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LITERATURE REVIEW

Oral Health Equals Total Health: A Brief Review

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ABSTRACT

Oral health is essential to total health and satisfactory quality of life. According to the World Health Organization (2012), oral health has been defined as a state of being free of mouth and facial pain, oral infections and sores, and oral and other diseases that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being. Oral conditions like dental caries and periodontal (gum) disease continue to plague humanity. Nearly all adults have existing tooth decay, and severe gum disease occurs in 15 to 20% of middle-aged adults. The adverse effects of inadequate care for teeth, gums, bite, and jaws can move beyond the mouth to affect overall physical and psychological health. Research has indicated that poor oral health may be associated with medical conditions such as heart disease, stroke, diabetes, pneumonia, and other respiratory diseases. It has also been linked to pre-term births and low-birth-weight babies. Jaw problems are also a common cause of headaches and ear and facial pain. Dental clearance prior to medical treatment, including cancer/bisphosphonate therapy and cardiac surgery, minimizes both oral and systemic complications. Many medical conditions have oral manifestations, and some medications have side effects that lead to compromised oral health as well as jaw function disabilities. This paper summarizes and highlights the importance of oral-systemic connections. In addition, the features of common dental problems are discussed.

Keywords: oral health; systemic health; periodontal disease; caries; temporomandibular disorders

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INTRODUCTION

Dentistry is the branch of medicine that deals with the diagnosis, prevention, and treatment of diseases/conditions of the teeth, gums, and other structures of the mouth/jaws/face. In collaboration with medical and allied health professionals, dental specialists also manage a variety of medically related problems, including oral/jaw pathologies, orofacial trauma, head and neck tumors, obstructive sleep apnea, and temporomandibular-disorder-related (TMD) headaches and ear symptoms.

Oral diseases are among the most common diseases found in humans. Despite their high social and economic burdens, oral diseases receive little attention in many countries and remain a neglected area of international health.¹ Oral health is defined as "a state of

being free from mouth and facial pain, oral and throat cancer, oral infections and sores, periodontal (gum) disease, tooth decay, tooth loss and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking and psychosocial well-being".² Table 1 shows the range of vital, social, and anti-social oral functions.

Oral diseases can produce serious functional limitations, discomfort, and pain leading to disability (physical, psychological, or social), impairment, and handicap.³ For this reason, these diseases significantly impact quality of life for sufferers.⁴⁻⁶

Oral-systemic connections

A bi-directional relationship exists between oral and systemic health. Many systemic diseases (e.g., immune deficiency disorders) may appear first in the mouth. In

Table 1. Spectrum of oral functions

Vital Functions	Social Functions	Anti-Social Functions
• Biting	• Smiling	• Spitting
• Chewing	• Kissing	• Burping
• Digesting	• Whistling	• Smoking
Tasting	• Drinking	• Swearing
• Swallowing	• Licking	
• Speaking	• Sucking	
• Breathing	• Expressing	
	• Attracting	
	• Making music	
	• Holding objects	

addition, many drugs used to treat medical conditions can induce oral side effects, including xerostomia (dry mouth), dysgeusia (distortion in perception of taste), and stomatitis (inflammatory disease of the mouth).⁷ Some medical treatments may also result in oral infections and/or complications (e.g., rampant caries due to xerostomia caused by salivary gland damage from head and neck radiation therapy (Figure 1).

Dental clearance is, thus, indicated prior to head and neck radiation therapy, chemotherapy, heart surgery, organ transplant, joint replacement and bisphosphonate therapy. Bisphosphonate therapy, in particular, can result in osteonecrosis of the jaws, especially in oncology patient populations (1% to 15%), in which high doses of such medications are employed.⁸ Clearly, the adverse effects of inadequate oral care go beyond the oral cavity and can affect general (systemic) health and psychological wellness. Numerous chronic medical conditions are caused by or associated with infectious diseases. For example, periodontal disease (gum infection caused by oral bacteria) has been associated with adverse pregnancy, cardiovascular disease, pulmonary disease, and diabetic outcomes.⁹ It has also been linked to erectile dysfunction in young adults.¹⁰ Ultimately, oral diseases could lead to infection, inflammation, and other serious impacts on overall health.¹

Common dental diseases and conditions

Common dental problems include bad breath, periodontal (gum) disease, mouth sores, oral cancers, tooth decay, tooth wear, tooth loss, TMD, wisdom tooth issues and unattractive smiles. This section will briefly discuss the importance and/or high incidence of oral cancers, tooth decay, periodontal disease, and TMD.

Oral cancer is the 8th most common cancer in the world.¹¹ Prevalence of oral cancers is relatively higher in men, older people, and people of lower education and income levels, with tobacco and smoking as major risk factors. Oral cancers can develop on the lip, tongue, oral mucosa, floor of mouth, base of tongue,



Figure 1. Rampant caries due to xerostomia caused by radiation therapy

and oropharynx. Signs and symptoms of oral cancers include (1) sore, irritated lumps or thick patches in lip, mouth, or throat, (2) white or red patches in mouth, (3) feeling that something is caught or stuck in the throat, (4) difficulty chewing or swallowing, (5) difficulty moving jaw or tongue, (6) numbness in the tongue or other areas of mouth, (7) swelling of jaw that causes poor fit or discomfort with dentures, and (8) pain in one ear without hearing loss. Early detection and referral are important, as oral cancers can spread quickly.

Nearly all adults have tooth decay, and severe periodontal disease occurs in 15 to 20% of middle-aged adults.¹² Tooth decay is the destruction of tooth structure caused by acid-forming bacteria in the presence of sugars (Figure 2).

Untreated caries in permanent teeth remains the most prevalent oral condition worldwide, affecting more than 2.4 billion people.¹³ Furthermore, the burden of untreated caries has shifted from children to adults, as three peaks in prevalence have been observed: at ages 6, 25, and 70 years. Increasing occurrences of untreated caries have been attributed to population growth and longevity and a significant decrease in tooth loss.¹³ Signs and symptoms of tooth decay include (1) toothache, (2) tooth sensitivity, (3) mild to sharp pain when eating or drinking something sweet, hot, or cold, (4) visible holes or pits in teeth, (5) brown, black, or white staining on any surface of a tooth, and (6) pain when biting down. Periodontal disease is an inflammatory disease that affects the soft and hard tissues supporting the teeth (Figure 3).

In the early stage (gingivitis), the gums become red and swollen due to bacterial inflammation. In the more advanced stages (periodontitis), bone loss and gum recession occur, and the teeth may become mobile and fall out.¹⁴ The signs and symptoms of periodontal disease include (1) bleeding gums when brushing and flossing, (2) red, swollen, or tender gums, (3) persistent bad breath, (4) pus between teeth and gums, (5) shaky, mobile, or separating teeth, and (6) changes in the

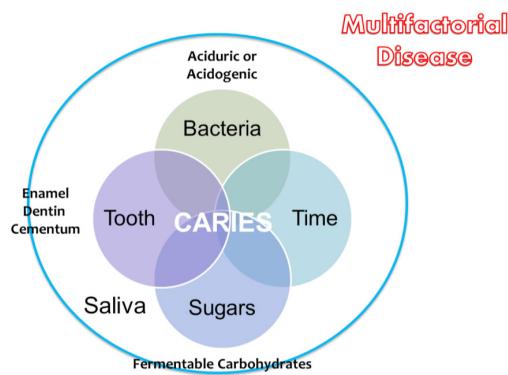


Figure 2. The multifactorial etiology of tooth decay¹²

way teeth fit when biting. Tooth decay and periodontal diseases are the foremost reasons for tooth loss and acute orofacial pain.

Temporomandibular disorders (TMD) refer to a collection of medical and dental conditions affecting the temporomandibular joint (TMJ), masticatory (chewing) muscles, and associated structures. They are a major cause of chronic orofacial pain.¹⁵ TMD is more prevalent among women and people between 14 and 45 years old.¹⁶⁻¹⁸ Its contributing factors can be broadly divided into (a) anatomical (skeletal and occlusal relationships), (b) pathophysiological (systemic and local), (c) trauma (macro or micro), (d) genetic, and (e) psychosocial (depression, anxiety, stress, somatization, etc.) factors. TMD has been shown to negatively impact quality of life for its sufferers. The signs and symptoms of TMD include (1) headache, (2) jaw pain, (3) neck and shoulder pain, (4) ear pain, (5) ear congestion, (6) tinnitus, (7) jaw joint sounds, (8) jaw function difficulty, and (9) abnormal jaw movements.

Risk factors for oral diseases

Oral diseases share a wide range of intrinsic and extrinsic risk factors with other noncommunicable diseases (NCDs), like cardiovascular disease, cancer, diabetes, and chronic respiratory illness.¹² Intrinsic factors include age, sex, and hereditary features, while extrinsic ones comprise unhealthy diet (particularly, one high in sugars), smoking, and harmful alcohol consumption. Sugar intake is the leading risk factor for tooth decay, and its reduction as part of a healthy diet promotes better oral health and reduces the risk of diabetes, obesity, and other NCDs. Smoking is a leading preventable cause of death and disease, including oral cancers and periodontal disease, and other conditions, such as premature tooth loss, tooth staining, and bad breath. Alcohol is a major risk factor for many diseases, including oral cancers and periodontal disease. Prevalence of oral diseases varies by geographic region, availability and accessibility of oral health services, and social determinants. It is higher in low- and middle-income countries as well as among poor and disadvantaged groups worldwide.



Figure 3. Patient with advanced periodontal disease

Strategies for oral disease prevention and management

Strategies for oral disease prevention and management have been detailed by the FDI and encompass (1) preventing oral diseases and promoting oral health, (2) developing human resources for oral health and public oral health, (3) integrating oral health care into primary health care, (4) inspecting, monitoring, and evaluating oral health information, (5) obtaining funding and establishing policies based on oral health priorities, and (6) Integrating oral health into public health programs.¹²

Of foundational importance are oral disease prevention and oral health promotion. Approaches to oral health care have traditionally focused on curative treatment rather than population-based preventive interventions. The tremendous financial cost and human resources required for individualized curative care is unaffordable and unrealistic for many countries and cannot be sustained on a global scale. Most oral diseases can be prevented through simple, cost-effective measures involving exposure reduction to known risk factors concomitant with fortifying oral health literacy and healthy oral behaviors.

Oral health education is essential to motivating people—the public, patients, healthcare professionals, educators, policy makers, etc.—to take action. As oral diseases share many risk factors with other major NCDs, a common risk factor approach (CRFA) has been proposed by the FDI World Dental Federation.¹² In addition to improving oral health, the CRFA also alleviates the global burden of NCDs when directed toward individuals, communities, and populations.

CONCLUSION

Oral diseases are a neglected area of international health, despite their high social and economic costs. They can and do negatively impact quality of life for many populations worldwide. A bi-directional relationship exists between oral and systemic health; the mouth can reflect the state of a person's general

health, and oral diseases can significantly impact overall health. Oral diseases share many risk factors with other major NCDs, including unhealthy diets with high sugars, smoking, and alcohol consumption. A CRFA should be taken to address this issue, as it contributes not only to improved oral health but also to alleviating NCDs.

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