

Original Article

Awareness of the Effect of Stress on Periodontal and Oral Health Status among Senior Military Medical Campus Students at Karary University in 2018

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Received: 8/6/2026

Accepted: 31/7/2026

Abstract

Background: Stress is a state of physiological or psychological strain caused by adverse stimuli, physical, mental, or emotional, internal or external, that tend to disturb an organism's functioning and may become a risk factor for oral and periodontal diseases. This study aimed to assess the awareness of the senior medical military students in the medical camps at Karary University in Sudan about the effect of stress on periodontal and oral health. **Methods:** This is a descriptive, cross -sectional study faculty-based carried out among 220 senior military medical students who attended the medical campus in Karary University in 2018. Data was collected by a self-administered questionnaire. The questionnaire was handed to the students during data collection and analyzed using the Statistical Package for Social Science [SPSS] version 22, and then the results were presented as percentages and frequencies in tables and figures. **Results:** This study found that 30% of the students observed bleeding while brushing their teeth during the study period. Many students, about 30.2% were aware that stress affects oral and periodontal health by reducing body immunity. 70% of military medical students were aware of the

relation between stress and smoking; 55% thought that there is a relation between stress and oral hygiene practice, and 68.20% reported that stress leads to bad brushing technique. Sixty percent knew that stress can cause periodontitis; 61.4% of the participants were aware of the relation between stress and harmful oral habits that affect the periodontal tissue. The majority of the military medical students (69.2%) read books as a stress coping strategy.

Conclusion: There is a relation between stress and oral hygiene, harmful oral habits on the periodontal tissue, and smoking. Most students had bleeding on brushing and coped with their stress by active methods such as reading books. . These percentages are comparable to those of other studies regarding the effect the effect of stress on periodontal and oral health status.

Keywords: Stress, medical students, periodontal and oral health.

Introduction:

Periodontal diseases are defined as inflammatory diseases caused by pathogenic microflora organized in biofilms surrounding the teeth and divided into two main forms: gingivitis and periodontitis (1). Psychological stress is considered a risk factor for periodontal disease (2). **Stress** is defined as a state of physiological or psychological strain caused by adverse stimuli, physical, mental, or emotional, internal or external, that tend to disturb an organism's functioning and which the organism naturally desires to avoid (3). Stress alters the cortisol level, which is an immunosuppressant hormone that may suppress immune function, thereby increasing the risk of periodontal diseases (4). Psychological stress can directly affect periodontal health by various biological mechanisms, and also, it can have indirect effects through the changes in lifestyle and health behaviors such as smoking (1).

Oral and parafunctional habits associated with stress, such as thumb sucking, tongue pressure on the teeth, nail biting, and bruxism, have been associated with dental migration and occlusal trauma, which may

contribute to the onset and progression of periodontal diseases (5).

Stress can lead to poor or neglected oral hygiene, irregular tooth brushing, irregular dental appointment attendance, and poor compliance. This leads to increased plaque accumulation, which is the primary etiological factor for periodontal disease, and decreased resistance of the periodontium to inflammatory breakdown (6). Various studies around the globe have emphasized that students studying in medical and dental school courses experience higher stress levels (7). The possible inducers of stress in medical/ dental students could be due to the pressure of studies, frequent examinations, and interpersonal factors such as excessive competitive attitudes among students and fear of losing an academic term due to failure in examinations (6). The stress which is experienced by military students may adversely affect their academic achievement, personal well-being, long-term professional capabilities, and it can have a negative impact on their cognitive functioning, learning, systemic, and oral health (8). During medical school, students' coping with stress is important because how medical students cope, not only predicts their mental health and academic performance but also

the quality of patient care they go on to deliver (9). Stress is a common problem among medical and dental students and is considered a risk factor for periodontal and oral diseases because it increases cortisol level in the blood, which leads to suppression of the immune response. Senior military students are more likely to experience elevated levels of stress; therefore, increasing their awareness of its potential effects may enhance their ability to cope with stress effectively.

The aim of the present study was to determine the awareness of the senior military students in medical camps at Karary University in Sudan about the effect of stress on periodontal and oral health.

Materials and Methods

A faculty-based descriptive cross-sectional study was conducted among Senior (semi-final and final) students at the medical campus (Medicine, Dentistry, Pharmacy, and Laboratory) of Karary University in Omdurman, Sudan. A designed self-administered

questionnaire was used to collect data from participants. Demographic data were collected (e.g., age), along with data on awareness regarding the relation between stress and oral/periodontal diseases, the relation between stress and oral hygiene habits and smoking habits, the oral and periodontal diseases that they had, and the techniques that they used to cope with stress. A total coverage technique was used to select study participants; two hundred twenty military medical students participated in this study. Data were analyzed using SPSS version 22, and results were presented as frequencies and proportions in tables and figures.

Results:

A total number of 202 participants were included in this study. The participants were male military semi-final and final medical students at Karary University, with an age range extending from 18 to 30 years, and a mean age 22.2 years (Table 1).

Table 1: The age of the participants

Age range	The mean (SD)
18- 30	22.2 $\pm$ 1.3

The findings of the present study revealed that 30% of participants reported that stress affect the oral and periodontal health by decreases the immunity as seen in (Table 2). In this study regarding the knowledge about the type of oral and periodontal diseases that caused by stress 45% of students stated periodontitis (Table3). The results demonstrated that 30% of the participants complained from bleeding with brushing followed by 27% oral ulcer as seen in (Table4). In this study 70% of participants were aware about the relation between stress and smoking .A total of 68.40% of participant reported that smoking provided a sense of relaxation, freedom sensation and improved mode (Table 5and 6). More than half of the participants (55%) were aware of the relation between stress and poor oral hygiene practice during the stressful periods .Furthermore, 68.2% reported that bad brushing technique was commonly associated with stress

,whereas 31.8% indicated that they completely neglected their oral hygiene during such periods (Table 5 and 6). Regarding stress related oral habits 61.4 of participants were aware of the relation between stress and harmful oral habits , with finger nail biting being the most frequently reported habit (43.8%) table 5and 6. When asked about tooth brushing frequency, 63% of the participants reported brushing their teeth twice daily (Figure1). Reading books was the most frequently reported stress coping strategy among military medical students, with 69.3% of participants indicating its use for stress reduction (Table 7).

Table 2 shows the participants' awareness regarding the specific effects of stress on oral and periodontal health. The majority (30.2%) believed that stress reduces body immunity, followed by 16.8% who reported oral ulceration, and 14.8% who thought it affects oral hygiene habits.

Table 2: The effect of stress on oral and periodontal health:

The effect of stress on oral and periodontal health	Frequency (n) and %
Gingivitis	(21) 10.4%
Decrease immunity	(61) 30.2%
Effect on inflammatory cells	(16) 8 %
By affecting oral hygiene habits	30) 14.8%
Affect the innervation of the tissue	(4) 2 %
Bleeding	(6) 3 %
Oral ulceration	(34) 16.8 %
Periodontitis	(30) 14.8 %
Total	(202) 100%

Table 3 shows the participants' knowledge about the specific types of periodontal disease caused by stress. Periodontitis was the most commonly identified disease (45%), followed by oral ulcer (26%) and gingivitis (10%).

Table 3: The knowledge about the type of oral and periodontal diseases that caused by stress:

Oral and periodontal diseases that caused by stress	Frequency (n) %
Gingivitis	(20) 10%
Periodontitis	(91) 45%
Oral Ulcer	(53) 26%
Periodontal abscess	(16) 8%
Gingival Enlargement	(8) 4%
Dental caries	(8) 4%
Gingival recession	(6) 3%
Total	(202) 100%

Table 4 shows the oral and periodontal symptoms that the students complained of. Bleeding on brushing was the most frequently reported symptom (30.1%), followed by oral ulcer (27%) and pulpitis (14%).

Table 4: The oral and periodontal diseases Symptoms and signs that military medical students complained of:

Oral and periodontal diseases	Frequency (n)	(%)
Halitosis (malodor)	7	3.5%
Bleeding on brushing	61	30.1%
Gingival recession	16	8%
Gingival Enlargement	9	4.5%
Dental caries	22	11%
Pulpitis (toothache)	28	14%
Oral Ulcer (aphthous ulcer)	55	27%
Tooth mobility	4	2%
Total	202	100%

Table 5 presents the students' awareness of the relationship between stress and three behavioral factors. The majority of participants (70%) acknowledged a link between stress and smoking, while 61.4% recognized its association with harmful oral habits, and 55% were aware of its effect on oral hygiene practices during stressful times.

Table 5: The awareness about the relation between smoking, bad oral habits, bad or neglect oral hygiene and stress:

The awareness about the relation between:	Yes (n) %	No (n) %	Total (n) %
Stress and smoking	(141) 70%	(61) 30%	(202) 100%
Stress and harmful oral habits	(124) 61.4%	(78) 38.6%	(202) 100%
Stress and oral hygiene during stressful times	(111) 55%	(91) 45%	(202) 100%

Table 6 summarizes the specific behavioral patterns related to stress. Regarding smoking, 68% of students reported that smoking provides relaxation and improves mood. Concerning oral hygiene, 68.2% admitted to using a poor brushing technique during stress,

while 31.8% completely neglected oral hygiene. Regarding harmful habits, nail biting was the most frequently reported (43.5%), followed by biting on hard objects (14%) and smoking (12.3%).

Table 6: The relation between smoking, oral hygiene, harmful habits and stress:

Stress and smoking	(n) Frequency %		Total
Bad mood leads to smoking	(18)	9%	(202) 100%
Smoking leads to relaxation, freedom sensation, and improves mood	(138)	68%	
Smoking leads to forgetting bad memories	(26)	13%	
Stress increases the number of cigarettes per day	(20)	10%	
Stress and oral hygiene during the stressful time	(n) Frequency %		Total
Bad Brushing technique	(138)	68.2%	(202) 100%
Neglect oral hygiene	(64)	31.7%	
Stress and harmful oral habits	(n) Frequency %		Total
Smoking	(25)	12.3%	(202) 100%
Snuff dipping	(24)	11.8%	
Bruxism	(20)	10%	
Fingernail biting	(88)	43.5 %	
Biting on hard Objects	(28)	14%	
Other bad habits	(17)	8.4%	

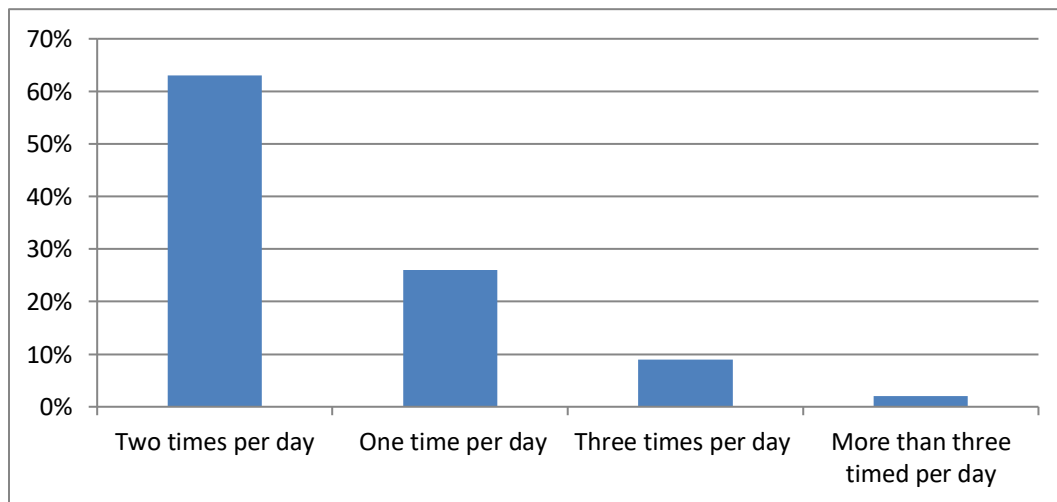


Figure1: The frequency of teeth brushing during the day

Figure 1 shows tooth brushing frequency; 63% of the participants reported brushing their teeth twice daily.

Table 7 presents the stress-coping techniques used by the participants. Reading books was the most commonly reported method (69.3%), followed by communication with friends and family (13.3%), and faith/praying (5%).

Table 7: The techniques used to cope with stress:

Stress copying techniques	(n)	Frequency %
Reading books	(140)	69.3%
Communication with friends and family	(27)	13.3%
Listening to songs and watching TV	(12)	6%
Playing foot ball	(8)	4%
Thinking about other things	(5)	2.4 %
Faith and praying	(10)	5%(
Total	(202)	100%

Discussion:

Stress was considered as one of the important risk factors that cause many inflammatory diseases including the periodontal diseases (10). Stress is considered a risk factor for many inflammatory diseases, including periodontal disease (10). Studies around the globe have emphasized that students studying in medical and dental universities experience higher stress levels because of academic factors such as a highly stressful learning environment, pressure of studies, heavy academic tasks, and frequent examinations with high required

academic grades, and interpersonal factors, such as excessive competitive attitudes among students and fear of failing an academic term, besides the military factors in our study (6, 11). In this study, the majority of the military medical students were aware that stress could affect oral and periodontal health by decreasing immunity as a results of an increase in stress hormones, this result was in agreement with the study done by Penmetsa et al., which showed that psychological factors have an adverse effect on plaque level and gingival status, and a strong positive correlation among

dental students between psychological parameter (depression, anxiety, stress) and periodontal parameter. This positive correlation occurs due to the direct effect of stress on immune system suppression, which may increase the susceptibility to periodontal diseases (12).

The military medical students in the present study 45% of them reported that the periodontitis is the most common types of oral and periodontal diseases that caused by stress and the most common periodontal diseases symptoms among students was gingival bleeding with brushing which is the early signs of the periodontal diseases, these results were in accordance with the study that done by kolaparthi et al, the results showed increase in the periodontal parameters like clinical attachment level (CAL) which reflect periodontitis with the increase in stress values(13).

In the present study, 45% of the military medical students reported that periodontitis is the most common type of oral and periodontal disease caused by stress, and the most common symptom among students was gingival bleeding on brushing, which is the early sign of periodontal disease. These results were in accordance with the study done by

Kolaparthi et al., which showed an increase in periodontal parameters such as clinical attachment level (CAL), which reflects periodontitis with the increase in stress values (13).

In the current study, more than half of the participants were aware of the relation between stress and poor oral hygiene during stressful times, and most of the students stated that bad brushing technique was usually associated with stressful times, while others demonstrated that they totally neglected oral hygiene during the stress period. Previous studies, such as those done by Salem et al. and Kolaparthi et al., suggested that students generally had poor oral hygiene, irregular tooth brushing, and neglected their oral health care under conditions of stress, thereby showing plaque accumulation, which is the primary etiological factor for oral and periodontal disease (gingival inflammation and periodontitis) (13, 14).

Findings of the present study showed that the majority of participants were aware of the relationship between stress and smoking, and most of them reported that Smoking leads to relaxation, a freedom sensation, and improves mood. The current study result was in line with that of AlSwuaillem et al., which reflected that a

high proportion of current smoker medical students like examination time, in students (47.8%) reported stress as the main reason for smoking (15). which oral hygiene mechanisms might be less effective and/or reduced in frequency during

The severity of periodontal disease is higher among smokers (increasing the depth of periodontal pockets, periodontal attachment, and bone loss). This stressful time. These changes occurring in behavior have been considered as a consequence of stress (10,13).

The presence of nicotine in the blood also results in vasoconstriction because of the release of adrenaline and noradrenalin. This vasoconstriction blocks nutrients from reaching periodontal tissues, suppresses antibody response, and inhibits neutrophil oral function (5). Chronic stress is associated with increased chances of depression, relationship difficulties, anxiety, and suicide (16). Studying in a medical field is a time of significant psychological distress for medical students, as they face numerous academic challenges that make them more prone to stress and anxiety when compared to students of other academic disciplines (17). Coping represents a key mechanism in the adaptation to stressful life events, involving a range of behavioral and psychological strategies aimed at

Regarding the oral hygiene practice among military medical students, the results managing, minimizing, or overcoming the challenges posed by stressors (18).

demonstrated that most of the students brush their teeth twice per day, which reflects their good awareness of the importance of regular brushing to maintain oral health despite the stress situations that they deal with. This result was not in agreement with the study of Kolaparthi *et al.* and Mahmood *et al.*, which suggested that students neglect oral hygiene practice during the study period, mainly in the In the present study, 69.2% of medical students read books, followed by communication with friends and family, as methods used to cope with stress, which are considered active coping strategies. Current study results were in agreement with the study done by Harris *et al.*, which investigated the stress coping mechanisms in fourth-year dental and

medical students. Results showed that active functional coping mechanisms were more common among dental and medical students, such as resting, talking with people who care (friends and family members), social interactions, and hobbies, which were the most commonly used coping methods (19).

It is important for the medical university to put the academic and military stressors and their effect on the students' general, oral, and periodontal health in the priority of faculty responsibility and to use different strategies to assist the students in active, positive coping. It is also important to increase awareness regarding stress effects and the coping modalities among medical students.

Conclusion:

There is a relation between stress and oral hygiene, harmful habits on the periodontal tissue, and smoking. Most of the students had bleeding on brushing and coped with their stress by active methods which is reading books (69.3%). These percentages are comparable to those of other studies regarding the effect of

stress on periodontal and oral health status.

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