

# Lifestyle Impact on Periodontal Health: A Review

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**Abstract:** *Periodontal health is greatly influenced by various lifestyle factors, including smoking, alcohol consumption, stress, systemic diseases, medications, nutritional deficiencies, sedentary lifestyles, and genetic predispositions. This article provides an overview of the negative impacts of these factors on periodontal health and highlights the importance of preventive measures and lifestyle adjustments. Smoking has been extensively linked to an increased risk and severity of periodontal disease, as well as reduced treatment efficacy. Alcohol consumption, depending on the dosage, can also contribute to periodontal disease through multiple pathways. Chronic stress, bruxism, untreated occlusal discrepancies, and systemic diseases such as cardiovascular diseases and diabetes mellitus have been associated with periodontal health complications. Medication intake, nutritional deficiencies, and sedentary lifestyles further impact periodontal health. On the other hand, maintaining good oral hygiene practices, regular dental visits, proper interdental cleaning, physical activity, weight management, and addressing sleep quality can promote periodontal health. Understanding genetic and epigenetic factors also plays a crucial role in comprehending individual susceptibility to periodontal diseases. In conclusion, preserving periodontal health requires a comprehensive approach that addresses lifestyle factors, emphasizes preventive measures, and considers individual genetic variations. By implementing these strategies, optimal periodontal health can be achieved, leading to improved overall well-being.*

**Keywords:** periodontal health, lifestyle factors, oral hygiene practices, smoking, systemic diseases.

## 1. Introduction

Throughout ancient civilizations, oral hygiene practices exhibited significant variations, leading to a wide prevalence of periodontal diseases due to their limited effectiveness. <sup>(1)</sup> The advent of industrialization brought about improved accessibility to dental care and the introduction of commercial oral hygiene products. However, the challenges of processed foods, increased sugar consumption, and tobacco usage emerged. In modern times, periodontal health is influenced by various lifestyle factors, including suboptimal dietary choices, smoking, stress, sedentary routines, and evolving oral hygiene practices. This article delves into the negative impacts of smoking, alcohol consumption, stress, systemic diseases, medications, nutritional deficiencies, and sedentary lifestyles on periodontal health. Preserving periodontal health requires emphasizing good oral hygiene, engaging in physical activity, and addressing lifestyle factors. Furthermore, understanding the role of genetic and epigenetic factors can guide future research and treatment strategies. Ultimately, promoting optimal periodontal health necessitates implementing preventive measures and making necessary lifestyle adjustments.

## 2. History

Throughout ancient civilizations, oral hygiene practices exhibited significant variations. Some resorted to rudimentary implements such as toothpicks or herbal concoctions, albeit with limited efficacy. Consequently, insufficient oral hygiene prevailed, resulting in the widespread prevalence of periodontal diseases. <sup>(1)</sup>

The medieval period witnessed a dearth of comprehensive oral hygiene practices. Inadequate nutrition and limited access to dental care further compounded oral health challenges. <sup>(2)</sup>

The Renaissance period brought forth remarkable advancements in science and dentistry. Eminent pioneers like Pierre Fauchard championed the significance of dental hygiene practices. However, the broad implementation of these practices remained restricted during this era. <sup>(2)</sup>

With the advent of industrialization, oral health experienced notable transformations. The Industrial Revolution facilitated improved accessibility to dental care, ushering in the era of commercial toothpaste and toothbrushes, thus elevating oral hygiene practices. Nonetheless, the introduction of processed foods, heightened sugar consumption, and the prevalence of tobacco usage presented novel obstacles to periodontal well-being. <sup>(3)</sup>

In the present-day, modern lifestyle habits continue to exert substantial influence on periodontal health. Suboptimal dietary choices, excessive sugar intake, smoking, heightened stress levels, sedentary routines, and evolving patterns in oral hygiene practices collectively contribute to the incidence of gum diseases and other oral health complications. <sup>(3)</sup>

### Smoking and Periodontal health

Smoking, a significant lifestyle factor, has detrimental effects on the well-being of the gums and supporting structures. The prevalence of tobacco use among approximately one-third of the global adult population is a cause for concern. Projections suggest that tobacco-related

deaths will surpass 10 million annually in the next two decades. Developing nations are witnessing an increase in smoking rates, indicating a rise in periodontal diseases. <sup>(4)</sup>

Extensive research has established a strong correlation between smoking and periodontal health. Smoking independently raises the risk and worsens the severity of periodontal disease. It also hampers the effectiveness of periodontal treatment. Studies show that the likelihood of developing periodontal disease is directly related to smoking intensity, as evident from clinical attachment loss and bone deterioration. Former smokers generally experience less attachment loss than current smokers but more than those who have never smoked. <sup>(5)</sup>

The underlying mechanisms through which smoking negatively affects periodontal health are gradually being uncovered. Research indicates that tobacco smoke induces changes in lipid A, specifically the 3 - OH fatty acids, leading to a reduction in the inflammatory potential of the oral microflora. This sheds light on the interesting observation of increased infection from periodontal pathogens and simultaneous reduction in clinical inflammation among smokers. <sup>(6)</sup>

Exposure to tobacco smoke extract alters the expression of major and minor fimbrial antigens in *Porphyromonasgingivalis*, a bacterium associated with periodontal disease. This exposure promotes the formation of biofilms containing two different species and modifies the pro - inflammatory capacity of *P. gingivalis* biofilms. The immunosuppressive effects of smoking further contribute to changes in cytokine profiles and immune cell function in the gingival crevicular fluid, potentially making individuals more susceptible to periodontitis. <sup>(5)</sup>

Moreover, smoking negatively impacts the success rates of periodontal treatment. Multiple studies consistently demonstrate lower success rates in smokers compared to non - smokers, especially in procedures such as regenerative and soft tissue grafting, as well as dental implantation. Smoking disrupts the oral microbiome, allowing harmful bacteria to thrive while diminishing beneficial bacteria. This leads to the establishment of a distinct microbiome in smokers affected by periodontitis. Nonsurgical periodontal treatment yields less favorable outcomes in smokers, and their post - surgical results are comparatively poorer. However, smoking cessation has positive effects on periodontal health, reducing the risk of tooth loss. Further research is needed to fully understand the impact of combined periodontal treatment and smoking cessation. Importantly, smoking increases the risk of peri - implantitis and implant failure, highlighting the need for smokers to be aware of these risks and consider quitting smoking for the betterment of their oral well - being. <sup>(5)</sup>

#### Alcohol and Periodontal Health

Alcohol consumption has been linked to the development of periodontal disease. Research suggests that alcohol can impact the health of periodontal tissues through various pathways, including detrimental effects on the body's defense mechanisms, liver functionality, protein metabolism, tissue healing processes, and bone metabolism. The

association between alcohol and periodontal disease appears to depend on the dosage, with higher levels of alcohol intake correlating with an increased risk. However, the specific type of alcohol consumed does not seem to play a significant role in this relationship. The effects of alcohol on periodontal tissues can vary, with the gingiva being the most prominently affected area, followed by the periodontal ligament and alveolar bone. Obtaining clearer insights necessitates more precise measurement of alcohol consumption and an understanding of consumption patterns. <sup>(7)</sup>

#### Stress and Periodontal Health

Chronic diseases result from long - term interactions between a host and its environment. Various mechanisms link psychosocial conditions to inflammatory periodontal diseases. These include endocrine changes, neglect of oral hygiene due to psychological disturbances, alterations in dietary intake, harmful habits induced by emotional disturbances, effects on gingival circulation and salivary flow, neurotic oral habits, lowered host resistance to disease, bruxism, stress - related acute necrotizing ulcerative gingivitis, aggressive periodontitis, systemic inflammatory disease, and the impact on wound healing. Stress can affect the course of oral diseases and wound healing by suppressing the cellular immune response. <sup>(8)</sup>

#### Bruxism

Patients with bruxism, who were aware of their parafunctional habits and exhibited obvious symptoms of tooth attrition, had no or minimal signs of periodontal disease. Additionally, there were no significant differences in bone height and clinical attachment level between patients with reported bruxism and those without. There is no detrimental effects of occlusal factors, such as bruxism, on the periodontium. <sup>(9)</sup>

#### Occlusal Discrepancies

untreated occlusal discrepancies had a significant negative effect on the overall clinical condition of the tooth, as evidenced by a worsening in prognosis and mobility. However, teeth with treated occlusal discrepancies did not show significant differences compared to teeth without initial occlusal discrepancies. The increase in probing depth over time was significantly associated with untreated occlusal discrepancies. Furthermore, the presence of parafunctional habits without an occlusal splint did not show a significant association with disease progression. Patient compliance with maintenance procedures was highlighted as a crucial factor in the success of periodontal treatment. <sup>(10)</sup>

### 3. Systemic Diseases and Periodontal health

#### Cardio Vascular Diseases

Periodontal disease (PD) acts as a modifiable risk element in the realm of cardiovascular diseases (CVDs). The intricate association between PD and CVDs encompasses diverse mechanisms, such as dysbiosis in the oral microbiome and systemic inflammation. Employing diagnostic biomarkers aids in evaluating this connection. Research on periodontal therapy exhibits promise in managing or preventing CVDs by diminishing gum inflammation and exerting an impact on the oral microbiome. The integration of periodontal care

within comprehensive health strategies facilitates the addressing of PD - related systemic disorders while promoting holistic well - being and the cultivation of healthy lifestyles. Efforts toward health promotion should encompass oral health care to achieve optimal wellness.<sup>(11)</sup>

### Diabetes Mellitus

The risk of severe periodontal disease is higher in diabetics, influenced by metabolic control and diabetes duration. Periodontal treatment is effective but recurrence is more likely with poorly controlled diabetes. Impact of treatment on diabetes control, especially HbA1c levels, varies. Reduction in HbA1c post - treatment is generally modest. Understanding the diabetes - periodontal disease relationship requires studying inflammatory mediators and variations across different diabetes severities. Enhancing diabetes and periodontal disease control improves quality of life for diabetics.<sup>(12)</sup>

### Hormonal Changes and Periodontal Health

The ovaries produce estrogen and progesterone, impacting gingival and periodontal tissues. Hormonal changes can cause inflammation and bacterial growth related to periodontal disease. Puberty, menstruation, pregnancy, and menopause affect oral health in women.

Good oral care during puberty helps prevent gingivitis. Menstrual hormonal changes can lead to gingival inflammation. Maternal periodontal disease can influence pregnancy outcomes, and the efficacy of periodontal treatment during pregnancy is still debated.

Oral contraceptives and menopause have implications for periodontal health. Bisphosphonate use can result in jaw complications. Postmenopausal women may experience burning sensations, taste alterations, reduced saliva, and increased dental risks.<sup>(13)</sup>

### Medications and Periodontal Health

Medication intake plays a role in periodontal conditions. Gingival overgrowth can occur due to medications like phenytoin, cyclosporin A, and nifedipine. Healthcare professionals should be knowledgeable about oral health complications caused by medications. Patient are in anticoagulant, which could increase bleeding while doing every simple procedure. To identify causative agents, a comprehensive medical history should include prescription drugs, over - the - counter drugs, and supplements.<sup>(14)</sup>

### Nutritional Deficiencies and Periodontal Health

When it comes to enhancing periodontal health, it has been proposed that the inclusion of vitamins and minerals, particularly vitamin C, can have a positive impact. Nutritional deficiencies can arise in individuals with medical conditions or who are taking specific medications, with the elderly population being particularly vulnerable due to factors such as decreased masticatory efficiency. To prevent and manage periodontal diseases, it is beneficial to provide nutrition consultation and a diverse range of food choices. In cases of micronutrient deficiencies, consideration should be given to dietary sources or supplementation.<sup>(15)</sup>

### Oral Hygiene and Periodontal health

When it comes to reducing the risk of periodontitis, good oral hygiene is essential. Regular toothbrushing and dental visits are effective in preventing periodontitis. However, the benefits of interdental cleaning with dental floss are limited. . Mechanical plaque control through toothbrushing and the use of appropriate interdental aids are recommended. Emphasizing oral care habits as a public health intervention is crucial in the prevention of Periodontitis.<sup>(16)</sup>

### Physical activity and Periodontal health

Engaging in physical activity is linked to a lower prevalence of Periodontitis. Exercise has the potential to reduce inflammation and promote periodontal health. Regularity and frequency of physical activity play important roles. Factors such as missing teeth and physical activity variables should be taken into account. The association is influenced by biological plausibility and behavioral factors.<sup>(17)</sup>

### Obesity and metabolic syndrome on Periodontal Health

The impact of obesity and metabolic syndrome (MetS) on the severity of periodontal disease remains uncertain. The relationship between MetS and periodontitis in obese individuals lacks conclusive evidence, with some indications of a stronger link between periodontitis and central obesity rather than overall obesity. Age and gender are additional factors that seem to contribute to the development of periodontitis. Overall, the influence of lifestyle factors on periodontal health is intricate and warrants further investigation.<sup>(18)</sup>

### Sleep and Periodontal Health

The relationship between Periodontitis and sleep quality is significant, but there are conflicting findings regarding sleep duration. Sleep apnea is currently under focus which could have a huge impact on lifestyle and periodontal health. Age was identified as a significant risk factor for Periodontitis, while no significant associations were found with sex, race, or socioeconomic status. The biological plausibility of the connection between sleep quality and periodontitis is supported by research on immune and inflammatory responses.<sup>(19)</sup>

### Genetics and Periodontal Diseases

Genetic variations in multiple genes contribute to periodontitis, with younger patients having a higher genetic risk. Over 100 genetic variants are involved, differing among ethnic populations. Studies have found associations between genetic variants and bacterial levels in periodontitis. Epigenetic modifications and the gene - environmental axis also affect susceptibility. Understanding these factors helps uncover shared pathways with cardiovascular diseases and could improve on future research and treatment. Many patients with genetical disorder like (Down's syndrome, mentally retarded, etc.,) have poor oral hygiene which also should be addressed<sup>(20)</sup>

## 4. Conclusion

Periodontal health is influenced by a diverse range of lifestyle factors that have evolved over time, shaping its well - being. Smoking emerges as a prominent factor, exerting a significantly negative impact by increasing the risk and

severity of periodontal disease, while impeding the effectiveness of treatment. Additionally, alcohol consumption contributes to periodontal disease through various pathways. Stress, bruxism, untreated occlusal discrepancies, systemic diseases, medications, nutritional deficiencies, and sedentary routines all contribute to the overall state of periodontal health. An intricate association is observed between periodontal disease and cardiovascular diseases, diabetes mellitus, hormonal changes, and medication use. Maintaining good oral hygiene practices, regular dental visits, and adopting appropriate interdental cleaning techniques are crucial for preserving periodontal health. Physical activity and weight management also play a positive role in promoting periodontal health. The relationship between sleep quality and periodontal health is significant, although further research is needed to fully comprehend it. Genetic variations and epigenetic modifications contribute to the development of periodontal diseases, emphasizing the importance of understanding individual susceptibility. Overall, addressing lifestyle factors and embracing preventive measures are key in the promotion of optimal periodontal health. Dental practitioners should be aware of all the future which could enable them to be a better clinician and academician

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