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ANALISIS PERTUMBUHAN GIGI MOLAR SUSU PADA ANAK STUNTING DITINJAU DARI STATUS GIZI

Analysis of Deciduous Molar Growth in Stunted Children Based on Nutritional Status

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ABSTRACT

Tooth eruption is a part of dental growth and development characterized by the movement of teeth toward the oral cavity following crown formation. This process is influenced by various factors, including nutritional status, which plays an important role in dental growth and the timing of tooth eruption. This study aimed to determine the relationship between the nutritional status of stunted children and the growth of milk molar teeth at the UPTD Aren Jaya Health Center. The research used was an analysis with a cross-sectional approach, a population of 58 stunted children at the UPTD Aren Jaya Health Center, with sampling using total sampling. Data analysis using statistical tests with the Spearman Rank correlation test. The results of the study showed that the nutritional status of stunted children at UPTD Aren Jaya Health Center was mostly within normal criteria, with a percentage of 97.2%. The growth of milk molar teeth in stunted children at UPTD Aren Jaya Health Center, all children had erupted by 100%. The results of this study can be concluded that there was no relationship between the nutritional status of stunted children and the growth of milk molar teeth at UPTD Aren Jaya Health Center. It is recommended for the health center to pay attention by conducting counseling to parents, this is done so as not to increase the population of stunted toddlers at the Aren Jaya Health Center UPTD.

Keywords: *deciduous molar growth, nutritional status, stunting*

ABSTRAK

Erupsi gigi merupakan bagian dari proses pertumbuhan dan perkembangan gigi yang ditandai dengan pergerakan gigi menuju rongga mulut sejak pembentukan mahkota gigi. Proses ini dipengaruhi oleh berbagai faktor, salah satunya adalah status gizi, yang berperan penting dalam pertumbuhan dan perkembangan gigi, termasuk tahapan erupsi gigi. Penelitian ini bertujuan untuk mengetahui hubungan antara status gizi anak stunting dengan pertumbuhan gigi molar susu di UPTD Puskesmas Aren Jaya. Penelitian yang digunakan adalah analitik dengan pendekatan cross sectional, populasi 36 orang anak stunting usia 2 tahun di UPTD Puskesmas Aren Jaya dengan pengambilan sampel menggunakan total sampling. Analisa data menggunakan uji statistika dengan uji Chi Square. Hasil penelitian menunjukkan bahwa status gizi pada anak stunting di UPTD Puskesmas Aren Jaya sebagian besar kriteria normal dengan persentase sebesar 97,2%, pertumbuhan gigi molar susu pada anak stunting di UPTD Puskesmas Aren Jaya, semua anak sudah erupsi sebesar 100%. Hasil penelitian ini dapat disimpulkan bahwa tidak terdapat hubungan antara status gizi anak stunting dengan pertumbuhan gigi molar susu di UPTD Puskesmas Aren Jaya. Disarankan bagi pihak puskesmas untuk memperhatikan dengan melakukan penyuluhan pada orang tua, hal ini dilakukan agar tidak memperbanyak populasi balita stunting di UPTD Puskesmas Aren Jaya.

Kata kunci: gigi molar susu, status gizi, stunting

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INTRODUCTION

Growth refers to a measurable increase in body size resulting from the expansion and multiplication of cells, which can be quantitatively assessed through indicators such as height, body weight, and head circumference.[1] Children also suffer from many dangerous diseases that can cause physical and cognitive damage as well as growth disorders such as stunting.[2]

Chronic malnutrition in children can be one of the factors contributing to stunting.[3] Stunting is the result of nutritional deficiencies during the first thousand days of life. Cases of stunting in children can lead to low-quality human resources in a country.[4] According to the UNICEF framework in Abdat (2019), there are three main factors, namely an unbalanced diet, low birth weight, and a history of illness. Stunting has a long-term negative impact on children. Children with stunting will experience a decline in learning ability, metabolic disorders, and a decline in immunity, and in the short term, it can increase infant and child mortality rates[3]. Stunting in children can also cause children to be susceptible to diseases, both infectious and non-infectious.[4]

Stunting in children can occur due to stunted growth caused by chronic malnutrition resulting from a prolonged condition that begins as early as 1000 days of life (from conception to 2 years of age).[5] In 2022, approximately 149.2 million children worldwide will experience stunting, equivalent to 26.7% of the total number of children under five in the world. The prevalence of stunting in Southeast Asia in 2022 is around 30.1%. Stunting in Indonesia in 2023 reached a median level of approximately 24.4%.[6]

Nutritional status refers to the physical condition of the body as a result of dietary intake and the utilization of nutrients. Nutritional status is a reflection of a person's nutrition, which can be indicated by physical appearance, whether underweight, normal, and overweight due to the balance between intake and utilization of nutrients, which can be measured using anthropometry based on BMI by taking data on the age, weight, and height of children.[7] In previous studies, nutritional status has a significant role in bone maturity and skeletal growth, as well as tooth development because the nutrients needed by tissues and organs function similarly to those in the oral cavity.[8] The development and growth of teeth and the oral cavity are influenced by nutrients both locally and systemically.[7]

Based on Regulation Number 2 of 2020 on child anthropometric standards, Body Mass Index for age (BMI-for-age) is utilized to classify nutritional status, including severly underweight, underweight, normal, risk of overweight, and obesity. The Child Anthropometric Standards are based on body weight and length/height parameters consisting of 4 indices, covering body weight according to age (BW/A), height/length according to age (PB/U or TB/U), weight according to height/length (BB/PB or BB/TB), and body mass index according to age (BMI/A). Body mass index according to age (BMI/A) for children aged 5 to 18 years as referred to in paragraph (1). The letter is used to determine the categories of malnutrition (severe underweight), undernutrition (underweight), good nutrition (normal), overnutrition (overweight), and obesity.[9]

Stunting can hinder a child's growth potential and cause them to grow up incomplete. Stunting in childhood is closely related to short stature and posture in adulthood, as well as the possibility of giving birth to babies with low birth weight in the future. One of the effects of stunting on child development is impaired development of the oral cavity.[1]

Nutritional status is the health status of each individual, measured by height and weight based on age. Nutritional status generally affects growth and development, including the growth and development of teeth.[10] According to research conducted by Alanazi et al (2023), poor nutritional status will have an impact on the growth and development of teeth and gums, such as the occurrence of dental malocclusion, high prevalence of caries, susceptibility to soft tissue injuries, stunted development of facial and jaw bones, and impaired tooth growth and development.[11] Dental health is an issue

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that must be addressed. Teeth are functional organs whose formation begins when the fetus is 6 weeks old in the womb and continues for several years after birth.

Tooth formation and development is the process of tooth formation that occurs gradually until the teeth move from within the alveolar bone to reach the occlusal plane. Tooth formation and development are divided into three stages, namely the pre-eruption stage, the eruption stage, and the occlusal stage.[12] According to Andriany (2018), the formation of healthy and perfect tooth structure is greatly supported by adequate nutritional intake.[13] Results of dental and oral health examinations in October 2024 on 10 children with stunting at the Aren Jaya Health Center revealed that 6 children had teeth that had already erupted, and 2 children had teeth that had not yet erupted. This study aimed to determine the relationship between the nutritional status of stunted children and the growth of milk molar teeth at the UPTD Aren Jaya Health Center

METHODS

The type of research used in this study is analytical with a cross-sectional design approach. The independent variable is the nutritional status of stunted children, and the dependent variable is the growth of deciduous molars. This study has obtained ethical approval No. 36/KEPK/EC/X/2024. The population in this study consisted of 36 stunted children aged 23-24 months (stunting data for February 2024 from the Aren Jaya UPTD Puskesmas) using total sampling. The instruments used in this study were nutritional anthropometry to measure nutritional status from the Indonesian Ministry of Health, and a format for assessing growth and dental development. Data analysis used the Chi-Square test, which was performed on two variables that were suspected to be related or correlated.

RESULT

The results of research on the relationship between the nutritional status of stunted children and the growth of deciduous molars at the Aren Jaya Community Health Center show the following anthropometric data:

Table 1. Frequency Distribution of Respondents Based on Nutritional Status

No	Nutritional Status	n	%
1	Severely Underweight (< 17)	0	0,0
2	Underweight (17 - < 18,5)	1	2,8
3	Normal (18,5-25,0)	35	97,2
4	Overweight (>25-27)	0	0,0
5	Obese (> 27)	0	0,0
	Total	36	100

Table 1 showed that of the 36 respondents, the majority, namely 35 respondents with a percentage of 97.2%, had a normal nutritional status.

Table 2. Frequency Distribution of Respondents Based on Deciduous Molar Growth

No	Tooth Eruption	n	%
1	Not yet erupted	0	0,0
2	Has erupted	36	100
	Total	36	100

Table 2 showed that all respondents had experienced eruptions, namely 36 people with a percentage of 100%. Table 3 showed that all respondents (100%) had experienced tooth eruption. Tooth eruption was observed among respondents classified as severely underweight (100%) and underweight (100%). No respondents were classified as having normal, overweight, or obese nutritional status. These findings indicate that, in this study population, tooth eruption had occurred despite underweight nutritional status.

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Table 3. Cross Tabulation between Nutritional Status and Deciduous Molar

Nutrition Status	Tooth Eruption				Total	
	Not yet erupted		Has erupted			
	n	%	n	%	n	%
Severely Underweight	0	0	1	100	1	100
Underweight	0	0	35	100	35	100
Normal	0	0	0	0	0	0
Overweight	0	0	0	0	0	0
Obese	0	0	0	0	0	0
Total	0	0	36	100	36	100

DISCUSSION

Analysis of Deciduous Molar Growth in Stunted Children Based on Nutritional Status

The results of the study indicate that there are 36 stunted children at the Aren Jaya Health Center who have erupted teeth. Tooth eruption is a series of processes involving the growth and development of teeth, which move continuously toward the oral cavity, beginning when the teeth are still in the jawbone and starting after the crown is formed[1]. Factors causing delayed tooth eruption include malnutrition and socioeconomic factors. In addition, delayed eruption can also be caused by delayed eruption or retention. Delayed eruption can be caused by genetic abnormalities. Nutrient intake is very important for child growth, including tooth eruption, because if children experience nutrient deficiencies, it can cause poor tooth growth and development.[14]Deciduous teeth develop in the 6th week of gestation and the 8th week of gestation.[15]

The results of the study shown in Table 1 indicate that of the 36 stunted children at the Aren Jaya Health Center, the majority had normal nutritional status, namely 35 respondents (97.2%). These research results indicate that the majority of children have normal nutrition, This is due to the innovation of Supplementary Feeding (PMT) and the provision of One Day One Egg based on innovation at the Aren Jaya Health Center UPTD to reduce stunting rates. The One Day One Egg innovation, known as “Endog Krimes,” is provided for one month, and PMT for toddlers is provided every day for 56 days. And the results can reduce the incidence of stunting. Although there were some obstacles in the field, namely that there were many migrants who were already registered at the Aren Jaya Health Center but had moved outside the Aren Jaya Health Center area.

Based on the results of the study, there was one child who was underweight (2.8%). This child was not categorized as stunted because he was in good health. Underweight children can be caused by several factors, one of which is genetics. This can be distinguished between stunted children and underweight children. Stunting is a condition of growth failure caused by chronic malnutrition. Meanwhile, underweight children are children who have a weight that is below the normal range for their age.

Stunting is a medical condition characterized by a lack of normal physical growth and development in children, particularly in terms of height, compared to other children of the same age stunting.[2] This can be compared to age through the WHO's -2 SD growth measurement and can be caused by malnutrition or chronic nutritional deficiencies. The nutritional status criteria according to the Indonesian Ministry of Health (2019) include: Severely underweight: < 17; Underweight: 17- 18.5; Normal: 18.5- 25.0; Overweight: > 25-27; and Obesity: > 27[16]. Meanwhile, according to the World Health Organization (WHO), stunting is classified based on height-for-age z-scores (HAZ) as follows: tall (> +2 SD), normal (−2 SD to +2 SD), stunted (< −2 SD to ≥ −3 SD), and severely stunted (< −3 SD).[17,18]

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Stunting is also one of the nutritional disorders that has been proven to affect tooth eruption. Stunting is a linear growth disorder that is not in accordance with age. Stunting is usually caused by malnutrition in the form of zinc deficiency and metabolic growth hormone deficiency.[18] The crosstab results show that 1 (100%) child with malnutrition and 35 (100%) children with normal nutritional status have all experienced eruption. This is because children with normal nutritional status will experience tooth eruption. Tooth eruption is the process of teeth moving from their place of formation in the alveolar bone towards the occlusal plane in the mouth. Nutritional status is one of the factors that influences tooth eruption. Children with good nutritional status will experience faster tooth eruption, while children with poor nutritional status will experience slower tooth eruption.[19]

Nutrition plays a crucial role in dental and jaw growth and development. Early tooth formation is affected by the availability of essential nutrients, including calcium, phosphorus, fluoride, and various vitamins obtained from dietary intake. Inadequate intake of macronutrients and micronutrients—such as carbohydrates, proteins, fats, vitamins, and minerals—can disrupt overall growth, tooth formation, and jaw development, which may subsequently interfere with the eruption process and lead to delayed tooth eruption. The growth and development of teeth and gums are influenced by nutrients, both systemically and locally. In the early stages of tooth growth, it is influenced by a number of factors, namely Ca, P, F, and vitamins in the diet. Nutrition and socioeconomic status affect tooth eruption. Nutritional deficiencies can cause delayed tooth eruption. Children from higher socioeconomic levels show faster tooth eruption compared to children from lower socioeconomic levels. This is related to the fact that children from higher socioeconomic levels receive better nutrition.[8]

Research conducted by Stitinjak et al. (2019) shows that there is a significant relationship between nutritional status and the eruption of permanent first molars.[7] This study was conducted on 238 children (100%). Among malnourished children, 18.1% (43 children) had not yet experienced eruption, and 4.6% (11 children) had already experienced eruption. Among children with normal body weight, 44.1% (105 children) had already erupted, and 1.3% (3 children) had not yet erupted. Children who were overweight were found to have 31.9% (76 children) who had already erupted. This indicates that the eruption of permanent molar 1 teeth is closely related to the nutritional status of children.[7]

These results differ from the research conducted by Setiawan (2018), which states that what influences the timing of tooth eruption is not nutritional status/stunting but body fat. Because the nutritional status of children, including fat intake, can affect the timing of tooth eruption in children.[4] Nutritional status is one of the key determinants of tooth growth and development. As part of nutritional factors, it plays a significant role in dental development, including the process of tooth eruption, which is commonly classified into five categories: severely underweight, underweight, normal, overweight, and obese. Adequate nutrition is essential for overall growth and development, including the eruption of teeth. Both systemic and local nutritional factors influence the growth of teeth and gingival tissues. During the early phases of dental development, essential nutrients such as calcium, phosphorus, fluoride, and vitamins obtained from the diet are particularly influential. In addition, nutritional intake and socioeconomic status affect the timing of tooth eruption. Nutritional deficiencies are associated with delayed tooth eruption, and children from higher socioeconomic backgrounds tend to experience earlier tooth eruption compared to those from lower socioeconomic levels, likely due to better access to adequate nutrition[20]. Delayed tooth eruption can be seen from several factors other than nutritional deficiencies. Factors that influence delayed tooth eruption include genetics, race, gender, systemic factors, and local factors. Genetic factors have a major

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influence in determining the timing and sequence of tooth eruption, including the process of calcification.

Research results indicate that children's nutritional status is related to the eruption of milk teeth. This is in line with Harahap's (2018) opinion that adequate nutritional intake is very important during the early stages of growth and development[1]. The growth and development of teeth and gums are influenced by nutrients both systemically and locally. In the early stages of tooth growth, several nutrients influence this process, namely calcium, phosphorus, fluoride, and vitamins in the diet. A lack of nutrient intake can lead to delayed tooth eruption, while an excess of nutrients can also have undesirable effects on tooth growth and development. During the stage of tooth growth and development, there are many cases of children experiencing tooth eruption disorders due to insufficient intake of nutrients. This can cause abnormalities in tooth growth.

Children with good nutritional status tend to experience normal eruption of primary teeth. Children with obesity tend to experience earlier eruption of primary teeth. A child's nutritional status is one measure used to assess how well their daily nutritional intake needs are met and how their body uses those nutrients. The most commonly used measure of nutritional status is the body mass index (BMI). Children's teeth need to be cared for by brushing them regularly, twice a day, and before bedtime. If a child's first teeth have not grown by the age of 1, it is best to consult a dentist. Some causes of delayed tooth growth in children include: malnutrition, syndromic disorders, developmental disorders, and endocrine disorders. This is proven by research findings that children who have not yet erupted teeth are under 1 year old.[1]

Delayed tooth eruption may present as either a localized or a generalized condition. This delay can arise from a wide range of etiological factors. Localized delayed tooth eruption is commonly associated with traumatic events, dental anomalies, or certain systemic conditions. Trauma may interfere with the normal eruption process through mechanisms such as ankylosis, dilaceration, concrescence, the formation of eruption cysts, or premature loss of primary teeth. Dental anomalies contributing to delayed tooth eruption include supernumerary teeth, regional odontodysplasia, and tooth fusion. In addition, delayed tooth eruption may be influenced by systemic and metabolic factors, including endocrine and nutritional disorders. Endocrine disturbances such as hypothyroidism, hypoparathyroidism, and hypopituitarism have been reported to disrupt normal tooth eruption. Several systemic conditions are also associated with delayed tooth eruption, including hemifacial hyperplasia, odontomaxillary dysplasia, cleidocranial dysplasia, Down syndrome, achondroplasia, tricho-dento-osseous syndrome, pycnodysostosis, and pituitary gigantism.[21] Trauma can cause ankylosis, dilaceration, concrescence, eruption cysts, and premature exfoliation of deciduous teeth. Dental abnormalities include supernumerary teeth, regional odontodysplasia, and fused teeth. Delayed eruption can be caused by endocrine disorders, nutritional disorders, and several systemic diseases. Endocrine disorders include hypothyroidism, hypoparathyroidism, and hypopituitarism. Systemic diseases that can cause delayed eruption include hemifacial hyperplasia, odontomaxillary dysplasia, cleidocranial dysplasia, Down syndrome, achondroplastic dwarfism, tricho-dento-osseous syndrome, pycnodysostosis, and pituitary gigantism.

CONCLUSION

Factors causing the eruption time of primary molars include genetics, socioeconomic status, and micronutrient deficiencies (calcium, phosphorus, fluoride, and vitamins). A limitation of this study is that nutritional status indicators equate chronic malnutrition (stunting) with acute malnutrition (wasting). Children with stunting show a slower eruption time of teeth (including primary molars) compared to children with good nutritional status. This occurs because essential nutrients such as calcium, phosphorus, and vitamin D,

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which are crucial for bone and tooth formation and mineralization, are not adequately supplied. There is a correlation between the nutritional status of stunted children and the growth of deciduous molars at the Aren Jaya Community Health Center. It is hoped that the health center will pay attention to this by conducting promotional activities for parents, so that the population of stunted toddlers at the Aren Jaya Health Center will not increase.

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