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# Perspective Chapter: Oral Health and Community Prevention in Children

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## Abstract

The child population is the most affected by the presence of caries. A preventable disease, which causes pain and school absenteeism, generates a significant expense in its treatment. If left untreated, it causes early tooth loss and malocclusion. Altering the quality of life at an early age leaves sequels. Primary care is essential in the prevention of oral diseases. Contact with the health team in first-level medical units, which begins during pregnancy and continues in the following stages of the child, plays an important role in its prevention, diagnosis, and treatment. Across the health system, these primary care practitioners play an important role in children oral health which includes provide preventive care, referral to dentists or dental care providers and caries risk assessment. This team will know how to refer the child to the dentist specialized in the treatment. This strategy largely represents community prevention. To this must be added the family, and the school, making use of the promotion of oral health in favor of children. Efforts to prevent childhood dental caries cannot only focus on individuals and their biology and behaviors individually. It should consider the backup determinants of children's dental health as well.

**Keywords:** oral health, community prevention, early childhood caries, primary care

## 1. Introduction

Children have the right to health and to enjoy their childhood in the best possible way. Healthy children have better opportunities to grow, develop, and learn and later become healthy and productive adults [1].

Child health should be understood as the necessary capacity for children or groups of children to develop and reach their potential, satisfy their needs, and develop the talents that allow them to successfully interact with their biological, physical, and social environment [2].

The period of childhood covers between 0 and 18 years. The notion of health status is different during childhood than in adulthood. Due to their development, children have a constant dynamic in their health and are exposed during this time to

multiple biological, environmental, cultural, and behavioral influences. It may be that these influences become risk or protective factors and/or promoters of health [1].

Oral health plays a primary role in the physical, mental, social, and economic well-being of individuals and populations. The oral cavity and the structures that surround it are essential parts of the human body, an integral part of its daily functioning, and contribute substantially to the general well-being of people [3]. All children and youth should have access to preventive services and treatment-based dental care [4].

Oral health promotion plays a fundamental role in the promotion of general health, since the interrelation between oral and general health has been approved [5]. Oral health promotion aimed at the entire child population is the general objective of a public dental health system. According to the United Nations Convention on the Rights of the Child, every child has the right to good oral health [6].

The presence of caries in children increases the risk of infections, malocclusion, and feeding and language difficulties, impacting school absenteeism, general health, and family finances [7]. In addition, the presence of untreated caries is another of the great problems faced by the child population. Statistical data show that in 2015, 7.8% of the global child population (573 million children) had untreated dental caries. The prevalence of untreated caries in deciduous and permanent teeth peaks at ages 1 to 4 years and 15 to 19 years, respectively [8]. Early childhood caries (ECC) remains the most common chronic childhood disease, with almost 1.8 billion new cases per year worldwide. It affects approximately 37% of children aged 2 to 5 years in the United States, and up to 73% of socioeconomically disadvantaged preschool children in both developing and industrialized countries [9].

## **2. Primary health care**

Primary health care (PHC) is one of the most important measures to promote the health of the population, and it represents “essential medical care”. The interventions are scientifically proven. It focuses on equitable distribution, community participation, an emphasis on prevention, the use of appropriate technology, and the involvement of a wide range of other health departments [10].

The concept of primary health care (PHC) was defined at the Alma Ata conference in 1978. After the conference, the concept of PHC was gradually developed during the 1980s by the health promotion approach. Health promotion according to the WHO (1984) includes the following points: 1) health promotion involves the population as a whole, in the context of their daily lives, rather than focusing on people at risk of specific diseases; 2) it is aimed at action on the determinants or causes of health; 3) combine diverse, but complementary, methods or approaches; 4) it aims at a particularly effective and concrete public participation; and 5) health professionals have an important role in fostering and promoting health [11].

### **2.1 Primary health care and oral health**

The evolution of this paradigm caused that, in 2009, at the seventh world conference of the WHO, dental care was integrated into primary health care services. It includes several domains, such as risk assessment, oral health assessment, preventive intervention, communication and education, as well as interprofessional collaborative practice [12].

The integration of oral health into primary care has been implemented in some health care systems to reduce the burden of oral disease and improve the access to oral health care, especially for disadvantaged individuals and communities [13].

## **2.2 Primary care and oral health in children**

In primary health care, interprofessional collaboration provided by medical personnel is a very helpful preventive strategy for children's oral health. Medical providers have numerous opportunities to see children from birth to at least 3 years old. On average, there will be 12 visits on a regular basis during this time; the medical office is a space that serves to extend access to preventive oral health services for children. Basic preventive oral care that may be provided by the physician includes as follows: 1. oral health risk assessment; 2. anticipatory oral health guidance; 3. application of fluoride varnish; 4. dental referral; and 5. prescription of fluoride supplements [12].

From the point of view of primary oral health care, what should be considered "essential" oral health care is crucial, especially in developing countries [11]. Children who had an early preventive dental visit were more likely to use preventive services later and incur lower dental costs over time [4].

The preventive services offered by the PHC are of great importance for oral health, and many mothers in the gestation stage are first attended by health workers in these centers, such as gynecologists, family doctors, nursing assistants (midwives), and activists accredited socio-sanitary, are people who come into contact with them long before a dentist. So, they can identify oral problems, such as the presence of tooth decay before a dentist. The dental surgeon must establish communication with them in such a way as to make an effective and timely referral to the dental outpatient department of a nearby public/private hospital. Therefore, it is important to meet expectant mothers/fathers-to-be at an early stage.

Untreated dental caries in mothers increases the risk of caries development among their children, as maternal transmission and early caries in children have been established. Vertical colonization of *Streptococcus mutans* from mother to child is well documented. Studies have shown that these *Streptococcus* are initially acquired by children from their mothers at around 2 years of age, which is the window of infectivity [14].

Primary care physicians frequently see children with pain due to dental cavities, as well as increased school absenteeism, eating problems, sleep loss, and risk of serious infections. The American Academy of Pediatrics (AAP) has recommended that primary care health care professionals conduct oral health risk assessments beginning at 6 months of age and refer patients to a dentist at 12 months of age [15].

## **2.3 Primary health care and children with special needs**

For children with special care needs and for their parents, APS will help in the prevention and control of many oral ailments. Infants and children with special health care needs may be at increased risk of developing oral conditions such as delayed tooth eruption, malocclusion, tooth decay, dental abnormalities, trauma, infections, and enlarged gums. It is very important that a general health professional is aware of these conditions and makes a referral to the appropriate dental specialist.

All of the conditions these children experience are attributed to various congenital syndromes, medications, or inherent immune deficiencies and include Down syndrome, Treacher-Collin syndrome, and ectodermal dysplasia. Various medications

cause gingival enlargements; for example, dilantin (phenytoin sodium) and phenobarbital, which are prescribed for epilepsy, can cause gingival hyperplasia. It is very important that a general health professional is aware of these conditions.

These children may need regular dental referrals. Like all children, they should have their first visit within 6 months after the eruption of the first tooth or at 12 months of age. However, future visits may need to be more frequent [14].

### **3. Community prevention**

Oral Health Promotion Programs (OHPP) for children are implemented globally in various communities and have been shown to be a useful intervention to control dental caries [5]. Dentists and oral health providers prioritize oral health promotion through education and prevention programs for all family members, children and parents, at all socioeconomic levels. Since they are the only means to avoid dental caries [16].

Unfortunately, dental programs and oral health prevention programs rarely receive the same level of attention as medical care among decision-makers when cost-effective allocation of scarce health resources is taken into account. This occurs despite statistics showing a high prevalence of oral diseases.

The 2016 Global Burden of Disease Study estimated that oral diseases affect at least 3.58 billion people worldwide. Dental caries is the most prevalent chronic disease among children, and dental care is the largest uncovered health care need [5]. It is a major public health problem [4].

#### **3.1 Working together for health**

Community participation in disease prevention is part of primary health care. To understand what it consists of, it is essential to recognize that the health of individuals and groups is defined by multiple factors, some of these determinants are very close and others far from individual control, in addition to this, there are social inequalities in health, that is, a distribution unequal opportunity to enjoy health. The impact of interventions on the different levels of health determinants is variable. Thus, policies (macroeconomic, employment, rights, etc.) influence more and more people than interventions closer to individuals [17].

Evidence of the importance of social determinants makes health a collective issue. This statement has two implications. The first is that although medical services can improve health, this is not a consequence of medicine but of all its determinants, one of which, but not the only one or the most important, is health services. The second is that health services must be reoriented to incorporate the collective dimensions of health and to address modifiable determinants from their sphere of social responsibility [18].

Oral health does not escape social determinants, for example, the population in contexts of poverty, social exclusion or low educational level, is more frequently exposed to unhealthy hygienic-dietary habits, and this situation is observed in relation to the presence of dental caries due to its multifactorial nature. Certain dietary habits increase the risk of appearance, while the frequency of brushing decreases it in the permanent dentition [7].

In the child population, oral health disparities are well documented, with low-income minority children experiencing the highest prevalence and disease of

caries [19]. In some low- and middle-income countries, the presence of caries in children aged 5 to 6 years exceeds 90%, indicating that dental caries is a permanent public health problem [5].

Evidence shows that childhood caries is associated with impaired cognitive development, increased school absenteeism, poorer school performance, increased job loss for parents, and poorer quality of life [19].

For this reason, simultaneous action at various levels is of the utmost importance, to enhance the effects of health interventions, so it is convenient to align the actions on the person and their immediate environment, such as the family and the place of study or work, with those that act further away from it, such as the policies that influence the neighborhood, the workplace, or the municipality.

Community work in favor of health is a network, and it consists of creating alliances to establish shared objectives and act cooperatively to achieve them. This network must include not only the different services involved (intersectionality) but also the community itself (community participation), since the commitment of each other will facilitate the implementation and maintenance of changes [17].

### **3.2 Preventive community strategies for oral health in children**

Preventive dental care can significantly improve oral health in children [20]. Interventions that integrate the participation of health and non-health sectors have been shown to be more effective in preventing diseases, since they cover the complexity of the problem, promoting awareness, autonomy, and the involvement of family networks among groups of increased risk [7].

#### *3.2.1 The school and the family main actors in community health*

There is more evidence that schools and parents are needed to reinforce good practices in children. Good oral health practices in the first 5 years of a child's life are critical to lifelong oral health. Factors including toothbrushing, fluoridation, dietary advice, and visiting the dentist, among others, improve oral health and behavior [21].

Since childhood caries is a public health problem, the WHO emphasizes the urgent need to act to control it and suggests its population-based prevention, through educational interventions on oral health (such as avoiding free sugars in complementary foods and beverages, promoting breastfeeding, using toddler finger brushes or soft brushes for children twice a day) aimed at pregnant women, new mothers, and primary health care providers, as well as interprofessional education with other health professions.

The family plays an essential role in interventions to improve brushing in young children. A clear example is the result of research, which shows that toothbrushing behaviors of young children are strongly associated with those of their parents, or caregivers, and with the level of family support for brushing [19].

Various factors have been identified that affect dental caries in children, including poor oral hygiene and nutritional status, as well as the level of knowledge, habits, attitudes, and self-efficacy related to oral health among school teachers and parents. These variables must be taken into account when developing oral health education programs for preschool children.

Oral health education can be reinforced throughout the school years, an influential period in children's lives. Lifelong beliefs, positive attitudes, and personal skills develop among children during the school years. During the children's school career, oral health education should be promoted in all their courses. In addition, it must be

regularly reinforced at home with school programs designed for it. School staff and parents should be involved in the school's oral health promotion efforts [22].

### *3.2.2 Dental and non-dental staff*

In addition, it recommends that, in order to bring childhood caries prevention measures closer to a greater number of children, they should be planned at appropriate times, such as the vaccination period. There is also a need to develop a training package for dental and non-dental staff to provide adequate prevention and management of this disease. On the other hand, interventions aimed at mothers, both during pregnancy and in the first year after childbirth, can effectively prevent this condition in a critical way [23].

### *3.2.3 Use of fluorides*

The combination of community, professional, and individual measures to control the caries process in children is the most effective strategy, for example, promoting proper nutrition, improving diet, fluoridating water, increasing the use of topical fluorides and dental sealants by primary health care providers, and using fluoride toothpaste.

The most effective public health preventive measure against caries is water fluoridation. The cost benefit is undeniable. The application of topical fluorides in the form of varnish in children reduces caries rates, proven by strong scientific evidence. Evidence recommends twice-yearly varnish application for high-risk populations, including indigenous children. Regular use of fluoride mouth rinses has been shown to reduce dental caries in older children, independent of other sources of fluoride [4].

## **4. Integration of oral health in general medical care: the pediatrician our ally**

Oral health is an indicator of overall health, quality of life, and well-being. Most oral diseases and conditions share modifiable risk factors with major noncommunicable diseases, such as cardiovascular disease, cancer, chronic respiratory disease, high levels of stress, and diabetes. There is a proven relationship between oral and general health. It is reported, for example, that diabetes is related to the development and progression of periodontitis. In addition, there is a causal link between high sugar consumption and diabetes, obesity, and tooth decay [24].

Pediatricians are the custodians of children's overall health and are the ideal health care staff to impart information and instructions on oral health care to this child population. This is mostly due to the number of children seen by pediatricians, which is much higher than what general dentists see. However, it is a responsibility that must be shared between these three professions, the dentist, the pediatrician, and the general practitioner. Many of the aspects that pediatricians can observe and that may go unnoticed by dentists are issues such as diet, weight, maturation, vaccines, different diseases, and growth [25].

### **4.1 Gap in pediatric knowledge about oral health**

Pediatricians have begun to play an important role in promoting oral health in their patients, taking preventive measures such as monitoring, referral to dental

services, and prior oral health counseling. However, it must also be recognized that there is also some limitation on the part of pediatricians, both in knowledge and in understanding certain clinical areas that are critical. This include differentiating the first clinical signs of dental caries, which is the recommended age to go to the dentist for the first time, the transmission of bacteria from the mother to her baby as part of the etiology of caries, and the use of fluoride [26].

The problem is serious because, if pediatricians do not identify certain factors, they will not refer these patients to a dentist, which has the consequence that there is no preventive care, and this being an important element for the oral care of children. To this is also added that sometimes the communication between the pediatrician and the dentist is not completely coordinated. This is because many pediatricians do not consider referring patients to the dentist as a necessity as soon as oral ailments are detected [27].

## **5. Oral health disparities at an early age**

Oral diseases in children are an urgent public health problem worldwide. It is estimated that early childhood caries affects around 600 million children worldwide, but this condition is entirely preventable. Dental health professionals around the world must act to improve the use of prevention measures and quality dental health care to improve global oral health [28].

Most children in the United States have benefits for having good oral health, such as a socially acceptable smile, frequent visits to the dentist directly, as well as not suffering from pain in their teeth. Many of them have the health insurance that parents have, which partially covers the cost of treatment [29].

In a systematic review in which 72 articles were included, it was determined that the prevalence of early childhood caries amounted to 98%, being present in children ranging from 4 to 12 years of age [30]. Mainly the groups of children with low socioeconomic status and people with a lower degree of education are affected. Oral diseases are expensive to treat, which is why they seriously affects the most disadvantaged population [31].

### **5.1 Social gradients in health**

Different studies show a strong association between economic position and the prevalence of oral diseases, which has been named “social gradient in health” [32].

While social gradients in perceived oral health and overall health exist in adult and child populations, not many studies have evaluated whether social gradients exist in a low-income population, specifically in a community of low-income mothers and their young children. It is important to know this perspective from the course of life, since mothers are the main source of transmission of tooth decay bacteria to their children. If there are social gradients in the oral health of low-income mothers, these gradients can be passed on to their young children and persist into adulthood [33].

Policies should focus on improving oral health education, as this could lessen gradients in oral health in low-salary mothers and their kids. Strong connection has been found between maternal-dental education and general health. If associations are causal, attempts to rise the education of low-income mothers can lead to have a better progress in their oral health. This result can break with the pattern of transmission of health gradients from education to their young children. Gradients [34].



Children who are in this economic situation experience longer dental appointments to repair or remove teeth that are in an unfavorable state; in turn, they are patients who experience pain or who may be dealing with a picture of infection. These patients are usually taken to dental care under emergency and not as prevention [29].

## **5.2 Disparities by race and ethnicity**

An ethnic group is defined as a group of people who identify with each other based on their affinities, such as the language itself, ancestral, social, national, cultural experiences, gastronomy, and religion [35].

Taking into account internationalization and the increase in migrant groups, the number of children of non-native origin will grow even more in the future, and with it the possibility of an increase in inequalities in oral health [36].

It has been reported that race and ethnicity also represent an important stratification factor for oral health disparities, as a result of an unbalanced distribution of dental services and care, as well as the economic situation among different racial communities. These groups are severely affected by tooth loss, lack of oral hygiene, tooth decay, and eating difficulties, among others [37].

There is an important theoretical and empirical literature on ethnic inequalities in health, which considers how exclusionary social processes such as labor market segregation, unemployment, income inequality, and poverty disproportionately affect racialized and immigrant groups and translate into health disparities [38].

Another difference that has been found depending on the community to which you belong is when choosing dental treatment. For example, African Americans are less likely to choose endodontic treatment than Hispanics. Also due to their economic situation, degree of education, and access to dental health, they report having worse access to oral health, a very bad perception of oral health and a high prevalence of dental caries. Language also plays an important role in gaining access to dental health. Namely, in the United States, people who do not speak English very well can face different barriers, which brings repercussions for their health [39].

## **5.3 Actions to improve inequality in oral health**

Currently, there is considerable evidence that inequalities in oral health are attenuated with the passage from childhood to adolescence. This socioeconomic stabilization in health during puberty is thought to improve when the impact of the family and family environment decrease, and that school, peers, and youth culture have a special role in children's lives [40].

Puberty is a phase when behaviors related to oral health are not supervised as closely by parents as they are during infancy. School and neighborhood potentially play a bigger role that can influence oral health and related behaviors. In addition, the transition from childhood to adolescence is a period of sensitive development in oral health, a stage that is accompanied by the replacement of primary teeth with permanent teeth. A reduction in tooth decay in early adolescence may mean less lifelong exposure of permanent teeth to oral health risk factors [41].

According to The Lancet, dentistry is in crisis globally: "Current dental care and public health responses have been largely inadequate, inequitable and costly, leaving billions of people without access to even basic public oral health care" [42].

Public policies and programs focused on children's oral health generally have two main objectives: to diminish the effect of oral conditions on the community and

to lessen obstacles that restrict access to oral health services. Exemplifications are potable water, fluoridation, and education programs aimed to improve and promote oral health literacy and as a result a healthy behavior. It also includes surveillance actions to supervise trends and identify high-risk-need groups and programs that supply screening and preventive services in schools or other community spaces [43].

## **6. Risk factors for oral diseases at an early age**

Oral health is a situation that affects both children and young people and the elderly. Efforts to improve oral health should be supported by research that includes socioeconomic, biological, and demographic factors, which increase susceptibility to develop oral diseases. Birth cohorts are longitudinal studies in which follow-up is performed from birth. This type of study is scarce, and in oral health much more. There are currently four different studies of this type: the one in the city of Pelotas in Brazil, the longitudinal study of Australian children, the Christchurch health and development study, and the Dunedin multidisciplinary development and health study [44].

The results of this study show us that various factors are involved for the development of dental caries in childhood, whether protective or risky. Oral health education and the use of dental services are influenced by the belief mainly of parents that it is not necessary to go to this type of assistance until the child starts school [44].

Tooth decay is a multifactorial disease that is affected by cariogenic plaque, fermented carbohydrates, time, a susceptible tooth, environmental factors such as saliva, fluoride availability, dental knowledge of parents, access to dental care, and socioeconomic issues [45].

The type of diet consumed in the child population plays a very important role. The intake of foods with high sugar content represents a great risk to oral health and consequently, for the subsequent development of oral diseases. These are easy to acquire, being able to generate among other aspects, caries, diabetes, hypertension, and obesity. The risk factors require a time of exposure to them to be able to cause some oral damage in individuals; that is why, at an early age, many damages cannot be easily observed, so you have a period where apparently there is no disease [46].

Malocclusions are one of the oral diseases that most affect the population, because they are multifactorial. The appearance of a malocclusion at an early age represents an indicator that this disease can be maintained at other ages and/or condition the appearance of others. This condition, in addition to causing morphofunctional damage, leaves the individual more susceptible to trauma. Several studies report that the presence of an increased highlight in children was a risk factor for suffering a traumatic injury [47].

## **7. Oral health from childhood and healthy aging**

Oral health in childhood and early childhood play a very important role, as they are precursors of good oral health later in life. That is why children have been the main objective to promote oral health and to develop scopes to prevent oral diseases. Many resources have been researched for a better understanding of the factors that affect oral health in children, primarily preschool children, mothers, and caregivers (National Institute of Dental and Craniofacial Research [48]).

As more studies show us about the effects of early-life experiences, experts are focusing on prevention and medical care, including activities that promote oral health during preconception, pregnancy, and the first 3 years of life. Health promotion activities represent a key element in decreasing morbidity, mortality, improving overall health and wellbeing [48].

A significant body of scientific evidence has established a strong relationship between oral health, overall health, and healthy aging. These tests are clear enough to justify their application in public health programs, in dental establishment, and in local groups in ways to promote healthy aging. The implementation of policies favorable to oral health would represent an effective and efficient use of public financial resources [49].

Aging is a serious global health problem for low-, middle-, and high-income countries. As we encourage the prolongation of life expectancy, this turns out as a monumental challenge. With age, a person becomes more vulnerable to the disease, and this leads to decreased intrinsic ability and functional ability [50].

It is not possible to achieve healthy aging without providing all people with access to the services and education that are necessary to maintain oral health and the functions we perform with it: eating, talking, and smiling. In ways to delay functional decline and rise people's health and well-being, it will be important not only to provide medical attention and long-term care insurance for all but also to include these systems of care into a much wider social infrastructure that therefore stimulate healthier behaviors [50].

## **8. Conclusions**

Primary care plays a key role in the prevention of oral diseases in childhood. All primary care workers must direct their efforts so that children do not suffer from any oral disease or are diagnosed and treated early. On many occasions, they are the first contact with the future mother, with the new mother, and with the children in their early childhood. Therefore, their collaboration is invaluable to promote oral health in the family and in children.

Involve people, families, community leaders, health care practitioners, educators, and policy-makers will help in the making of a framework to be used in and with the community. Addressing disparities is recognized as a crucial part of improving oral health. This can be more efficient when used in a culturally sensitive framework that addresses concerns particular to specific communities.

Community prevention as part of primary health care involves the whole of society. The public and private health sector, the school, and the family are essential actors in health promotion. We all have the commitment to ensure a future with well-being for children. A child free of oral conditions is a child with a better chance of developing healthily.

## **Conflict of interest**

“The authors declare no conflict of interest.”

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