

## Oral Hygiene Practice and Its Relation with Stress among the Adult Patient Visiting the National Guard Hospital and Military Hospital in Madinah

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### Abstract

**Background:** Stress is increasing day by day in everyone's life and it is likely to contribute to the progressive long term development of oral diseases. It can motivate individuals to cope in unhealthy ways that foster oral diseases. Chronic stress also contributes to high allostatic load that can lead to the dysfunction of physiological systems critical to homeostasis, and thus affect the underlying mechanisms of diseases progression, more generally.

**Methods:** It was a hospital based cross sectional study which is completed in the period of 4 months. Total 511 patient were included in the study. A pretested questionnaire was used for data collection. The questionnaire included socio-demographic status, oral health practice. Stress was measured by using modified dental anxiety stress scale questionnaire having score 0 to 3 from never to severe stress. Three questions were reversed due to positive answer. Total score of stress was calculated by combing each score of every question. Total score is divided into three scale, low stress (0-14), Moderate stress (15-30) and severe stress (31- 45).

Ethical permission was obtained from the ethical committee of Taibah University College of Dentistry. The statistical analysis was performed by the Statistical Package for Social Science (SPSS) version 21 (SPSS Inc., Chicago, IL, USA). The significant value was obtained by using Chi Square test and  $P < 0.05$  is set to be significant.

**Results:** Total study participants were 511 among them males 258 and females 253. Females (65%) were having severe stress as compared to males (35%) and there was no significant relation with gender ( $P = 0.170$ ). Mostly younger age group (20-30 years) were under high stress (52%). Fifty eight percent of participants suffering from severe stress were smokers ( $P < 0.000$ ) and 68% of the participants were having bleeding gum who suffered from severe stress ( $P = 0.009$ ). Thirty nine percent of severe stress participants were cleaning their teeth only occasionally ( $P = 0.044$ ) and among them 13% never cleaned their teeth ( $P < 0.000$ ). Regarding brushing of teeth maximum number of participants from all level of stress were using brush and toothpaste for cleaning of their teeth that was 66%, 77% and 68% respectively ( $P = 0.014$ ). Only 10% of severe stress participants used nothing to clean interdental space ( $P = 0.469$ ).

**Conclusion:** It was observed that female and younger participants had severe stress. Among them more than fifty percent were smoker and having complain of bleeding gum. Number of severe stress participants were cleaning their mouth occasionally and some were not using interdental cleaning aids.

**Keywords:** Bleeding gum; Interdental space; Oral hygiene; Stress, smokers; Taibah University

## Introduction

Stress is unavoidable process and is increasing day by day in everyone's life [1]. It's defined in general as the need to make a behavioral adjustment to environmental changes. It can also be defined as adaptive response of an organism to a threatening stimulus, which provides the link between the psychological and physiological processes that are associated in the onset of the disease [2]. And it is a part of the human condition that is present universally, but to varying degrees, and has different effects on individuals [3].

Chronic stress is likely to contribute to the progressive long term development of oral diseases through at least two distinguishable pathways. First, stress can motivate individuals to cope in unhealthy ways that foster oral diseases (e.g., substance use, including illicit drugs, alcohol and tobacco, poor diet). Second, chronic stress contributes to high allostatic load that can lead to the dysfunction of physiological systems critical to homeostasis, and thus affect the underlying mechanisms of diseases progression, more generally [4].

Stress has been defined in general as the need to make a behavioral adjustment to environmental changes. It can also be defined as adaptive response of an organism to a threatening stimulus, which provides the link between the psychological and physiological processes that are associated in the onset of the disease [5,16]. While there seems to be a common belief that psychosocial stress affects oral hygiene behavior, this assumption has rarely been proved.

Periodontitis is an inflammatory response of the periodontium, which involves the destruction of investing tissues around the teeth and results in loss of tooth support and leading to tooth loss. Although, bacterial pathogens are required to initiate the disease process [7-9]. It is found in 5-20% of most adult populations worldwide [10,11]. Most studies have found that periodontitis affects majority of the adult population after the age of 35-40 years [12]. The etiological significance of biological and behavioral risk factors for periodontal diseases, such as smoking, advancing age, oral hygiene, and systemic diseases like diabetes mellitus has already been established [13-17]. Other factors such as stress, depression and anxiety are not yet confirmed as absolute risk conditions, but have been identified in some observational studies [18-20].

The contribution of psychological factors to the development and progression of the periodontal disease has recently become an area of increased research activity. Studies indicated that there might be strong relationships between stress, depression, and periodontal disease demonstrating convincing linkages between depression and elevated cortisol levels, negligence of oral hygiene, pocket depth, attachment loss, and tooth loss [21]. Mannem and Chava [22] found stress to be an important risk factor for periodontal disease. Regarding to smoker people the studies shows that's smoking is more prevalent in depression patients [23,24]. And among the many harmful oral habits, which are believed to be induced by emotional disturbances, smoking is possibly the most important in relation to worsened periodontal conditions [25].

Emotional conditions are suggested to cause alterations in dietary intake and affecting periodontal health with indirect pathway. Psychological factors affect the choice of foods through the physical consistency of the diet, and the quantities of food eaten during stressful periods is likely to cause an increase in the accumulation of plaque. Considering that psychological stress and plaque may act synergistically on the concentration of periodontal IL-1 $\beta$ , if the neglect of oral hygiene behavior occurs as a result of mental stress, the concentration of periodontal IL-1 $\beta$  might reach maximum levels [26, 27].

## Aim of this study

To know relationship of stress with oral hygiene practice among the patients visiting the National Guard Hospital and Military Hospital, Madinah, Saudi Arabia.

## Methods

This was a hospital based cross sectional study conducted over a period of four months from January 2017 to April 2017. The patients were included in the study who visited the dental outpatient department (OPD) of National Guard Hospital and Sultan Military Hospital of Madinah city. These two hospitals are covering the patients and their family who works in the National Guard and Military respectively. Convenient sampling methods that means the males or females who visited in the dental OPD selected the patients. The purpose of the study was explained to each patient by the interviewer before taking interview and verbal consent was taken. Total 511 patients gave answer properly. Those patients who did not agree to be interviewed or gave incomplete answer were excluded from the study.

A pretested questionnaire was used for data collection. The questionnaire included socio-demographic status, oral health practice, visiting dentist and smoking habits. Stress was measured by using modified dental anxiety stress scale questionnaire having score 0 to 3 from never to severe stress. Three questions were reversed due to positive answer. Total score of stress was calculated by combing each score of every question. Total score is divided into three scale, low stress (0-14), Moderate stress (15-30) and severe stress (31- 45). The patients were divided into three age groups ranging from 20-30, 31-40, and above 40 years.

Ethical permission for the study was obtained from the ethical committee of Taibah University College of Dentistry. The Microsoft Office Excel was used to collect data. The statistical analysis was performed by the Statistical Package for Social Science (SPSS) version 21 (SPSS Inc., Chicago, IL, USA). The significant value was obtained by using Chi Square test and  $P < 0.05$  is set to be significant.

## Results

The total study participants consisted of 511 and among them males 258 and females 253. It was observed that more females (65%) were having severe stress as compared to males (35%) and there was no significant relation with gender ( $P = 0.170$ ) Table 1.

Table 1: Relation of stress with gender

Stress level	Male N%	Female N%	Total N%
Less stress	49 55	40 45	89 100
Moderate stress	198 51	193 49	391 100
Severe stress	11 35	20 65	31 100

$P = 0.170$  Not significant

It was also observed that more number of participants who were under high stress falls in the age group of 20 – 30 years (52%) as compared to other groups Table 2.

Table 2: Relation of stress with age

Stress level	20 – 30 yrs N%	31 – 40 yrs N%	> 40 yrs N%	Total N%
Less stress	61 69	18 20	10 11	89 100
Moderate stress	239 61	113 29	39 10	391 100
Severe stress	16 52	10 32	5 16	31 100

Table 3 shows that 58% of participants suffering from severe stress were smokers and it was found that level of stress is highly significant relation with smoking ( $P < 0.000$ ). Sixty eight percent of the participants were having bleeding gum who suffered from severe stress ( $P = 0.009$ ) Table 4.

Stress level	Yes N%	No N%	Total N%
Less stress	19 21	70 79	89 100
Moderate stress	161 41	230 59	391 100
Severe stress	18 58	13 42	31 100

$P > 0.000$  highly significant

Table 4: relation of stress with the bleeding gum

Stress level	Yes N%	No N%	Total N%
Less stress	35 39	54 61	89 100
Moderate stress	211 54	180 46	391 100
Severe stress	21 68	10 32	31 100

$P = 0.009$  Highly significant

It was surprisingly to observe that 39% severe stress participants were cleaning their teeth only occasionally ( $P = 0.044$ ) and among them 13% never cleaned their teeth ( $P < 0.000$ ) Table 5 & 6.

Table 5: Relation of stress with the cleaning of teeth.

Stress level	Morn- ing only N %	Evening only N %	Morning evening N %	Occa- sional- lyN %	Total N %
Less stress	6 7	9 10	60 67	14 16	89 100
Moderate stress	44 11	47 12	238 61	62 16	391 100
Severe stress	2 6	3 10	14 45	12 39	31 100

$P = 0.044$  level of stress is significant with cleaning

Table 6: Relation of stress with the time of cleaning teeth

Stress level	One time N %	Two time N %	Occa- sional- ly N %	Never clean N %	Total N %
Less stress	7 8	65 73	16 18	1 1	89 100
Moderate stress	88 23	232 59	68 17	3 1	391 100
Severe stress	5 16	15 48	7 23	4 13	31 100

$P < 0.00$  level of stress is highly significant with time of cleaning

Regarding brushing of teeth maximum number of participants from all level of stress were using brush and toothpaste for cleaning of their teeth that was 66%, 77% and 68% respectively.  $P = 0.014$

Table 7: Relation of stress with the tools of cleaning teeth

Stress level	Brush+ toothpas- teN %	Brush+ miswakN %	iswakN %	Noth- ingN %	To- talN %
Less stress	59 66	21 24	6 7	3 3	89 100
Moderate stress	302 77	70 18	13 3	6 2	391 100
Severe stress	21 68	4 12	3 10	3 10	31 100

$P = 0.014$  level of stress is significant with tools of cleaning

Table 8: Relation of stress with tools of cleaning in between teeth

Stress level	Brush N %	Dental floss N %	Tooth-pick N %	Nothing N %	Total N %
Less stress	22 25	25 28	32 36	10 11	89 100
Mod-erate stress	98 25	149 38	118 30	26 7	391 100
Severe stress	9 29	9 29	10 32	3 10	31 100

P = 0.469 Level of stress is not significant

The relationship between the level of stress and cleaning in between the teeth was not significant as p value = 0.469. The participants who were in severe stress, among them only 10% never used any tools of cleaning the teeth as well as for interdental cleaning.

## Discussion

This cross sectional study was conducted to determine the association between stress and oral health practice and oral hygiene among the patients visited National Guard Hospital and Military Hospital, Madinah, Kingdom of Saudi Arabia.

Brushing, interdental cleaning, tongue hygiene are the most important tools for better oral health. The oral health related factors are associated with poor social and emotional well being but it is not possible to determine the exact pathway [28]. Stress can increase the frequency of mouth sores. Students often have mouth sores during their school year but no more or fewer during holidays [29]. It can also cause facial pain, grinding teeth, poor oral hygiene and gum diseases. Little is mentioned in the literature about mental stress relationship to oral health but some researchers found that stress were a risk factor for periodontal diseases. We have tried to find that oral hygiene practice is affected due to stress and this leads to affect oral health.

In the present study all the patients were aware about the importance of brushing but we found significant relation between the stress and oral hygiene. In our study percentage of severe stress was high among female (65%) as compared to male (35%) which shows in table 1. Mostly youngsters (20 – 30 years) were having severestress (52%). In several studies rate of depression was higher among female [30-31]. Stress among female high might be due to restriction in outdoor activity and confined more inside which is common in some Saudi community and this leads to excessive use of smart phones on social media. The other reason might be for female jobs are only in few sector. Pratt et al [32] reported that adult aged 20 years and over stress were more likely to be smokers than those without stress. This study also shows the patients of severe stress were mostly smokers and it has highly significant relation between severe stress and smoking (P > 0.00). This study was supported by the previous study by Choi et al [33].

Table 4 shows that 65% patients having severe stress complained of bleeding gum. This study strongly supported by the notion discussed by several authorsthat stress effect on gingiva and periodontal health [34,35]. It might be stress induced neglect of oral hygiene practice and not giving attention on oral hygiene maintainance and this leads to oral health problem like bleeding gum, gingivitis, periodontitis and dental caries. Several other scientists also studied and found similar findings [36-38]. Lin et al found dental pain which was associated with stress[39]. A study involving high school students reported that the higher the level of stress during the university examination and that leads to higher perception of the oral diseases [40].

Table 5 shows that 39% patient suffering from severestress were cleaning their teeth occassionally. This shows that people in severe stress do not give attention on oral hygiene practice which leads to further oral infection like gingivitis and periodontitis. In term of brushing, 61% were cleaning their mouth at least once daily (Table 6) and similar data were reported by researcher [41]. Among the all patients 10% were neither using any brush and nor using any tools to clean interdental space (Table 7 and 8). Segura and Sheiham found possitive association between work related demands and periodontal diseases indicated by bleeding or pocket [42].

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