



Perceived Sources of Stress and Coping Strategies in Dental Students and Interns

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ABSTRACT Dental students are exposed to different stress factors in different stages of dental education which, apart from affecting their physical and mental health also has an impact on academic performance. The present research attempts to identify the perceived sources of stress and coping strategies amongst dental students and interns. Questionnaire consisting demographic data, Modified Dental Environmental Stress Questionnaire and Tactics for Coping with Stress Inventory were administered to undergraduate dental students and interns (N= 320). Stress showed an upward trend from first to final year. Stress due to emotional factors was significantly higher than academic, social and physical factors. Females were more stressful than males. Students staying at home were more stressful than those staying in hostel. There is a need for intervention programs at the level of students, parents, teachers and administration to develop an overall positive institutional atmosphere for dental education and student welfare.

INTRODUCTION

Stress is defined as an organism's total response to environmental demands or pressures. It is described in Stedman's Medical Dictionary as, "physical or psychological stimulus that can produce mental tension or physiological reactions that may lead to illness."

The stress phenomenon amongst dental students has been reported since 1970s (Alzahem et al. 2011). Although most of these studies were cross-sectional in design, they have shown significant increase of stress amongst dental students in relation to different variables.

Many studies have been conducted in different dental and medical schools across the world and in India (Sanders and Lushington 1999; Acharya 2003; Shaikh et al. 2004; Sofola and Jeboda 2006; Alzahem et al. 2011; Al-Samadani 2013; Al-Sowygh 2013; Alzahem et al. 2013; Paudel et al. 2013; Marin et al. 2014).

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 (Al Omari 2005) but also on their academic performance (Westerman et al. 1993).

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 (Reddy et al. 2013).

Most of the previous studies about stress amongst dental students focused mainly on sources of stress and factors influencing the level of stress, such as gender and other demographic variables and have been conducted through surveys using the Dental Environment Stress (DES) Questionnaire (Alzahem et al. 2011; Al-Sowygh 2013; Alzahem et al. 2013; Paudel et al. 2013).

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 (Supe 1998; Shaikh 2004; Al-Sowygh 2013; Paudel et al. 2013; Saxena et al. 2013; Marin et al. 2014).

Apart from identifying the sources of stress, the present research includes identifying the coping strategies adopted by students. This study also addressed the response to stress and coping strategies for interns since researchers' review of literature showed scarcity of information in this direction.

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Objectives

This study was carried out with the following objectives:

1. To study and compare the stress amongst undergraduate dental students and interns at VSPM Dental College and Research Center, Nagpur, Maharashtra, India on the basis of year of study, gender, living arrangement, educational place, mother tongue, dentistry as 1st choice of admission and admission to dentistry as own/ Parents' choice
2. To ascertain and compare dental students' and interns' ways of coping stress.

MATERIALS AND METHODS

Approval by Institutional Ethics Committee for conducting the study was obtained. This study was carried out at VSPM Dental College and Research Center, Nagpur, Maharashtra, India, which is a private dental college affiliated to Maharashtra University of Health Sciences (MUHS) Nashik. The undergraduate course is of four years duration and one year rotatory internship. The clinical training starts from third year of the course.

Following questionnaires were suitably modified and peer reviewed for validation by 34 faculty members and administered to undergraduate dental students and interns (N= 320)

- Personal data and other relevant information
- Dental Environmental Stress Questionnaire (Garbee 1980)
- Tactics for Coping with Stress Inventory (Boyers 1999)

Dental Environmental Stress (DES) Questionnaire, specific for dental students was developed by Garbee which contains 38 stress factors with 5 response Likert scale (1= Not Stressful to 4= Very stressful and 5= Not Applicable) This was modified to make it culturally appropriate and to suit Indian context.

The 45 factors were grouped into 4 categories :

Academic factors: (15) Emotional factors (17) Physical factors (5), and Social factors (8).

Tactics for Coping with Stress Inventory has 22 common ways of coping with stressful events. The even number items have constructive tactics and the odd numbers has less constructive

tactics. The students had to mark those tactics which they were using.

Students' suggestions to reduce stress at institutional level were also invited. Pilot study (N=30) and focused group interviews were conducted.

The data of pilot study was analyzed using appropriate statistical methods. Based on the feedback and inputs obtained from the students, concerned medical faculty, subject experts and results of the pilot study, the questionnaires were modified and finalized.

Five groups were included in the study design: Group 1: 1st year, Group 2: 2nd year, Group 3: 3rd year, Group 4: Final Year and Group 5: Interns. The modified questionnaires were administered to all groups. (N= 320)

Informed consent was obtained from the students of all the batches participating in the study and their identity was kept confidential.

Statistical Analysis

The analysis comprised of assessing the stress impact with reference to some of the key demographic factors like 'year of study', 'Gender', 'Living Arrangement', 'Educational Place' and 'Dentistry as first choice for admission' and 'Admission to Dentistry student's own/ parents' choice'. For factors with two levels, the statistical significance of each stress component was evaluated using non-parametric Wilcoxon Rank Sum Test. For factors with more than two levels, the significance was evaluated using non-parametric Kruskal-Wallis Rank Sum Test. The association of stress inducing factors (Academic, Emotional, Social and Physical) was tested against stress level ($md > 3$, $md < 3$) using chi-square test. Z-test for proportions was used for testing the pair wise significance of difference in the proportion of stressed students according to stress inducing factors.

RESULTS AND DISCUSSION

Out of 434 students, 320 participated in the study with response rate of 74%. Age of the study population ranged from 17 to 25 years.

Year wise distribution of students was, 1st year : N=85, 2nd year: N=56, 3rd year: N=41, Final year: N=64 and Interns: N=74. Out of total 320 students, 38% (121) were stressed (Median ≥ 3)

Since the questionnaire does not seek information regarding acute stress (for example, Exam stress), it could be administered at any stage or time. Yet, care was taken to administer the questionnaires to students in the fifth month of the beginning of academic session.

This paper confirmed the findings of other papers that there is considerable stress amongst dental students (Sanders and Lushington 1999; Acharya 2003; Sofola and Jeboda 2006; Alzahem et al. 2011; Al Samadani 2013; Al-Sowygh 2013; Paudel et al. 2013; Alzahem et al. 2014).

Stress showed an upward trend from 1st to final year (Fig. 1) which was similar to some studies which concluded that stress is more for clinical years than pre-clinical years (Acharya 2003; Gorter et al. 2008; Kumar et al. 2009; Al-Sowygh 2013).

Variable 1: Year of Study

Final year was the most stressful group with 61% stressed students, followed by interns group (47%). Probable reasons for this could be, in final year, students have to appear for examination in more subjects than the previous years, and have time pressures to complete work quota in a specific period. Dental students in

Saudi Arabia were found to be more stressful in their final years due to uncertainty of their future. In fourth and fifth year students the reason of stress found was “Fear of not having possibility to pursue a post graduate dental education program” (Al-Sowygh 2013).

Stress in interns has not been addressed to in previous papers. In the present paper, interns were the second most stressful group. It could be because of professional future insecurity, increasing competition at the post graduate entry examination and of uncertainty of getting a good job.

The 1st year students were least stressful of all the groups (Stressed students (Median ≥ 3) 19%). Considering them as first timers to a professional course and challenges in facing new environment, new curriculum and a different examination pattern the researchers expected a contrary result. Alzahem (2013) studied effect of year of study on stress levels in male dental students in Saudi Arabia. In this study first year students reported lowest level of stress while third year students had highest level of stress.

In a study carried out at tertiary health care centre in Nepal, the students in all years of study had high prevalence of stress (Paudel et al. 2013).

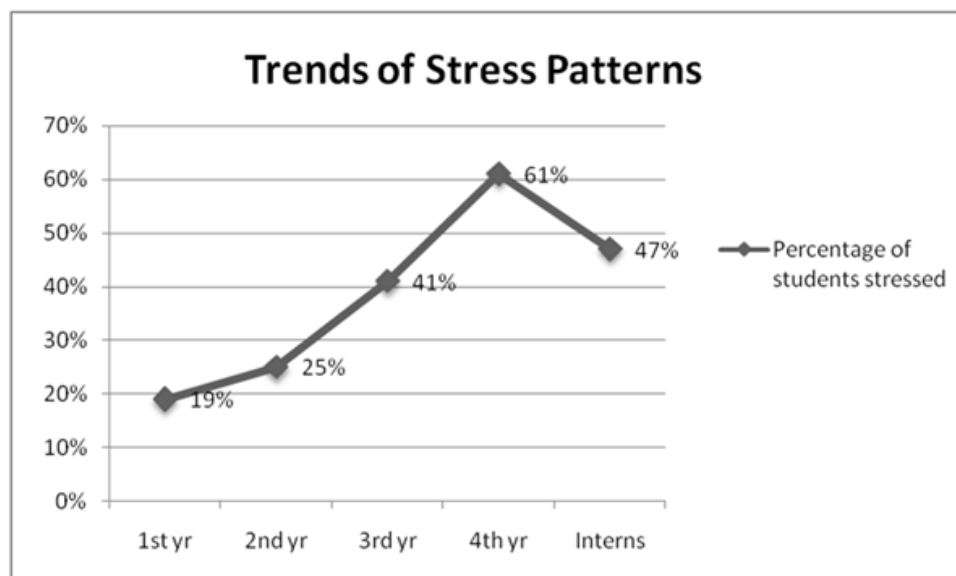


Fig 1. Trends of stress patterns

Dominant Stress Inducing Factors

Out of 45 factors studied, different year of study showed inclination towards one of them.

The dominant stress inducing factors for all the groups as shown in Table 1 were examination and grades, fear of failure which is similar to few other studies (Rajab 2001; Acharya 2003; Al Omari 2005; Morse and Dravo 2007; Kumar et al. 2009). Professional future insecurity, competition for post graduate seats were similar to some studies done in Indian dental institutions (Acharya 2003; Kumar et al. 2009). In addition Reddy et al. (2013) identified examinations and grading procedures as stress inducing factors.

Probable reason for this could be the increase in number of dental colleges in India with more than 20,000 dental graduates passing out every year, there is a tough competition for post graduate seats and also in profession. In India, post-graduation is a prerequisite to get a teaching assignment in dental institutes. Also, the cost of education has increased in the last few years more so in private institutions.

A study on clinical dental students in Jed-dah also reported exam grades and fear of failure as stress inducing factors (Al-Samadani 2013). In a study carried out at Nepal, insecurity regarding professional future, examinations and grading procedures were most stressful factors (Paudel 2013).

Association of Stress Inducing Factors

A comparison was made between stress inducing factors which were grouped as Academic, Emotional, Social, and Physical.

As shown in Table 2, it was found that emotional factors caused high stress. This was contrary to previous studies (Supe 1998; Alzahem et al. 2011; Kanyakumari et al. 2014). At this stage it could only be presumed that this could be because the students who take admission in a private dental college could be more emotionally dependent on both peer groups and family bonding. Probably extending this work to other similar dental colleges would confirm the researchers' findings.

Coping Strategies

Table 3 shows that seeking out friends for conversation and support, joking with friends and using humor, trying to focus on the things which can be controlled and accepting the things which can't be controlled were the dominant coping strategies adopted by students of most of the groups.

Most of the coping strategies adopted by students were constructive. There was no difference on the basis of variables like year of study, gender and living arrangement. Paudel et al. (2013) reported that listening to music was

Table 1: Dominant stress factors for all the groups

<i>Dominant stress factors for all groups</i>	<i>Mean value</i>				
	<i>1st yr</i>	<i>2nd yr</i>	<i>3rd yr</i>	<i>Final Yr</i>	<i>Interns</i>
Competition for PG seats	3.175	3.143	3.658	3.167	3.522
Exam and grades	2.973	3.111	3.1	3.483	2.889
Fear of failure	2.774	3.255	3.073	3.532	3.072
Professional future insecurity	2.568	2.815	2.692	2.81	3.11

(Of the 4 dominant stress factors, different year of study showed inclination towards one of them)

Table 2: Association of stress inducing factors

<i>Stress inducing factors (Percent stressed)</i>	<i>Academic</i>	<i>Emotional</i>	<i>Social Physical</i>
Academic (37.5%)	-	P=0.0541	P=0.2138
Emotional (45.3%)*	-	P=0.0000	P=0.0011
Social (16.2%)	-	-	P=0.0000
Physical (32.5%)	-	-	-

*Stress due to emotional factors was significantly higher
(The p-values indicate significant difference of proportion of stressed students corresponding to the factors)

Table 3: Dominating coping strategies (Tactics for Coping with Stress Inventory: Jim Boyers, Kaiser-Permanent Medical Center and Health Styles, Santa Clara, CA)

S. No.	Coping strategies	Group					Total Out of 320
		I	II	III	IV	V	
1.	I ignore my own needs and just work harder and faster.	30	21	17	21	34	123
2.	I seek out friends for conversation and support.*	59	35	28	44	47	213
3.	I eat more than usual.	20	9	6	8	15	58
4.	I engage in some type of physical exercise.	23	13	8	18	24	86
5.	I get irritable and take it out on those around me.	20	23	26	29	27	125
6.	I take a little time to relax, breathe and unwind.	52	27	19	27	33	158
7.	I smoke a cigarette or drink a caffeinated beverage.	4	1	0	5	7	17
8.	I confront my source of stress and work to change it.	33	17	10	20	25	105
9.	I withdraw emotionally and just go through the motions of my day.	27	19	15	20	15	96
10.	I change my outlook on the problem and put it in a better perspective.	45	25	15	19	26	130
11.	I sleep more than I really need to.	37	21	16	30	27	131
12.	I take some time off and get away from my working life.	37	25	24	26	22	134
13.	I go out shopping and buy something to make myself feel good.	35	32	20	25	32	144
14.	I joke with my friends and use humor to take the edge off.	55	38	29	37	49	208
15.	I drink more alcohol than usual.	0	1	0	1	1	3
16.	I get involved in a hobby or interests that help me unwind and enjoy myself.	34	16	33	25	162	
17.	I take medicine to help me relax or sleep better.	5	1	2	4	4	16
18.	I maintain a healthy diet.	46	22	19	20	27	134
19.	I just ignore the problem and hope it will go away.	33	24	17	20	23	117
20.	I pray, meditate or enhance my spiritual life.	42	34	19	35	42	172
21.	I worry about the problem and am afraid to do something about it.	29	29	14	27	21	120
22.	I try to focus on the things I can control and accept the things I can't.	54	35	28	41	44	202

* (Seeking out friends for conversation and support was one of the dominant coping strategies)

the leading stress reduction method during all academic years. Whereas another study finds active coping, proper planning, religion, and acceptance as some of the stress coping strategies used by most students (Al-Sowaygh 2013).

Most common "less" constructive coping strategies were, going out for shopping (45%), others included, getting irritable and taking it out on those around (39%), sleeping more than needed (40.93%), ignoring own needs and just working harder and faster (38.43%), just ignoring the problem and hoping it will go away (36.56%)

Very few students were found to adopt strategies like smoking (5.31%), taking medicines to sleep better (5%) and drinking alcohol (0.93%).

Variable 2: Gender

Gender distribution was 24% (74) males and 76% (232) females. Female students were more stressful (38% with Median ≥ 3) than male students (31% with Median ≥ 3).

Keeping in mind that the 2 group's distribution on the basis of gender was not equal, still

our study is indicative of females demonstrating more stress than males. This is similar to other studies (Heath et al. 1999; Reddy 2013; Kanyakumari et al. 2014) but contrary to some (Acharya 2003; Kumar et al. 2009). Al-Sowaygh (2013) reported that female students perceived significantly greater stress than males due to their psychological makeup and greater expressivity of thoughts and feelings. Higher stress in females may be due to way of reacting to stressful situations and sensitive nature.

Gender Wise Dominant Stress Factors

Table 4 shows gender wise dominant stress inducing factors which were fear of failure, fine imposed as punishment, competition for PG Seats, exam and grades, receiving criticism about work from staff.

Gender Wise Dominant Coping Strategies

Gender wise dominant coping strategies were joking with friends and using humor (Males: 69%, Females: 64%), seeking out friends for con-

versation and support (Males: 65%, Females: 67%), trying to focus on the things which can be controlled and accepting the things which can't be controlled (Males: 61%, Females: 63%).

Variable 3: Living Arrangement

According to living arrangement, distribution showed 59% (186) students staying at home while 41% (131) at hostel or rental room. Stress was more for students staying at home (41% with Median ≥ 3) as compared to those staying at hostel (34% with Median ≥ 3).

This was similar to a study conducted in a medical school in Pakistan (Shaikh et al. 2004) and a study carried out in Canada which reported that students living with their parents had higher stress scores than students living away from home (Muirhead and Locker 2007). Humphris et al. (2002) revealed that students living at home were less stressed than those living away. The possible reasons for this may be because students staying at home have family pressures, parental expectations which they have to fulfill, daily travel to college, lack of control over own expenses.

Stress Factors as per Living Arrangement

Table 5 shows that competition for postgraduate seat, fear of failure, exam and grades, pa-

tients late coming or not showing up for appointment and fine imposed as punishment were the common dominant stress inducing factor for students staying at home and hostel.

Coping Strategies as per Living Arrangement

Dominant coping strategies according to living arrangement were seeking out friends for conversation and support (Home and hostel group: 67%), joking with friends and using humor (Home group: 66%, Hostel Group: 65%), trying to focus on the things which can be controlled and accepting the things which can't be controlled (Home group: 61%, Hostel group: 66%).

Students staying at home were mostly adopting less constructive coping strategies while students staying at hostel were adopting more constructive stress coping methods.

Other Variables

No significant correlation was found between following variables and stress: Place of education (City/ Metro Vs. Small Town Rural), mother tongue (local Marathi Vs. others), dentistry as first choice of admission, dentistry as own Vs. parents' choice of admission.

First choice for admission has been reported as an important demographic variable and it has

Table 4: Gender wise dominant stress inducing factors

S. No.	Stress factor	Mean value for males	Mean value for females
1.	Fear of failure*	3.13	3.11
2.	Fine imposed as punishment	3.11	2.91
3.	Competition for PG seats*	3.05	3.9*
4.	Exam and grades	2.97	3.14
5.	Receiving criticism about work from staff	2.67	2.66

* Fear of failure and competition for PG seats here dominant stress inducing factors for males and females respectively.

Table 5: Stay wise dominant stress inducing factors

S. No.	Dominant stress factors	Mean value for students staying at home	Mean value for students staying at hostel
1.	Competition for PG seats	3.43*	3.2*
2.	Fear of failure	3.13	3.09
3.	Exam and grades	3.12	3.07
4.	Patients being late or not showing up for appointment	3.06	2.72
5.	Fine imposed as punishment	3.06	2.72

(Competition for postgraduate seat was the common dominant stress inducing factor for students staying at home and hostel)

been shown that there is more stress amongst those students who were admitted in dentistry-against their first choice (Rajab 2001; Acharya 2003; Sofola and Jedoba 2006). It was observed that those students who joined dentistry due to parental pressure showed higher stress (Kanyakumari et al. 2014). But researchers of the present paper found no such correlation.

Students' Suggestions

Some of the suggestions given by students for relieving stress were emotional support like teachers' encouragement and understanding, more interaction with teachers and relaxed atmosphere. Institutional measures like increase in number of patients, improved canteen, WiFi campus and recreational facilities like sports, gym in college campus and more extracurricular activities.

This paper identified the perceived sources of stress among dental students and interns, analyzed the trends of stress patterns, coping strategies and explored the possibility of using the results, to reduce the negative consequences of stress on students by efforts taken at the institutional level by future intervention programs at the level of students, parents, teachers and administration.

There is a need of implementing intervention programs at the level of students, teachers, parents and administrative authorities.

Studies suggest that for early detection of stress correct identification of signs and symptoms and proper intervention are required (Alzahem et al. 2011). Management of stress has been studied more amongst medical than dental students (Alzahem et al. 2011).

Few interventions as discussed in the literature were providing conducive learning environment and emotional support (Heath et al. 1999; Stewart 2006; Divaris 2008), providing counseling services for dental students (Heath et al. 1999; Divaris 2008), introducing stress management training over time which is proven to be effective in stress reduction and coping (Tisdelle 1984), revising criteria for admission by introducing aptitude test for student selection (Mozer et al. 1990; Pau 2007).

Brondani (2014) described a module with sessions tailored to the discussion of stress management and suicide prevention. The pedagogies included standardized patients, invited

guest lectures, in-class activities, video presentation, and self-reflections.

Alzahem et al. (2014) recommend a stress management program with easy application for students and dental schools, where students can achieve high outcomes with the least expenditure of time and effort.

Dominant coping strategies adopted by students suggest that emotional support system is a major stress relieving factor as perceived by students. 'Student Mentor Program' and regular small group meetings to discuss and solve problems can be effective. Lopez (2010) identified peer mentoring as effective stress management measure. As researchers found in this study that emotional stress inducing factors were predominate, a need to provide emotional support through these measures is justified.

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. This will also help to improve student teacher relationship and overall positive approach towards learning. In the long term, the effectiveness of these measures is expected to help the students to be more efficient in their professional life with better practical and clinical skills. Ultimately better health professionals will be produced which will improve the health care services in the community, region and country.

CONCLUSION

This study confirmed the findings of other studies that there is considerable stress in dental students. Stress showed an upward trend from first to final year. Stress level for final year students was highest amongst all the groups (61% with Median ≥ 3 .) Dominant stressors for all groups of students were exam and grades, competition for postgraduate seats, insecurity regarding professional future and fear of failure. The stress due to emotional factors was significantly higher than academic, social and physical factors ($p < 0.001$). Female students were more stressful (38% with Median ≥ 3) than male students (31% with Median ≥ 3). Stress was more for students staying at home (41% with Median ≥ 3) as compared to those staying at hostel (34% with Median ≥ 3).

There is a need for implementing intervention programs at the level of students, parents, teachers and administration to develop an overall positive institutional atmosphere for dental education and student welfare. And hence, it would not be premature to conclude that this study has a global relevance.

RECOMMENDATIONS FOR FURTHER RESEARCH

The impact and effectiveness of the intervention programs in reducing stress levels of dental students are recommendations for future research. Also longitudinal research could be helpful to investigate amount of stress during academic career.

LIMITATIONS OF THIS RESEARCH

The current research was limited to one private dental college in India, the results of which may not reflect the general trend in other national or regional institutions. This research does not investigate acute stress like exam stress. Bias cannot be ruled out because information was collected from self-administered questionnaires and the responses received were based on students' interpretation of the questions.

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