Perceived Sources of Stress and Coping Strategies among Clinical Dental Students in Two Nigerian Universities

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Abstract

Background: Dentistry is perceived as a highly stressful profession and the dental school is often where the stress begins. Contemporary dental curricula require students to attain diverse proficiencies such as acquisition of theoretical knowledge, clinical competencies, skills acquisition and best practices which add up to stress. The objectives were to identify the sources of perceived stress, and the coping strategies adopted by clinical dental students in two Nigerian Universities.

Materials & Methods: A cross-sectional study involving all clinical students in the two oldest dental schools in Nigeria. A validated self administered, structured questionnaire comprising of the modified version of dental environmental stress survey(DES), the perceived stress scale and brief coping scale was used in collecting data from the participants.

Results: The potential sources of stress which were most frequently reported were the academic factors with volume of learning rated highest (84.2%) followed by demanding curriculum (72.6%) and frequent formative and summative assessment (51.7%). Inadequate infrastructures and erratic power supply were considered the most frequent(70.7%, 67.6%) sources of stress among the physical and environmental factors. Workload was also a major concern for stress with requirement to perform specified types and number of procedures rating the highest(76.9%) followed by time limits(69.8%). More (47.8%) females pray/ meditate while 29.6% cry as a means of relieving stress while the males play games which are all statistically significant (p= 0.003, 0.001 and 0.000 respectively).

Conclusion: The most frequently reported source of stress are the academic factors with volume of learning rated the highest followed by demanding curriculum and frequent examinations. The strategies adopted to cope with stress across the gender were praying and crying among females and playing games in males

Key words: perceived stress, sources, dental students, coping strategy

Introduction

Stress was defined by Hans Selye in the early 1930s as a big biopsychosocial model that refers to the consequence of failure of an organism to respond adequately to mental, emotional or physical demands whether actual or imagined[1]. The dental training curriculum demands that students master multiple domains of not only theory, but also clinical proficiencies and patient relation protocol[2] resulting in a strenuous lifestyle affecting one's physical and mental well-being. The stress phenomenon amongst dental students has been reported since 1970s[3]. Typical sources of stress for dental students include frequent examinations, examination phobia, reduced leisure time, and demanding curriculum[4,5]. Other sources include requirements to perform specified types and numbers of procedures, anxious patients,

time limits, complicated treatment, possible conflicts, staff and faculty, lack of self confidence, and the differences between the students expectations and reality[4,5]. Stress is influenced by one's personal system of beliefs and attitudes. Stress can either motivate the student to peak performance or reduce their effectiveness in different degrees[6]. Many studies have been conducted in different parts of the world including Nigeria[2,7,8,9]. Most of these studies have investigated the relationships between stress perception and several factors such as gender, marital status, living environment and academic year[3,8,9,10,11,12]. Students are exposed to different stress factors in different stages of dental education which may have negative impact not only on their physical and mental health [13]but also on their academic performance[14]. A study carried out in Chennai, India concluded that there was a corresponding increase in cases of depression with every increase in cases of stress among the students[15].

However, few studies on coping strategies adopted by students have been carried out to investigate different aspects of coping with stress by medical and dental students[3,8,16,17].

This study aimed at identifying the sources of stress, perception of stress and the concurrent coping strategies adopted by clinical students in two oldest Nigerian dental schools.

Methodology

This is a cross-sectional study conducted during the second semester of the academic year 2013/2014, among the undergraduate clinical dental students of the Faculty of Dentistry, Universities of Lagos and Ibadan which were established in 1964 and 1975 respectively. All the students who participated in the study were informed about the objectives of the study and ethical principles were strictly followed. Informed consent was obtained from those who participated in the study. The questionnaire collected information on the students' socio-demographic characteristics, perceived stress (using the Perceived stress scale[18], sources of stress (adapted and modified from Dental Environment Stress Survey[6]) and coping strategies (modified from Brief Coping Scale[19]).

Perceived Stress Scale (PSS) is the most widely used psychological tool for measuring the perception of stress[18]. It is a measure of the degree to which situations in one's life are appraised as stressful. The questions in the PSS asked about the feelings and thoughts of the students during the past month. The modified form of PSS used consisted of 10 items; 5 positive and 5 negative items. The negative element was intended to assess the lack of control and the negative effective reactions, while the positive element measured the degree of the ability to cope with the existing stressors. Each item was rated on a five point scale from 0 = Never, 1 = Almost Never, 2= Sometimes, 3 = Fairly often, 4=Very often covering the preceding month. The PSS score was computed by reversing the responses such that something which was 'never' done had the highest weight of 4(e.g. 0=4,1=3,2=2,3=1) to the positively stated items. The reverse-coded items were finally summated to the remaining scale items to achieve the assessment score. The score ranged from 0 to 50, with the higher scores indicating higher levels of perceived stress and the lower scores indicating lower level of stress.

Dental environmental stress (DES) Questionnaire: The research design was modified to accommodate both the clinical and didactic aspects of training which was accomplished by using a modified DES questionnaire containing 38 stress related items patterned after the original DES questionnaire by Garbee et al [6]. The 38 items were divided into seven groups of potential stressors: academic factors, physical and environmental factors, patient treatment and patient clinical factors, social factors, workload, performance pressure and job related factors upon graduation. Respondents evaluated the items based on their personal experience on whether it was stressful or not, and a third response when not applicable was also included.

Brief COPE Questionnaire: The coping strategies that were felt to be most appropriate to combat the potential stressors under evaluation were utilized using a 17 item modified from the original brief COPE questionnaire [19]. The responses anticipated were based on their kind of reaction to different stressful circumstances in the dental learning environment tabulated on a 4 point of 1=Not at all to 4 = Very much.

The participants parental occupation was categorized into executives, civil servants, semi-skilled and unskilled (a modified categorization by Famuyiwa and Olorunshola[20] based on the specific occupation written by the student. The social class of each participant was then calculated using the summation of the father's and mother's educational and occupational levels divided by four into 4 classes[21]. Class 1 is referred to as high socioeconomic class, Class 2 &3 as middle socioeconomic and class 4 as low socioeconomic class.

Data Analysis: The data were entered into Microsoft Excel and analyzed using SPSS version 19.0 statistical software. Descriptive statistics including frequency distributions, means and standard deviations were calculated for each problem and the variables. The student problem section of each questionnaire was scored to yield an average score across all the items. In addition, the problem score in each category was calculated for each respondent. The mean of the average problem score of all respondents was computed and referred to as overall problem score.

Results

A total of one hundred and forty nine students correctly filled questionnaires out of the one hundred and sixty one returned were analyzed. Sixty nine were males and eighty were females, with a male to female ratio of 1:1.6. Participants' age range was 18-37 years, with a mean of 23.7±2.6 years (SD). The final year students had the highest proportion of 41.6%. A high majority (92.6%) of the respondents lived in campus hostel, about 71% were Yoruba and 42.3% of respondents' parents belonged to the high socioeconomic class **(Table 1)**.

Table 1: Sociodemographic characteristics of respondents

Variables	N (%)
Gender	
Male	69 (46.3)
Female	80 (53.6)
Year of study	
Fourth	26 (17.4)
Fifth	61 (40.9)
Sixth	62 (41.6)
Marital status	
Single	132 (88.6)
Married	14 (9.4)
Cohabiting	3. (2.0)
Residential status	
Campus hostel	138 (92.6)
Outside campus	6 (4.0)
With family	5 (3.4)
Tribe	
Yoruba	106 (71.1)
Hausa	2 (1.3)
Ibo	26 (17.5)
Others	15 (10.1)
Socioeconomic status(SES)	
Low	7 (4.7)
Middle	55 (36.9)
High	63 (42.3)
No response	24 (16.1)

Mean age=23.7±2.6 years, age range 18-37years

The overall mean perceived stress score in the study population was 16.9±4.7. Among the male students, the mean score was highest in the sixth year respondents while among the females, the level of perceived stress was highest in the fourth year respondents which was statistically significant (p=0.03) **(Table 2)**.

Table 2: Mean Perceived stress according to Socio-demographic variables

Year of Study	Mean PSS	P Value
Male		
400	18.3	
500	18.3	0.08
600	20.3	
Female		
400	35.5	
500	20.6	0.03
600	22.3	
Location of Accommodation		
Campus Hostel	23.2	0.53
Outside Campus hostel (Family/ rented apartment)	23.4	
Marital Status		
Single	21.5	0.21
Married/ Cohabitation	22.3	

Overall mean PSS = 16.9±4.7

Considering location of accommodation, students living outside campus hostel (with family or rented apartments) had a slightly higher mean score compared with those staying on campus hostel, while the mean score of perceived stress was higher in the married students compared with their single counterparts.

The potential sources of stress which were identified most frequently reported by the respondents shared a common theme of academic factors with the volume of learning rated as the highest (84.2%) followed by demanding curriculum (72.6%) and, professional examinations (51.7%). Among the physical factors and environmental factors, inadequate infrastructures and power supply from the national grid with no alternate power supply (70.7%, & 66.4% respectively) were considered the most frequent sources of stress **(Table 3)**.

Workload is a major concern for stress with requirement to perform specified types and numbers of procedures rating the highest (76.9%) followed by time limits (71.2%). About two-thirds (65%) of respondents considered "not having enough procedures" as the most stressful among the patient treatment and training factors, while 61% considered reduced leisure time a source of stress **(Table 3)**.

Table 3: Respondents sources of stress

Sources of stressor	N	Yes (%)	No (%)
Academic factors			
Volume of learning	146	123(84.2)	23(15.8)
Frequent examinations	147	76(51.7)	71(48.2)
Lots of assignments	147	58(39.5)	89(60.5)
Demanding curriculum	146	106(72.6)	40(27.4)
Physical &Environmentalfactors			
Inadequate infrastructure	147	104(70.7)	43(29.3)
Inadequate hostel facilities	146	97(66.4)	49(33.6)
Lack of water supply	147	87(59.2)	60(40.8)
Power failure and no alternative power supply	148	100(67.6)	48(32.4)
Patient treatment and patient clinical factors			
Lack of personal hand instrument			
Patient late or not showing up	147	65(44.2)	82(55.8)
Inability to get suitable patients			
for exam	145	83(57.2)	62(42.8)
Examination phobia	147	53((36.7)	93(63.3)
Lack of self confidence	148	34(23.0)	114(77.0)
Not enough procedure done	149	97(65)	52(35)
Social factors			
Reduced leisure time	147	90(61.2)	57(38.8)
Interpersonal relationship	147	34(23.1)	113(76.9)
Language barrier	143	36(25.2)	107(74.8)
Financial problems	143	57(39.9)	86(60.1)
Workload			
Requirement to perform specified			
Types and number of procedures	147	113(76.9)	34(23.1)
Patient care responsibility	145	55(37.9)	90(23.1)
Anxious patients	146	61(41.8)	85(58.2)
Complicated treatments	143	51(35.7)	92(64.3)
Time limits	146	104(69.8)	42(28.8)
Performance Pressure			
My performance has been below expectation	145	49(33.8)	96(66.2)
My performance is just okay	144	77(53.5)	67(46.5)
I've failed 50% of my courses	143	11(7.7)	132(92.3)

Respondents adopted more than one strategy to cope with stress. The strategies most frequently adopted by females were keeping of feelings to self (54.7%), looking on the bright side of life (52.1%), concentrating on what had to be done next (50.7%) and double the efforts and work harder (50.4%) while amongst the males, convincing self that things are not as bad as they seem, concentrating on what to do next, doubling the efforts and work harder and looking on the bright side of life (49.4%, 45.6%, 45.4% and 45.1% respectively) were the most frequently adopted strategies **(Table 4a)**.

Table 4a: Strategies adopted by respondents in coping with stress across gender

			Male		Female	
.)	Strategies adopted	N	Yes N(%)	No N(%)	Yes N(%)	No N(%)
i)	Concentrate on what to do next	136	62(45.6)	2 (1.5)	69 (50.7) p=0.56, X^2=3.2	3 (2.2)
ii)	Talk to friends	143	60 (42.0)	7 (4.9)	67 (46.8) p=0.68,X^2=4.0	9 (6.3)
iii)	Talk to parents /relatives	142	58 (40.9)	8 (5.6)	62 (43.6) p=0.72, X^2=2.04	14 (9.9)
iv)	Sleeping	141	59(41.8)	8 (5.7)	66 (46.8) p=0.34, X^2=4.50	8 (5.7)
v)	Crying	142	50(35.2)	16(11.3)	42(29.6) p=0.003, X^2=8.2	34(23.9)
vi)	Spiritual—praying, meditation /yoga	138	59(42.8)	4(2.9)	66(47.8) p=0.001, X^2=8.7	9(6.5)
vii)	Watch television, movies	142	61(45.0)	6(4.2)	57((40.1) p=0.17, X^2=6.2	18(12.7)
viii)	Play games/sports	141	52(36.9)	14(9.9)	31(22.0) p=0.00, X^2=26.4	44(31.2)
ix)	Smoking alcohol / tobacco	142	7(4.9)	59(41.5)	7(4.9) p=0.66, X^2=3.3	69(48.6)
x)	Keep feeling to self	143	58(40.3)	9(6.3)	64(54.7) p=0.36, X^2=4.35	12(8.4)
xi)	Tried to look on bright side of life	142	64(45.1)	2(1.4)	74(52.1) p=0.19, X^2=6.13	2(1.4)
xii)	Spend more time alone	143	57(39.9)	10(7.0)	64(44.7) p=0.9, X^2=1.02	12(8.14)
xiii)	Refuse to think about it too much	141	57(40.8)	9(6.4)	65(46.1) p=0.87, X^2=8.11	10(7.1)
xiv)	Double the efforts and work harder	141	64(45.4)	2(1.4)	71(50.4) p=0.22, X^2=5.7	4(2.8)
xv)	Convince self things aren't as bad as it seem	142	63(49.4)	4(2.8)	67(47.2) p=0.32, X^2df=4.6	8(5.6)
xvi)	Avoid being with people	143	37(25.9)	30(21.0)	48(32.5) P=0.26, X^2=3.2	28(19.6)

Twenty nine point six percent of females and 11.3% of males cry as a means of coping with stress, which is statistically significant (p=0.003) while 47.8% and 42.8% of females and males respectively pray or meditate on spiritual materials to cope with stress which is also statistically significant (p=0.001). Majority (36.9%) of males play games compared with the female counterparts (22%) to cope with stress which is also statistically significant (p=0.000). An equal number (7; 4.9%) of male and female respondents use smoking, intake of alcohol and tobacco as the least strategy to cope with stress **(Table 4a)**.

Considering regression analysis of coping strategies across gender, crying and playing games were statistically significant. More females tend to cry when stressed while their male counterparts would rather get involved in playing games/sports as a means of coping when stressed **(Table 4b)**.

Table 4b: Regression analysis of coping strategies across gender adopted by respondents

Coping strategies	Standard coefficient Beta	t	p
i) Concentrate on what to do next	0.048	0.548	**0.585**
ii) Talk to friends	-0.166	1.456	**0.149**
iii) Talk to parents /relatives	0.029	-0.277	**0.149**
iv) Sleeping	0.051	0.531	**0.597**
v) Crying	0.383	4.11	**0.000**
vi) Spiritual—praying, meditation /yoga	0.010	0.104	**0.917**
vii) Watch television, movies	0.060	0.604	**0.520**
viii) Play games/sports	-0.341	-3.695	**0.000**
ix) Smoking alcohol/ tobacco	0.000	0.003	**0.998**
x) Keep feelings to self	-0.115	1.12	**0.265**
xi) Tried to look on bright side of life	0.063	0.576	**0.566**
xii) Spend more time alone	-0.043	-0.416	**0.678**
xiii) Refuse to think about it too much	0.016	0.162	**0.871**
xiv) Double the efforts and work harder	-0.016	0.160	**0.871**
xv) Convince self things aren't as bad as it seem	-0.136	-1.379	**0.171**
xvi) Avoid being with people	-0.022	-0.192	**0.848**

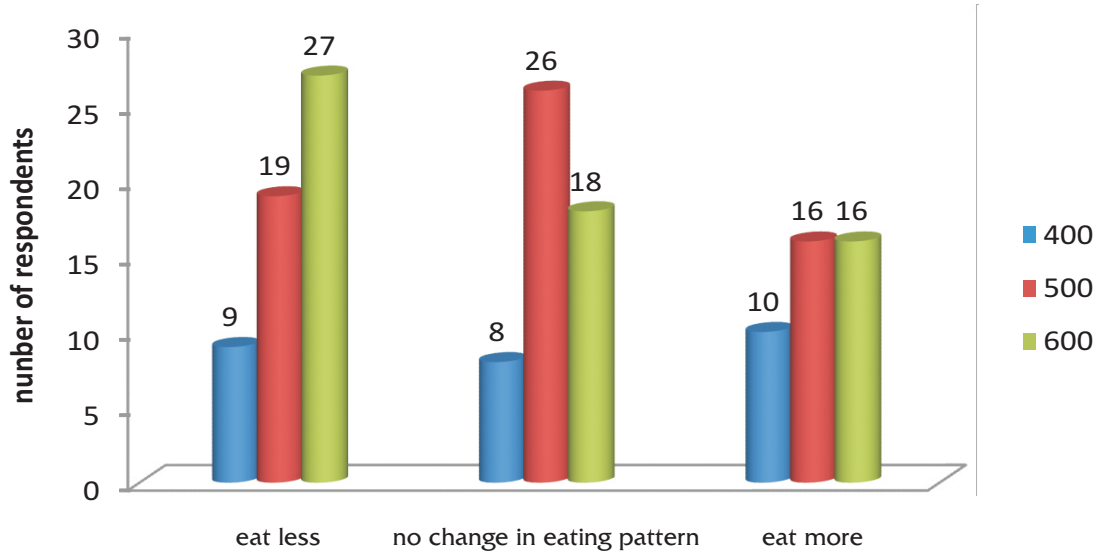
Out of the total respondents, a slightly higher number (62; 41.6%) of females consider stress as affecting their daily function than the males (56; 37.6%). However, about a third (49; 32.9%) of females and 41(27.5%) males do not think they need the help of a professional like a psychologist to cope with stress, while 23(15.4%) females and 25(16.8%) males believe the services of a professional will be beneficial to help cope with stress **(Table 5)**.

Table 5: Respondents response to effect of stress

Variable		Male	Female	Total
Does stress affect how you function daily?	No	11	13	24
	Yes	56	62	118
	No response	3	4	7
				X^2= 0.9, p=0.6
Do you think you need professional help when stressed?	No	41	49	90
	Yes	25	23	48
	No response	5	6	11
				X^2= 0.53, p=0.76

When considering the eating pattern, most (27/62) of the 600 level students eat less, a high majority (26/61) of the 500 level claimed there is no change in their eating pattern and just a little above one-third (10/26)of the 400 level students eat more. **(Figure 1)**

Fig 1: Respondents eating pattern when stressed



Discussion

The age range of 18-37 years with a mean of approximately 24 years is slightly higher than 18-25 with a mean of 22 years reported by a previous study by Al-Sowygh[8]. This might be due to the fact that applicants often write Unified Tertiary Matriculation Examination (UTME) and the qualifying examination organized by their university of choice (Post-UTME) several times before gaining admission into the University because admission to professional courses like dentistry is highly competitive.

The 400 level (first year clinical) students were the least in this study because the curriculum used in most dental schools is such that they were probably having lectures and postings with their medical counterparts and had not become fully integrated into the dental school for their clinical dental training. A high majority of the respondents are from the high socio-economic class which is in conformity with findings from a previous study[22].

The overall perceived stress score of 16.9±4.7 in this study is lower than 18.9 and 26.6 among private medical students in Malaysia [23] and students in professional courses in Navodaya[24] respectively . The gender linked difference in stress perception in dental school may be attributed to differing patterns of psychological morbidity, in which males are said to be simply less expressive of their concerns [13,14,15] and reporting less perceived stress. Other studies have confirmed the social construct of masculinity in which men are less expressive of stress and thus more vulnerable to health risk [10,11,25]. This study agrees with what has been previously reported by Nabila[23], Al-Saleh et al [26], Eisler[27], and Shah et al [28]. However, other studies found no difference in stress perception between males and females[24,29].

In this study, respondents staying outside campus hostel perceived stress a little more than those staying in at the hostel. This is similar to previous studies by Deshpande et al[17] in India, and Muirhead & Locker[30] in Canada. The possible reasons given were that students staying at home have family pressure, parental expectations which they have to fulfill, daily travel to College and possible lack of control over own expenses[16]. However, Humphiset al[31] found that living at home reduced the effects of educational stress on dental students.

Concerning marital status, Al-Saleh et al[26] in their study reported that single students reported lack of time for relaxation more significantly than married students, while the married reported neglect of personal life as a huge problem. This was attributed to the fact that married students already endure less personal time, due to their social status, and do not feel the effects as much as the single students. This however, is in contrast to the present study where married students perceived a higher stress than single students. This could be due to the fact that in addition to the school work, married students also have additional burden of caring for their family and thus aggravate the stress level.

The highest ranking stressors were those in the domain of academic factors and workload; a finding that concurs with other studies [8,25]. Clinical training includes fulfilling a specified number of patient procedures in a variety of disciplines, which also adds to overall stress. Wegman[32] in a study on posture of students found that, as students assume unnatural body positions, there was an increase in physical stress that adversely affected work performance. Lectures and examinations, coupled with the learning structure of the institution require students to work harder and longer. Studies have shown that dental students experience more stress than medical students which might be attributed to the psychomotor skills required in dentistry [25,33].

Though inadequate infrastructure is a factor predisposing to stress in this study which is uncommon in previous studies conducted in developed countries[16,28]. Inadequate hostel facilities and power failure are local problems that students often face within this environment which also add up to the stress.

Modalities to reduce perceived stress have been reported which include students-centred academic policies, non-qualitative evaluation of training, feedback and advisory systems for students and overall improvements of the learning environment[9]. Different mechanisms were adopted to cope with stress by individuals and in this study a high majority of males tend to get involved with sporting activities like playing football and basket ball while more of the females cry. In a study among Indian students[16], psychological support in form of talking to friends, parents, and relatives was the most preferred way of alleviating stress. It is also important to target prevention strategies at the students who have mild or moderate levels of psychological stress in order to prevent the development of more serious conditions. Early identification by using effective services will prevent possible future illnesses. Student mentored programmes and regular small group meetings to discuss and solve problems can be effective. Lopezet al[35] in their study identified peer mentoring as effective stress management measure. These interventions would help to improve capability of the students to cope with day to day stress, improve physical and mental health with more focused approach resulting in better academic performance. In the long term, the effectiveness of these measures is expected to help the students to be more effective in their professional life with better practical and clinical skills[16]. Other interventions as suggested by Stewart[36] and Divaris[37] included providing conducive learning environment and emotional support, providing counselling services for dental students, introducing stress management training over time which is proven to be effective in stress reduction and coping. Ultimately, better health professionals will be produced which will improve health care services in the community and in the country at large.

Conclusion

The most frequently reported source of stress are the academic factors with volume of learning rated the highest followed by demanding curriculum and frequent professional examinations. Different mechanisms were adopted by students in coping with stress but crying was more prevalent among the females while males were engaged in sporting activities.

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