

Evaluation of Effect of Stress on the Periodontal Health among Dental Students of Goenka Research Institute of Dental Science, Gandhinagar

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Abstract

Introduction: Recent studies have shown that psychological factors can lead to neglect of oral hygiene in an individual. As a student, various kind of stress is associated due to tough competition and busy academic schedule. Therefore, this study was undertaken to evaluate the relationship between stress and periodontitis. **Objectives:** The aim of the study was to evaluate and establish the relationship between stress and the periodontal disease among dental students of Goenka Research Institute of Dental Science (GRIDS), Gandhinagar. **Materials and Methods:** A depression, anxiety, and stress (DAS) questionnaire was designed to measure the severity of range of symptoms common to DAS and distributed among 100 undergraduate dental students of GRIDS, Gandhinagar. Periodontal parameters such as probing depth and clinical attachment loss were assessed. The results were analyzed using the Statistical Package for the Social Sciences software. **Results:** Positive correlation was found between stress and clinical attachment loss and pocket probing depth. The results were found to be statistically significant. **Conclusion:** The relationship between stress and periodontal parameters was found to be clinically and statistically significant. The study suggested that dental students with extremely severe levels of DAS presented with increased pocket depth and clinical attachment loss. Therefore, psychological factors have an adverse effect on periodontal health.

Keywords: Stress, Psychological, Periodontitis

INTRODUCTION

Stress is a reaction of a body to a deleterious nature that they are found to distract normal physiological equilibrium. It results in development of depression and anxiety.^[1,2] Stress can be acute or chronic, it depends on the individual, acute stress is the sudden and temporary response of the human body to a stressor which has a defined beginning and end. Exposure to the stress results in an acute response that is characterized by a “fight or flight” reaction. Chronic stress is the response to intermittent and repeated exposure to a stressor over a continuous period. Repeated exposure to the chronic stress has biological cost and can lead to neurobiological immune dysfunction.

Periodontitis is a multifactorial disease.^[3] It is usually characterized by the destructive inflammatory process that affects the tooth as well as the supporting hard and soft tissues, resulting in the tissue destruction. Periodontal diseases are due to many local or systemic risk factors, the dental plaque being the main causative factor and genetic polymorphisms, socioeconomic status, tobacco chewing, and smoking habits

being the threatening risk factors. Stress has shown stronger association with periodontitis.^[4] A relationship was established between gingivitis and psychogenic factors such as stress, anxiety, and depression in the 1970s.^[5] DeMarco used the term “periodontal emotional stress syndrome” to insist the impact of the stress suffered by the soldiers involved in the Vietnam War on the progression of periodontal disease in them.^[6]

Oral hygiene depends on the mental health of the patient.^[7] It has been reported that psychological factors can lead patients to neglect their oral hygiene which results in a dental plaque build-up that has a major effect on periodontal health.^[8] Studies have shown that the stress generated by university studies

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results in a decrease in oral hygiene levels and an increase in crevicular interleukin-1 β levels. Therefore, the earlier reports conclude that stress is a risk factor for gingival inflammation.^[9]

This psychological stress is generally thought to have a net-negative effect on the efficacy of the immune response, subsequently resulting in periodontal health breakdown. On the other hand, depression and anxiety are also the most common psychiatric conditions associated with periodontitis and have shown a biological plausibility in the literature.

Student's life has many benefits, it also imposes stresses that are inevitable. Due to the various factors such as tight academic schedule, competition among the dental students, they suffer from the burden of achieving various targets amongst them which can lead to the development of psychological stress. This excessive stress in turn increases the prevalence of psychological factors such as depression, anxiety, and substance abuse and suicidal thoughts. Literature suggests that psychological stress has a detrimental effect on oral health;^[10] hence, this study was undertaken to assess the effect of depression, anxiety, and stress (DAS) over periodontal health indicators among the dental students. Negative life events manifested as psychological stress and depression are common in day-to-day life, emphasizing the relationship between the person and environment.^[11]

This survey is designed to evaluate the effect of stress on periodontal health.

MATERIALS AND METHODS

A 10-item DAS questionnaire designed based on a previous study^[27] to measure the severity of a range of symptoms common to DAS, a validated questionnaire was distributed among 100 undergraduate dental students of a private college. The questionnaire was based on DAS and all the questions had options 0, 1, 2, and 3 to be responded, later their scores were summed and assessed in which, score 1: Normal in DAS scale; score 2: Mild in DAS scale; score 3: Moderate in DAS scale; score 4: Severe in DAS scale; score 5: Extremely severe in DAS scale. Followed by, periodontal parameters such as presence or absence of pocket depth of more than 3 mm and clinical attachment loss were assessed. The results obtained from the survey were tabulated, analyzed, and represented graphically using the Statistical Package for the Social Sciences software (Version 23). Then, the Chi-square test was done to find out the association between the stress and periodontal parameters.

For each question choose from the following alternatives:

- 0 – Never
- 1 – Almost never
- 2 – Sometimes
- 3 – Fairly often
- 4 – Very often.
- 1. In the past month, how often have you been upset because of something that happened unexpectedly?

0 1 2 3 4

- 2. In the past month, how often have you felt that you were unable to control the important things in your life?

0 1 2 3 4

- 3. In the past month, how often have you felt nervous and stressed?

0 1 2 3 4

- 4. In the past month, how often have you felt confident about your ability to handle your personal problems?

0 1 2 3 4

- 5. In the past month, how often have you felt that things were going against your way?

0 1 2 3 4

- 6. In the past month, how often have you found that you could not cope with all the things that you had to do?

0 1 2 3 4

- 7. In the past month, how often have you been able to control irritations in your life?

0 1 2 3 4

- 8. In the past month, how often have you felt that you were on top of things?

0 1 2 3 4

- 9. In the past month, how often have you been angered due to things that happened that were outside of your control?

0 1 2 3 4

- 10. In the past month, how often have you felt difficulties were piling up so high that you could not overcome them?

0 1 2 3 4

- You can determine your PSS score by following these directions:

- First, reverse your scores for questions 4, 5, 7, and 8. On these four questions, change the scores like this: 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0.

- Now add up your scores for each item to get a total. My total score is _____.

- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.

- Scores ranging from 0 to 13 would be considered low stress.

- Scores ranging from 14 to 26 would be considered moderate stress.

- Scores ranging from 27 to 40 would be considered high perceived stress.

- Depending on their perception, total score could put one of those individuals in the low stress category and the total score could put the second person in the high stress category.

RESULTS

The present study was to assess the effect of stress on periodontal health among undergraduate dental students. Out of 100 students, 46% had a DAS score of 5, 24% had a DAS score of 4, 15% had a DAS score of 3, 10% had a score of 2, and 5% had a DAS score of 1. Out of 100 students, 64%

of them presented with pocket depth of more than 3 mm. About 33% of students with DAS score of extremely severe presented with pocket depth of more than 3 mm. Furthermore, 17% of students under severe category; 10% of students under moderate category; 3% of students under mild category; and 1% of students under normal category presented with pocket depth of more than 3 mm. The association between pocket depth and stress was assessed by Chi-square test and was found to be statistically significant with $P = 0.027$. Out of 100 students, 63% of them presented with clinical attachment loss. 39% of students with a DAS score of extremely severe presented with clinical attachment loss. Furthermore, 13% of students under severe category, 10% of students under moderate category, 5% of students under mild category, and 1% of students under normal category presented with clinical attachment loss. The association between clinical attachment loss and stress was assessed by Chi-square test and was found to be statistically significant with $P = 0.00$ (Figures 1-4).

DISCUSSION

Oral health can reflect the overall health status of a personnel. Periodontal disease and tooth caries are the most common oral ailments. Periodontitis, which is a multifactorial disease, can have various risk factors such as age, diabetes, genetics, and psychological stress. On the other hand, stress has shown a stronger association to periodontal disease which stands proven in the literature.^[10] Stress experienced in day-to-day life depends on an individual's personal life. Similarly, there is a variation in stress between professionals and non-professionals, wherein professionals have shown higher levels of stress when compared to non-professionals.^[28] Among the various professionals, health professionals are majorly subjected to stress. Being the forerunners for the health-care system, they are subjected to greater stress-related responsibilities.^[29] Hence, this study was taken up to assess the effect of DAS over periodontal health indicators among dental students.

Dental students are exposed to significant stressors. Education in the medical field intends an intensive and competitive preparation of graduates in an attempt to achieve a personally rewarding and socially meaningful career, and hence, various medical programs may have physical and psychological effects on the wellbeing of medical students. Studies have also showed that medical students experience high levels of stress during their undergraduate training.^[27]

In the present study, dental students have depicted higher stress which, in turn, increases the periodontal health issues.^[30] On the other hand, the academic and professional outcomes are attributed to poor academics and professional dissatisfaction and leads to stress attributed to the stress. On the other hand, dentistry being an art and science in and due to the demanding nature of the training itself evidenced from the research, it was shown that dental students experience considerable amount of stress during training. However, the research confirms that the main effects of stress are attributed to low academic

performance and psycho-emotional well-being. The fear of poor performance in academics has been the main stressor

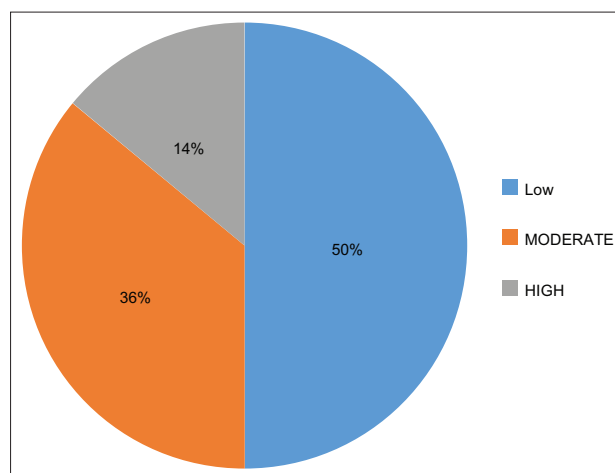


Figure 1: Pie chart depicts the distribution of the students based on their PPS score

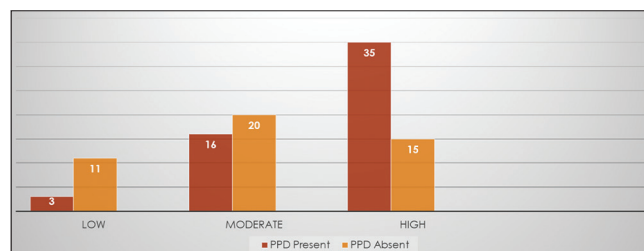


Figure 2: Bar graph showing the association between PPS score and pocket depth

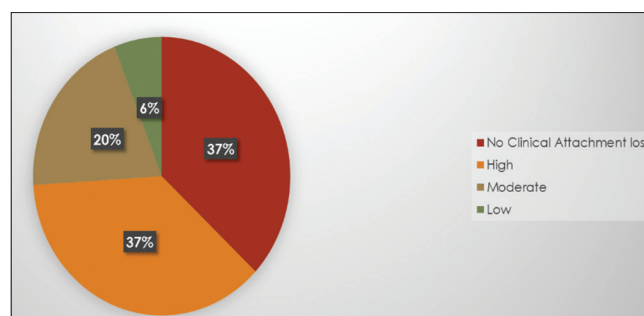


Figure 3: Out of 100 students, 63% of them presented with clinical attachment loss

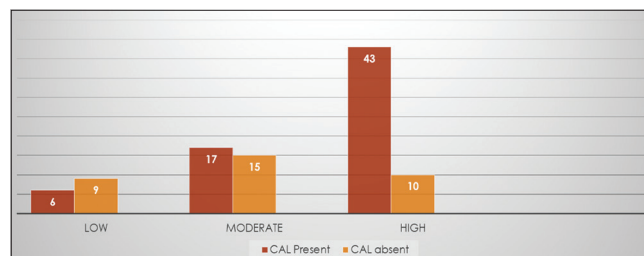


Figure 4: Bar graph showing the association between PPS score and clinical attachment loss

across the 5-year study period to be the underlying cause of the stress among dental students. Stress experienced by students was the significant workload, and these findings of our study are in coincidence with the study conducted to compare stress levels among medical and paramedical students.^[31] However, in contradiction to our findings, there are reports suggesting lower stress levels in dental students than that of medical and nursing students.^[32] The previous studies have shown that academic stress among students can cause gingival inflammation and diminution of the quality of oral hygiene.^[33] Apparently, that stress can negatively influence the oral health status.^[8,34,35] Participants who are highly susceptible to depression had shown higher values of PD and CAL. In 2019, Penmetsa and Seethalakshmi showed that psychological factors have an adverse effect over the plaque levels and gingival status among the dental students. Similarly, Singh *et al.*, in 2016, showed that higher score on perceived stress was associated with higher scores on general psychopathology and burnout.

This correlation may be due to the negligence of oral hygiene practice under stressful conditions and thereby resulting in increased susceptibility to periodontal disease. These findings are in accordance with the present study.

CONCLUSION

The present study suggests that dental students with extremely severe levels of DAS presented with increased pocket depth and clinical attachment loss. Therefore, psychological factors have an adverse effect on periodontal health. Hence, more awareness programs should be conducted among the students to educate about the role of stress on periodontal diseases.

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