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Improving children's oral health through assessment, prevention, and treatment

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ABSTRACT

The health of the mouth of children says a lot about their general health. Since it is a fact that what affects the mouth can also affect the general health of the body, it follows that any improvements in the health of the mouth will, inadvertently, bring about some gains in general health. Consequently, it is of utmost importance that we bring to bear upon the health of children, all the recent giant strides that have been made in the areas of genomics, biological, behavioral, social, and health services research, which have strengthened the evidence base available to support initiatives and translational efforts. To translate the available researches into policies and practices that may have positive impacts upon the health of children, there exists the need to support current guidelines with extra efforts to ensure that children receive better care. The purpose of this paper was to assess the need to improve children's oral health through assessment, prevention, and treatment. Issues such as oral health assessment and oral disease prevention strategies that can be adopted to combat children's oral health challenges are also highlighted. Treatment modalities are equally addressed.

INTRODUCTION

The oral health status of children in Africa follows a social gradient like that of children in most areas of the world. Disadvantaged children have the largest share of oral diseases but do not have easy access to dental care (Varenne et al., 2011). The response of health services is mostly curative and generally inadequate due to insufficient resources. Although oral disease programmes, when they exist, improve the health of the whole population, the difficulty in reaching the most disadvantaged populations further aggravates health-related social inequalities (Petersen, 2009).

According to Petersen (2005) oral diseases, being a major health issue in the world, are economically affecting people of developed countries as 10% of health expenditure is related to dental care. There is an

improvement in oral health in most developed countries, but in many developing countries, available facilities and services are a far cry from what is expected. We still have dentally disadvantaged people with low socio-economic status everywhere (Adamu & Eneojo, 2013).

ORAL HEALTH CARE FOR CHILDREN

Oral health is an integral part of the overall health of children. Oral health is a functional, structural, aesthetic, and psychosocial state of wellbeing and is essential to an individual's general health and quality of life (American Dental Association [ADA], 2014). All children should have access to preventive and treatment-based dental care to eliminate existing disparities in access to oral health care and improve areas where advocacy for children's oral health is most needed.

According to Jackson et al. (2011), dental health can affect the functional, psychological, and social dimensions of a child's well-being. For example, oral pain has devastating effects on children, including loss of sleep, poor growth, behavioral problems, and poor learning. Developmentally, crucial processes of communication, socialization, and self-esteem are also affected by poor dental health (Locker & Matear, 2017). Dental problems are associated with a substantial reduction in school attendance and parental working days. There is also recent evidence linking oral disease to other health problems, such as low birth weight, preterm delivery, and iron deficiency (Clarke et al., 2006).

COMMON ORAL HEALTH PROBLEMS AFFECTING CHILDREN

Several problems affect the oral health of children. Although baby teeth are eventually replaced with permanent teeth, keeping baby teeth healthy is important to a child's overall health and well-being.

Tooth decay

Tooth decay is one of the most common chronic childhood conditions across the United States. According to the Centers for Disease Control and Prevention (2020), 20% of children from the ages of five to eleven have at least one untreated decayed or decaying tooth, and 13% of adolescents have the same problem. A decaying tooth is caused by certain types of bacteria that live and thrive in the mouth. A sticky, film-like buildup of bacteria called plaque perpetually accumulates on teeth. If exposed to the right type of foods, plaque will produce acids and eat away at a tooth's enamel, or the hard outer surface of the teeth. The stickiness of the plaque keeps the acids in constant contact with the surface of the tooth, gradually decaying the tooth.

According to Moynihan and Kelly (2014) consumption of free sugars (i.e. sugars added to food and beverages and sugars naturally present in honey, syrups, fruit juice, and fruit juice concentrates) is of critical importance to the development of dental caries. There is evidence from cohort studies that two key characteristics are critical in early childhood caries dietary practices: the age at which the sugar is introduced to a child and the frequency of its consumption (Chaffe et al. 2015; Feldens et al. 2018).

Thumb sucking

Thumb sucking is a common behavior of infancy and early childhood. This oral habit can interfere with the growth and normal development of the jaw, favoring the onset of malocclusion and changes in normal swallowing and speech patterns, depending on factors such as duration, frequency, intensity, and facial pattern. (Proffit et al., 2007).

Tongue thrusting

Tongue thrust is the forward movement of the tongue tip between the teeth to meet the lower lip during deglutition and in sounds of speech so that the tongue becomes interdental. Tongue thrust is an oral habit pattern related to the persistence of an infantile swallow pattern during childhood and adolescence and thereby produces an open bite and protrusion of the anterior tooth segment (Tulley, 1969). It is also the habit of sealing the mouth for swallowing by thrusting the top of the tongue forward against the lips. Just like thumb sucking, tongue thrusting exerts pressure against the front teeth, pushing them out of alignment, which causes them to protrude, creating an overbite, and possibly interfering with proper speech development. It can be hereditary or learned behavior.

Lip sucking

Lip sucking involves repeatedly holding the lower lip beneath the upper front teeth. Sucking of the lower lip may occur by itself or in combination with thumb sucking. This practice results in an overbite and the same kinds of problems as with thumb sucking and tongue thrusting. Lip sucking habit causes the protrusion of the upper teeth (Profitt et al. 2000).

Early tooth loss

Premature loss of a child's "baby teeth" typically occurs from tooth decay, injury, or lack of jaw space. If teeth are lost before the permanent teeth come in, the nearby teeth can tip or shift. When a permanent tooth tries to emerge into its space, there may not be enough room. The new tooth may emerge tilted. Crooked or misaligned teeth can cause a range of problems, from interfering with proper chewing to causing temporomandibular joint problems Leite-Cavalcanti et al. (2008) opined that the premature loss of primary teeth reduces the arch length required for the succeeding teeth. Hence, predisposes crowding, rotation, and impaction of the permanent teeth.

Bad breath

Also known as halitosis, fetid halitus, mouth odor, bad mouth odor, malodor "is a condition in which halitus/breath is altered in a manner unpleasant for the affected individual and affects both the individual and also those with whom they interact" (Motta et al., 2011).

Sensitive teeth

Another common childhood dental problem is sensitive teeth. It is a relatively common, painful dental condition. Typically, the pain is short and sharp and occurs in response to certain stimuli applied to exposed dentin. Children's enamel is thinner than that of adults, and it's easily worn down by plaque and acid. As enamel wears away, a child's gums may begin to recede, and cracks can develop on the tooth surface, exposing nerve endings. (Addy, 2002).

Gum disease

Gum disease, or gingivitis, is the inflammation of the gum tissue. It's often caused by poor oral and dental hygiene and plaque buildup (Adamu & Eneojo, 2013). During the early stages of gingivitis, a child's gums are often swollen and red, and they recede from the teeth and bleed easily after flossing. Other indicators of gum disease include bad breath and a perpetually bad taste in the kid's mouth.

Grinding

Also known as bruxism. It is noted as the commonest of the many parafunctional habits of the dentofacial system. Bruxism activity leads to tooth wear and damage, restoration fractures, temporal headache, and other temporomandibular disorders. The prevalence is about 14-20% in children (Manfredini et al., 2013).

Over-retained primary teeth

Sometimes, a baby tooth does not get loose. If a primary tooth would not loosen, it could cause the permanent tooth underneath to try to erupt in the same space. As a result, two teeth can exist in a spot meant for just one. Or, a baby tooth might remain solid for years as other teeth loosen around it. In these instances, the child may not have a permanent tooth to replace the primary one, so the primary tooth is not pushed out of the mouth. Common causes for over-retained deciduous teeth are malpositioning of the tooth germ, abnormal resorption of the roots, ankylosis, supernumerary tooth in the path of eruption, and agenesis of the replacing tooth (Sabri & Nassey, 1993). Over-retained teeth can lead to cavities and other dental problems if left untreated.

ORAL HEALTH ASSESSMENT

Oral health assessment is central to planning effective care, as planning interventions and evaluation rest on this first step of the management process (Brennan & Chapman, 2012). Practitioners should aim to prevent oral problems; therefore, proactive care, rather than reactive management to emerging problems, is important (Freer, 2000). Assessment skills are necessary for all practitioners who have contact with children and young people (Cook & Montgomery, 2010; Brennan & Chapman, 2012). Some children may become distressed, uncooperative, or unwilling for practitioners to assess their oral cavity because of their illness or previous experiences. This is known as an oral phobia (Gibson et al. 2012).

An anxious or scared child who may be in pain creates a need for the operator or their assistant to work closely with the child or young person and family to build strong, trusting relationships whereby he or she feels comfortable for oral assessment to take place. Distraction through play therapy or recreational activities can also help the child to feel relaxed and more accepting of oral assessment and subsequent management of any oral health issues (Peate & Whiting, 2006). Play therapy and working with children and families give them some control over their situations, enabling them to feel empowered as participants in their care (Hagger, 2009). Freer (2000) suggested that the provision of an oral health assessment tool has value in monitoring the holistic needs of the individual and has a purpose in evaluating care and identifying potential oral health care problems. Oral assessment tools such as a mouth mirror and the probe used regularly would assess

the lips, teeth, oral mucosa, gingiva, and tongue noting any changes, therefore evaluating if oral health is improving or deteriorating, coupled with identifying potential future risks. Incorporating an oral assessment tool into the holistic care of the child could potentially identify problems and prevent the child from suffering unnecessary pain and discomfort resulting from health issues.

Oral health risk assessment may also be administered periodically to all children to learn about their potential risk of oral health problems to inform plans for preventive strategies to combat them.

PREVENTIVE STRATEGIES

Prevention, diagnosis, and treatment of oral diseases are highly beneficial, can be undertaken, and should be encouraged during pregnancy with no additional fetal or maternal risk compared with the risk of not providing care (National Maternal and Child Oral Health Resource Center, 2012).

After birth, dental health practitioners recommend that parents do the following:

a) Exclusively breastfeed infants for 6 months and continue breastfeeding as complementary foods are introduced for 1 year or longer, as mutually desired by mother and infant

b) Discourage putting a child to bed with a bottle. Establish a bedtime routine conducive to optimal oral health.

c) Wean from a bottle by 1 year of age.

d) Limit sugary foods and drinks to mealtimes

e) Avoid carbonated, sugared beverages and juice drinks that are not 100% juice.

f) Limit the intake of 100% fruit juice to no more than 4 to 6 per day

g) Encourage children to drink only water between meals, preferably fluoridated tap water.

h) Foster eating patterns that are consistent with guidelines

(The American Academy of paediatrics [AAPD], 2020).

The value of good oral hygiene lies in controlling the levels and activity of disease-causing bacteria in the oral cavity and delivering fluoride to the surface of the tooth. It is important to remember that pathogens can be passed from caregiver to child (Berkowit, 2006; Douglass et al., 2008; Köhler et al., 1983). Thus, anticipatory guidance for both parent and child is important.

Those who care for children

a. should demonstrate to the children, by example, what it means to maintain good oral hygiene habits

b. discourage bad oral habits

c. introduce them to dental care professionals early in life to alley the fear of the dental office and for the caregivers to detect oral problems early in their natural history and take steps to provide prompt treatment for them

d. with a significant history of tooth decay should avoid sharing with the children items that they have introduced into their mouth

e. ensure that their teeth are cleaned twice a day

f. should supervise teeth cleaning in older children until they can brush all alone by themselves

TREATMENT MODALITIES

A. Detect and treat any oral problem early (Adamu & Eneojo, 2013).

B. Periodic scaling and polishing of teeth to remove bacteria biofilm and dental calculus (Adamu & Eneojo, 2013).

C. Fluoride varnish can prevent about one-third (33%) of cavities in the primary (baby) teeth and any child at caries risk should have regular 5% fluoride varnish application (AAPD, 2015).

D. Exposure to dietary fluoride is imperative to all dentate infants and children and can be delivered through fluoridated waters; and for those in underdeveloped countries, use of fluoridated toothpaste, fluoridated salt, and fluoridated milk (Albino & Tiwari 2016).

E. Pits and fissure sealants can help prevent cavities also prevent cavities for children with 'giant' pits and fissures (Adamu & Eneojo, 2013).

F. According to Giacaman et al. (2018), the use of atraumatic dental caries removal and tooth restoration with glass Ionomer cement for cavitated dentine lesions is supported by studies in developing countries. For multi-surface restorations in primary teeth, resin-based composite is superior to glass ionomer restorations (Dhar et al., 2015).

CONCLUSIONS

Oral health is an integral part of the overall health and well-being of children. All dental health care professionals who are familiar with the science of dental health care problems, capable of assessing risks, comfortable with applying various strategies of prevention and intervention, and connected to dental resources can contribute considerably to their oral health.

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REFERENCES

Adamu, V. E. & Eneojo, N. I. F. (2013). *Your mouth: A pragmatic exposé of informed self-care and astute decision-making skills for the oral healthcare consumer*. Westbow Press.

Addy M. (2002). Dentin hypersensitivity: New perspectives on an old problem. *Int Dent J*, *52*, 367-75

Albino, J., & Tiwari, T. (2016). Preventing Childhood caries. *J Dent Res.*, 95(1), 35-42.

American Academy of Pediatric Dentistry. (2015). *Caries risk assessment and management for infants, children, and adolescents.* http://www.aapd.org/media/policies_Guidelines/Bp_CariesRiskAssesment.pdf.

American Dental Association. (2014). ADA, positions-policies, and statements. https://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/ada-policy-definition-of-oral-health.

Brennan, E., & Chapman, S. (2012). Assessment. In Macqueen, S., Bruce, E., & Gibson, F. (Eds). *The Great Ormond Street Hospital Manual of Children's Nursing Practices*. Blackwell Publishing.

Chaffee, B. W., Feldens, C. A., Rodrigues, P. H., & Vítolo, M. R. (2015). Feeding practices in infancy associated with caries incidence in early childhood. *Community Dent Oral Epidemiol. 43, 338-348.*

Clarke, M., Locke, D., Berall, G., Pencharz, P., Kenny, D., & Judd P. (2006). Malnourishment in a population of young children with severe early childhood caries. *Pediatr Dent*, *28*(3), 254–9.

Centers for Disease Control and Prevention. (2020). *Oral health.* https://www.cdc.gov/oralhealth/childrenadults/child.htm?ga=1.169728801.1230828255.1469201074

Cook, K., & Montgomery, H. (2010). Assessment. In Trigg, E., Mohammed, T. (Eds). Practices in Children's Nursing: *Guidelines for Hospital and Community. 00Third edition*. Elsevier.

Dhar, V., Hsu, K. L., Coll, J. A., Ginsberg, E., Ball, B. M., Chhibber, A., Johnson, M., Kim, M., Modaresi, N., Tinanoff, N. (2015). Evidence-based update of pediatric dental restorative procedure: dental materials. *J Clin Pediatr Dent, 39*(4), 303-310.

Douglass, J. M., Li, Y., & Tinanoff, N. (2008). Association of mutans streptococci between caregivers and their children. *Pediatr Dent*, *30*(5), 375–387.

Feldens, C. A., Rodrigues, P. H., de Anastácio, G., Vítolo, M. R., & Chaffee, B. W. (2018). Feeding frequency in infancy and dental caries in childhood: a prospective cohort study. *Int Dent J., 68*(2), *113-121.*

Freer, S. (2000). Use of an oral assessment tool to improve practice. *Professional Nurse*. *15*(10), 635-637.

Giacaman, R. A., Munoz-Sandoval, C., Neuhaus, K. W., Fontana, M. & Chalas, R. (2018). Evidence-based

strategies for the minimally invasive treatment of carious lesions: Review of the literature. *Adv Clin Exp Med., 27*(7), 1009-1016.

Gibson, F. Macqueen, S., Bruce, E. (2012) Personal hygiene and pressure ulcer prevention. In Macqueen, S. et al. (Eds). *The great Ormond street hospital manual of children's nursing practices.* Blackwell Publishing.

Hagger, L. (2009). *The child as vulnerable patient: protection and empowerment.* Ashgate Publishing.

Jackson, S. L., Vann, W. F., Jr, Kotch, J. B., Pahel, B. T., & Lee, J. Y. (2011). Impact of poor oral health on children's school attendance and performance. *Am J Public Health, 101*(10), 1900–6.

Köhler, B., Bratthall, D., & Krasse, B. (1983). Preventive measures in mothers influence the establishment of the bacterium Streptococcus mutans in their infants. *Arch Oral Biol*, *28*(3), 225–231.

Leite-Cavalcanti, A., de Alencar, C. R., Bezerra, P. K., & Granville-Gracia, A. F.(2008). Prevalence of early loss of primary molars in school children in Campilla Grande, *Razi. Pak Oral Dent J*, *28*, 113-6.

Locker, D., & Matear, D. (2017). *Oral disorders, systemic health, well–being and the quality of life: A summary of recent research evidence*. www.utoronto.ca/dentistry/facultyresearch/dri/cdhsru/health_measurement/7.%20%20No%2017.

Manfredini, D., Winocur, E., Guarda Nardini, L., & Lobbezoo, F. (2013). Epidemiology of bruxism in adults: A systematic review of literature. *Journal of Orofacial Pain, 27*(2), 99-110.

Motta, L. J., Bachiega, J. C., Guedes, C. C., Laranja, L. T., & Bussadori, S. K. (2011). Association between halitosis and mouth breathing in children. *Clinics (Sao Paulo), 66*, 939–42.

Moynihan, P. J., & Kelly, S. A. (2014). Effects on caries of restricting sugars intake: systematic review to inform WHO guidelines. *J Dent Res., 93*(1), 8-18

Oral Health Care during Pregnancy Expert Work Group. (2012). Oral health care during pregnancy: A national consensus statement. *National Maternal and Child Oral Health Resource Center.*

Peate, I., & Whiting, L. (2006). *Caring for children and families.* John Wiley & Sons.

Petersen, P. E. (2009). Global policy for improvement of oral health in the 21st century- implications to oral health research of World Health Assembly 2007, World Health Organization. *Community Dent Oral Epidemiol*, *37*(1), 1-8. doi: 10.1111/j.1600-0528.2008.00448.x. pmid:19046331.

Profit, W. R., Fields, H. W., & Sarver, D. (2007). *Contemporary Orthodontics,* Elsevier.

Profit, W. R., Fields, H. W., Ackerman, J. L. (2000). *Contemporary orthodontics. 3rd Ed.* Mosby Year Book Inc., pg. 120-4.

Sabri, R. & Nassey, I. (1993). La retention des dent temporaires. *Rev Odonto-Stomatol*, *22*, 307-314.

Tulley, W. J. (1969) A critical appraisal of tongue-thrusting. *Am J Orthod*., *55*, 640-50.

Varenne, B., Fournet, F., Cadot, E., Msellati, P., Ouedraogo, H. Z., Meyer, P. E, Cornu, G. F., Salem, G., Petersen, P. E. (2011). Environnement familial et disparités de santé dentaire des enfants en milieu urbain au Burkina Faso. *Rev Epidémiologie Santé Publique*, *59*(6), 385-92.