Comparison of Stress, burnout and its association among postgraduate orthodontic and undergraduate students in India

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Abstract

Aim and Objectives: Stress and burnout are the wave of the present decade and dentists and dental specialists are found repeatedly on top of the charts of the more stressed occupation; however, the prevalence among orthodontic postgraduates in India has not been well researched. The present study aimed to investigate the stress and burnout levels of postgraduate students of orthodontics in India. Materials and Methods: A descriptive, cross-sectional study was conducted to evaluate stress and burnout in postgraduate students of orthodontics in India. A stratified randomized sampling method, with stratification as North, East, West, South, and central population was employed. A questionnaire format formulated by the International Stress Management Association, including Maslach burnout inventory was filled by each of these individuals. Results: A total of 284 individuals showed significance for stress and personal accomplishment (PA) ($P < 0.05$) whereas statistically insignificant for genders. There is statistically significance for geographical distribution to depersonalization and PA. The Pearson’s correlation is positive for stress and components of burnout in postgraduates and is negative for undergraduates. Conclusion: This study was the first of its kind to explore stress, burnout, and its association among orthodontic postgraduate students and undergraduates in the country. There are significant levels of stress and burnout in both undergraduates and postgraduates. There is a statistically significant positive correlation to the components of burnout found in postgraduates. These findings may help orthodontic community in planning, management, and prevention of stress and burnout.

Keywords: Burn out, depersonalization, emotional exhaustion, Maslach burnout inventory, stress

Introduction

Most studies in orthodontic literature objective to provide the practitioner with improved understanding of orthodontics and its treatment plan. It is time to spotlight on the state of mind of the orthodontic postgraduates. Just how resilient is today’s generation of Orthodontists? Can they cope up with the stresses and strains of patient care or have they become emotionally exhausted depersonalized and burnt out.

Stress is defined as the biological reaction to any adverse internal or external stimulus, physical, mental or emotional which tends to disturb the organism’s homeostasis. Stress is considered as a two-edged sword that could either stimulate and motivate the students to peak performance or reduce the students to ineffectiveness. Stressors due to fear of parents were more significant in Western countries than in Eastern countries and to resources and dental material supply were more significant in the developing countries in Africa. Occupational stress among dentists has regularly been the individual of research in the last two decades. Burnout is a distinct psychological construct. It has a number of features that separate burnout from occupational stress. Burnout differs from stress in which it requires consistent pressures to be brought to bear on the individual. A state of emotional, physical, and mental tiredness as a result of work conditions. Maslach and Jackson stated burnout as a syndrome of emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). The three dimensions of the burnout are

Access this article online

Quick Response Code: www.ijds.in

DOI: 10.4103/IJDS.IJDS_127_17

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How to cite this article: Venkatesh Nettam, Mandava P, Sankar Singaraju G, Ganugapanta VR, Yelchuri H, Revathi Peddu. Comparison of Stress, burnout and its association among postgraduate orthodontic and undergraduate students in India. Indian J Dent Sci 2018;10:66-71.
not equivalent, but refer to three distinct aspects of the syndrome. EE refers to feelings of being depleted of one’s emotional resources, depersonalization refers to a negative, callous, or excessively detached response to the recipients of one’s services or care, while reduced PA refers to a decline in one’s feelings of competence and less successful achievement in one’s work.[7]

Occupational stress and burnout in students attending orthodontic specialty has not been studied thoroughly. A few studies describing stressful aspects of dentistry have reported a number of specialists responding to the survey, but none of these reports a separate analysis of the specialist’s responses. The stressors in orthodontic practice are similar to those in dentistry, but some stressors unique to the orthodontic profession do exist.[8]

Research on burnout among students always serves a scientific goal since it provides information on the prevalence of burnout and associated factors. However, research on burnout also serves another goal, namely, to provide information for prevention.[5] The purpose of the present study is to evaluate stress and burnout and its association among undergraduates and postgraduates. Hypothesis of this study was postgraduate students has more stress and burnout levels.

**Materials and Methods**

A descriptive, cross-sectional, and comparative study was conducted to evaluate stress and burnout in undergraduate and orthodontic postgraduate students of India.

A pilot study was conducted on a sample of postgraduate students of orthodontics and dentofacial orthopedics who have attended the lingual orthodontic course (January 22, 23–2013, Mangalore, India.) to check the feasibility of the methodology planned. Pilot testing assessments were utilized to validate the questionnaire of stress and burnout for the study proper. Cronbach’s alpha’s analysis was computed as measures of internal consistency. With regard to burnout scales, significant values were observed. The alpha values were 0.91 (EE), 0.64 (DP), and 0.84 (PA).

A minimum sample size was estimated to be 133 based on the pilot study. In view of the design of this study, the sample was selected by a stratified randomized sampling method, with stratification as North, East, West, South, and central population. Sample size determined on the basis of a pre-assigned significance level of 95% and power of 80%.

Recruitment of study participants was carried out in postgraduate students of orthodontics and dentofacial orthopedics who attended 19 IOS PG STUDENTS CONVENTION-2015, Bengaluru, India. The clinical undergraduate students from different dental colleges throughout the India were included in the study as comparison group.

Questionnaire for stress was derived from International Stress Management Association, the questionnaire comprised 25 questions with dichotomous (YES/NO) options, scored as “1” for YES and “0” for NO. Based on total score obtained, sample is divided into three groups as - ≤4-least likely, 5–13-more likely, and ≥14-most prone.

Maslach burnout inventory, as in the investigation by Gorter et al.[5] will be used in the study. Burnout will be measured using the three dimensions of the 22 item.

- EE; seven items
- DP; seven items
- PA; eight items.

The items were ranked by respondents according to their reported frequency on a seven-point Likert scale, where 0 - never, 1 - a few times a year, 2 - monthly, 3 - a few times a month, 4 - weekly, 5 - a few times a week, and 6 - every day.

**Scoring results**

The interpretation of scoring for burnout is shown in Table 1. A high score in the first two sections and a low score in the last section may indicate burnout. Additional sociodemographic variables were also collected in the survey questionnaire. Participant responses <80% questions were excluded from the study. The questionnaire was given to both postgraduate and undergraduate and evaluated separately. Only one examiner (N V) involved in data collection, data analysis, and evaluation.

**Data analysis**

Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) 21 version IBM, USA. Basic demographic data were expressed in percentages. Mean scores were calculated for respective domains. Statistical tests ANOVA, unpaired t-test was done to find out the significance of results. Pearson’s correlation was done. The level of significance was set at $P < 0.05$ for all tests. Kappa statistics was performed for intraexaminer reliability.

**Results**

A total of 284 (51% male and 49% female) postgraduate (50%) and undergraduate (50%) students were given questionnaires by hand, of which 165 questionnaires received back. The participants who did not answer more than 20% of questions were excluded and the final study sample for statistical study was 190 (70% male and 30% female) postgraduate (50%) and undergraduate (50%) students.

| Table 1: Scoring interpretations for components of burnout |
|----------------------------------------------------------|
| **Section A: EE** | **Section B: DP** | **Section C: PA (Personal achievement)** |
| ≤17 (low-level burnout) | ≤5 (low-level burnout) | ≤33 (high-level burnout) |
| 18-29 (moderate burnout) | 6-11 (moderate burnout) | 34-39 (moderate burnout) |
| ≥30 (high-level burnout) | ≥12 (high-level burnout) | 40 (low-level burnout) |

EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment
VenkateshNettam, et al.: Stress and burnout in orthodontic postgraduates

Analysis obtained was 142 thus accounting to a response rate of 71%. For the final selected sample, the questions which were not answered were recorded by their mean score. The undergraduate sample (comparison group) was collected by mailed questionnaires, and same methodology was followed as mentioned above to equalize the sample in all variables as study sample. The frequency of distribution is shown in Figure 1. Analysis of the data revealed that the mean age of the postgraduates and undergraduates were 26.16 ± 2, 20.98 ± 1.14. The mean of stress is analogously expressed and was not statistically significant (P > 0.05) for gender and geographical distribution in relation to stress in both postgraduates and undergraduates [Table 2]. The means score of participants for EE, DP, and PA are shown in Table 3. The mean values of EE were equally noted and are not statistically significant (P > 0.05) for both gender and geographical distribution in postgraduate and undergraduate sample [Table 3]. The mean values of DP is quantified similar for gender, unlike it is high in East India with statistical significance (P < 0.05) for geographical distribution in relation to postgraduates [Table 3]. The mean values of DP are similarly expressed for gender and are high in Central India with statistical significance (P < 0.05) for geographical distribution for undergraduates [Table 3]. The mean values of PA are comparatively in the same range for both the genders. It is found to be low in South Indian students which are statistically significant (P < 0.05) in relation to geographical distribution for postgraduates [Table 3]. The mean value of PA is similarly expressed for gender but it is found to be low in East Indian undergraduates (P < 0.05) shown in Table 3. The comparative evaluation of stress and burnout in both the undergraduate and postgraduates is shown in Table 4. There is statistical significance (P < 0.05) for comparison of stress and PA in postgraduates and undergraduates. Pearson’s Correlation analysis was done to investigate the relationship between the stress and burnout. The results showed that there was a significant correlation between stress and burnout components in orthodontic postgraduates. The positive correlation for stress and EE, DP and as well as negative correlation for PA in postgraduates is clearly depicted in the Figure 2. However, it was noted that there was no significant correlation between stress and burnout (EE, DP, and PA) components in Undergraduates. The Figure 2 represents the negative correlation for stress and EE, DP, and PA.

Discussion

Cooper et al.[5] reported that the dental profession was the most stressful among all health-care professions. It may be argued that a relation between work stress and burnout is no surprise. Nevertheless, burnout is usually seen as a consequence of occupational stress.[6] According to Murtomaa H et al.[9] burnout begins with a health-care employee experiencing work as stressful which progresses through the experience of stress and fatigue to a defensive stage marked by changes in behavior and attitudes toward patients.

Brake et al.[10] reported that that one in every five active Dutch dentists was at risk of burnout, with one in every eight having high overall levels of burnout. In a German study[11] conducted at the universities of Dresden, Freiburg, and Bern among dental students, 10% had nonnormal values regarding EE, 17% regarding reduced PA and 28% regarding DP.

Our study showed that 57.7% of postgraduates were more prone to stress, 33.1% were showing moderate to high level of EE, 66.9% were in the ranges of moderate to high levels of DP, and only 20% showed high levels of PA. Even though the frequency of high levels of stress and burnout were relatively high in undergraduates than postgraduates but the mean scores were high for postgraduates (P < 0.05).

There are studies in this regard reporting that females perceived more stress than males,[2,12-14] while some studies

![Figure 1: Geographical distribution of professionals](image)

**Table 2: Test of significance for overall comparison of stress among professionals in relation to gender and region wise**

| Stress | Postgraduates | Undergraduates |
|--------|---------------|----------------|
|        | Gender wise   |                |                |
|        | Males         | Females        |                |
|        | Mean±SD       | Mean±SD        | P              |
| Gender wise |               |                |                |
| Males    | 14.97±4.96    | 14.02±3.87     | 0.21           |
| Females  |               | 10.08±1.99     | 0.61           |
| Region wise |             |                |                |
| North    | 13.60±4.72    | 13.14±4.06     | 0.66           |
| South    | 14.86±3.66    | 15.23±4.90     | 0.66           |
| East     | 14.47         | 14.03±1.70     | 0.40           |
| West     |               |                |                |
| Central  |               |                |                |
| F        | 0.593         |                | 1.016          |
studies revealed some variation in perceived stressors between males and females,\textsuperscript{[17–22]} while other studies did not detect any gender differences.\textsuperscript{[23,24]} Pani et al.\textsuperscript{[25]} used a biomarker (salivary cortisol) to measure dental students’ stress and found no gender difference at the baseline and in clinical settings. Similarly, the present study showed no gender variance as regards to stress and burnout levels, and statistical insignificance with unpaired t-test for gender. The insignificant difference could be attributed to the fact that they were living and working in the same environment and facing the same sources and amount of stressors.

Our study demonstrated the different levels of stress between undergraduates and postgraduates ($P < 0.05$). PA appears to be the main component of burnout phenomenon within both the groups and is also statistically significant with $P = 0.05$ when both groups are compared. This component seems to be higher in postgraduates compared to undergraduates. However, the results of our present study are in contrast with Al-Zubair NM et al.\textsuperscript{[26]} study which had been conducted with masters or PhD students.

The study also shows that both undergraduates and postgraduates revealed moderate to higher levels of burnout with the mean score levels of burnout being higher in postgraduates. This variation could be due to habituated working environment for enduring period of time that a postgraduate is exposed during their studies. Unlike undergraduates whose working conditions are inconsistent. The features of burnout in undergraduates may be due to those levels of stress which undergraduates are showing or variation in subjective perception during the time of examination.

Pearson’s correlation coefficient analysis was carried out to correlate stress and burnout components for postgraduates and undergraduates. It showed a positive correlation for burnout in postgraduates while it was not same in the case of undergraduates. This difference can be attributed to habituated working environment for enduring period of time that a postgraduate is exposed to during their studies. Unlike undergraduates whose working conditions are inconsistent. The features of burnout in undergraduates are due to those levels of stress which undergraduates are showing or variation in subjective perception during the time of examination.

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EE seems to be the second major factor of stress and burnout. However, the difference between the groups is not statistically significant. The present study displayed 7.7% of EE, 35.9% of DP and 50% of reduced PA participants. Humphris et al.\textsuperscript{[23]} had reported a 22% prevalence of EE burnout “cases” among European dental students, this proportion, however, ranged from 3% in Finland to 46% in Germany. Pöhlmann et al.\textsuperscript{[28]} in a study among German and Swiss dental students found that 10% of respondents were “cases” in the domain of EE, 28% in DP, and 17% in reduced PA. Direct relationship between

Table 3: Test of significance for overall comparison of burnout among professionals in relation to gender and region wise

| Gender wise     | Postgraduates | Undergraduates | $P$  |
|-----------------|---------------|----------------|-----|
|                 | Mean±SD       | Mean±SD        |     |
| EE              |               |                |     |
| Males           | 15.5±9.32     | 12.9±3.19      | 0.36|
| Females         | 12.8±9.16     | 12.4±3.03      |     |
| Region wise     |               |                |     |
| North           | 13.0±8.38     | 12.6±2.99      | 0.67|
| South           | 14.3±9.93     | 12.4±2.24      |     |
| East            | 17.1±10.78    | 12.0±2.90      |     |
| West            | 13.3±9.19     | 13.2±3.87      |     |
| Central         | 13.9±8.09     | 12.9±3.26      |     |
| $F$             | 0.724         | 0.590          |     |

| DP              |               |                |     |
| Gender wise     |               |                |     |
| Males           | 11.0±8.11     | 9.2±2.12       | 0.96|
| Females         | 9.5±7.05      | 9.8±2.30       |     |
| Region wise     |               |                |     |
| North           | 7.1±4.28      | 9.6±1.43       | 0.001*|
| South           | 10.9±8.45     | 10.1±1.62      |     |
| East            | 14.1±7.08     | 7.6±2.42       |     |
| West            | 10.1±8.93     | 9.5±2.59       |     |
| Central         | 9.5±5.96      | 10.5±1.85      |     |
| $F$             | 4.443         | 5.516          |     |

| PA              |               |                |     |
| Gender wise     |               |                |     |
| Males           | 29.9±12.16    | 27.6±9.03      | 0.14|
| Females         | 32.7±10.04    | 25.4±8.80      |     |
| Region wise     |               |                |     |
| North           | 34.5±8.91     | 31.6±9.04      | 0.001*|
| South           | 27.7±12.23    | 24.9±9.21      |     |
| East            | 28.6±10.82    | 20.4±8.80      |     |
| West            | 34.6±10.94    | 24.8±9.82      |     |
| Central         | 30.3±11.16    | 32.0±9.49      |     |
| $F$             | 2.672         | 11.109         |     |

Gender wise - Unpaired t-test, *Statistically significant at $P<0.001$, region wise - ANOVA test, EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment, SD: Standard deviation

Table 4: Comparison of stress and burnout among postgraduate and undergraduate students

|                | Postgraduates | Undergraduates | $P$         |
|----------------|---------------|----------------|-------------|
| Stress         | 14.5±9.47     | 10.1±5.23      | 0.001*      |
| EE             | 14.2±9.30     | 12.6±3.11      | 0.066       |
| DP             | 10.3±7.62     | 9.5±2.22       | 0.264       |
| PA             | 31.3±11.22    | 26.5±8.96      | 0.001*      |

*0.001 is statistically significant. EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment

showed that overall males perceived more stress than female,\textsuperscript{[6,15]} as like of stress there are studies showing that women exhibit less DP compared to men.\textsuperscript{[146]}
studies cannot be made, because a network of personal, sociocultural factors, curricular, and extracurricular may interact with the respondent’s development and expression of burnout symptoms.

Humphris suggested that several ways of burnout can be prevented which include recognition and understanding of the problem, organizing regular breaks from work so that levels of negative experience from burnout are temporarily relieved. Teaching and research may divert and distract the burnout dentist from patient contact. Changing the general attitudes of management and raising their awareness to the possibility of burnout in staff is also vital in prevention and subsequent treatment. Improving working posture and the physical working environment and slowing down the pace of work can prove surprisingly effective in reducing burnout.

The preventive strategies can be at two levels: individual and organizational. At an individual level, it is important to retain cognitive clarity, holding meetings among colleagues to share problems and emotional states, fostering personal balance, and simulating working situations (role play). At an organizational level, preventive strategies are meant to change the working environment of operators and their work-style. It aims at improving organizational culture by stimulating and updating. Support and counseling services are routinely available to medical and dental students; however, these resources appear to be underutilized. It will require concerted efforts of all stakeholders including need assessments, climate studies and qualitative research to identify and implement measures that are required to promote students’ personal, academic, and professional well-being.

**Conclusion**

There are significant levels of stress and burnout in both undergraduates and postgraduates. Statistically significant with a positive correlation to components of burnout found in postgraduates. These findings may help dental community in planning, management, and prevention of stress and burnout.
Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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