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Assorted Errands in Prevention of Children's Oral Diseases and Conditions

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Additional information is available at the end of the chapter

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1. Introduction

Children are young human beings; they are vulnerable to various ailments including oral diseases and conditions. In order to prevent the various oral diseases and conditions in children, all people responsible in looking after the children have a role to play so as to protect them from acquiring oral diseases or receive appropriate prompt management. This chapter presents responsibilities of various stakeholders in prevention of children's oral diseases and conditions. The impact of oral diseases in children's general health, growth and development is presented. The various oral diseases and conditions and the significance of their prevention is described. Finally, responsible stake holders and their various errands are elucidated.

2. Prevention of children's oral diseases and conditions

The word *prevent* comes from the Latin "*praeventus*", which means anticipate or hinder. Prevention literally implies the act of putting a stop to something from happening. It refers to measures taken to make the occurrence of something from none existence or not progressing to a worse situation [1]. Subsequently, prevention of diseases is actions aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are feasible, retarding the progress of the disease and disability. Prevention of oral diseases and conditions, therefore means to put a stop or to avoid the oral diseases and or conditions from occurring, control the already existing condition or disease not to progress further or take charge such that the impact of the condition or diseases is handled to improve quality of life of the affected individual. Disease preventive strategies are acting on the chain of disease causation where individuals who are at risk or have higher possibilities of contracting the disease or having the

stated condition are made less likely to contract the disease by decreasing their susceptibility, for example action of fluoridated dentifrices on strengthening the teeth to prevent dental caries.

3. Essence of prevention of children's oral diseases and conditions

The rationale behind prevention of oral diseases in children lays back to the sense of wide-spread of the common oral diseases (dental caries and periodontal conditions) among them, where about 60-90% of children worldwide are affected [2].

Unfortunately, these oral diseases and conditions tend to create socio-demographic gradients [3]; where regardless of knowledge and scientific based evidence advances and achievement for the control and treatment, globally oral diseases have tended to accumulate in the most disadvantaged populations. In these populations the affected child usually have severe and multiple conditions or diseases. It is reported that about 50 million school hours are lost annually in USA due to dental pain as a result of dental caries and that dental pain is the second common condition at medical emergencies, hence oral diseases in children are a public health problem as they impact children's socio and psychological well being as well as restrict school activity [4]. Table 1 summarizes a range of research findings showing the socio-psychological impact of oral diseases to children. In most developing countries, the cost of treating dental caries among children alone will require their total health care budget [5]. Furthermore the clinical approach to dental treatment has proved to be an economic burden in industrialized countries where expenditure on oral health is about 3%-12% of total health expenditures.

Country	Age (yrs)	Dental pain prevalence (%)	Socio-psychological impact
South Australia [6]	5-15	31.8	Disturbed sleep and schoolwork
England [7]	8	47.5	Crying disturbed sleep, play, schoolwork, eating
Tanzania [8]	10-19	36.4	Disturbed eating, smiling, study and socializing
Thailand [10]	11-12	25.1	Disturbed eating, smiling, study and socializing
Uganda [11]	10-14.	42.1	Caries, subjective oral health indicators, dental attendance
Kerala, India [12]	12	68.0	Dissatisfaction with oral status and dental appearance

Table 1. Socio-psychological impacts of dental caries

4. Benefits of prevention of children's oral diseases and conditions

Children are young human beings who are dependent on adults to take care of their health issues both socially and economically. They are more vulnerable to diseases, and once sick it

is their parents or guardians who decide and act for their health care. On the other hand, prevention of oral diseases through instituting most oral health related-behaviours like tooth brushing and use of fluoridated toothpaste are determined by the family. Likewise, associated expenses are to be incurred by a family earner.

Oral health is an integral part of overall well-being and essential for eating, growth, speech, social development, learning capacity and quality of life and tooth decay has been reported to have negative impact on childhood nutrition, growth and weight gain [13]. Additionally; World Federation of Public Health Associations [14] admits that oral health problems in children can impact on many aspects of their general health and development, causing substantial pain and disruption to their lives and often altering their behaviour.

Prevention of oral diseases is relatively less costly compared to curative dental services, therefore it is considered beneficial. For example, water fluoridation may appear expensive, but because of its wider coverage and its easy application versus dental treatment for a decayed tooth in an individual, it remains a better choice. Prevention of oral diseases is cost effective particularly in middle and low income countries where resources necessary for conventional dental treatment are scarce and a substantial proportion of their financial resources for health is directed to address infectious diseases.

Another benefit of preventing oral diseases in children is to minimize pain, discomfort and suffering; enable them to eat and socialize well, avoid loss of school hours ultimately contribute into their growth and development.

5. Levels of disease prevention

The concept of prevention is conveniently defined at four levels, namely primordial, primary, secondary and tertiary prevention though in reality the stages blur one into the next.

5.1. Primordial prevention

This is a relatively recent classification of disease prevention. It seeks to prevent at a very early stage, often before the risk factor is present in the particular context, the activities which encourage the emergence of lifestyles, behaviours and exposure patterns that contribute to increased risk of disease. Or it is actions and measures that inhibit the emergence of risk factors in the form of environmental, economic, social, and behavioral conditions and cultural patterns of living. In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles, the main intervention being through individual and mass education. According to Porta [15], primordial prevention consists of conditions, actions, and measures that minimize hazards to health and hence inhibit the emergence and establishment of processes and factors (environmental, economic, social, behavioral, cultural) known to increase the risk of diseases. Furthermore, Porta [15] states that primordial prevention is accomplished through many public and private healthy public policies and intersectoral action and that it may be seen as a form of primary prevention. Primordial prevention addresses

broad health determinants rather than preventing personal exposure to risk factors, which is the goal of primary prevention. For instance, outlawing alcohol would represent primordial prevention, whereas a campaign against drinking would be an example of primary prevention. In dentistry primordial prevention will include enforcing a law on fluoride levels in various products and education on causes and prevention of oral diseases and conditions to individuals and to the community.

5.2. Primary prevention

Primary prevention can be defined in several ways. One of these definitions states that primary prevention is the action taken prior to the onset of disease, which removes the possibility that the disease will occur. It also can be defined as the first level of health care, designed to prevent the occurrence of disease and promote health, or as prevention of disease through the control of exposure to risk factors. Approaches for primary prevention include population-wide strategies and high-risk strategies focusing on population sub-groups. It may be accomplished by measures of "Health promotion" and "specific protection" that is; measures designed to promote general health and well-being, and quality of life of people or by specific protective measures. Examples of primary prevention in dentistry include fluoridation of public water, oral evaluation, dental prophylaxis, Fluoride use as preventive agent, fissure sealants, use of Xylitol, mouth guards, regular dental examinations and self-care such as tooth brushing, flossing, use of dental rinses and medicinal mouthwashes.

5.3. Secondary prevention

Is defined as the application of available measures to detect early departures from health and to introduce appropriate treatment and interventions. Others define secondary prevention as the second level of health care, based on the earliest possible identification of disease so that it can be more readily treated or managed and adverse sequelae can be prevented. This level of prevention is also defined as action which halts the progress of a disease at its incipient stage and prevents complications. Screening is a major component of secondary prevention. Examples of secondary prevention in dentistry are Fluoride use on incipient caries, dental restorations, periodontal debridement, root canal treatments, serial extraction, fixed and removable appliances, installation of caps and crowns. Removal of broken or impacted teeth, especially the third molars is also a type of secondary preventive dentistry.

5.4. Tertiary prevention

Is the application of measures to reduce or eliminate long-term impairments and disabilities, minimising suffering caused by existing departures from good health and to promote the patient's adjustments to his/her condition. In other words, it is the third phase or level of health care, concerned with promotion of independent function and prevention of further disease-related deterioration. It also can be defined as all the measures available to reduce or limit impairments and disabilities, and to promote the patients' adjustment to irremediable conditions. Examples of tertiary prevention in dentistry include; denture fabrication, bridges,

implants, oro-maxillofacial surgery, periodontal surgery, fixed prosthodontics and space maintainers. Most dental procedures aiming at children fall under the first three levels of prevention.

6. Rationale of oral disease prevention in children

Although dental diseases are not among the feared killer diseases like ebola and malaria, their high prevalence inflict heavy pain in the community in terms of treatment cost, physical and physiological incapacitation and rarely death. Oral health is part and parcel of the general health in such a way that severe illness on orofacial region can lead to systemic problems like malnutrition, immunosuppression, septicemia etc.

The rationale for preventing oral diseases and especially in children can be viewed under three areas; the disease burden inflicted by oral diseases to the community, the common risk factors shared by oral diseases and other chronic diseases and the lifelong effects to be gained if efforts for prevention are directed to children.

6.1. Disease burden

Despite great improvements in the oral health of populations in several countries, globally, oral health problems still persist [16]. Traditional treatment of oral diseases is extremely costly; it is the fourth most expensive disease to treat in most industrialized countries where 5–10% of public health expenditure relates to oral health [17, 18]. In most developing countries resources are primarily allocated to emergency oral care and pain relief; it is estimated that, if treatment were available in these countries, the costs of dental caries in children alone would exceed the total health care budget for children [5].

6.2. Relation to general health

There is a group of risk factors common to many chronic diseases and oral diseases. They include tobacco and alcohol use, frequent consumption of sugars and inadequate physical activity, especially when coupled with consumption of excess calories, [19-23]. Hence, addressing these factors will ultimately prevent other systemic diseases. The four most prominent non-communicable diseases sharing risk factors with oral diseases are cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary diseases; the factors are preventable and relate to lifestyles.

6.3. Lifelong effect in children

Children are young, easy to learn and usually what they learn at early age is retained for life. Therefore, efforts for directing disease prevention to children who are likely to practice preventive measures and maintain good oral health throughout adulthood are justified.

7. Oral diseases and conditions that affect children

There are many oral diseases affecting children. They may be congenitally transmitted or acquired through environmental interaction. The chapter describes some of the common oral diseases and conditions in children

7.1. Dental caries

Dental caries or tooth decay is the disease which causes destruction of tooth material, which includes: enamel, dentin, root and pulp. It is one of the most prevalent chronic diseases worldwide [16]. Dental caries forms over time through interaction between cariogenic bacteria and fermentable carbohydrates or cariogenic food particles left on the surface of the tooth. When bacteria feed on the sugars in the food they produce acids responsible for tooth demineralization. All people carry bacteria in their mouth which make them susceptible to tooth decay. In particular, risks for caries development include physical, biological, environmental, behavioural, and lifestyle-related factors such as poor oral hygiene, inappropriate methods of feeding infants, diet high in sugars, high numbers of bacteria, and frequent use of medications containing sugar or causing dry mouth, insufficient fluoride, malnutrition including vitamin and mineral deficiencies and some medical conditions, such as Sjogren's syndrome, that decreases the flow of saliva in the mouth. The teeth are susceptible to caries throughout lifetime, though host factors including tooth structure and saliva modify the progression of the disease. Children are susceptible to aggressive tooth decay of primary teeth known as early childhood caries.

Treatment of dental caries: Some initial dental caries process may stop if prevention actions (like oral hygiene improvement) are put in place. Nevertheless, treatment options for more severe caries include dental fillings. When decay reaches the dentin but not yet in the pulp, it can be treated by removing the decay using rotary or hand instruments; the cavity is then cleaned and filled with dental materials of choice. When the lesion extends into the pulp and/or root canal of the tooth, it is treated by root canal treatment procedure. The procedure involves preparation of an access cavity followed by removal of dead tissue, blood vessels and nerves from the canal and finally cleaning of the root canal(s). Biocompatible materials are filled in the cavity and the canals. When indicated, a crown is placed on the tooth to strengthen the restored tooth crown.

Tooth Extraction: Removal of the tooth is opted if the extent of tooth decay and/or tooth infection is beyond repair with filling or root canal treatment. When the tooth is extracted, it can be replaced with dental implant, partial bridge or denture.

7.2. Periodontal diseases

Periodontal disease refers to gingivitis (an inflammatory condition of the soft tissues surrounding a tooth or the gingiva) and periodontitis (involving the destruction of tooth supporting structures such as the periodontal ligament, bone, cementum and soft tissues). Periodontal disease is initiated by a complex of bacterial species, mainly composed of Gram-

negative, anaerobic bacteria growing in subgingival areas. The persistent inflammation due to host response to pathogens causes the destruction of periodontal tissues, leading to clinical manifestations of the disease [24]. In general, most children and adolescents worldwide have signs of gingivitis. An aggressive periodontitis affects about 2% of young individuals during puberty and may lead to premature tooth loss.

Causes of periodontal diseases: Periodontal diseases are caused by bacteria in dental plaque—a sticky substance that forms on tooth surface, but other factors influence the disease progression. In reaction to bacterial invasion, the body immune system releases substances that inflame and damage the connective tissues of the gingiva, periodontal ligament or even the alveolar bone. This leads to swollen, bleeding gums which are signs of gingivitis. Further damage involving cementum, alveolar bone with periodontal pockets indicates severe form of periodontal disease. Some genetic and environmental factors put the host susceptible to periodontal diseases. Rare syndromes affecting phagocytes, the structure of the epithelia, connective tissue, or teeth, could have severe periodontal manifestations. For some disorders, the responsible gene or tissue defect has been identified.

Haim-Munk and Papillon-Lefèvre syndromes are rare autosomal recessive disorders associated with periodontitis onset at childhood and early loss of both deciduous and permanent teeth [25, 26].

Tobacco and alcohol use: Tobacco use is clearly a risk factor for periodontal disease. In contrast, a small but significant association exists between alcohol consumption and loss of periodontal support [27].

Infection like HIV and AIDS: An infection process impairs the immune response thereby lowering the gingival protection from local infection.

Nutrition: Historically, specific, overt nutritional deficiencies have been associated with periodontal disease. Vitamin C deficiency leads to scurvy with decreased formation and maintenance of collagen, increased periodontal inflammation, haemorrhage, and tooth loss.

Diabetes: The relation between periodontal health and diabetes has been described as bidirectional; although periodontitis is a potential complication of diabetes, evidence suggests that treatment of periodontal infections in diabetics could improve glycaemic control [28].

Stress: Emotional and psychosocial stresses clearly are factors in periodontal disease, but their precise role in the pathogenesis of this disease is unknown [29].

Impaired immune response: Severe periodontal disease and loss of tooth-supporting tissues often occurs if the individual's host response or immune function is impaired. Various systemic diseases such as leukaemia and thrombocytopenia could be associated with increased severity of periodontal disease.

Treatment for periodontal diseases: The foundation of periodontal therapy is anti-infective non-surgical treatment aimed at controlling the bacterial plaque and other prominent risk factors. Proper tooth brushing can prevent and treat initial stages of bacterial induced gingivitis. However, scaling and root planning is indicated for treating advanced periodontal disease.

Dental plaque and calculus can be removed from tooth-crown and root surfaces (scaling and root planing) by use of various manual or powered instruments. Special attention is devoted to biofilm debridement in periodontal pockets combined with improved personal oral hygiene. Additional use of local antibiotics, local antiseptic drugs, and systemic antibiotics provides some extra benefit compared with debridement alone.

7.3. Dental trauma

Dental trauma is any injury to the mouth, including teeth, lips, gums, tongue, and jawbones. About one third of 5 years old children have sustained traumatic dental injuries involving primary teeth mostly tooth luxation: boys have slightly higher frequency than girls. A prevalence of 5–12% has been found in children aged 6–12 years in the Middle East. A significant proportion of dental trauma relates to falls, sports, unsafe playgrounds or schools, road accidents and violence [30].

An important predisposing factor for dental trauma is large maxillary overjet and incomplete lip closure. Other risk factors associated with incisors injury in elementary school children are playing without mouthguard and/or faceguard and sociobehaviour factors including gender (Male>Female) and increased participation in sport activities [31, 32].

Treatment of dental trauma varies according to the type or extent of injury like fracture, avulsion and luxation (tooth displacement). Tetanus booster and antibiotics should be administered whenever a dental injury is at risk for infection. Arrangements should be made for prompt follow-up with a dentist or an oral and maxillofacial surgeon [33, 34]. Specific procedural details of each type of fracture is beyond the scope of this chapter

7.4. Dental malocclusion

Malocclusion is not a disease but rather a set of dental deviations which in some cases can influence quality of life and interfere with oral functions. The prevalence of different traits of malocclusions varies with age, ethnicity and geographical location. The reported incidence ranges from 32 to 93 percent [35].

The causes of malocclusion include hereditary transmission, oral habits such as thumb sucking, tongue thrusting, pacifier use, prolonged use of a bottle early loss of teeth, impacted teeth, or abnormally shaped teeth, misalignment of jaws due to fractures after a severe injury, tumours of the mouth and jaw, congenital and acquired jaw deformities and abnormal orofacial muscle function.

Treatment: Every dentist who treats children practices orthodontics, whether knowingly or not. It is not enough to think of orthodontics as being solely concerned with appliances.

Orthodontics is the longitudinal care of the developing occlusion and any problems associated with it. All qualified dental practitioners should be encouraged to consider the orthodontic requirements of their patients. Orthodontic treatments include the uses of fixed and removable appliances, tooth extraction for space gain and surgery to correct dental and jaws relation [36].

7.5. Oral mucosal lesions

There are many mucosa lesions occurring in the mouth. Some are local due to local derangement, while others occur in the mouth manifesting systemic diseases like HIV/AIDS. Of the oral mucosa lesions, Leukoplakia is the most frequent form of oral precancer and appears in the oral cavity as a white patch that cannot be rubbed off [37]. Oral lesions may be in form of a swelling, blisters, cyst, ulcers and mucosa colour change or mucosa plaque.

Oral manifestations of systemic diseases: Many systemic disease manifests with oral signs and symptoms, hence, the mouth is considered as the mirror of the general body health. Some oral lesions (e.g. Koplik's sport) are very specific thus are used in confirming diagnosis of some diseases. Some lesions appear at the initial stage of systemic diseases that should alert clinician to speculate and work for early diagnosis of particular systemic conditions. Before the introduction of Highly Active Antiretroviral Therapy (HAART), approximately 40–50% of people who were HIV-positive had oral disease caused by fungal, bacterial or viral infections that often occur early in the course of the disease [38]. The common systemic diseases with oral lesions include; HIV, Sickle cell anaemia, Hodgkin's lymphoma, Sjögren's syndrome, drugs side effects, Herpes simplex, Varicella-zoster, measles, oral hairy leukoplakia and syphilis.

Congenital anomalies: There are many orofacial conditions occurring congenitally. Of the developmental disorders, congenital diseases of the enamel or dentine, problems related to the number, size and shape of teeth, and craniofacial birth defects such as cleft lip and/or palate are most important [39].

8. Basic principles of prevention of oral diseases in children

WHO Global Oral Health Programme for public health has set down basic principle approaches underlying effective oral disease prevention namely; acting on socio-determinants of health, working as one through the common risk factor approach and implementation of multiple strategies of prevention in different settings.

Socio-determinants of health: It is now apparent that individual behaviours such as oral hygiene practices, dietary patterns and attendance for dental care, which are the bases for prevention of oral diseases and conditions are largely influenced by family, social and community factors, as well as political and economical measures [40]. Therefore, WHO recommends that oral disease prevention strategies (public health strategies) need to be directed at underlying socio-determinants of health. They include; socioeconomic and political context, social position and health care system [41].

The common risk factors approach as one of the underlying strategies for public health approach recognizes that chronic non-communicable diseases such as obesity, cancers, diabetes and oral diseases share a set of common risk conditions and factors. Hence providing a rationale for partnership in disease prevention which is particularly applicable in countries with limited numbers of oral health personnel.

The multiple strategies of prevention: The other underlying principle is the multiple strategies to be implemented in different settings. There should be a mix of complementary public health approaches that focus both on assisting individuals and communities to avoid disease and on the other hand to create supportive environments that are conducive to sustain good health. In the prevention of oral diseases, the high-risk approach has been largely dominant. Finally, the WHO now increasingly acknowledges that the best preventive strategy for public health approach is a combination of the high-risk and directed population approaches, [42].

9. Available prevention approaches for specific oral diseases and their effectiveness

Evidence base of oral health interventions from systematic reviews and effectiveness studies conducted between 1994 to 2005 reveal that there are several approaches for diseases prevention [43]. Water fluoridation and use of topical fluorides as toothpaste, mouthrinses and varnishes were effective in reducing caries prevalence of 14 to 46% respectively. Whereas fissure sealants are reported to have caries reduction of up to 86% in 12 months and 57% in 48 months time. Dental health education provided a short term improvement in oral health knowledge and had limited effects on oral health behaviours. While the effectiveness of dietary control on reducing caries was not revealed. Table 2 below, summarizes the prevention approaches for specific oral diseases and their effectiveness.

Oral Diseases/Conditions prevention approach	Effectiveness in oral disease prevention
Dental health education	<ul style="list-style-type: none"> • Short term improvement in oral health knowledge • Limited effect on oral health related behaviour • Not effective for caries reduction • Short-term effect on plaque control and gingival bleeding
Topical fluorides	Caries reduction when fluoridated: <ul style="list-style-type: none"> • Toothpaste 24% • Mouthwashes 26% • Gels 28% • Varnishes 46%
Fissure sealants	Caries reduction ranging from 86-57% in a year or two.
Water fluoridation	Caries reduction by 14%
Dietary approach	Not effective in reducing caries.

Table 2. Available prevention approaches for specific oral diseases and their effectiveness, modified from Watt, R. G. [40]

10. Different stakeholders responsible for children's oral health

There are diverse stakeholders for children's oral health who vary in accordance to the child's age or place where the child is located on a specified period of time. Another category is the overall universal stakeholder.

The stakeholders in accordance to the child's age are presented for three age groups namely; birth to three years, four to seven years and eight to twelve years.

10.1. From birth to three years

At birth children do not have teeth. Usually the mothers are the fundamental persons in charge of the children's oral health. Under special circumstances, for example a very sick mother or a mother who pass away after delivery, caretakers may become principally accountable. Whether the mother is available or not, more carers come in as the child grows to one year and further to three years. They include; fathers, siblings, helpers and other family members. Other important responsible groups for prevention of oral diseases in young children are the professionals that is; Medical personnel (Medical doctors and nurses) and Dental personnel (Dentists, Dental Hygienists, Dental Nurses).

10.2. Four to seven years

As children grow they also assume responsibility on their health issues. Thus the stakeholders for children aged four to seven years are the mothers, fathers, children themselves, siblings, helpers, other family members and nursery/school teachers. The Medical personnel (Medical doctors and nurses) and Dental personnel (Dentists, Dental Hygienists, Dental Nurses) are accountable in prevention of oral diseases in this age group.

10.3. Eight to twelve years

The primary responsible persons for the oral health of eight to twelve years old children are the children themselves. These are supported by mothers, fathers, siblings, helpers, other family members and school teachers. The Medical personnel (Medical doctors and nurses) and Dental personnel (Dentists, Dental Laboratory Technologists, Dental Hygienists, Dental Nurses) have a big role to play in prevention of oral diseases in this age group.

The stakeholders can also be looked at in terms of location. The various locations of interest are the homes, school, health facilities and institutions for children with special health care needs.

10.4. Responsible stakeholders for children's oral health at homes

At homes the stakeholders responsible for children's oral health are Parents and guardians, children themselves and other children carers (siblings, relatives or helpers).

10.5. Responsible stakeholders for children's oral health at school

The stakeholders responsible for children's oral health at schools are teachers, children themselves and other children carers depending on the school system.

10.6. Responsible stakeholders for children's oral health at health facilities

At Health facilities responsible stakeholders for children's oral health include Medical personnel (Medical doctors and nurses), Dental personnel (Dentists, Dental Laboratory Technologists, Dental Hygienists and Dental Nurses).

10.7. Responsible stakeholders for children's oral health at Institutions for children with special health care needs

The oral health of children living at institutions is a responsibility of children carers, parents/guardians and children themselves depending on their level of dependency.

10.8. Universal stakeholders

In this chapter, governments, professional associations, Dental products manufacturers, the media and NGOs are considered universal stakeholders because their responsibilities cut across ages and locations. The governments are responsible for policies and governance of all issues pertaining to health. Whereas, professional associations' responsibilities are to safeguard the health of the people they serve. The dental products manufacturers are responsible to supply products required at all levels of prevention regardless of age or place. The NGOs can at any age and location play any role that falls within the organisation's governing regulations.

11. Assorted errands

The different tasks of various stakeholders in the prevention of oral diseases among children are presented with the centre of attention being the four levels of prevention.

11.1. Tasks of various stakeholders in executing primordial prevention of oral diseases among children

Under primordial prevention the task is to give education before the risk factor for oral diseases has occurred. The target group is the community without the risk factors.

The responsible individuals and their responsibilities are presented below;

11.2. Oral health personnel

Dentists, Dental Therapists, Dental Hygienists, Dental Nurses and Community Dental Workers or any other oral health workers are primarily responsible to give oral health

education (OHE). That is; to inform the community on the common oral diseases and conditions that affect children, their causes and measures to prevent them. Important messages for the community comprise proper and timely tooth brushing of children's teeth, sensible use of sugary containing food stuffs including avoiding leaving a nipple in the child's mouth at night. Other messages include maintenance of playgrounds, blunting sharp edges, securing windows and stairs as well as shunning slippery floors to protect young children against injuries, regular visit to a dentist for check-up and discouraging misconceptions, beliefs and practices harmful to children's oral health. As Narksawat et al. [44] put it that parents must be motivated to consistently spend the time required to take care of the primary dentition of their children by regular cleaning and controlling the snacking behavior of their children. Emphasis should be directed to parents of children with special health care needs, motivating and empowering them to realize these preventive strategies. In order to execute primordial prevention, the oral health personnel ought to target the community because this stage is done to a community who do not have the risk factors.

11.3. Community

The obligation of the community that is; parents, school teachers, children and other family members is to receive OHE and make use of the received information in order to avoid the risk factors. Parents of children with special health care needs, require endurance in looking after their children's oral health.

11.4. School teachers

School teachers are responsible to supervise children's playing activities, maintenance of playgrounds and controlling availability of sugary foods within school premises.

11.5. Universal stakeholders

In order for the primordial prevention to succeed, support is required from universal stakeholders, that is; Governments, Professional Associations, the Media and NGOs. The support expected is through formulation and enforcement of policies on OHE, provision of funds and personnel to take part in OHE activities as well as support to the profession to air Oral Health Education messages/campaigns through various media.

11.6. Tasks of various stakeholders in executing primary prevention of oral diseases among children

Primary prevention targets the community and the children in particular. The goal is to prevent personal exposure to risk factors.

11.6.1. Governments

Governments are in charge of policy formulation and implementation. The government520ents therefore are liable to have in place policies supporting primary prevention of oral diseases in children such as those governing school oral health programmes including those directed to

children with special health care needs, where required fluoridation of public water and fostering availability of fluoride tablets. They should provide conducive working environment, avail funds and give any other support to preventive programmes.

11.6.2. Oral health personnel

Primary prevention requires oral health personnel (Dentists, Dental Therapists, Dental Hygienists, Dental Nurses, Community Dental Workers or any other oral health workers) collectively or individually to do oral evaluation, regular dental examinations, dental prophylaxis, fissure sealants and health education with emphasis on plaque control and use of fluoridated tooth paste twice per day in the morning and evening before retiring to bed. They are also responsible to correct oral habits, and monitor occlusal development so as to prevent malocclusions. These procedures can be done at the chair side but also in communities such as primary schools or reproductive and child health clinics. Moreover, oral health care workers need to devise special primary preventive programmes for children with special health care needs bearing in mind the challenges encountered during dental treatment to these children. It may require outreach programmes to visit children at their schools where tailor-made information and instructions are given to the children.

11.6.3. Medical personnel (Medical doctors and nurses)

The medical personnel who see children for various ailments should join oral health personnel by mentioning prevention of oral diseases when they talk about prevention of other diseases particularly those sharing common risk factors such as diabetes, heart diseases, hypertension and cancers. The medical personnel attending children with special health care needs are liable to emphasise prevention of oral diseases.

11.6.4. Parents and community at large

The responsibility of parents and other community members is to advocate the use of Fluoride as a caries preventive agent and plaque control for prevention of gum diseases. Fluoride tooth paste used during tooth brushing twice a day in the morning and before retiring to be bed is universally accepted to prevent dental caries. Therefore, parents are responsible to brush their children's teeth from the eruption of the first tooth to six years of age. From age seven to 10 years, parents should supervise children's tooth brushing. In older children, parents should supervise flossing, use of dental rinses and medicinal mouthwashes. Furthermore, parents are responsible to facilitate the use of Xylitol and mouth guards if indicated. Parents should take their children for regular dental visits so that children's oral health can be monitored. Supervision and facilitation of using dental rinses and medicinal mouthwashes is another parents' task. Parents of children with special health care needs should pay special attention to prevent oral diseases for their children. This is particularly important given the hassles encountered in the dental settings by parents and oral health workers during dental treatment of children with special health care needs.

11.6.5. School and sports teachers

School children spend most of their day time at schools and therefore in contact with school teachers. The teachers are obliged to facilitate preventive actions against oral and other diseases. They can supervise tooth brushing or mouth rinse activities. They can support other programmes like Fluoride application or fissure sealing.

11.6.6. NGOs

Various national and international NGOs have funds and volunteers to support preventive programmes. They can arrange and participate in community services such as oral health screening, Fluoride application or fissure sealing programmes by giving funds and organising for personnel to take part in various programmes.

11.6.7. Dental products manufacturers

The dental product manufactures supply a wide range of products that are used to realize primary prevention of oral diseases among children. They are responsible to avail good quality products at affordable prices the dental products for prevention of diseases; tooth brushes, tooth paste, mouthwashes, fissure sealants, fluorides, dental floss, mouth mirrors as well as dental supplies including gloves, antiseptics etc.

11.7. Tasks of various stakeholders in executing secondary prevention of oral diseases among children

Secondary prevention involves actions which halt the progress of a disease at its incipient stage and prevents complications.

11.7.1. Governments

In order to facilitate provision of services to children at early stages of oral diseases so as to halt their progress and prevent complications, governments are required to provide conducive dental clinic working environments, avail funds, have in place and enforce policies on dental supplies. Governments are also responsible to oversee activities related to prevention of oral diseases in children in public sectors, private sectors and insurance companies.

11.7.2. Oral health personnel (Dentists, dental therapists, dental hygienists, dental nurses, community dental workers or any other oral health workers)

The Oral health personnel working in public or private sectors are responsible to provide or take part in treatment of various oral diseases and conditions. They should use Fluoride [45] on incipient caries, restore decayed teeth or perform root canal treatments where necessary, professional tooth cleaning and if indicated periodontal debridement. They should keep abreast with new knowledge, procedures, techniques and materials to facilitate them offer quality treatment of oral diseases at their early stages. Oral health care workers providing dental treatment to children with special health care needs should equip

themselves with techniques to address the challenges encountered during dental treatment to these children.

11.7.3. Medical personnel (Medical doctors and nurses)

The medical personnel who see children for various ailments are liable to do early diagnosis of oral diseases and make prompt referral. Whereas Rozier et al. [46] demonstrated that non-dental professionals can integrate preventive dental services into their practices, the American Academy of Pediatrics recommends physician interventions in addressing dental caries to include oral health screening and referral when indicated, provision of oral hygiene instructions, dietary information, and anticipatory guidance to parents, as well as prescription of fluoride supplements. In so doing they will facilitate early identification of oral diseases, promote their readily treatment and prevention of adverse sequelae.

11.7.4. Parents

Parents have a significant role to play to aid the oral health personnel in executing secondary prevention of oral diseases among children. They have to take their children for dental consultation at early stages of the disease. For the parents to achieve this task they have to develop a practice of looking into their children's mouths and consult dentists for any abnormal development principally so for children with special health care needs. After consulting the dentists they need to comply with appointments and instructions given by professionals.

11.7.5. Dental products manufacturers

A diverse list of materials and supplies is needed to support oral health personnel in delivering secondary prevention of oral diseases among children. The dental products manufacturers are responsible to avail required materials and supplies at affordable prices and of good quality. The requirements range from instruments, dental materials and dental supplies to dental equipment.

11.7.6. School teachers

Since school teachers spend most of their working time with children, their role in secondary prevention of oral diseases among children is to remind and motivate parents as well as children to consult dentists as per professional recommendations.

11.7.7. NGOs

The NGOs can support treatment programmes through volunteer services and provision of funds to buy required instruments, dental materials, dental supplies or dental equipment depending on the NGO's capacity.

11.8. Tasks of various stakeholders in executing tertiary prevention of oral diseases among children

There are a few actions at the level of tertiary prevention of oral diseases among children:

11.8.1. Governments

As for other levels of prevention, governments are responsible to provide conducive working environment, avail dental supplies and funds to allow provision of tertiary level prevention to those children who need such services. The governments should have policies to govern provision of tertiary level oral health care.

11.8.2. Oral health personnel (Dentists, dental therapists, dental hygienists, dental nurses, dental laboratory technologists or any other oral health workers)

It is the responsibility of oral health personnel to provide or take part in provision of tertiary level oral health care. This level is provided at health facilities. The oral health personnel should bear in mind that tertiary prevention in children at times implies primary prevention of oral problems in adult life.

11.8.3. Parents

The tertiary level care in children is important for future oral health of adults. Parents are therefore required to consult dentists for this care as will be advised by dentists and to comply with appointments and instructions given by professionals.

11.8.4. Dental products manufacturers

The dental products manufacturers should avail required materials and supplies for the preparation of children's tertiary level care because they are important for future oral health of adults. Tertiary prevention in children should not be considered as cosmetic therefore the required instruments, materials and other supplies should be availed at a reasonable cost.

11.8.5. NGOs

The NGOs should support treatment programmes as per individual organisation policy and capability.

Basically, oral disease prevention is difficult to attain but it is a responsibility that has to be fulfilled. It is worth to direct efforts of disease prevention to children because they are young, easy to learn and usually what they learn at early age is retained for life thus children are likely to adopt preventive measures and maintain good oral health throughout adulthood.

12. Conclusion

Diverse groups of people are responsible to execute prevention of oral diseases in children. If they work as a team and accountable on each individual errand, oral diseases in children can

be minimized or controlled thus enable children to eat well and ultimately grow well which contribute to improved children's social development, learning capacity and thus good quality of life.

13. Recommendations

The different errands should be publicized and motivate all responsible groups or individuals to be accountable with their roles in order to realize prevention of oral diseases in children.

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