INTRODUCTION

Oral health is an integral part of the overall health of adults and children. The most common oral disease encountered by children is dental caries. Dental caries is an infectious disease that results from an interaction between oral flora and dietary carbohydrates on tooth surface. [1, 2]

Dental caries is a chronic progressive disease which leads to gradual destruction of the hard tissues of the tooth structure. In Africa a serious increase in dental caries prevalence was detected, where 90% of the lesions were found untreated [3,4]

In many regions of the world, dental caries is still considered a major public health problem and the most prevalent chronic childhood disease as well as the most common unmet health care need of childhood [5,6].

Dental decay, pain, or infection can cause eating, learning esthetic and speech problems for children, which can negatively impact their general health and interactions with friends and family, thus affecting their quality of life [3,7]

Developed countries experienced a significant caries reduction over the last 20 years mainly due to the higher awareness, better orientation of the public about the use of fluorides and behavior modification. [8]

Most developing countries lack the resources and infrastructure required to provide children with the necessary care and attention. Treating dental caries in these countries with the traditional method of restorative dentistry was found to be beyond their financial capabilities [9].

Pediatricians have the responsibility to take the primary care for the child from birth to adolescence [10]. Because of their frequent contact with families for routine preventive visits in the child's first few years of life, pediatricians are in an ideal and unique position to advice families about the prevention of oral diseases in their children. The American Academy of Pediatrics (AAP) emphasizes that pediatric health care professionals should be trained to perform an oral health risk assessment on all children beginning at 6 months of age. [11, 12].

Earlier studies have found that practicing pediatricians are in favor of playing a greater role in the promotion of oral health, despite a perceived lack of training in this area. [13, 14].

Regardless of assumptions about dental capacity, models of the impact of implementation of a policy in which pediatricians would receive training in caries risk assessment, screen toddlers, and refer children to dentists suggest that such a policy would decrease the burden of untreated dental disease. [15]

REVIEW OF LITERATURE

Oral health is an essential component of general health. The ability to chew and swallow is a critical function required to obtain essential nutrients for the body. Oral cavity harbors many virulent organisms and is considered a gateway for many infections.Therefore, oral hygiene is very much necessary for overall health. [2, 3]

Dental health also plays important roles in speech and in enhancing appearance. Despite a low mortality rate associated with dental disease, they result in impairment of teeth functions and hence they have a detrimental effect on the quality of life. Moreover, dental disease causes considerable pain and anxiety and are expensive to treat. [16]

The results of archaeological surveys revealed that experience of dental caries was low until the nineteenth century, when it rose sharply in several European countries. This steady increase during the century 1850 to 1960 coincided with increasing importantion of cane sugar from the Americas. In Britain, a defining moment occurred around 1900 when poor teeth were the most important cause of rejection of volunteers for military service. This became a wake-up call for those concerned with public health. [17]

Dental caries is an infectious transmissible disease that can occur when cariogenic bacteria colonize a tooth surface in the presence of dietary carbohydrates, especially refined sugars. The bacteria metabolize the carbohydrates, producing lactic acid, which over time demineralizes the tooth structure [18]

Dental caries is the most common chronic disease affecting children [1]. It is 5 times more common than asthma, and its prevalence is high among children from families with income below poverty level. This disease not only causes damage to the tooth but is also responsible for several morbid conditions of the oral cavity and other bodily systems. [19,20]

It is unfortunate that although dental caries as a disease is decreasing in developed countries, it can be categorized as an epidemic in less and under developed ones. [21]

Epidemiology of dental disease:

Dental caries can occur soon after eruption of the primary teeth, starting at 6 months of age. Referred to as early childhood caries (ECC), dental caries in preschool children can take several forms. The most severe form has a pattern of early initial attack on the maxillary incisors with the attack continuing on other teeth as they erupt. [22]

Ge et al., 2008 stated that severe Early Childhood Caries (S-ECC) is a particularly aggressive form of dental caries affecting young children and has serious consequences on primary dentition, affecting the overall health, well being and the quality of life of the child. [23]

Many definitions of (ECC) have appeared in the literature. The American Academy of Pediatric Dentistry has defined ECC as(the presence of 1 or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger [24]

AAPD also defined (S-ECC) with differences according to age: in children younger than 3 years of age, it is defined as any sign of smooth surfaces caries, whereas in children from 3 to 5, it is defined as 1 or more cavitated, missing (due to caries), or filled smooth surface in primary maxillary anterior teeth, or a decayed, missing or filled score(dmft) > 4 at age 3, or a dmft >5 at age 4, or dmf >6 at age 5. [25]

Prevalence of ECC:

Prevalence of ECC varies among populations and within the same population, according to several established or controversial associated factors. It is well established that dietary and biological factors such as frequent consumption of high sugar foods and the presence of bacteria such as Streptococcus mutants (S. mutans) Contributes to ECC development. [26]

Dental caries is unequally distributed among the population. Caries incidence, prevalence, and severity is greater in minority and economically disadvantaged children. [19, 27]

In 1998 an analysis of a US national survey data, revealed that poor children had 5 times more untreated decay than did children from higher income families. Among children 2 to 5 years of age, those in families at or below the poverty level were found to be 106 times more likely to have experienced dental caries than children in families with incomes above the poverty level. [22]

In Egypt the prevalence of ECC varied among different research. A study in Cairo was carried out to determine the prevalence of early childhood caries among Egyptian children by reviewing the patient's

assessment charts of patients attending the Pediatric Dentistry Department, Faculty of Oral and Dental Medicine, Cairo University thoughout the year 2003-2004. The results of this study revealed that the prevalence of ECC among the children attending the department clinics was 8.022%. While boys showed higher caries prevalence than girls. [29]

In The US, dental caries incidence was found to begin in the permanent teeth at about 6 years of age with the eruption of central incisors and first molars. Among children 5 to 11 years of age, 26% have experienced one or more lesions in permanent teeth. This proportion increases to 67% among adolescents 12 to 17 years of age. [30]

Risk factors for ECC:

Numerous studies have investigated the risk factors for ECC. These factors include Limited parental education, childhood poverty, a diet high in sugar, a relatively high frequency of snacks, bottle feeding with sugary drinks and other inappropriate methods of infants feeding such as on demand nocturnal feeding, insufficient exposure to fluoride, poor oral hygiene, as well as episodic dental visits of parents and their children, Lack of professional advice for dental care, poor perinatal and prenatal health, and salivary and microbiological risk factors have all been implicated in the etiology of ECC.[24, 25,31]

Prolonged use of the baby bottle is believed to be associated with increased risk of caries though the use of the bottle may not be the most important factor in ECC development. The use of bottle containing milk, juice or any other sweetened liquid with fermentable carbohydrates as a substitute for pacifier, especially nocturnally, puts a child at risk of ECC.[32]

It was reported that malnutrition, prenatal health, prenatal nutritional status of mother and child as well as possible enamel deficiencies associated with low birth weight may cause ECC. [33,34]

Other risk factors like poor oral hygiene, sibling with a history of ECC, low level of education of caregivers, lower social and economic status, low family income, limited access to dental care, lack of dental insurance of children, deficits in parenting skills and knowledge or child management were reported to significantly increase the risk for ECC.[35]

One of the most common etiological factors in ECC are pregnant mothers having carious teeth with high salivary S.mutans count.[36]

Pregnancy leads to many temporary adaptive changes in the body, due to release of number of hormones as estrogen, progesterone, relaxin and gonadotropin.[37] Moreover, Pregnancy causes nausea and vomiting which usually lead to neglect of tooth brushing, so during this period the chances and risk of caries, gingival, periodontal and dental infections become higher than normal**.** The oral cavity is affected by such endocrine actions, and may present both transient and irreversible changes as well as modifications that are considered pathological.[38]

Microbiological studies had proved that children usually attain S.mutans from their mothers and that isolated strains from mother-child pairs have shown similar bacterial profiles with similar chromosomal or plasmid DNA patterns.[39-43] This showed that mothers are the main source of transmission of dental caries to their children.[44] Moreover, according to some studies children whose mothers S.mutans salivary count was high,

attained bacteria at younger ages than those whose mother's salivary count was low.[45,46]

Modes of S.mutans Transmission:

S.mutans bacterium can be transmitted both horizontally and vertically. [36, 42] Horizontal transmission is more common in siblings, children in same classroom, nursery or day care centers. It usually spreads through contaminated saliva, sputum, blood from one person to another one. Children in the same nursery school have reported to carry similar bacterial strains of *S.mutans* in their saliva.[47] On the other hand, vertical transmission is from parents to children. The term is restricted by some to genetic transmission and extended by others to include also transmission of infection from one generation to the next, by fluid as saliva, milk or through the placenta [48]. In vertical transmission *S.mutans* spread mainly from mothers to their children.[40]

Exact method of vertical transmission is believed according to the literature that there may be close contact between mother and children by sharing of food and utensils.[49]

Impact of ECC on life:

Untreated dental caries can have a significant impact on the quality of children's physical and social lives, especially among child and adolescent populations that belong to lower income groups [50, 51]

Untreated decay can lead to problems with eating, speaking, and attending to learning. Children who are poor were reported to suffer 12

times the number of restricted activity days caused by dental problems, compared with more affluent children. [52]

Dental caries in primary teeth can have both short- and longer-term negative consequences. Caries lesions often cause pain because they can progress rapidly in primary teeth and involve the pulp before they are either detected or treated. About 1 in 10 children 2 to 17 years of age and 1 in 5 children from low-income families made dental visits because they were in pain or something was bothering them. [53]

Regardless of their degree of progression, lesions cavitated into dentin require reparative treatment or tooth extraction, both are frequently traumatic experiences for young children. Young children with untreated, symptomatic carious teeth often present to emergency departments of hospitals for their first dental visit. [54]

Also, untreated caries lesions in young children may be associated with failure to thrive**,** although evidence is conflicting regarding this association. [50,55] Social outcomes of dental caries in young children are poorly documented, but children 5 to 7 years of age in the US had been estimated to lose more than 7 million school hours annually because of dental problems and/or visits.[51]

Untreated caries typically was cited as a cause to increased infections, dysfunction, poor appearance, and low self-esteem. [53]

Longer-term consequences of dental caries in primary teeth include an increased probability of caries in the permanent dentition and possible loss of arch space. [56] Lack of treatment for caries in primary teeth will often result in the premature loss of the primary teeth, especially molars.

Premature loss of primary molars can lead to loss of arch space as the first permanent molars drift into the missing tooth spaces**.** The result can be crowding of the permanent teeth, the severity of which depends on the amount of lost space**.** [(57)]

Some dentists believe that crowding increases the risk of both caries and periodontal disease in the permanent dentition because of the disruption of normal tooth-to-tooth relations that promote self-cleaning. This widely held belief is not well supported by observational studies, however**.** [(56)]

Prevention:

Approaches to the prevention of dental caries involve attempts to reduce the microbiological burden, reduce the availability of refined sugars, increase the resistance of teeth, or some combination of these approaches. Reducing the microbiological burden is the focus of interventions using antimicrobial rinses and dentifrices and behavioral interventions to improve oral hygiene and thus remove the bacterial plaque coating tooth surfaces. Behavioral interventions are also used to reduce the availability of fermentable carbohydrates through changes in the composition of the diet and frequency of ingestion of refined sugar. [(58)]

Role of Pediatrician in ECC prevention:

Although caries spread among poor and minority children presents itself as a major public health issue and its neglect leads to barriers with adequate nutrition, speech, as well as attending to learning, underprivileged third world children continue to have limited access to dental care. The idea

of dental visits is still considered as a luxury which should only be attempted if there is a persistently serious problem. [59]

On the other hand, in these same areas, regular visits to pediatricians are mandatory to receive vaccination .Hence the pediatrician is always the first and usually the only physician examining the child from birth through early childhood and till adolescence unless a specific health problem appears.[13,60]

This frequent contact with families provides pediatricians the unique opportunity to play a well-documented role in primary oral health promotion for children. Because of their frequent contact with families for routine preventive visits in the child's first few years of life, pediatricians are in an ideal and unique position to advice families about the prevention of oral diseases in their children. The AAP emphasizes that pediatric health care professionals should be trained to perform an oral health risk assessment on all children beginning at 6 months of age [12]

Although all experts appreciate the significance of dentistry through the early years of life but minimal action has been taken in most emerging economies to spread dental awareness among primary care pediatricians. [10]

The problem sometimes even extends in well developed areas where some earlier studies have shown that the oral health competency and practice of some pediatricians were less than adequate. [61, 62]

Generally, children are taken to the dentist only if there is a problem with the teeth; by this time, most of the teeth are carious because of poor oral hygiene. A pediatrician who is familiar with the science of dental

caries, capable of assessing caries risk, knowledgeable about preventive strategies, and connected with dental resources can contribute to the oral health of his or her patients. [63]

The involvement of pediatricians in oral health prevention during child care visits in early childhood may play an important role in the diagnosis and prevention of the dental health of their patients. [64]

AAP stated that pediatricians are health professionals who supervise the processes of growth and development of children from birth and must be able to educate parents about basic preventive dental care, early diagnosis of pathological changes in the oral cavity and appropriate referrals for the children [65]

However, the extent of pediatricians' knowledge about preventive oral health and their contribution therein and to the assessment of oral health remains to be determined.

Moreover, little is known about the incidence of dental problems in pediatric practice and whether pediatricians perceive barriers to their patients receiving professional dental care. Finally, it is important to know how pediatricians value the promotion of oral health and whether they would be willing to take on additional activities in the field.

Pediatricians should have adequate knowledge and awareness of oral disease risk factors, its preventive and interceptive strategies. Moreover they must be convinced of their crucial role to be able competently address child oral health issues. [13, 61]

A shortage of dental providers, which limits access to dental care, is a significant contributory factor to the problem of poor oral health. On the other hand it has been demonstrated that delivery of preventive

dental services is feasible and acceptable at pediatric well-child visits (WCVs). [66]

It was reported that relative to access to dental care, access to primary preventive medical care is less of a problem for children, with only 19% of 3- to 4-year olds missing their WCVs. Thus early intervention by a trained primary care provider can help decrease future dental treatment needs and costs in the population for which the demand for dental services outpaces access to dental providers. [66]

Primary preventive strategies for oral health are an essential public health priority since dental caries is the most common chronic disease among children worldwide. Experts have recommended to begin initiatives with very young children to promote positive outcomes during childhood and subsequent adulthood. [67]

Dental care should start at approximately six months of age with the eruption of the first tooth. Regular annual visits are then required to determine if there is a need for prevention or treatment. [68]

Dental decay may show its effects at 3 years of age. Because pediatricians and other pediatric health care professionals are more likely to encounter children at this age than are dentists, it is necessary for them to be aware of pathophysiology and associated risk factors of early childhood dental caries. They will then be able to make appropriate decisions about referring children to a dentist for effective interventions [61]

The evidence in the literature revealed that when the frequency of visits to the pediatrician and pediatric dentist are analyzed, regardless of the nature of the service being sought (public or private), the parents

consistently consulted pediatricians throughout the first year of life, which did not occure in relation to dental queries [63]

A review of 56 Web sites of on-line oral health resources revealed that these sites addressed major content areas including anticipatory guidance, oral health risk assessment, oral screening, diagnosis of caries, and fluoride varnish. However, significant gaps were noted in addressing procedural skills, as well as the cultural and medical-dental interface.[69]

Data revealed that 89% of infants and 1-year olds had office-based physician visits annually, compared with only 1.5% who had dental visits. Consequently, visits to physicians outnumbered visits to dentists at 250 to 1 for this age group**.** Because the youngest of the pediatric patient population visit the pediatrician more than the dentist, it is critical that pediatricians be knowledgeable about dental caries, prevention of the disease, and interventions available to the pediatrician and the family. [70]

With regard to pediatricians knowledge, attitudes, and practices. towards prevention of oral disease, various studies have shown that the oral health competency and practice level of some pediatricians are less than adequate [60,71]

In 2006, 1000 pediatricians were surveyed in Italy to assess their knowledge, attitude and practices toward prevention of oral diseases in their child patients. Results showed that more than half knew the main risk factors for oral diseases and this knowledge was higher in pediatricians with higher number of working hours per week, and in those who believed that oral disease may be prevented. Pediatricians who had higher knowledge about main risk factors for oral diseases, believed that they have an important role in preventing oral disease and that they can perform oral examinations. The authors concluded that there was a lack of knowledge

among pediatricians, although almost of them believed that they had an important role in preventing oral diseases. [63]

In 2011, a study was conducted in Egypt to asses level of awareness and attitudes towards oral health among 198 pediatricians who were members of the Pediatric Medicine Department at Ain Shames university. It was found that less than half of the sample had a good awareness level of main risk factors for oral disease. Awareness level was least in those pediatricians with more than 25 years of experience, and high in pediatricians that had an additional private clinic and those who examine more than 25 patients/ day. The authors concluded that oral health knowledge was lacking among participated pediatricians. [72]

Another study was made to assess the knowledge, attitudes, and practices of pediatricians from the Kannur district of Kerala,India,regarding the prevention of dental caries. Although majority of the respondents were aware of the major risk factors, only 22% of the respondents knew that caries is transmitted from mother to child. Almost all the pediatricians agreed with and know the role of the pediatrician in the prevention of dental caries. Only 39.47% of the pediatricians performed oral health assessment during physical examination, whereas 51.27% of pediatricians performed oral health examination only in the presence of a relevant complaint. Among the pediatricians, 89.48% adviced tooth brushing after the first tooth erupts. Counseling of patients regarding dental caries was provided only by 57.89% of the pediatricians. The survey also indicated that 78.95% of pediatricians referred patients to dentists only when there is a dental problem. The results also indicated that 73.68% of the pediatricians believed that their oral health education was inadequate. [73]

Inadequate dental knowledge of physicians has suggested that some oral and dental health curricula. Instructions should be included in their medical curricula [74]