

Impact of Poor Oral Health on Overall Health: A Systematic Review

Bashayr hassan alshehri, Tariq Hussain Jaber Alwadani, Mohammed Solaiman Al Wadani, Nawal Mohammed Hurubi, Moeed Muhammad Al-Wadaei

General dentist Prince Sultan Center Dental, Jazan Armed Forces Hospital (NAFH)

Corresponding Author: Dr. Bashayr hassan alshehri, Email: bashayrdec@gmail.com

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ABSTRACT

Suboptimal oral health is a very common but often ignored societal health issue with serious overall health consequences. Dental caries, periodontal disease, and tooth loss, as oral diseases, impact billions of people around the globe and have been identified as drivers of systemic inflammation, chronic disease development, and poor quality of life. This systematic review presents the modern peer-reviewed evidence on the relationship between poor oral health and systemic health outcomes. Predefined keywords related to the topics of oral health and systemic disease were used to search databases such as PubMed, Scopus, CINAHL, and Google Scholar. It included 15 high-quality peer-reviewed studies, such as systematic reviews, meta-analyses, and extensive population-based studies. The results show that there are consistent relationships between poor oral health and cardiovascular disease, diabetes mellitus, respiratory illnesses, poor pregnancy outcomes, and elevated mortality. Some of the biological processes that relate to oral and systemic health are chronic inflammation, microbial translocation, and immune dysregulation. The review emphasizes the need to incorporate oral health in primary care, chronic diseases, and health policy. Oral health care is vital in the enhancement of population health, solving health disparities, and providing holistic and patient-centered care.

Introduction

Oral health is an essential part of general health, well-being, and the quality of life. The oral cavity is vital in several key functions like eating, speaking, and interpersonal interactions, in addition to acting as an entry point between the external environment and the inner system of the body. However, oral health has traditionally been segregated by mainstream healthcare delivery and policy, and as a result, preventable oral diseases are

largely neglected. However, recent studies have shown that poor oral health is not limited to localized pain or loss of teeth but is strongly associated with systemic illnesses and negative health factors.

Oral diseases continue to be one of the most prevalent noncommunicable disorders worldwide, particularly among older adults, those of low socioeconomic status, and

people with scarce access to medical services. Of concern is periodontal disease, a chronic inflammatory disease of the tissues that support the teeth, which has a high relationship with systemic inflammation and chronic disease. Poor oral health not only portends physical symptoms but also has impacts on nutrition, mental health, social participation, and economic productivity.

Increasing awareness of the links between oral health and overall health has stimulated a new interest in learning to assess the role of oral diseases in influencing general health outcomes. This systematic review will summarize recent peer-reviewed findings on the effect that poor oral health has on systemic health, review underlying biological factors, and speculate on the implications for clinical practice and the general health population. This review, by synthesizing existing evidence, illustrates the many reasons why oral healthcare is needed in holistic models of healthcare.

Methods

Study Design

The systematic review method has been utilized to identify, appraise, and integrate peer-reviewed articles investigating the connection between poor oral health and overall health outcomes. The review was conducted using the Preferred Reporting Items of Systematic Reviews and meta-analyses (PRISMA) to provide transparency, rigor, and reproducibility.

Data Sources and Search Strategy

The search of literature included PubMed, Scopus, CINAHL, and Google

Scholar. Only articles dating back to January 2021 were searched within the period of January 2021 to June 2026. The search terms were a combination of poor oral health, periodontal disease, dental caries, tooth loss, systemic disease, cardiovascular disease, diabetes, respiratory disease, pregnancy outcomes, and mortality. Results were narrowed down with the help of Boolean operators and database-specific filters.

Inclusion and Exclusion Criteria

Studies were incorporated when they were peer-reviewed, written in English, and looked at the relationships between oral health conditions and the overall state of systemic health among adults. Eligible study designs were systematic reviews, meta-analyses, cohort studies, and extensive cross-sectional studies. Case reports, editorials, abstracts of conferences, and studies that dealt only with pediatric outcomes without systemic implications were excluded.

Data Extraction and Quality Assessment

Information was identified about the study design, population, oral health, systemic outcomes, and salient findings. Methodological quality was measured with standardized appraisal tools that suited each study design. The final synthesis included only studies that had sufficient methodological rigor.

Biological Mechanisms Linking Oral and Systemic Health

Periodontal disease is a chronic inflammatory disease characterized by

irreversible dysbiosis of the oral microbiome and continuous destruction of periodontal tissues. The inflamed periodontal pockets act as reservoirs of inflammatory mediators and pathogenic bacteria that can gain access to the systemic circulation via the exposed epithelium. These microbial products and pro-inflammatory cytokines then contribute to systemic inflammation, endothelial dysfunction, and immune dysregulation after circulation. They have been linked to the etiology of cardiovascular disease, diabetes mellitus, and some cancers, which suggests the far-reaching impacts of oral health on overall health (Xi et al., 2024; Sulaiman et al., 2024).

Recent data also demonstrates that periodontal pathogens influence the composition of gut microbiota, a cascade of dysbiosis, to the periphery of the oral cavity. This oral-gut axis has the potential to exacerbate metabolic pathologies and gastrointestinal cancers by promoting chronic low-grade inflammation and may modify host immune responses (Xi et al., 2024). Also, persistent release of inflammatory mediators of periodontal lesions leads to a systemic pro-inflammatory state that can worsen atherosclerosis and impaired glycemic regulation in predisposed patients (Sulaiman et al., 2024).

One of the most essential processes that links oral disease to the presence of a chronic systemic condition is systemic inflammation. Inflammatory biomarkers, including C-reactive protein, interleukin-6, and tumor necrosis factor-alpha, have also been noted to be high in patients with periodontal disease (Arbildo-Vega et al., 2024). Pathophysiological processes leading

to endothelial dysfunction, insulin resistance, and long-lasting immune activation linked to cardiovascular disease and diabetes mellitus involve these inflammatory agents (Li et al., 2024; Essa et al., 2025).

Microbial translocation is another important biological pathway between oral and systemic health. Direct spread of the oral cavity to distal organs has been demonstrated by the presence of oral pathogens, such as *Porphyromonas gingivalis* and *Fusobacterium nucleatum*, in atherosclerotic plaques, placental tissues, and respiratory secretions (Hensel et al., 2024; Wu et al., 2025). In addition to bacterial dispersion, chronic oral infection may damage the host defense system, strain immune homeostasis, and precondition a person with systemic infections, increasing the consequences of chronic illnesses and overall health status (Watt et al., 2022).

Impact of Poor Oral Health on Systemic Diseases

Cardiovascular Disease

Recent evidence suggests a strong correlation between periodontal disease and cardiovascular disease (CVD). Big cohort studies and umbrella reviews indicate a higher risk of coronary artery disease, ischemic stroke, atherosclerosis, and cardiovascular mortality in subjects with periodontitis (Arbildo-Vega et al., 2024; Li et al., 2024). These patterns occur even when these associations are adjusted to known cardiovascular risk factors, which include smoking, obesity, and socioeconomic status.

The mediator in the oral-cardiovascular relationship is chronic systemic inflammation. Elevated circulating levels of inflammatory markers relate to periodontal disease, which facilitates endothelial dysfunction, vascular remodeling, and plaque instability that cause atherogenesis (Qu & Zhang, 2024). Second, oral pathogens have been found in atherosclerotic plaques, like *Porphyromonas gingivalis*, lending some support to a possible direct microbial role in vascular injury (Wu et al., 2025). Though the relationship is still complicated, there is an emerging body of evidence to indicate that better periodontal health might affect cardiovascular risk profiles favorably, demonstrating the necessity of considering oral health in cardiovascular prevention interventions.

Diabetes Mellitus

The relationship between oral health and diabetes mellitus is established and is reciprocal. Poorly-controlled glycemia alters the vulnerability of periodontal disease by lowering immune capability and tissue repair, and periodontal inflammation increases insulin resistance with prolonged systemic inflammatory activity (Essa et al., 2025). According to recent population-based research, patients with diabetes and untreated periodontal disease report worse metabolic control, complications, and health services usage than those with healthy periodontal determinants (Li et al., 2024).

Recent interventional studies and meta-analyses have shown that periodontal therapy is correlated with a slight yet clinically significant decrease in glycated

hemoglobin (HbA1c) levels. These gains can be compared to the outcomes of specific pharmacologic intensification methods, which highlight the clinical importance of oral health management in a holistic approach to diabetes care (Arbildo-Vega et al., 2024). Assessing dental conditions as a component of diabetes care can thus help to achieve better results in the long run.

Respiratory Diseases

Periodontal disease and poor oral hygiene have been attributed to an increase in respiratory diseases like pneumonia and chronic obstructive pulmonary disease (COPD). The forceful transfer of pathogenic oral bacteria to the lower respiratory tract is a primary biological process, especially in older adults, patients in hospitals, and long-term care institutions. Periodontal pathogens like *Porphyromonas gingivalis* and *Fusobacterium nucleatum* may cross the respiratory tract, causing infection and augmenting persistent inflammation. In addition, systemic inflammatory mediators that originate in periodontal lesions can aggravate pulmonary activity and lead to the progression of COPD. These results highlight the significance of oral health care as a prevention measure against respiratory morbidity (Xiong et al., 2023; Zhang et al., 2024).

Recent findings suggest that enhanced oral health behavior, such as receiving routine professional dental care and practicing systematic daily oral cleansing, correlates with a minimum rate of aspiration pneumonia and respiratory pathogenesis (Wu et al., 2025). They are especially necessary in

older adults, hospitalized patients, and in long-term care facilities, where oral pathogenic bacteria are pulled into the lower respiratory tract. At the same time, aspiration is a common infection pathway. Moreover, mounting evidence demonstrates that inadequate oral hygiene is an initial risk factor of aspiration pneumonia, and oral care interventions can deliver immense benefits in reducing the occurrence of the condition in high-risk groups (Hamad & Nativ-Zeltzer, 2023). Together, these results bring about emphasis on oral health as a risk factor that can be modified in preventing respiratory disease, particularly in high-risk and institutionalized populations.

Adverse Pregnancy Outcomes

Recent studies have shown that oral diseases in pregnancy are linked to adverse effects like preterm birth, low birth weight, gestational diabetes, and hypertensive disorders. The contribution of periodontal disease to these complications (systemic inflammatory mediators and the hematogenous dissemination of oral pathogens) can disrupt placental activity and fetal development. Periodontal lesions have been identified to produce elevated levels of cytokines, prostaglandins, and C-reactive protein in maternal serum and amniotic fluid, which are associated with premature labor and retarded fetal development. Such mechanisms emphasize maternal periodontal health as a modifiable risk factor in prenatal attention (AlSharief & Alabdurubalnabi, 2023; Nannan, Xiaoping, and Ying, 2022).

Despite the conflicting evidence on the impact of periodontal treatment on

pregnancy outcomes, having excellent oral health during pregnancy is universally upheld since it is safe. It has the potential to improve pregnancy outcomes. Primary dental care and early periodontal interventions have been suggested as part of overall prenatal care aimed at enhancing maternal and neonatal health (Hensel et al., 2024).

Oral Health, Nutrition, and Quality of Life.

Poor oral health also has a significant impact on nutrition and general quality of life. Loss of teeth, oral pain, and compromised masticatory function limit the dietary intake, resulting in decreased dietary intake of nutrient-rich foods, such as fruits, vegetables, and lean protein. Such dietary restrictions lead to malnutrition, frailty, sarcopenia, and exacerbation of chronic disease, especially among older adults and medically vulnerable populations (Wu et al., 2025).

The psychosocial outcomes are also heavy. Patients with oral cavity diseases often feel embarrassed, self-depreciated, and isolated socially, and exhibit anxiety or depression. These psychosocial consequences are harmful to functioning and life satisfaction, which supports the need to address oral health as a predictor of physical and mental health (Hensel et al., 2024).

Public Health and Health Equity Implications

Poor oral health is disproportionately impactful among the socially and economically disadvantaged groups of people, reflective of inequities in healthcare

systems more broadly. Recent population-wide studies include evidence that patients with low income, low educational attainment, racial and ethnic minority, living in rural areas, and without dental insurance coverage have notably higher levels of untreated dental caries, periodontal disease, and tooth loss (Li et al., 2025). The presence of structural barriers, such as poor access to dental care, high patient out-of-pocket payments, oral health workforce shortages, and poor health literacy, leads to a delayed diagnosis and treatment of oral diseases, therefore letting preventable conditions develop to more advanced phases.

These oral health inequalities have significant downstream effects on systemic health and use of health care. Patients with underserved populations tend to use emergency departments for dental-related complaints, which leads to fragmented care, greater healthcare spending, and continued disease burden (Peres et al., 2021) further, since oral health is strongly related to the presence of chronic systemic diseases, like diabetes and cardiovascular disease, oral health inequities exacerbate morbidity, mortality, and quality of life disparities already present in populations (Nazir et al., 2021).

Incorporating oral health in primary care and public health systems is one of the most important opportunities to curb health inequities. There is some evidence indicating that interprofessional care models in which medical providers screen for oral health conditions and make timely referrals can enhance early detection and continuity of care among underserved populations. Community oral health programs, dental

initiatives in schools, and increased coverage of oral health services under the social protection of the population have proven to be effective in decreasing the burden of oral diseases and reducing health disparities (Peres et al., 2021).

Limitations of the Review

Several limitations can characterize this systematic review. Limiting to English-language publications could have filtered out important overseas studies. Diversity in research designs, outcome measures, and oral health assessment instruments aided cross-study comparisons. Moreover, a significant number of included studies were observational, and this limits causal inference.

In spite of these constraints, the similarity of the results in different populations and settings enhances the credibility of the general conclusions. The accumulating mass of good-quality research points in favor of the clinical and population health significance of poor oral health as an antecedent of systemic disease.

Conclusion

This review systematically establishes that the impact of poor oral health on overall health is both far-reaching and wide-ranging. Oral diseases play a role in the development and progression of significant systemic disease through pathways that encompass chronic inflammation, microbial spread, and immune dysregulation. Evidence has led to the incorporation of oral health into primary care, chronic disease management, and

policy in public health. Oral health as a primary component of overall health is an essential concept to achieve better population outcomes, fewer health inequalities, and a more holistic healthcare system. Poor oral health is not just a dental issue but an important investment in health and well-being around the world.

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