The Relationship between Stunting Conditions and the Incident of Caries in Children: A Mini Review

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Abstract: This study explores the relationship between stunting conditions and the incidence of dental caries in children. Stunting, a condition characterized by impaired growth and development, is often associated with nutritional deficiencies. Dental caries, on the other hand, are caused by bacterial erosion of tooth enamel. The mini review aims to investigate whether there is a correlation between these two health issues in children. Findings indicate a significant association between stunting and dental caries. Children who are stunted are more likely to experience tooth decay and other oral health problems. This correlation is attributed to several factors, including nutritional deficiencies, compromised immune system, reduced saliva production. The findings from these studies highlight the importance of addressing both stunting and dental caries to ensure the overall health and well-being of children. Early intervention and preventive measures are crucial in preventing and mitigating these conditions. Future research should focus on developing effective strategies to address both stunting and dental caries in children, particularly in vulnerable populations.

Keywords: Stunting, Caries, Children

INTRODUCTION

Children's nutritional health is very important for optimal growth and development. The main nutritional problems that often occur in children are malnutrition, stunting and obesity. State of the World's Children 2019: Children, food and nutrition states that more than 7 million children under five suffer from stunting, 2 million children under five are overweight or obese. The results of a survey by the Ministry of Health in 2022 (SSGI 2022), 1 in 5 children under five suffer from stunting. Basic Health Research in 2018, 1 in 5 children aged 5-12 years were obese.

WHO (2015), stunting is a condition of impaired growth and development of children caused by chronic malnutrition and recurrent infections, which is characterized by the child's height being below standard. It is a condition of chronic malnutrition that occurs during the earliest period of a child's growth and development. Not only short stature, this condition has many bad impacts on children. The cause is multifactorial can occurs since in the womb. The symptoms appear when the child is 2 years old.

Dental caries is the most common multifactorial disease in children worldwide and is generally untreated. Factors that influence the emergence of dental caries involve food composition, oral hygiene, socio-economic status, number of bacteria, salivary immunoglobulin levels and fluoride intake (Fejerskov O & Kidd EAM, 2003).

Other scientific evidence shows that dental caries has a negative impact on the nutritional status and growth of children. Based on several recent research results that report a relationship between dental caries and underweight (low BMI for age), stunting (low height for age) and failure to thrive.

A history of neonatal stunting can influence the incidence of dental caries in early childhood. It was found that there was a decrease in saliva flow rate and saliva composition in children with stunting. Stunting causes salivary gland abnormalities, changes in saliva composition, and changes in minerals in children's teeth. A quarter of all 5-year-old children in Indonesia are affected by stunting, and almost all of these children suffer from severe caries in their primary teeth.

Stunting, a condition characterized by impaired growth and development, is a significant public health problem in many parts of the world. It is often associated with nutritional deficiencies, particularly a lack of essential micronutrients. Dental caries, on the other hand, are a common oral health issue, caused by bacterial erosion of tooth enamel. While these two conditions have been studied extensively, their potential relationship has not been fully explored.

METHOD

Search for articles using Google Scholar, Pubmed and Research Gate. Below are the 10 articles reviewed. This mini review aims to investigate the existing literature on the relationship between stunting conditions and the incidence of dental caries in children. By examining the available research, we can gain a better understanding of the factors that contribute to both conditions and the potential impact they have on children's overall health and well-being.

This review will discuss the definition and prevalence of stunting and dental caries, as well as the potential mechanisms linking these two conditions. Additionally, the review will explore the implications of the relationship between stunting and dental caries for public health and the development of effective interventions.

RESULTS

Name/ year	Title	Variable	Desain	Location	Results
Munifah Abdat / 2019	Stunting in Toddlers is Affected by Dental Health	- Prevalence of stunting Dental health (caries or not)	Cross sectional	Aceh	- Short nutritional status (stunting) occurs due to chronic malnutrition, the cause of which is an infectious disease that has been suffered for a long time. - The infection causes a decrease in appetite which is associated with the occurrence of caries. - The consequences of caries cause pain, disrupt chewing function and affect nutritional status. - If a toddler's nutritional status is disturbed, they are at risk of stunting. - Adequate nutrition is also very necessary for the eruption of teeth in toddlers, - Stunted toddlers can experience delayed tooth eruption. Stunting in toddlers and the health condition of their teeth are interrelated.
Miftah Tri Abadi, Abral / 2019	Pathogenesis of Dental Caries in Stunting	- Stunting sufferers Caries pattern	Cross sectional	Pontianak	- The pattern or pattern of dental caries in stunting sufferers based on the sequential division of sextants is sextant II, sextant VI, sextant IV, sextant III, sextant I and finally sextant V; There is a significant relationship between the risk factors for caries, namely saliva pH, the habit of eating cariogenic foods, the type of milk drink, toothbrushing habits and the debris index with the dental caries index (def-t index).

Name/ year	Title	Variable	Desain	Location	Results
Munifah Abdat, Said Usman, Chairunas, Hafidha Suhaila / 2020	Relationship between stunting with dental and oral status in toddlers	- Characteristics of mother's toddlers : Age, Level of education, Profession, Family income level - deft index - OHIS (Oral Hygiene Index Simplified) - Dental and oral health behavior	Cross sectional	Pidie district, Aceh	- Based on questionnaire results, many parents of stunted no attention to his oral hygiene of their toddlers. - The results of measurements with deft index in stunting and normal toddlers show stunting toddlers at 6.13 (very high category) and normal toddlers 3.7 (Moderate category). - There is a relationship between nutritional status variables with deft and there is a relationship between nutritional status variables and OHIS. - There was a significant relationship between stunting with the dental and oral status in toddlers, the strength of the correlation is sufficient.
Eva Peris Renggli, et.al /2021	Stunting Malnutrition Associated with Severe Tooth Decay in Cambodian Toddlers	- Characteristics and feeding practices - Dental caries experience - Critical stage of child development	Secondary data analysis	Cambodia	- The first longitudinal study to examine the association between dental caries and stunted growth in children under 2 years in Cambodia - Demonstrate that severe tooth decay is associated with developing stunting malnutrition. - The study highlights the need to prevent and treat early childhood tooth decay as an important part of programmes to prevent child undernutrition and to promote children's optimal growth and development during a critical stage of life.

Name/ year	Title	Variable	Desain	Location	Results
Abubakar Lutfi, Dkk. / 2021	The Relationship between Stunting and the Severity of Dental Caries in Children Aged 10-12 Years in Tuah Negeri District, Musi Rawas Regency	- Nutritional status - DMFT Status	Cross-sectional	Musi Rawas Regency	- - In stunted children, there were 15 children (44.12%) who had DMFT scores in the low category, 16 children (47.06%) who had DMFT scores in the medium category, 3 children (8.82%) who had DMFT scores in the high categories. The results of bivariate analysis showed p=0.000 - There is a significant relationship between stunting and the severity of dental caries in children aged 10-12 years in Tuah Negeri District, Musi Rawas Regency.
Arlette Suzy Setiawan, Dkk. / 2022	Neonatal stunting and early childhood caries: A mini-review	- Neonatal stunting - Early childhood caries	Mini review	-	- The concept that links maternal malnutrition affecting fetal outcomes in neonatal stunting can affect the incidence of caries in early childhood. - Evidence of this direct relationship has not been obtained; - Comprehensive longitudinal studies are needed to support the conclusions in this mini-review. - Environmental factors can lead to enamel hypoplasia leading to persistent ECC, early detection of these enamel defects is critical to the understanding role of ECC etiology and to help implement effective strategies.

Name/ year	Title	Variable	Desain	Location	Results
					- Prevention is critical due to the nature of the enamel that can be strengthened and reinforced but cannot be replaced. - The socialization of the first dental visit that both general practitioners and pediatricians can echo is important. - This can ensure that information is conveyed on maintaining the infant's oral hygiene and health, in line with the child's general health in the future.
Siska Yohana, Dkk. / 2022	Caries Experience among Children with History of Neonatal Stunting	- Characteristics of patients based on nutritional status - Components of d-t, f-t, m-t in children with neonatal stunting	This was a baseline and 1-year follow-up analysis of a cohort of stunted children in a potential stunting	Bandung City	- Fifty-five children met the inclusion criteria and participated in the 1-year study. - Decay, missing, filling teeth (Dmft) was in the intermediate category at baseline and fell into the high category at 1-year follow-up, - The increase in caries remained in the low category. - Dysplastic children with a history of neonatal developmental delay experience dental caries beginning in the first year of life and may become more severe later in life.
Hoda Atef Abdelsattar Ibrahim, et.al / 2022	Childhood malnutrition and hypo mineralized m olar defects	- presence or absence of MIH and HSPM and their levels measured as percentage as	Cross-sectional study	Egypt	- The first study which can identify that children with both high and low BMI could be at risks of dental caries. - The first study to address the prevalence

Name/ year	Title	Variable	Desain	Location	Results
		well as Caries Indices. - Exposures were types of malnutrition and the socioeconomic status.			of MIH, HSPM and CI collectively in the malnourished children. - In general, malnutrition could be a risk factor for dental abnormalities. - Children with low socioeconomic levels have a greater incidence for HSPM compared to children with higher socioeconomic level. - Different dental abnormalities could co-exist together.
Desi Andriyani, Arianto, Rudi Chandra / 2023	Short Nutrition Status (Stunting) With Dental Caries in Preschool Children in Sukabumi Indah Subdistrict, Bandar Lampung City	- Prevalence of stunting - Prevalence of caries	Cross sectional	Bandar lampung	- Nutritional status with caries experience (dmft) has a significant relationship, where the average dmfs in the group of stunted children is 14.03 ± 6.16, while the average dmfs in the group of normal children is 7.47 ± 3.74 (p=0, 0001). - Nutritional status influences the occurrence of caries.

DISCUSSION

Based on the reviewed journals, a reciprocal relationship exists between stunting and oral health in children. Stunting can negatively impact a child's oral health, and conversely, poor oral health can contribute to stunting. While one study found no correlation between stunting and the eruption of permanent first molars, many children with stunting experience neglect in oral hygiene, leading to oral health issues. A child's nutritional status from an early age significantly influences their future dental health.

Maternal malnutrition during pregnancy can lead to neonatal stunting and increase the risk of early childhood caries (ECC). This early onset of caries can predispose children to dental cavities in their permanent teeth. Children with developmental delays, including those with stunting, often experience early-onset caries that progressively worsen.

Both underweight and overweight children are at risk of developing cavities. Malnutrition is generally considered a risk factor for dental abnormalities. Severe tooth decay is associated with stunting. Preventing and treating early childhood caries is a crucial component of addressing child malnutrition and promoting optimal growth and development.

Nutritional status influences the development of cavities. There is a significant correlation between stunting and the severity of dental caries in children aged 10-12 years. Stunting, a result of chronic malnutrition, is often linked to prolonged infections that reduce appetite and contribute to tooth decay. Stunting in toddlers is interconnected with their oral health. Generally, stunted children experience delayed tooth eruption. Stunting also influences caries patterns.

CONCLUSION

The Relationship Between Stunting and Dental Caries in Children: A Complex Connection

Stunting, a condition characterized by impaired growth and development in children due to chronic malnutrition, has been linked to various health issues, including dental caries. Here are some key factors that contribute to this relationship:

1. Nutritional Deficiencies:

- **Reduced Saliva Production:** Inadequate nutrition can lead to decreased saliva production, which plays a crucial role in neutralizing acids and preventing tooth decay.
- **Weakened Enamel:** Malnutrition can result in weaker tooth enamel, making it more susceptible to erosion and decay.
- **Compromised Immune System:** A weakened immune system due to malnutrition may increase the risk of infections, including those that contribute to dental caries.

2. Infections and Disease:

- **Chronic Infections:** Stunting is often associated with chronic infections, such as gastrointestinal diseases, which can affect a child's overall health and oral health.
- **Reduced Appetite:** Infections can lead to reduced appetite, further hindering nutrient intake and contributing to malnutrition.

3. Poor Oral Hygiene:

- **Lack of Access to Care:** Children from disadvantaged communities, where stunting is prevalent, may have limited access to dental care and oral health education.
- **Caregiver Knowledge:** Parents or caregivers may not be aware of the importance of oral hygiene or lack the resources to maintain it.

4. Delayed Tooth Eruption and Development:

- **Malocclusion:** Stunting can lead to delayed tooth eruption and abnormal jaw development, which can affect the alignment of teeth and increase the risk of cavities.

5. Socioeconomic Factors:

- **Poverty:** Stunting often occurs in poverty-stricken areas where access to nutritious food, healthcare, and dental care is limited.
- **Education:** Lack of education and awareness about oral health can contribute to poor dental hygiene practices.

Addressing the relationship between stunting and dental caries requires a multi-faceted approach:

- **Improved Nutrition:** Promoting access to nutritious food, especially during early childhood, is crucial.
- **Oral Health Education:** Providing education and training to parents, caregivers, and healthcare providers on oral hygiene practices and the importance of early dental care.
- **Increased Access to Dental Care:** Expanding dental care services, especially in underserved areas, to ensure timely check-ups and preventive treatments.
- **Community-Based Programs:** Implementing community-based programs that address both malnutrition and oral health issues.
- **Government Policies:** Supporting policies that promote child health, nutrition, and access to healthcare.

By addressing these factors, we can help reduce the prevalence of stunting and improve the oral health of children, leading to better overall health and well-being.

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