INTRODUCTION

Stress is body’s reaction to physical, mental, or emotional stimuli. Dental education is challenging and stressful experience, stress levels among dental graduates are higher than general population. Studies show multifactorial nature of stress that is associated with psychological and physical effects in different phases of dental education. The rapid increase in curricular content has steered attention of dental educationists for identifying and addressing the academic stress and stressors among their students. This is the key to enhance quality of learning environment. In addition, social factors such as accommodation or educational background with which students enter dental institution may also provoke stress.

Dental environment stress (DES) is usually reported to be caused by frequent exams, time limited course goals, clinical and laboratory assignments, patient handling, high performance expectations, financial status and insufficient relaxation time. Stress symptoms may include tension, anxiety, fear, depression, fatigue, headache, cynicism and others.

OBJECTIVE: Present study was conducted to assess the perceived academic sources of stress among undergraduate dental students and determine its association with gender, year of study, pre-university education and accommodation. This study was conducted in dental section, Islamabad Medical and Dental college, Islamabad from July to November 2016.

METHODOLOGY: BDS students were asked to rate their perceived stress on four point Likert scale of modified version of Dental Environment Stress (DES) questionnaire. Descriptive statistics were applied to find the mean scores and SD on all items. Using SPSS v.21, Kruskal Wallis test was used to compare stress levels among different undergraduate professional years and Mann-Whitney U test was applied to determine the association and stress sources and demographic variables.

RESULTS: A total of 172/200 participants responded (86%) to the survey. Overall stress in undergraduate dental students was in moderate range. Majority of students (93%) reported that syllabus load was either stressful or very stressful (3.53±0.64), 85% students reported lack of relaxation time as stressful or very stressful (3.42±0.86) and fear of failing was reported as stressful or very stressful by 82.5% (3.34±0.87). When stress scores of all classes were compared third year reported more mean stress scores than other years (2.50±0.50). Females were more stressed compared to males with mean score of (2.37±0.39), students living at home were more stressed than hosteilies (2.38±0.38) and those with GCE A-levels had higher stress (2.40±0.38) compared to HSC background students. Academic performance was the most stressful of the five stress domains (3.07±0.74).

CONCLUSION: Syllabus load followed by lack of time for relaxation and fear of failing were the most perceived sources of stress. Academic performance was the most stressful of the five stress domains and third year BDS was the most stressed class.

KEY WORDS: Dental Education; Dental Students; Psychological Stress, Stessor, Undergraduate.


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dizziness, insomnia, impaired immune system and tachycardia. When left unattended these may potentially transpire in burnout and suicide in some severe situations.

Stress in dental students had been identified using different stress scales, including, "Dental Environment Stress Scale" (DES), "Maslach Burnout Inventory" (MBI), and "Psychosocial Stress Inventory" (PSSI). Among these, DES is commonly utilized.

Many studies have identified stressing among dental undergraduates, however there is scarcity of literature exploring stress sources among Pakistani undergraduate dental students, and explore its association with the demographic variables. Therefore, the aim of the present study was to explore perceived stress sources, stress levels and their association with sociodemographic factors of gender, pre-university education system, and academic performance with reported reliability of 0.89 with Cronbach's Alpha (0.87). In this study, stress was considered mild if it had a mean score of 1.99, moderate with a score of 2-2.9 and 3 or more was considered severe.

For all classes, means with standard deviations were calculated jointly and separately for the 41 items in the questionnaire. Mean stress scores and their standard deviation were calculated for all demographic variables and the "pentagon of stressors" (five stress domains) consisting of personal aspects, educational workload, environment, clinical work, and patient associated factors, and academic achievement. Distribution of data was assessed with Shapiro-Wilk test which showed that it was not normally distributed.

Kruskal Wallis test was used to find association among the four BDS classes and their stressors on the four-point Likert scale. The ranking orders were analysed to determine the highest mean rank for study years, which was then related to the statistical significance. Dissimilarity in replies from the BDS classes were considered statistically significant. Significance in difference of perceived academic stressors with demographic variables and stressor domains was found with Mann-Whitney U test. The ranking orders were analysed to determine the highest mean rank for each demographic variable separately. A p-value of less than 0.05 was deemed statistically significant.

RESULTS

One hundred and seventy two out of two hundred students participated in the study giving a response rate of 86%. The students were divided into three age groups, first ranging from age 18 to 21 years, second from 21-23 years and third group of age 24 and above. Majority of the students 56% were in the second age group, with a mean age of 21±1.6 years. Socio-demographic details of participants are presented in Table 1. As there were no married participants, further comparisons were not done with marital status.

Mean scores of highest stressors for all students who reported these items as stressful or very stressful, in the
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Minimum stress was perceived with "language barrier" 6% (1.4±0.6), "Availability of qualified laboratory technicians" 16.7% (mean=1.73±0.88) and "Inadequate number of instructors/teachers in relation to student" 18% (1.7±0.95).

Table 3: Mean DES Scores and Level of Significance with Year of Study

Table 2: Comparison of mean of DES scores of each demographic variable within stress domains

Table 1: Sociodemographic characteristics of the study population

Table 3: Mean DES Scores and Level of Significance with Year of Study

<table>
<thead>
<tr>
<th>Domain</th>
<th>Demographics</th>
<th>Mean DES Score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Factors</td>
<td>Gender Male</td>
<td>2.00</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>2.10</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Intermediate HSC</td>
<td>2.26</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>Hostel</td>
<td>2.05</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Accommodation</td>
<td>2.09</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>Gender Male</td>
<td>2.11</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
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<td>2.18</td>
<td>0.52</td>
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<tr>
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<tr>
<td></td>
<td>Accommodation</td>
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</tr>
<tr>
<td></td>
<td>Workload</td>
<td>Gender Male</td>
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</tr>
<tr>
<td></td>
<td>Female</td>
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<td>Intermediate HSC</td>
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<td>0.57</td>
</tr>
<tr>
<td></td>
<td>Hostel</td>
<td>2.91</td>
<td>0.68</td>
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<tr>
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<tr>
<td></td>
<td>Clinical training and patients</td>
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<td>2.41</td>
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<tr>
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<td>Hostel</td>
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<td></td>
<td>Academic performance</td>
<td>Gender Male</td>
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<td>3.16</td>
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<td>1.00</td>
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<tr>
<td></td>
<td>Hostel</td>
<td>2.94</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Descent order were "Overloaded feeling due to syllabus load" 93% (3.53±0.64), followed by lack of relaxation time 85% (mean=3.53±0.64), "Fear of failing" 82.5% (3.34±0.87), "Clinical requirements" 81.3% (Mean=3.27±1.0), "late ending day" 75% (Mean=3.17, ±1.00) along with "examinations" 72.7% (Mean=3.13, ±0.98).
Mean scores for demographic variables revealed that females were more stressed (2.37±0.39) than males (2.25±0.356). Students with GCE A-level were slightly more stressed (2.40±0.38) than F.Sc. students (2.34±0.39) and those living at home with families were more stress (2.38±0.38) than those living in hostels (2.28±0.39).

Mann Whitney U test revealed following results for the socio-demographic variables under study. Female students were significantly more stressed from "clinical requirements (quota)" (p=0.001), "competition of grades" (p=0.01), "transitions from pre-clinical to clinical work" (p=0.01), "conducting procedures on patients with poor oral hygiene" (p=0.01), "fear of being unable to catch up if left behind" (p=0.03), "fear of not being able to join a postgraduate dental education program" (p=0.03), "insecurity concerning lack of employment positions" (p=0.03), "Responsibility of getting suitable patients" (p=0.03).

A comparison of educational background was done with DES, which revealed GCE A-level students were more stressed with "being treated as immature & irresponsible by faculty" (p=0.03) besides "lack of confidence to be a successful dental student" (p=0.04). However, HSC students felt more stress with "language barrier" (p=0.02) and in "getting relevant study material" (p=0.02). Comparison of accommodation revealed that students who live in their homes were significantly stressed in "insecurity related to professional future" (p=0.045), "insecurity of lack of employment" (p=0.004) along with "receiving criticism about work" (p=0.005). Students living in the hostels on the other hand reported "lack of home atmosphere in hostel" p<0.001 with statistically significant difference. Comparison of DES domains with demographic variables and item-wise DES mean scores which were calculated for the four BDS classes along with the results of Kruskal Wallis test are shown in Table-2 and Table-3, respectively.

**DISCUSSION**

This study evaluated various stressors perceived by undergraduate dental students and their association with demographic variables. Moderate levels of DES scores (2.35±0.38) were reported by students. Elani et al in a systematic review reported a similar pooled mean DES (2.34±0.23), whereas Poly et al. in a comparative study of dental and medical students reported similar mean DES (2.39±0.40) for dental and medical students (2.21±0.29).14,15

Three highest stress factors reported in this study were syllabus load (3.53±0.64), lack of relaxation time (3.42±0.86) and fear of failing (3.34±0.87). Tangade et al. reported fear of failing (3.07 ± 0.72), unemployment fear (2.73 ± 0.74), financial issues (2.71 ± 0.83), and lack of relaxation time (2.69 ± 0.95).16 Al-Sowygh et al reported assigned class work (3.52±0.79), late ending day (3.52±0.81) and Lack of time for relaxation (3.43±0.79) as most stressful factors.17 A local study reported, huge syllabus as the second most common stressor.18 Another study reported "late ending day" as major stressor for males, and final-year students.3 These results endorse the result of the present study, dental curriculum is inherently demanding, clinical work requirements and assigned academic load contribute to stress.15 Variation in highest perceived stressor in studies can be attributed to difference in daily working hours of many institutes and financial support from family for local students.

Present study identified that BDS classes reported significant differences in various stress items. "Late ending day", "syllabus load", "examination and quizzes" were more stressing for first year. These results are endorsed by a study which reported same stressors for their first- and second-year students, however "amount of assigned work" stressed their students more compared to examination and quizzes. "Lack of relaxation time" and "moving away from home" were main stressors for first year in another study.19 First year students of present study were more stressed about "insecurity concerning lack of employment", like a Malaysian study.20 Senior students have better knowledge of dentistry and information on various job opportunities in the market which could have reduced this stress in subsequent years.

Third year BDS had significantly high scores for stressors associated to clinical training, these results are in accordance with previous studies.4,20-22 A shift from preclinical to clinical settings and application of procedural skills on real patients is demanding for third year students. Previous studies showed a similar trend with increase in stress levels from first year to the final year with stress peaking in the 3rd year.3,16,23 Conversely a Turkish study reported that clinical years were less stressed contrasted to preclinical years.24 This could be due to syllabus load in addition to the atmosphere created by the preclinical staff, which may add to the overall stress for the students.

Socio-demographic aspects affect dental students. In this study female students were significantly more stressed, these results are in accordance with previous studies.20,25,26 This could be because females confess more to having stress or they may feel, and encounter added stress.27 Generally, males do not express their stress or cope with it. Living in a "patriarchal society" and fearing to fail their duties Pakistani men rarely admit depression or stress.15

In Pre-university education system comparison total mean scores for the students of GCE A-level was slightly more (2.40±0.38) as compared to High School Certificate
HSC counterparts (2.34±0.39). Effect of pre-university education on stress levels has scarcely been reported in literature. However, some studies reported comparison of having or not having a previous degree with stress levels.27,28 One study reported insignificant difference in academic success of medical students from different pre-university education systems. GCE A-level students give extra study time and hence tuition fee.29 They also go through substantial documentation for equivalence before admission, these reasons could result in greater stress for them.

Dental curriculum is essentially didactic, students with GCE A-level are trained in critical thinking and active involvement in learning. This could explain why A-Level students are significantly more stressed than their HSC counterparts on "being treated as immature by faculty" and "lack of confidence to be a successful student". Since A-level students were in minority in present study the results cannot be generalized to all A-level dental student population. Significantly higher stressors for HSC students were "language barrier" and "difficulty in getting study material". This could be because two languages are still used in F.Sc. examinations and students are dependent on didactic teaching strategies.

In this study the students who were living with families reported higher stress scores, these results are endorsed by one previous study.30 Conversely, other studies have reported that students living away from home were more stressed.16,31 Possible reason could be that more time and effort are required for commuting, there are added claims on student's time by their families and friends, or the reason could be the feeling of "academic isolation".28

Comparison in "pentagon of stressors" domains disclosed that major stress scores were reported in "academic performance", and "workload", "Academic performance" being the highest stress domain for final year, similar to results of previous studies.15,19,32 An Egyptian study reported academic pressures as second greatest stressful domain.33 Other studies reported it as either the stressful39 or incredibly stressful domain.4,20 First year students in present study perceived workload as the highest stressor, in contrast to another study which reported that the senior years were more stressed with workload.33 The clinical factors domain was third highest in present study, in contrast a West-Indian study found that this domain was most stressful.19 For clinical year students of this study the stress related to the "personal factors" was higher, this result is supported by another study done in Egypt but is opposed by another study which reported that all classes were highly stressed by "personal factors".34 Third year perceived "Educational environment" as most stressful domain, this result is endorsed by another study.19 Reason could be the shift to clinical situations, where students are not only assigned theoretical assignments, they also are required to work with teaching and support staff, and patients while practically performing on real patients.

Students require protected time to relax, identification of the stressors will help formulating strategies to prevent stress build up and its negative effects. Formal student support programs including counselling cells and mentor-mentee programs can contribute to this and ensure an environment which reduces stress and promotes student well-being. The transitional phase of preclinical to clinical, needs to be addressed to support students for better self and patient management.

Inclusion of only one dental college along with not exploring effect on stress due to student's personality traits were limitation of this study. Future studies need to be designed to conduct a comprehensive research involving multiple institutes to report more remarkable findings at national level. Student's individual personalities should be considered in future studies on annual performance along with effect of implementation of stress coping programs.

CONCLUSION

Syllabus load, followed by less relaxation time and fearing to fail were most stressful factors reported by the undergraduate dental students. More stress was reported by female students, those living at home and students with a background of A-levels compared to their counterparts. Academic performance is the most stressful of the five stress domains for students of all classes. Third-year BDS was the most stressed class. The study indicates that dentistry is stressful therefore dental students require training for stress coping. Recognition of stressors, awareness, student counselling, mentor-mentee programs need to be provided in institutes to help improve student wellbeing.

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CONFLICT OF INTEREST

None declared.

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