

# Assessment of Stress Levels in Patients Visiting for Dental Treatment.

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## ABSTRACT

**Introduction:** The perception of stress might have a multifactorial influence on a disease process. Surprisingly, this theoretical perspective has not been discussed in the context of odontogenic problems. **Materials and Methods:** Hence this cross-sectional study was planned enrolling individuals randomly selected from the Outpatient Department aged over 18 years for duration of 6 months. Perceived Stress Scale (PSS) was used to measure perception of stress. The data was analyzed using Chi-square/Fisher's exact test in SPSS version 15.0 (SPSS Inc., Chicago, IL, USA). **Results:** Our data indicated that unskilled individuals (29.4%) sought dental treatment more frequently than the other categories of occupational groups included in this study. Patients with Oral submucous fibrosis (OSF) and lichen planus showed relatively higher stress levels compared to patients with other dental conditions. A correlation analysis showed that stress levels were considerably lower in patients from professional category than in the non-professional groups, emphasizing the significance of education and professional status on the perception of stress in individuals. **Conclusion:** Based on this study findings it can be concluded that nature of the dental problem and the education and professional status of patients can differentially impact the perception of stress among outpatients seeking dental treatment.

**Key words:** Stress levels, Patients, Dental treatment, Perceived Stress Scale (PSS), Psychological processes, Psychological stress, Perceived stress, Psychological distress, Physical disorder, Disease states, Questionnaire study.

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## INTRODUCTION

The word stress is generally used to imply to the things, which pose a challenge or, a threat to the normal well being of an individual. The perception of stress might influence the pathogenesis of disease process. It is a common assumption amongst the health researchers that the impact of stressful events is, to a certain extent, determined by individual's perceptions of their stressfulness.<sup>1</sup> The psychological states and traits of an individual might influence the immune system in a manner that might alter body's ability to defend against a disease process. Psychological stress is thought to influence a wide range of physiological processes and disease states with existing evidence supporting stress as a risk factor in depression, cardiovascular disease, HIV/AIDS, delayed wound healing, upper respiratory infections, autoimmune diseases and total mortality.<sup>2,3</sup> Sometimes, it is difficult to distinguish conceptually between an individual's perceived stress and psychological distress. Cross-sectional correlation between perceived stress and physical disorder may actually reflect an association between psychological distress and physical disorder.<sup>1</sup> Perceived stress scale (PSS) questionnaire is designed to tap the degree to which respondents found their lives unpredictable, uncontrollable and overload-

ing. These three issues have been repeatedly found to be the central components of the experience of stress. Surprisingly, this theoretical perspective has not been accompanied by development of psychometrically valid measures of perceived stress in the field of odontogenic problems. The present study was hence planned as an attempt to assess the stress levels in patients seeking dental treatment using Perceived stress scale (PSS) questionnaire used to measure an individual's perception of stress over the past months and to determine the likelihood of whether perceived stress might be making them more susceptible to stress-induced compromises of their health. In the present study, an attempt was made to measure an individual's perception of stress in the perspective of their occupation while a correlation was, also, tried to be sought to between the clinical/radiological diagnosis and their perceived levels of stress over the past few months.

## MATERIALS AND METHODS

A cross-sectional study was designed consisting of 598 individuals randomly selected from the outpatients aged above 18 years over duration of 6 months. The patients included in the study were informed

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about the details of the study and a written informed consent was obtained. The study protocol was approved by the Institutional Ethics Committee governing the protection of privacy of the subjects enrolled for the study. A detailed case history was taken including chief complaint, history of presenting illness and previous medical conditions (If any). A thorough clinical examination, including systemic and regional examination, was done. Treatment planning was done based on the final diagnosis considering all clinical investigations. After an initial work-up, the Perceived Stress Scale (PSS) (Table 1) was used to measure perception of stress over the past months. The said scale was tested for internal validity before the actual conduct of the study and was found to have good internal consistency reliability with a Cronbach's alpha coefficient of 0.78.

The statistical software used for the analysis of the data included SAS 9.2, SPSS version 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment version 2.11.1 while Microsoft word and Excel were used to generate graphs, tables etc. Descriptive and inferential statistical analysis was carried-out. Results on continuous data were presented as Mean  $\pm$  SD (Min-Max) while results on categorical measurements were presented in Number (%). Significance was assessed at 5% level of significance. Chi-square/Fisher's exact test were used to find significance of the study parameters on the categorical scale between two or, more groups.

## RESULTS

The present cross-sectional study consisted of 598 individuals randomly selected from the out patients aged above 18 years over a period of 6 months. Perceived Stress Scale (PSS) (Table 1) was used to measure perception of stress over the past months. Table 2 shows the distribution of the patients according to their occupation. A majority of patients i.e., 176 patients constituting 29.4% of the patient cohort were observed to be from the unskilled group. Housewives and students constituted the second and third largest groups with 152 patients (25.4%) and 102 patients

(17.1%) respectively. Table 3 shows the clinical/radiological diagnosis profile of the study cohort. 245 patients (40.9%) were diagnosed with chronic generalized gingivitis and was the biggest group among our study cohort. While the least common condition diagnosed was leukoplakia with only 9 cases (1.5%) observed. A significant number of our patient cohorts perceived high or very high levels of stress (Table 4). 42% of patients perceived high levels of stress followed by 21.7% of patients experiencing very high stress levels. 19% of the patients had average stress scores while 10.7% and 6.4% of patients had low and very low levels of stress respectively. When the stress levels were correlated with the clinical/radiological diagnosis, patients with oral submucous fibrosis (OSF  $p$ -values of 0.027) and lichen planus ( $p$ -values of 0.03) showed highly significant results with relatively higher stress levels (Table 5). Table 6, similarly, correlation between the occupation of the patients and perceived stress levels indicated that patients in professional category experienced significantly ( $p$ -value of 0.002) least stress levels (Table 6).

## DISCUSSION

Psychological stress can contribute to poorer health practices, increased disease risk, accelerated disease progression, greater symptom reporting, more frequent health service utilization and increased morbidity/mortality. The term psychological stress has been defined as the extent to which an individual perceives (Appraises) that demands exceed the ability to cope in life. The Perceived Stress Scale (PSS) was developed by Cohen *S et al.*<sup>3</sup> to measure the degree to which situations in an individual's life are appraised as stressful. PSS has become one of the most widely used psychological instruments for measuring non-specific perceived stress.<sup>4-13</sup> The PSS predicts both, the objective biological markers of stress and the increased risk for disease among persons with higher perceived levels of stress.<sup>14-26</sup> The original PSS consisted of 14 items that were purported to form a unidimensional scale of global perceived stress.<sup>3</sup> Although scores

**Table 1: Perceived Stress Scale (PSS) Scores and Associated Levels of Health Concern.**

Total Score	Perceived Stress Levels	Health Concern Levels
0-7	Much Lower than Average	Very Low
8-11	Slightly Lower than Average	Low
12-15	Average	Average
16-20	Slightly Higher than Average	High
21 and over	Much Higher than Average	Very High

**Table 2: Showing the Distribution of Patients According to their Occupation.**

Occupation	No. of patients	%
Unskilled	176	29.4
Skilled	60	10.0
Housewives	152	25.4
Business People	16	2.7
Executives	12	2.0
Service	47	7.9
Professionals	25	4.2
Students	102	17.1
Others	8	1.3
Total	598	100.0

**Table 3: Clinical/Radiological Diagnosis of the Study Cohort.**

Clinical/Radiological Diagnosis	No. of patients	%
Acute peri-apical abscess	54	9.0
Chronic generalized gingivitis	245	40.9
Oral submucous fibrosis (OSF)	26	4.3
Chronic apical periodontitis	40	6.7
Completely edentulous	14	2.3
Chronic irreversible pulpitis	134	22.4
Partially edentulous	32	5.4
Recurrent aphthous ulcer	28	4.7
Leukoplakia	9	1.5
Lichen planus	16	2.6
Total	598	100.0

**Table 4: Showing Perceived Stress Levels Amongst the Patients**

Perceived Stress Levels	No. of patients	%
Very Low	38	6.4
Low	64	10.7
Average	115	19.2
High	251	42.0
Very high	130	21.7
Total	598	100.0

**Table 5: Showing Correlation between the Clinical/Radiological Diagnosis and Perceived Stress Levels.**

Clinical/Radiological Diagnosis	Perceived Stress Levels					Total (n=598)	p-value
	Very Low (n=38)	Low (n=64)	Average (n=115)	High (n=251)	Very High (n=130)		
Acute peri-apical abscess	2 (5.3%)	10 (15.6%)	10 (8.7%)	25 (10%)	7 (5.4%)	54 (9%)	0.169
Chronic generalized gingivitis	16 (42.1%)	17 (26.5%)	53 (46.08%)	100 (39.8%)	59 (45.3%)	245 (40.9%)	0.11
Oral submucous fibrosis (OSF)	0 (0%)	1 (1.6%)	4 (3.5%)	9 (3.6%)	12 (9.2%)	26 (4.3%)	0.027*
Chronic apical periodontitis	2 (5.3%)	4 (6.3%)	7 (6.1%)	20 (8%)	7 (5.4%)	40 (6.7%)	0.874
Completely edentulous	3 (7.9%)	2 (3.1%)	1 (0.9%)	5 (2%)	3 (2.3%)	14 (2.3%)	0.163
Chronic irreversible pulpitis	13 (34.2%)	18 (28.1%)	24 (20.9%)	51 (20.3%)	28 (21.5%)	134 (22.4%)	0.316
Partially edentulous	1 (2.6%)	4 (6.3%)	5 (4.3%)	18 (7.2%)	4 (3.1%)	32 (5.4%)	0.426
Recurrent aphthous ulcer	1 (2.6%)	4 (6.3%)	4 (3.5%)	15 (6%)	4 (3.1%)	28 (4.7%)	0.596
Leukoplakia	0 (0%)	2 (3.1%)	3 (2.6%)	2 (0.79%)	2 (1.5%)	9 (1.5%)	0.530
Lichen planus	0 (0%)	2 (3.1%)	3 (2.8%)	6 (2.1%)	5 (3.2%)	16 (2.7%)	0.03*

\*  $p < 0.05$ **Table 6: Showing Correlation between the Occupation of the Patients and Perceived Stress Levels.**

Occupation	Perceived Stress Levels					Total (n=598)	p-value
	Very Low (n=38)	Low (n=64)	Average (115)	High (n=251)	Very High (n=130)		
Unskilled	9 (23.7%)	22 (34.4%)	34 (29.6%)	71 (28.3%)	40 (30.8%)	176 (29.4%)	0.804
Skilled	6 (15.8%)	2 (3.1%)	15 (13%)	24 (9.6%)	13 (10%)	60 (10%)	0.200
Housewives	7 (18.4%)	14 (21.9%)	30 (26.1%)	65 (25.9%)	36 (27.7%)	152 (25.4%)	0.769
Business People	0 (0%)	2 (3.1%)	3 (2.6%)	6 (2.4%)	5 (3.8%)	16 (2.7%)	0.762
Executives	2 (5.3%)	2 (3.1%)	4 (3.5%)	4 (1.6%)	0 (0%)	12 (2%)	0.552
Service	3 (7.9%)	2 (3.1%)	11 (9.6%)	22 (8.8%)	9 (6.9%)	47 (7.9%)	0.557
Professionals	6 (15.8%)	3 (4.7%)	2 (1.7%)	7 (2.8%)	7 (5.4%)	25 (4.2%)	0.002**
Students	5 (13.2%)	16 (25%)	15 (13%)	48 (19.1%)	18 (13.8%)	102 (17.1%)	0.179
Others	0 (0%)	1 (1.6%)	1 (0.9%)	4 (1.6%)	2 (1.5%)	8 (1.3%)	0.925

\*\*  $p < 0.01$ 

on the 14-item PSS tended to exhibit good reliability estimates across the literature, four of the items tended to perform poorly when evaluated using exploratory factor analysis.<sup>1</sup> As a result, the PSS is commonly implemented using the 10-item form.<sup>27</sup> Up till now, comparing stress levels in our society has been impeded by a lack of study of stress. So, an attempt was made to assess stress levels in patients coming for dental treatment using Perceived stress scale (PSS) questionnaire. In the present study, data collected revealed that unskilled individuals (29.4%) seek dental treatment more than other categories of occupational groups. Out of the 598 patients screened who came for the dental treatment, 40.9% cases were of chronic generalized gingivitis as authors perception of the survey could find that the patient experienced symptoms of bleeding, halitosis and other gingival problems which were the main reasons of concern followed by tooth decay (22.4%) and pain and swelling in relation to the teeth (Acute peri-apical abscess, 9%). On the other hand, the Potentially malignant epithelial lesions (PMELs) like leukoplakia cases reported were rare (1.5%) most of which were diagnosed during the routine clinical examinations and were not the basis of patients' chief complaints. When patients were questioned regarding the same, it was found that they were not worried about them much since such lesions did not pose any problem in the normal functioning of their lives. This posed as a challenge in educating the patients regarding the harmful nature

of such lesions although they did not affect patients' daily routine. In the present study, it was found that patients coming for the dental treatment had high levels of stress with 251(42%) of the patients falling into the same category followed by very high level of stress observed in 130 patients (21.7%) suggesting that patients coming for the dental treatment are stressed out in their lives regarding their personal and family problems. The correlation between levels of stress and disease prevalence in the oral cavity showed that patients with Oral submucous fibrosis (OSF) and oral lichen planus had perceived higher levels of stress. When the patients were counseled, it was observed that the conditions which made the patients to visit the hospital were difficulty in opening the mouth and burning sensation with difficulty in chewing food being the prime concerns which brought the patients under high and very high levels of stress eventually resulting in their decision to visit dental hospitals for the treatment. These two conditions were followed by chronic generalized gingivitis for which the patients had significant amount of stress leading to their visit to the dental hospitals for treatment. On the other hand, most of the edentulous patients visited to get dentures or patients with acute peri-apical abscess/chronic irreversible pulpitis didn't experience significant levels of stress probably because they did not experience any major symptoms of pain or discomfort. Correlation between the occupation and stress showed that stress levels were considerably lower among

professionals compared to unskilled groups (Farmers, labors and shop keepers), indicating the impact of education and social well-being on perception of stress.

**Strengths of the Study:** The present study revealed that higher Perceived Stress Scale (PSS) scores were associated with higher levels of stress. There is also greater likelihood of stress perception influenced by life-style patterns and social background. Also, higher scores were associated with an increase in an individual's vulnerability to compromised health, especially, if a big life stress had occurred in the near past.

**Limitations of the Study:** Though the present study highlighted the impact stress can have on the pathogenesis as well as the severity of the conditions affecting the oral and para-oral regions, the study focused only on the oro-dental complaints of the patients without taking into consideration the general medical condition. Furthermore, the conditions affecting the oral and para-oral regions might have some association in the form of common etiology as well as similar manifestations of the associated systemic disorder. Also, numerous systemic conditions affecting the general systems of the body have their manifestations in the oral cavity apart from similar etiologies. Treatment of various systemic diseases, also, has its adverse effects manifesting in the oral mucosa as well as the other oral and para-oral structures. Thus, the study could have been even stronger taking into consideration the associated medical disorders mandating the need for such studies in future for finding the correlation and the exact association between them. Another significant limitation of the study was the lesser representation of the patients affected with the various pre-cancerous and cancerous conditions of the oral and para-oral regions which actually potentially mound-up the stress even in educated patients. Further studies in this regard will largely benefit the management of stress in such patients because they are the main source of potential stress in such patients who are affected with conditions with poorer prognosis.

## CONCLUSION

From the present study, it could be concluded that in most of the cases, stress and dental problems are lying together as aggravating factors for one another like in case of oral submucous fibrosis, stress is induced in the patients because it alters a patient's normal physiological functions related to oral and para-oral structures while in case of lichen planus, stress is one of the etiological factors for the disease process to set-in. Furthermore, the burning sensation perceived in both the cases, further, aggravates a patient's stress. The present study, also, highlighted the significance of education and professional status on the perception of stress in the said individuals concluding that the patients who were well-educated were well-versed with the conditions and related problems of the oral cavity having lesser stress and better abilities to cope-up with the same.

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## CONFLICT OF INTEREST

The author declare no conflict of interest.

## ABBREVIATIONS

**AIDS:** Acquired Immuno-Deficiency Syndrome; **HIV:** Human Immuno-Deficiency Virus; **OSF:** Oral Submucous Fibrosis; **PMELs:** Potentially Malignant Epithelial Lesions; **PSS:** Perceived Stress Scale.

## SUMMARY

The perception of stress might have a multifactorial influence on a disease process. Surprisingly, this theoretical perspective has not been discussed in the context of odontogenic problems. The present study was planned with the same intent. Based on the findings of the present study, it could be concluded that the nature of dental problems and the education and professional status of patients can differentially impact the perception of stress amongst the outpatients seeking dental treatment and this, further, has an impact over the improvement or, worsening of the said diseased states.

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