



## The Impact Of Oral Health Education And Preventive Measures On Dental Caries And Periodontal Diseases

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Article History	Abstract:
Received: Revised: Accepted:	<p>Oral problems, including dental caries, periodontal diseases, and tooth loss, are significant global public health concerns. This is due to the fact that inadequate oral health has extensive impacts on general health and quality of life. In improving oral health, especially in developing countries, there are obstacles that need to be addressed. It is crucial to enhance public health programs worldwide by implementing efficient preventative measures against diseases and simultaneously boosting oral health. Frequently, collective actions are employed for the purpose of oral health education. These actions often involve delivering lectures utilizing various materials such as flipcharts, videos, PowerPoint presentations, as well as implementing other activities like supervised teeth brushing and topical fluoride application. This paper aimed to review the impact of oral health education and preventive measures on dental caries and periodontal diseases.</p>
CC License CC-BY-NC-SA 4.0	<p><b>Keywords:</b> Effectiveness, education programmes, prevention, dental caries, periodontal diseases</p>

### Introduction:

Oral illnesses are highly frequent worldwide and can be substantially prevented. The prevalence of dental caries is considerable, affecting 60-90% of school children and the majority of adults in developed nations. This condition is becoming more common in emerging countries and is particularly widespread in some

Asian and Latin American countries. Periodontal disease is widespread worldwide, affecting 5-15% of most populations with severe periodontitis. This condition is strongly linked to diabetes and weakened immune systems. The National Oral Health Survey reveals that dental caries affects 63.1% of 15-year-olds and a staggering 80.2% of individuals aged 35-44 in India. Periodontal disorders affect a significant proportion of the population, with a prevalence of 67.7% among 15-year-olds and up to 89.6% among individuals aged 35-44. Prevalence of edentulism is elevated in some nations among individuals aged 65 and above. Oral cancer ranks as the 8th most prevalent form of cancer globally. It is the 3rd most common in South-central Asia and is twice as widespread in less developed nations compared to more developed ones. Additionally, there has been a significant rise in the occurrence of oral cancer in certain European and other industrialized countries [1,2].

The prevalence of dental trauma varies in industrialized countries, with rates ranging from 16% to 40% among 6-year-olds and from 4% to 33% among 12-14-year-olds. In certain Latin American countries, approximately 15% of schoolchildren experience dental trauma, while in the Middle East, the prevalence is around 5-12% among 6-12-year-olds [1].

Oral illnesses significantly impede activities in educational, professional, and domestic settings, resulting in the loss of countless hours of productivity worldwide each year. Furthermore, these diseases frequently have a substantial negative effect on individuals' psychosocial well-being, leading to a major reduction in their overall quality of life [3].

Ensuring the avoidance of illness, impairment, and distress should be a fundamental objective of any community aspiring to offer a satisfactory standard of living for its population. Implementing preventive measures at the community or population level is the most economically efficient strategy and yields the most significant outcomes for a community or population, be it a school, neighborhood, or nation. A community prevention program is a well-designed intervention that aims to prevent the occurrence of a disease within a specific group of people. Various strategies for avoiding dental problems are available, and the most economically efficient option is through health education [3].

Health education encompasses a variety of educational experiences aimed at promoting voluntary behaviors that contribute to well health. These activities or behaviors might originate from people, families, institutions, or communities. The scope of health education encompasses instructional initiatives targeting children, parents, policy makers, and health care providers. Extensive evidence in dentistry and other health fields has established that possessing accurate health information or knowledge does not automatically result in favorable health behaviors. Acquiring knowledge can be utilized as a means to empower different population groups by providing them with precise information regarding health and healthcare technologies. This enables people to proactively safeguard their own health [1,4].

Oral disease treatments are typically available in industrialized and highly developed countries. However, they can be costly and not easily accessible. Many persons face barriers such as lack of access to care, as well as insufficient insurance or financial resources to cover the expenses. In underdeveloped and impoverished nations, access to suitable medical treatments is typically nonexistent. Disorders of the craniofacial complex have a significant impact on a person's quality of life, leading to nutritional, functional, and psychosocial implications. Moreover, oral disorders impose a significant financial burden on people, families, and nations, regardless of their level of development [4].

The objective of oral health education is to enhance understanding, which can result in the adoption of beneficial oral health practices that contribute to improved oral health. The World Health Organization has implemented a fundamental oral health care program for less industrialized nations. This program focuses on providing oral health education and highlights the importance of integrating health education with other oral health activities, such as offering preventive, restorative, and emergency dental care. There has been a new focus on evaluating the efficacy of oral health education programs. This aligns with the need for empirically supported research and will assist policymakers in determining funding allocation. Several systematic reviews have been performed on the existing evidence. These studies have demonstrated that oral health education can effectively enhance knowledge in the short term and somewhat influence behaviors such as tooth brushing and healthy eating [5].

### **Understanding Periodontal Diseases:**

Periodontal diseases refer to a range of chronic inflammatory illnesses affecting the gums, bone, and ligaments that support the teeth. Periodontal disease originates from gingivitis, a condition characterized by inflammation of the gingiva. This inflammation is triggered by bacteria present in dental plaque, a microbial biofilm that develops on the teeth and gingiva. In this Primer, the term gingivitis specifically denotes gingivitis caused by plaque. Chronic periodontitis is the result of untreated gingivitis advancing to the point

where the gingiva, bone, and ligament are lost. This causes the formation of deep periodontal "pockets," which are a characteristic feature of the illness and can ultimately result in tooth loss. Periodontal disease can exacerbate illnesses such as diabetes by increasing the body's total inflammatory load. Periodontal diseases refer to a range of chronic inflammatory illnesses that affect the gums, bone, and ligaments supporting the teeth. Periodontal disease originates from gingivitis, a condition characterized by inflammation of the gingiva. This inflammation is triggered by bacteria present in dental plaque, a biofilm consisting of microorganisms that accumulates on the teeth and gingiva. Within this Primer, the term gingivitis specifically denotes gingivitis that is caused by the presence of plaque. Chronic periodontitis is the result of untreated gingivitis advancing to the point where the gingiva, bone, and ligament are lost, resulting in the formation of deep periodontal pockets. These pockets are a characteristic feature of the illness and can ultimately result in the loss of teeth. Periodontal disease can exacerbate illnesses such as diabetes mellitus and atherosclerosis by increasing the body's total inflammatory burden. Periodontal diseases refer to a range of chronic inflammatory illnesses affecting the gums, bone, and ligaments that support the teeth. Periodontal disease originates from gingivitis, a condition characterized by inflammation of the gingiva. This inflammation is triggered by bacteria present in the dental plaque, a microbial biofilm that develops on the teeth and gingiva. Within this Primer, the term gingivitis specifically denotes gingivitis caused by plaque buildup. Chronic periodontitis is the result of untreated gingivitis that advances to the point that the gingiva, bone, and ligament are lost. This causes the formation of deep periodontal 'pockets', which are a characteristic feature of the illness and can ultimately result in the loss of teeth. Periodontal disease can exacerbate systemic inflammation, hence exacerbating illnesses such as diabetes mellitus and atherosclerosis [6-8].

#### **Impact of oral health education on dental caries and periodontal diseases:**

Dental health education has long been recognized as a crucial component of dental health services. It is typically provided to people and groups in many contexts, including dentistry schools, workplaces, and facilities for older citizens. The educational interventions employed have exhibited significant diversity, ranging from the straightforward dissemination of knowledge to the implementation of intricate programs incorporating psychological and behavior modification tactics. The interventions have aimed to bring about changes in various aspects, including knowledge, attitude, intentions, beliefs, behaviors, utilization of dental services, and oral health status. These efforts demonstrate dentistry's enduring and potentially groundbreaking focus on preventing oral illness through advancements in knowledge, attitudes, habits, and the adoption of healthier lifestyles. Nevertheless, the growing strain on healthcare resources has prompted inquiries into the expenses and efficacy of various healthcare delivery methods. Similarly, this applies to preventative treatments as they have been widely assumed to decrease the occurrence of diseases and hence decrease the need for healthcare services and the associated expenses. Responses to inquiries regarding the efficacy of health education will provide us with insights on whether or not it is worthwhile, and if so, the most successful approaches given certain conditions. Well-executed evaluation studies also contribute to the advancement of these types of therapies. In recent years, a significant body of literature has evolved that describes studies aiming to assess the efficacy of different educational and behavior modification strategies, both individually and in combination [1].

Nakre and Harikiran's study revealed that oral health education is a highly successful method for improving knowledge, attitude, and practices related to oral health. This education also helps reduce plaque buildup, bleeding gums, and the occurrence of cavities [1].

#### **Effect of preventive measures on dental caries and periodontal diseases:**

In affluent and developed countries, the use of efficient preventative measures has yielded favorable outcomes, with a decline in caries and a likely stabilization of periodontal disease. Prevention in underdeveloped nations faces specific challenges, mostly due to the high incidence of periodontal disease, increasing rates of caries, and limited resources available to address these issues. Given the right support, significant progress can still be made in these emerging nations. Oral disease prevention methods might be recommended based on economic resources and disease patterns. The prioritization sequence will differ across different countries, and the utilization of specific methods may be influenced by both national and local legislation. Water fluoridation is the most efficacious measure to prevent tooth decay in communities with access to piped water supply. It is cost-effective and not contingent on individual actions. In cases when water fluoridation is not possible, alternate methods at the community level include salt fluoridation, fluoridation of school water, or supervised consumption of fluoride supplements [9,10].

Supervised administration of fluoride mouthrinsing, typically conducted in educational institutions, proves to be efficacious in both fluoridated and non-fluoridated populations. Fluoride gels or solutions can be

administered by dentists or their assistants directly onto the teeth of individual patients. It is advisable to use fluoride toothpastes whenever feasible as a regular component of personal oral hygiene. Every preventive activity includes an educational element. Community leaders and other individuals should get education on the establishment and upkeep of community preventive measures that have an impact on them. Patients should get education on their personal oral hygiene, the utilization of fluoride, the limitation of sugary snacks between meals, and the importance of frequent dental checkups when services are accessible. Public dental health education might be focused on certain target populations, such as pregnant women [11].

Given that dental caries is a prevalent issue in numerous countries, it is advisable to contemplate public policies aimed at regulating the accessibility of highly cariogenic foods. When correctly applied, fissure sealants are extremely efficient at preventing tooth decay on the biting surfaces. It is advisable to use them on recently emerged teeth in those who are prone to dental issues, and they can be particularly beneficial for individuals with disabilities. The use of sealants may be limited in resource-constrained settings because to the need for trained operators and the relatively high cost of the process. The primary measure in managing periodontal disease is to enhance the patient's capacity to regulate plaque by toothbrushing, flossing, or chewsticks [9,11].

The individual approach to preventing periodontal diseases is based on a biological and behavioral model. It emphasizes the need of controlling the biofilm mechanically, minimizing the amount of potentially harmful bacteria, and removing high-risk habits such as smoking. The global focus in dental education curricula and research investments is centered on this strategy. The theoretical knowledge of periodontal disease progression and the necessity of surgical and clinical intervention to ensure and sustain periodontal health have been significantly shaped by the "biomedical" approach. This approach also supports the assumption that those designated as "high-risk" for illness development should be the focus of therapeutic or preventive measures. The primary objective of this biomedical approach is to promote changes in cleanliness and smoking habits through the provision of chairside advice and counseling, with the aim of preventing potential health issues. [12].

Hence, the conventional clinical strategy has little relevance in altering the prevalence of periodontal disease within the community. The conventional method of mitigating periodontal disease is expensive and can impose a substantial financial strain, even in affluent nations. Oral disease treatment, including periodontal disease, is projected to be the fourth most costly ailment to treat in developed countries. In fact, it can surpass the whole national healthcare budget of certain countries, such as Kenya. This method is not effective for the most vulnerable populations - those who are impacted by health inequities and individuals with specific requirements [12,13].

In addition, the dental staff in the majority of countries lacks the capacity to effectively manage the significant burden of periodontal disease, particularly in cases requiring secondary or tertiary care. Prior research has demonstrated that implementing conventional oral hygiene practices alone for modifying behavior during chairside sessions yields only temporary success, as it relies on the patient's adherence. Hence, alternative strategies for implementing public health interventions to prevent, mitigate, and manage periodontal diseases on a community scale [14-17].

### **Challenges and barriers to the utilization of dental health services:**

Obstacles related to the utilization of dental health services encompass the financial burden of services, challenges in securing dental appointments, dental anxiety, limited availability of oral health care services, and restricted access to oral health services. In Saudi Arabia, the primary obstacle frequently mentioned is the financial burden associated with dental care, with 62.1% of elderly individuals discontinuing their dental treatment due to the high costs involved [18,19].

A study conducted by El-Lassy in 2014 in Damanhour city, Egypt, found that 46.7% of elderly individuals residing in residential homes faced obstacles when it came to visiting dental clinics. The primary barrier, reported by the majority of participants (88.6%), was financial difficulties. Other obstacles that hinder the utilization of dental health services among older adults include a scarcity of professionals, insufficient knowledge about the available services, as well as mental, physical, and medication-related conditions that can greatly complicate oral care. Elders may be unable to access necessary dental care due to poor health and the presence of multiple chronic diseases [20].

Furthermore, additional factors include the accessibility of dental services, apprehension, limited financial resources, and the geographical distance that individuals must traverse to obtain care. Dental barriers typically do not have inherent limitations. Untreated dental conditions can have a detrimental impact on an individual's physical and mental health, as well as their overall quality of life. Therefore, by collectively

investigating these obstacles, we can generate more valuable and cohesive data regarding necessity, request, and the results of oral health [21].

### Conclusion:

Oral health education is successful in enhancing knowledge, attitude, and practice related to oral health. It also reduces plaque, bleeding on probing of the gums, and the occurrence of tooth decay, while improving gum health. This review examines the efficacy of oral health education programs and identifies key factors that contribute to their effectiveness. The review has demonstrated that oral health education is efficacious in enhancing the knowledge and oral health-related behaviors of the intended demographic. The prevention of periodontal disease relies not only on enhancing existing individual interventions, but also on identifying public health interventions that can be both effective and sustainable in real-world circumstances.

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