency on PA, may indicate that students are challenged to cope in an academic environment. This finding may be consistent with the fact that a number of stressors noted in the DES were located in the 'self-efficacy beliefs' category.^[16]

The overall scores (Table 4) indicate that the group is not at risk of burnout. Although the mean scores for the programme may be favourable, considerable variations across the academic years were noted. The 1st-year class started off positively, showing 'engagement with work', the 2nd-year class appeared to be at risk of burnout, and at the 3rd-year level students appeared to be coping better. Of concern is that EE, the key dimension of burnout, increased progressively over the 3 academic years, with 62% of students falling into the 'high' category in the 3rd year. Dimensions of burnout were also found among qualified dental hygienists, with high levels of EE (14%) and DP (15%) and high levels of diminished PA (29%).^[14] Hinshaw *et al.*^[7] reported on stress and burnout experienced by dental hygiene educators. The authors highlighted institutional responsibility to reduce stress experienced as a result of educators' roles and responsibilities.

The results of this study cannot be generalised with regard to the broader oral hygiene student

population. However, the findings provide insight into the perceptions and experiences of UWC oral hygiene students.

Conclusion

This study found that stressors were identified within the oral hygiene student population. Stressors were generally similar to those reported by dental hygiene and dental students in the international literature. The fact that EE increased progressively across the 3 years indicated a need for intervention to improve the experiences of students in the dental learning environment.

The results suggest that interventions should address student stressors at a generic student level and at the level of the academic year.

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