

# Association Between Perceived Stress and Periodontal Health: A Cross-Sectional Questionnaire-Based Study

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**Abstract:** **Background:** Psychological stress can negatively affect periodontal health through behavioral and immunological pathways. Understanding this relationship may inform preventive strategies. **Objective:** To assess the association between perceived stress and self-reported periodontal health and oral hygiene habits in adults. **Methods:** A cross-sectional questionnaire study was conducted using Google Forms among 250 adults aged 18–60 years. The survey included demographic information, the 10-item Perceived Stress Scale (PSS-10), oral hygiene habits, self-reported periodontal symptoms, and stress-related behaviors. Data were analyzed using descriptive statistics, correlation tests, and multivariate logistic regression. **Results:** Among 250 respondents, the mean PSS-10 score was  $18.4 \pm 6.2$ , with 38% reporting high stress ( $PSS \geq 20$ ). High-stress individuals had significantly higher self-reported bleeding gums (62% vs. 34%), gum swelling (57% vs. 28%), and halitosis (45% vs. 20%) compared to low-stress participants ( $p < 0.001$ ). Brushing frequency and use of interdental aids were significantly lower in high-stress individuals ( $p = 0.02$ ). Multivariate regression confirmed that higher stress scores were independently associated with increased odds of periodontal symptoms (OR = 2.3, 95% CI: 1.5–3.5,  $p < 0.001$ ). **Conclusion:** Higher perceived stress is significantly associated with increased self-reported periodontal symptoms and poorer oral hygiene practices. Stress management may play an important role in periodontal disease prevention.

**Keywords:** Stress, Periodontal Health, Oral Hygiene, PSS-10, Questionnaire Study

## 1. Introduction

Periodontal disease is a chronic inflammatory condition influenced by microbial, systemic, and behavioural factors. Psychological stress may exacerbate periodontal disease by:

- Altering immune responses and increasing pro-inflammatory cytokines
- Increasing cortisol levels
- Reducing motivation for oral hygiene
- Encouraging behaviors such as smoking and poor diet.

Despite growing evidence, few studies have directly linked perceived stress with self-reported periodontal symptoms in adult populations. This study aims to address this gap using a cross-sectional questionnaire administered via Google Forms.

## 2. Materials and Methods

### Study Design and Participants

A cross-sectional questionnaire-based study was conducted using an online Google Form survey platform. The study targeted adults aged 18–60 years. Participation was voluntary, and the questionnaire link was distributed via social media

platforms, messaging applications, and email circulation. Individuals who were able to read and understand the questionnaire and who provided electronic informed consent were included. No identifiable information was collected, ensuring participant anonymity.

### Data Collection Instrument

A structured Google Form questionnaire was designed, consisting of:

- 1) **Demographics:** age, gender, education, smoking status, and medical history
- 2) **Perceived Stress Assessment:** 10-item PSS-10; scores 0–40, categorized as low (0–13), moderate (14–19), high (20–40)
- 3) **Oral Hygiene Practices:** Brushing frequency, interdental aid use, frequency of dental visits
- 4) **Self-Reported Periodontal Symptoms:** Bleeding gums, gingival swelling/redness, halitosis, tooth mobility, pain while chewing
- 5) **Lifestyle:** Sleep duration, coping behaviors

## 3. Questionnaire

Section	Item	Response Options / Scoring
1. Consent	I voluntarily agree to participate in this study	<input type="checkbox"/> Yes
2. Demographics	Age	_____ years
	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Prefer not to disclose
	Education	<input type="checkbox"/> High School <input type="checkbox"/> Undergraduate <input type="checkbox"/> Postgraduate <input type="checkbox"/> Other
	Smoking Status	<input type="checkbox"/> Never <input type="checkbox"/> Former <input type="checkbox"/> Current
	Medical Conditions	<input type="checkbox"/> Diabetes <input type="checkbox"/> Hypertension <input type="checkbox"/> Cardiovascular disease <input type="checkbox"/> None <input type="checkbox"/> Other: _____

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	Please indicate how often you felt or thought a certain way in the last month	0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Fairly often, 4 = Very often
3. Perceived Stress Score (PSS-10)	Felt upset by unexpected events	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt unable to control important things	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt nervous or stressed	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt confident handling personal problems (reverse scored)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt things were going your way (reverse scored)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Found it hard to cope with everything	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Controlled irritations in life (reverse scored)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt on top of things (reverse scored)	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt angered by things outside control	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Felt difficulties piling up	<input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
	Total PSS Score: Sum of 10 items (0–40)	0–13 = Low stress, 14–19 = Moderate stress, 20–40 = High stress
4. Oral Hygiene Practices	Brushing Frequency	<input type="checkbox"/> Once daily <input type="checkbox"/> Twice daily <input type="checkbox"/> More than twice daily
	Use of Interdental Aids	<input type="checkbox"/> Floss <input type="checkbox"/> Interdental Brush <input type="checkbox"/> Mouthwash <input type="checkbox"/> None
	Dental Visits Frequency	<input type="checkbox"/> Every 6 months <input type="checkbox"/> Once per year <input type="checkbox"/> Only when needed <input type="checkbox"/> Rarely/Never
5. Self-Reported Periodontal Symptoms	Bleeding Gums	<input type="checkbox"/> Never <input type="checkbox"/> Occasionally <input type="checkbox"/> Frequently <input type="checkbox"/> Always
	Gingival Swelling/Redness	<input type="checkbox"/> Never <input type="checkbox"/> Occasionally <input type="checkbox"/> Frequently <input type="checkbox"/> Always
	Halitosis	<input type="checkbox"/> Never <input type="checkbox"/> Occasionally <input type="checkbox"/> Frequently <input type="checkbox"/> Always
	Tooth Mobility	<input type="checkbox"/> Yes <input type="checkbox"/> No
	Pain While chewing	<input type="checkbox"/> Never <input type="checkbox"/> Occasionally <input type="checkbox"/> Frequently <input type="checkbox"/> Always
6. Lifestyle	Sleep Duration	<input type="checkbox"/> <5 hours <input type="checkbox"/> 5–6 hours <input type="checkbox"/> 6–7 hours <input type="checkbox"/> 7–8 hours <input type="checkbox"/> >8 hours
	Coping Behaviors	<input type="checkbox"/> Exercise <input type="checkbox"/> Meditation/Relaxation <input type="checkbox"/> Social Support <input type="checkbox"/> Hobbies <input type="checkbox"/> Other: _____

#### 4. Statistical Analysis

Data from 250 completed questionnaires were analysed using SPSS version 25.0. Descriptive statistics (mean ± SD, frequency, percentage) were calculated. Chi-square tests assessed associations between stress categories and periodontal symptoms. Spearman correlation examined the relationship between PSS-10 scores and symptoms. Multivariate logistic regression determined independent associations after adjusting for age, gender, and smoking status. Statistical significance was set at  $p < 0.05$ .

#### 5. Results

A total of 250 participants completed the online survey. The study population had a mean age of  $32.5 \pm 9.4$  years, with 135 females (54%) and 115 males (46%). Most participants were non-smokers (60%), and 16.8% reported medical conditions such as diabetes, hypertension, or cardiovascular disease.

Based on the PSS-10, 28% of participants had low perceived stress (score 0–13), 34% had moderate stress (14–19), and 38% had high stress (20–40), with a mean score of  $18.4 \pm 6.2$ . Regarding oral hygiene practices, 58% of participants brushed twice daily, 28.8% once daily, and 13.2% more than twice daily. Interdental aid usage was reported by 42%, and only 36% visited a dentist every six months.

Self-reported periodontal symptoms were common: bleeding gums were reported by 50% of participants, gingival swelling/redness by 44%, halitosis by 34%, tooth mobility by 15.2%, and pain while chewing by 20.8%. The prevalence of symptoms increased with higher stress levels. For example,

bleeding gums were reported by 34% of low-stress, 48% of moderate-stress, and 62% of high-stress participants. Similar trends were observed for gingival swelling (28%, 42%, 57%) and halitosis (20%, 30%, 45%), showing a clear association between perceived stress and self-reported periodontal health. Lifestyle factors showed that most participants slept between 6 and 8 hours each night. Common coping behaviors included exercise (38%), hobbies (35%), meditation or relaxation (28%), and social support (25%). Participants with higher stress scores tended to report fewer coping behaviors and slightly poorer oral hygiene practices.

Overall, these findings suggest a strong association between perceived stress and self-reported periodontal symptoms, highlighting the potential influence of psychological stress on oral health.

#### 6. Discussion

This study demonstrates a significant association between perceived stress and self-reported periodontal symptoms in an online adult population. Participants with higher stress reported increased bleeding gums, gingival inflammation, halitosis, and tooth mobility. These findings are consistent with literature suggesting that psychological stress can influence oral health through behavioural changes and immune modulation.

Lifestyle factors such as sleep duration and coping behaviors were also related to stress levels. Individuals with better coping strategies and adequate sleep reported lower stress and fewer periodontal symptoms, emphasizing the role of holistic health practices in maintaining oral health.

The use of an online questionnaire allowed for efficient data collection, though self-reported periodontal symptoms are a limitation and may not reflect clinical periodontal status. Future studies could integrate clinical examinations to validate these findings.

## 7. Conclusion

This study highlights a significant relationship between perceived stress, measured by PSS-10 scores, and self-reported periodontal symptoms. Participants with higher stress levels experienced more frequent periodontal complaints. Lifestyle factors such as sleep duration and coping behaviors influenced stress and oral health outcomes. These findings emphasize the importance of stress assessment and management in preventive dental care and suggest that addressing psychological stress may improve both overall well-being and periodontal health.

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