Journal of Muhammad Medical College
Website: jmmc.mmc.edu.pk

Original Article

Relationship of mental stress and anxiety with periodontitis

Farwa Shah Syeda [1,*], Munir Ahmed Banglani[2], Nida Talpur[3], Maham Shah[4], Mahwish Memon[5], Abdul Ghani Shaikh[6].

1: Trainee MSc; Community Dentistry, Institute of Dentistry. LUMHS. Jamshoro.

2: Associate Professor; Community Dentistry. Institute of Dentistry. LUMHS. Jamshoro.

3: Assistant Professor; Institute of dentistry. LUMHS. Jamshoro.

4: Lecturer; Institute of dentistry. LUMHS. Jamshoro.

5: Assistant Professor; Institute of dentistry. LUMHS. Jamshoro.

6: Assistant Professor; Institute of dentistry. LUMHS. Jamshoro.

***=corresponding author**
shahfarwa110@gmail.com

Abstract:

Introduction: Periodontitis is an ailment with multiple factors where bacterial dental plaque is marked as the main causative agent for the beginning of this inflammatory phenomena, but also the host defense and environmental components takes part in the progress of disease. Among the environmental factors stress is a considerable factor that regulates the host defense mechanism through hypothalamic pituitary adrenal axis and can play role in the development of periodontitis.

Objectives: To determine the relationship between mental stress and anxiety with Periodontitis. (Chronic localized Periodontitis)

Methodology: A total of 118 respondents were included in this correlational cross-sectional study. The subjects who fulfilled the inclusion criteria underwent periodontal examination by means of probing depth for presence of chronic localized periodontitis and were asked to fill the 42-item Depression Anxiety Stress Scale (DASS) questionnaire to check association between mental stress, anxiety and its related symptoms with periodontitis.

Results: Some participants showed normal range in DASS Scale and some showed mild and moderate levels of depression, stress and anxiety. However, we found that higher the value of depression, anxiety and stress, higher was the value of probing depth.

Conclusion: There was positive correlation between mental stress and anxiety with periodontitis. However, Depression was found to have a slightly more association with Periodontitis. Moreover, further studies can be done to determine link between mental stress and its related symptoms with periodontitis.

Keywords: Stress, Anxiety, Depression, Periodontitis, Probing depth, DASS.

Introduction:

Pearson's Periodontitis is the swelling and infection of supporting tissues of the teeth.[1] Periodontal disease have symptoms like inflammation, bleeding gums that may be induced or spontaneous, pocketing, loss of alveolar bone attachment or loss of alveolar bone, tooth mobility and even loss of tooth.[2] Periodontitis is an ailment with multiple factors where bacterial dental plaque is marked as the main causative agent for the beginning of this inflammatory phenomena, but also the host defense and environmental components takes part in the progress of disease. Environmental risk factors like smoking and diabetes may alter the host reaction and thus modify the disease process, severity and outcome. [3] Among the environmental factors stress is a considerable factor that regulates the host defense mechanism through hypothalamic pituitary adrenal axis and can play role in the development of periodontitis.[4] Stress is body's process to respond to stressor. Pessimistic events in life manifests as psychological

stress and depression which is common in everyday life, highlights the link between an individual and environment. [5,6] Some Studies have suggested that stress and depression play role in reducing the immune system function which facilitates inflammation.[7] The effect of stress on periodontal status is direct as well as indirect as the way by which somebody copes with it as a person under stressful situation and adopts behavioral changes as inadequate oral hygiene measures, tobacco smoking and bruxism.[1]

Eke et al. during 2015, used data of National Health and Nutrition Examination Survey (NHANES) from 2009 to 2012 and reported prevalence of periodontitis as 46% in adults with 30 years of age or older illustrating up to 65 million people in which 9% showing severe periodontitis.[8] Review of literature shows that stress, a common condition in our daily life, is linked with some general and oral health problems for example periodontitis. Periodontitis on the other hand is a common cause of tooth loss. Although stress has impact over periodontal health; yet evidence is scanty with respect to undergraduate/postgraduate health professional students. Therefore, in this study we planned to assess the correlation between mental stress and anxiety with periodontitis by measuring the periodontal health by clinical parameters of periodontitis and scale to analyze depression, anxiety and stress in dental students.

Objective:

To determine the correlation between mental stress and anxiety with periodontitis.

Methodology:

This cross-sectional study, after approval from Institutional review board was conducted for two months April -May 2021. Sampling population includes students of 1st and 2nd year BDS of Institute of Dentistry Liaquat University of Medical & Health Sciences Jamshoro. The sample size calculated was 118 by using standardized formula for cross sectional studies and participants were chosen by convenience sampling technique.

Inclusion criteria:

- Both male and female respondents with periodontitis
- Age between 18-22 years
- Participants who showed willingness to participate in the study by signing the written consent

Exclusion Criteria:

- Participants with diabetes, respiratory tract infection and any systemic illness were excluded.
- Respondents with habit of smoking were excluded

Data was collected from the participants after taking informed written consent. Participants were asked to fill questionnaire of Depression Anxiety Stress Scale (DASS) and periodontal assessment was done by measuring probing depth of the periodontal pocket.

Periodontal status: was checked by probing depth (PD). [7] The PD was checked by William's periodontal probe and the respondent having probing depth more than or equal to 4mm, in 4 teeth at least were considered as having chronic localized periodontitis.[6]

Stress Evaluation: was done by using Depression Anxiety Stress scale (DASS)[7], which was a 42 item questionnaire and the answers of that were scored giving scores ranging from 0-3. The data collected was analyzed by SPSS version 26. Descriptive statistical analysis and Pearson's co-relation was used to co-relate the variables of interest

Results:

The participants in the study were between 18-22 years. The respondents showed only mild to moderate depression, anxiety and stress levels with a significant number of participants showing normal levels in the DAS Scale. Tables 1-3 show the frequency of depression anxiety and stress respectively.

Table 1: Frequency of depression

	Frequency	%	Valid %	Cumulative Percent
Mild	22	18.6	18.6	18.6
Moderate	8	6.8	6.8	25.4
Normal	88	74.6	74.6	100.0
Total	118	100.0	100.0	

Table 2: Frequency of anxiety

	Frequency	%	Valid %	Cumulative percent
Mild	56	47.5	47.5	47.5
Moderate	10	8.5	8.5	55.9
Normal	52	44.1	44.1	100.0
Total	118	100.0	100.0	

The participants showed probing depth up to 4 and 5mm that was the periodontal parameter used to measure chronic localized periodontitis as can be seen in Table 4.Table 5 shows results of Pearson correlation coefficient between parameters of chronic localized periodontitis (probing depth) and mental stress, anxiety and

depression. It can be observed that there exists a significant positive relationship between them. [P<0.01]

Table No 3: Frequency of stress

	Frequency	%	Valid %	Cumulative Percent
Mild	56	47.5	47.5	47.5
Moderate	10	8.5	8.5	55.9
Normal	52	44.1	44.1	100.0
Total	118	100.0	100.0	

Table No 4: Frequency of probing depth.

	Frequency	Percent	Valid Percent	Cumulative Percent
4	89	75.4	75.4	75.4
5	29	24.6	24.6	100.0
Total	118	100.0	100.0	

Table 5: Result of 2 tailed Pearson's correlation between each of the components with probing depth.

		Anxiety	Depression	Stress
Probing Depth	Pearson Correlation	0.353**	0.419**	0.384**
	p value	0.000	0.000	0.000
	N	118	118	118

Discussion:

Stress, by reducing immunity, may alter periodontal health of a person. Stress alters not only the behavioral change (oral hygiene habits, smoking, use of certain medicines and change in diet) but also physiological responses such as altered salivary flow, hormonal disturbance, change in gingival fluid circulation and modified immune reactions.[9] In a study[7] it has been shown that stress among professionals has direct link with periodontal diseases. Like other professions, health care providers also face huge stress. Similarly, undergraduates' students of BDS also face different stressors. Studying in medical institutes is very intense and competitive in order to obtain a self-rewarding and socially important career, therefore various medical programs have physical and mental effects on health of medical students. Vindhiya et al. showed that dental students have higher stress level that leads to periodontal problems.[10] The finding of current study are in agreement with study of Penmetsa et al. which found dental students with high stress levels than medical and pharmacy students[7] Moss et al. stated that depression was related to increased severity of periodontitis.[11] Their results are in line with our study as depression seemed to have strongest relationship with chronic localized periodontitis as can be observed in Table 1.

A study from Baghdad elicited positive correlations between stress, IL-1β and clinical periodontal parameters [12] which is in accordance with our study which showed that higher the levels of depression, anxiety and stress, higher is the value of probing depth as was observed from the analyses presented in Tables 1-4. In contrast to our findings, Shende AS et al did not found an association between stress and periodontal disease. [3] Among 35-60 years old individuals, Castro et al in a case control study evaluated relationship between periodontitis and life events, anxiety and depression. There was no notable association found between periodontitis and psycho emotional factors.[13]

We found statistically significant positive relationship between probing depth and each of anxiety, depression and stress. This indicates that higher levels of anxiety/depression or stress predict higher probing depth. Moreover, among the three parameters considered, depression seems to have the strongest relationship as it has the highest significant value followed by stress and anxiety as shown in table 5, which may be due to negligence of oral hygiene under stressful conditions as during exams which can have an indirect effect on periodontal health status on an individual. However, direct association between severity of periodontal disease and severity of depression has been reported in the literature.[7] The periodontal parameter (probing depth) used was slightly high among dental students because of oral health awareness in them and DASS scores were also slightly high may be because of examination stress or the competitive training during the course or personal life problems. Furthermore, the results of our study are in accordance with most of the studies in literature which has found a notable association of DASS effects over periodontal health measuring parameters

Conclusion:

We found positive correlation between chronic localized periodontitis and mental stress, anxiety and its related symptoms. Therefore, awareness should be

made among students regarding the good oral hygiene practices during stressful situations to avoid periodontal problems.

Acknowledgments:

Thankful to participants of study and all those who helped to complete this study.

Financial disclosure statement:

This research did not receive any grant.

Conflict of interest:

The authors declare that they have no conflict of interest.

References:

1. Vyas M. Study on Correlation of Stress and Periodontal Status. J Adv Med Dent Sci Res. 2018;6(2); 94-96.
2. Gunepin M, Derache F, Trousselard M, Salsou B, Risso J-J. Impact of chronic stress on periodontal health. J Oral Med Oral Surg. 2018;24(1):44–50.
3. Shende AS, Bhatsange AG, Waghmare AS, Shiggaon LB, Mehetre VN, Meshram EP. Determining the association between stress and periodontal disease: A pilot study. J Int Clin Dent Res Organ. 2016;8(2):111-114.
4. Mahendra L, Mahendra J, Austin RD, Rajasekhar S, Mythili R. Stress as an aggravating factor for periodontal diseases. J Clin Diagn Res. 2011;5:889–93.
5. Jaiswal GR, Jaiswal SG. Psychological stress: Its effect on periodontal status of individuals. J Dr NTR Univ Heal Sci. 2015;4(4):241.
6. Singh D, Bakshi D, Sahota J, Kaur G, Thakur A, Singh J. A mirror reflection of psychological stress on periodontal status: A clinicobiochemical study. HECS Int J Com Health and Med Res 2017;3(3):46-51.
7. Penmetsa GS, Seethalakshmi P. Effect of stress, depression, and anxiety over periodontal health indicators among health professional students. J Indian Assoc Public Health Dent 2019;17:36-40.
8. Helmi MF, Huang H, Goodson JM, Hasturk H, Tavares M, Natto ZS. Prevalence of periodontitis and alveolar bone loss in a patient population at Harvard School of Dental Medicine. BMC Oral Health. 2019;19(1):254.
9. Khan R. Stress and Periodontal Disease-An insight into the association. World Research Journal of Critical Care 2013, 1(2):24-6.
10. Vindhiya Varshini V, Arvina Rajasekar, Effect of Stress on Periodontal Health: A Clinical Study, J Res Med Dent Sci, 2020, 8 (7): 259-263.
11. Aeran, Himanshu & Tuli, Amrinder&Ghodpage, Pallavi &Tekwani, Kirti. Correlation between depression and periodontal health: A clinical study done among outpatients at Seema Dental College and Hospital, Rishikesh. International Journal of Oral Health Dentistry. 2020. 6. 41-43.
12. Mahmood AA, Leka'a MI. Effect of the examination stress on periodontal health status and salivary IL-1? among Iraqi dental students. J baghdad Coll Dent. 2013;25(4):72–78.
13. Ravishankar TL, Ain TS, Gowhar O. Effect of academic stress on plaque and gingival health among dental students of Moradabad, India. J Int AcadPeriodontol. 2014;16(4):115–120.