

Dental Caries and Child Quality of Life

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ABSTRACT

Dental caries is a worldwide, pervasive oral health issue. It significantly impairs the quality of life of children and their families due to its physical, psychological, and socio-economic outcomes, potentially leading to pain, discomfort, and even life-threatening complications. It can even lead to missed school days and hinder academic performance due to its oral pain in children. The impact remains regardless of how it could be treated, prevented, or accessed for dental care at a young age. This study advocates for proactive measures to prevent dental caries and improve the overall quality of life of young children. In the physical aspect of dental caries, through various cross-sectional studies, it was concluded that children with dental caries have a greater chance of difficulty eating, sleeping, speaking, and attending school compared to those who do not have dental caries. As one of its solutions, implementing dental health programs in schools and promoting oral hygiene practices can inform children about dental caries and its prevention. Meanwhile, on psychological aspects, children who have dental caries tend to experience lower self-esteem during the assessment, which includes embarrassment and shame about their oral appearance. Dental caries is also likely to cause children to go through social isolation and social exclusion among friends. To retrieve individuals' self-esteem level, it is necessary to connect children to mental health professionals or counselors. It is also essential to openly communicate between children and parents about the feelings and experiences of social exclusion. Moreover, from the perspective of socio-economic outcomes, financial strain could distress children and their families that is caused by high-priced dental treatments. To reduce its burden, it is encouraged to access affordable dental insurance for children and their families, especially those from low-income communities. Getting check-ups at community dental clinics could also provide affordable fee structures for essential treatment services.

Keywords: early childhood caries, quality of life, preschool children, oral health status, prevention, public health.

Subject: Dentistry, Healthcare

INTRODUCTION

Dental caries, also known as tooth decay or cavities, is one of the most universal chronic diseases among people worldwide (Selwitz et al., 2007). Dental caries usually develops when bacteria in the mouth metabolize sugars and produce acids that demineralize the hard tissues of the teeth, which are enamel and dentine (World Health Organization, 2017). Dental caries are often treated by caries prevention, early detection, and a diagnosis based on risk indicators and risk factor assessments, which are the most current practical approaches (Warreth, 2023). Generally, dental caries could be prevented by consuming a healthy diet, limiting sugar and using Xylitol instead, which is a natural sugar substitute that can inhibit bacterial growth and reduce acid production, brushing teeth twice a day with fluoride toothpaste before bedtime, applying dental sealants, drinking plenty of tap water, limiting acidic drinks that erode tooth enamel, and flossing once a day (Department of Health & Human Services, n.d.).

Dental caries is a pervasive oral condition that can affect general health and often causes pain and infection in every individual, regardless of age. However, its consequences become more effective for these young children in terms of physical, psychological, and socio-economic impacts. Early childhood is a profoundly crucial period of development, and dental caries is a paramount concern during this phase. It does not only cause physical discomfort but also disrupts aspects such as proper nutrition, speech development, and social interactions. Yet, despite its widespread prevalence and potentially devastating consequences, dental caries remains a neglected issue. This research aims to endorse proactive initiatives aimed at preventing and addressing this pervasive oral health issue. Below, this paper lists the effects of dental caries that can have an impact on the Oral Health related Quality of Life (OHRQoL) of children and their families.

Physical Effect

On the physical aspect, a clinical exam was conducted using the survey Oral Impacts on Daily Performance (OIDP) in daily activities. The purpose of this study was to identify which specific daily activities children were getting discouraged from. From a total of 7,247 children, 33.5 percent of those who had teeth with untreated dental caries experienced an impact on at least one of the OIDP activities: difficulty eating and sleeping. The study shows that untreated dental caries in children will have a greater chance of “difficulty eating” at $P = 0.007$ and “difficulty sleeping” at $P = 0.023$ (Souza et al., 2017).

Untreated cavities can cause massive pain and infections that could potentially lead to problems with eating, speaking, and attending to learning. These issues have a strong impact on underprivileged children. Additionally, a cross-sectional study was conducted to assess the association between oral health status and school performance in Bengaluru, India. Oral health status was assessed using the *df-t* index (number of decayed and filled teeth), and academic performance was assessed based on the marks obtained. To prove this, a study concluded that the effect of caries-related pain on distraction from learning and school performance is significant, as the pain and infection caused by dental caries lead to problems such as eating, speaking, and learning. It primarily affects the child’s school attendance and mental and social well-being while at school. Furthermore, research conducted in Michigan has observed instances of loss of sleep, distracted focus during school, and absences from school, all caused by the pain associated with dental caries (Garg et al., 2012). If a child is experiencing caries-related pain, appropriate pain management strategies, such as access to dental care, are needed. Likewise, implementing dental health programs in schools and promoting oral hygiene practices can inform children about dental caries and its prevention.

Psychological Effect

Meanwhile, on the psychological and psychosocial aspects, dental caries can lead to a loss of self-esteem and cause embarrassment and shame about their dental appearance. A study was conducted among 10 to 17 year old adolescents to assess the impact of dental disorders (dental caries) on adolescents’ self-esteem levels. Oral health assessment was carried out using a WHO type III examination, and self-esteem level was measured using the Rosenberg Self-Esteem Scale score (RSES). The results showed a significant correlation between self-esteem and individuals’ perceptions of their dental aesthetics and dental caries. Those who regarded themselves as ‘less attractive’ tended to exhibit lower self-esteem scores than those who viewed themselves as ‘attractive.’ This suggests that self-esteem can be significantly influenced by dental caries. It can alter one’s appearance, which can erode self-esteem; low self-esteem can lead to an inability to socialize, perform work, and restrain from daily activities (Kaur et al., 2017). Additionally, data from the National Health and Nutrition Examination Survey showed that half of all people with depression rated their teeth condition as ‘fair’ or ‘poor’. This could find a strong link between oral diseases such as dental caries and mood conditions like stress, distress, anxiety, depression, and loneliness (The Connection between Oral and Mental Health, n.d.).

Children with dental caries may also experience social isolation or social exclusion due to their oral health condition. They may face exclusion from social activities and gatherings due to their permanent appearance. Teasing or bullying by peers can lead to feelings of loneliness and anxiety as well. An observational study examining the association between oral health conditions, dental caries, and loneliness or social isolation was conducted using the NIH Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies. From the seven studies included, most cross-sectional studies demonstrated an association between oral health and loneliness as well as social isolation (Hajek et al., 2022). Children who experience psychological distress related to dental caries should be referred to mental health professionals or counselors. Especially for those who have dental anxiety or phobias, cognitive-behavioral therapy can help overcome their fears. It is also important to ethically and honestly communicate between children and parents about their feelings and experiences.

Socio-economic Effect

Dental caries can have a crucial socio-economic impact on children and their families. Inequalities by individual socio-economic position can affect children’s dental health; reports from around the world show similar results. Due to the fact that children from higher income households have more chances to access dental care, including a more professional assessment, a higher prevalence of dental caries may be common in people with lower socio-economic status due to a lack of prevention and treatment services as well as a poor diet high in sugar (Oral Health and Socioeconomic Inequalities, 2023). Regardless of age, income, or type of insurance children or their families have, more people report financial barriers to dental care than to any other type of health care. In 2014, the National Health Interview Survey (NHIS) was conducted to investigate financial barriers to dental care. Across age groups, the research revealed that a higher proportion of participants reported facing financial barriers to receiving dental care (dental caries) compared to other forms of healthcare. Specifically, when compared to children and seniors, adults and children encountered financial barriers more frequently to certain types of healthcare. For instance, 4.3% of children cited economic reasons as reasons for not receiving necessary dental care (Vujicic et al., 2016). Over \$45 billion is lost in productivity in the United States each year due to untreated oral

disease, and over 34 million school hours are missing due to unplanned urgent dental care, which dental caries could take part in. In 2017, there were 2.1 million emergency room visits for dental emergencies (CDC, 2023). To avoid these extra expenditures, children and their families are encouraged to access affordable dental insurance, especially in low-income communities. Check-ups at community dental clinics could also offer affordable fee structures.

CONCLUSIONS

Dental caries, otherwise known as tooth decay or cavities, is one of the most pervasive chronic diseases among people. Through various research and cross-sectional studies conducted, dental caries has been identified as a multifaceted issue that can be distinguished on physical, psychological, and socio-economic aspects. The impact remains regardless of how it could be treated, prevented, or accessed for dental care at a young age.

It can cause children physical discomfort, which potentially leads to significant difficulty with daily activities: eating, sleeping, speaking, learning, etc. To mitigate these hassles, it is required to implement comprehensive strategies for children so they can focus on preventive measures and be informed about affordable dental care that could soothe their oral pain. On the basis of psychological outcomes such as loneliness, anxiety, and social isolation, children will be helped by psychological counseling that can promote and retrieve self-esteem. It is also essential to control the emotional challenges associated with dental caries, improve their physical appearance, and nurture their mental well-being. As it is a definite challenge and burden for people who are from low-income backgrounds to bear the weight of high-cost dental treatment services for their children, it is crucial to advocate for accessible and affordable dental care options for these people. By alleviating the financial strain on families, we can effectively eliminate the crucial socioeconomic impact and burden of dental caries on children and their families, thus contributing to a healthier and more equitable society.

REFERENCES

- [1]. Selwitz, R. H., Ismail, A. I., & Pitts, N. (2007). Dental caries. *The Lancet*, 369(9555), 51–59. [https://doi.org/10.1016/s0140-6736\(07\)60031-2](https://doi.org/10.1016/s0140-6736(07)60031-2)
- [2]. Warreth, A. (2023c). Dental caries and its management. *International Journal of Dentistry*, 2023, 1–15. <https://doi.org/10.1155/2023/9365845>
- [3]. Souza, J. G. S., Souza, S. E., Noronha, M. D. S., Ferreira, E. F. E., & De Barros Lima Martins, A. M. E. (2017). Impact of untreated dental caries on the daily activities of children. *Journal of Public Health Dentistry*, 78(3), 197–202. <https://doi.org/10.1111/jphd.12259>
- [4]. World Health Organization: WHO. (2017b). Sugars and dental caries. [www.who.int. https://www.who.int/news-room/fact-sheets/detail/sugars-and-dental-caries#:~:text=Free%20sugars%20are%20the%20essential,teeth%20\(enamel%20and%20dentine](https://www.who.int/news-room/fact-sheets/detail/sugars-and-dental-caries#:~:text=Free%20sugars%20are%20the%20essential,teeth%20(enamel%20and%20dentine)
- [5]. Department of Health & Human Services. (n.d.). Tooth decay. Better Health Channel. <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/Tooth-decay#>
- [6]. Lewis, C., Grossman, D. C., Domoto, P., & Deyo, R. A. (2000). The role of the Pediatrician in the oral Health of Children: a national survey. *Pediatrics*, 106(6), e84. <https://doi.org/10.1542/peds.106.6.e84>
- [7]. Garg, N., Anandakrishna, L., & Chandra, P. (2012). Is there an Association between Oral Health Status and School Performance? A Preliminary Study. *International Journal of Clinical Pediatric Dentistry*, 5(2), 132–135. <https://doi.org/10.5005/jp-journals-10005-1150>
- [8]. Kaur, P., Singh, S., Mathur, A., Makkar, D. K., Aggarwal, V. P., Batra, M., Sharma, A., & Goyal, N. (2017). Impact of Dental Disorders and its Influence on Self Esteem Levels among Adolescents. *Journal of Clinical and Diagnostic Research*. <https://doi.org/10.7860/jcdr/2017/23362.9515>
- [9]. The connection between oral and mental health. (n.d.). Delta Dental. <https://www.grinmag.com/archive/en/ddia/2017/wellness/oral-and-mental-health-connection/#:~:text=It%20also%20indicated%20that%20half,%2C%20anxiety%2C%20depression%20and%20loneliness.>
- [10]. Hajek, A., Kretzler, B., & König, H. (2022). Oral Health, Loneliness and Social Isolation. A Systematic Review and Meta-Analysis. *Journal of Nutrition Health & Aging*, 26(7), 675–680. <https://doi.org/10.1007/s12603-022-1806-8>
- [11]. Oral health and socioeconomic inequalities. (2023, March 7). Oral Health Foundation. <https://www.dentalhealth.org/blog/oral-health-and-socioeconomic->

