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The Relationship Between Tooth Brushing Behavior of Elementary School Students with Dental Caries and Stunting

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ABSTRACT

The oral cavity is the most important part, the main place for the reception of nutrients for the body. Oral and dental health status, food consumption, nutritional status, and overall well-being are interrelated. Poor nutrition in children is caused by an imbalance of nutrients, leading to a deficiency of energy and protein, which hampers their growth and development. Stunted children are more susceptible to dental caries due to changes in saliva. Reduced saliva volume decreases its buffering and cleaning abilities. This study aims to analyze the relationship between tooth tooth-brushing behavior of elementary school students and dental caries and stunting. This is an observational analytical study with a cross-sectional design. The sample was selected through purposive sampling with a maximum of 50 students from SD Baumata, Taebenu District, Kupang Regency. Data collection was done using questionnaires and caries examinations to determine the presence of caries in the oral cavity. Stunting was measured anthropometrically using the weight-for-height index. The chi-square test results showed a significant relationship between knowledge (p=0.035), attitude (p=0.039), and behavior (p=0.039) with caries. In contrast, the test for the relationship between knowledge (p=0.0002), attitude (p=0.000), and tooth brushing behavior (p=0.000) all showed a significant relationship with stunting. The conclusion is that there is a relationship between the knowledge, attitude, and behavior of students with caries and stunting. It is recommended to conduct further research on the relationship between diet, nutrient intake, and the incidence of caries and stunting.

INTRODUCTION

Malnourished children have a significantly higher rate of decay in both primary and permanent teeth compared to well-nourished children (Rahman et al., 2016). Therefore, children's dental and oral health is an important issue that needs attention. Stunting can hinder physical growth and development, including increasing the risk of oral health problems (Lutfi et al., 2021).

Children with stunting experience about 7% more cognitive impairment compared to non-stunted children (Ekholuenetale et al., 2020), and have lower knowledge levels (Ginting & Pandiangan, 2019). Stunted children are highly susceptible to caries due to changes in saliva (Abdat et al., 2020). Reduced saliva production at night can increase the risk of dental caries (Llena et al., 2015). The acid will damage the enamel; if it accumulates in the mouth, it will repeatedly cause low pH over a period of time (Lutfi et al., 2021). If the oral cavity is not maintained, it will cause pain, and chewing disorders, and can affect other aspects of body health (Diyanata et al., 2022). According to Li and Wang, cit. (Mappangara et al., 2020), children with caries in primary teeth are three times more likely to develop caries in permanent teeth.

School children have low levels of knowledge and behavior toward dental and oral health (Arsyad et al., 2018), and still rely on their parents (Anwar, 2016). Changing poor behavior requires effort, and the environment plays a role in shaping an individual's behavior. The roles of parents and educators are crucial in changing children's behavior. Therefore, educating children about dental health is essential to improve their knowledge (Nugraheni et al., 2018). Preventing dental disease should start from an early age (Liasari et al., 2021) by limiting sugary foods and drinks, maintaining a balanced diet, brushing teeth, and regular dental check-ups (Clarke, 2018). Brushing teeth with fluoride toothpaste is important because the fluoride content in the saliva is essential (Razi, Surayah, & Widia, 2020). Proper tooth brushing should be done in the morning before meals and at night before bed, with the right duration and frequency (Santi & Khamimah, 2019).

The importance of early caries prevention not only improves children's oral health but also enhances their nutritional status and overall growth and development (Zahid et al., 2020). The prevalence of stunting in Indonesia is higher compared to Malaysia at 8.4%, Thailand at 8.4%, Vietnam at 15%, and the Philippines at 30% among children under five years old (Soekatri et al., 2020). In Indonesia, the highest number of stunting cases is in East Nusa Tenggara (NTT) at 35.3%, ranking first among the 34 provinces in Indonesia. Data on stunting in children under five years old in Kupang Regency in 2021 shows 40.4% prevalence, weight-for-height at 19.0%, and weight-for-age at 41.5%. The Indonesian government has reduced the prevalence of stunting in children through the National Strategy for Accelerating Stunting Prevention (Theodorea et al., 2022).

SD Negeri Tulun, SDN Manefu, SDN 2 Baumata Timur, SDN Bonen, and SD GMIT Baumata are schools located in Desa Baumata, Taebenu District. These five schools have an agreement with the Dental Health Study Program at Poltekkes Kupang for an Independent School Dental Health Program (UKGS Mandiri) that includes promotive, preventive, and simple curative dental and oral health efforts in 2021. This will facilitate the implementation of this study. The purpose of this study is to analyze the relationship between the tooth-brushing behavior of elementary school students and dental caries and stunting.

METHOD

This study is an observational analytic study with a cross-sectional design. It was conducted at elementary schools in the Taebenu Baumata area, Kupang Regency, during April-May 2023. The population in this study comprised school children at SD Baumata, Taebenu District, Kupang Regency. A sample of 50 school children from SD Baumata was selected through purposive sampling. The study obtained a research permit and an ethical eligibility certificate from the Research Ethics Committee of Poltekkes Kemenkes Kupang with no: LB.02.03/1/0127/2023.

The primary data used in this study include dental caries and stunting examinations. Dental caries were examined to determine the presence or absence of caries, while stunting was assessed by measuring weight with a weighing scale and height with a height-measuring tool. The nutritional status (stunting) was estimated anthropometrically using the weight-for-height (BB/TB) index. The tools used in this survey included questionnaires to measure variables of knowledge, attitude, and tooth-brushing behavior.

The collected information was recorded and presented in structured tables. Data analysis was performed to describe the independent and dependent variables and to test the relationship between the tooth brushing behavior of elementary school students and dental caries and stunting using the Chi-Square test.

RESULTS AND DISCUSSION

The research was conducted at SD Baumata, Taebenu District, Kupang Regency, involving 50 children from five elementary schools within the working area of Puskesmas Baumata, Taebenu District, Kupang Regency. The schools included SD Tulun, SD Manefu, SD GMIT Baumata, SDN 2 Baumata Timur, and SDN Bonen.

Table 1. Student Age and Gender Characteristics

Variable	Frequency (n)	Percentage (%)
Age		
6-7 Years	33	66,0
8-9 Years	16	32,0
11 Years	1	22,0
Gender		
Male	31	62,0
Female	19	38,0
Total	50	100,0

Table 1 shows that the majority of respondents were aged 6-7 years, with a higher number of male respondents compared to female respondents.

Table 2. Distribution of Knowledge, Attitude, and Behaviour Variables

Variable	Frequency	
	n	%
Knowledge		
Good	13	26,0
Fair	23	46,0
Less	14	28,0
Attitude		
Good	11	22,0
Fair	23	46,0
Less	16	32,0
Behaviour		
Good	11	22,0
Fair	23	46,0
Less	16	32,0

Table 2 shows that the level of knowledge about tooth brushing of elementary school students is included in the moderate criteria, only some children are in the good category. The distribution of primary school children's attitudes about tooth brushing shows that most of them are in the moderate criteria, while tooth brushing behaviour measured by the questionnaire answer score includes moderate criteria and there are also good behaviours.

Table 3. Distribution of Caries and Stunting Variables

Variable	Caries			Stunting	
	f	%		f	%
Caries	19	38,0	Skinny	27	54,0
No Caries	31	62,0	Very Thin	23	46,0
Total	50	100.0	Total	50	100.0

Table 3 shows that the results of the examination of the oral cavity contained 19(38%) permanent carious teeth and found that there were children whose teeth were not carious, while the results of weight and height estimates obtained by children who were underweight and very underweight.

Table 4. Results of Analysis of the Relationship between Knowledge, Attitude, Behaviour with Caries

Variable	caries				Total		p-value
	Caries		No caries				
	n	%	n	%	n	%	
Knowledge							
Good	5	10,0	8	16,0	18	26,0	
Fair	5	10,0	18	36,0	23	46,0	0,035
Less	9	18,0	5	10,0	14	28,0	
Attitude							
Good	2	4,0	9	18,0	11	22,0	
Fair	7	14,0	16	32,0	23	46,0	0,039
Less	10	20,0	6	12,0	16	32,0	
Behaviour							
Good	2	4.0	9	18,0	11	22,0	
Fair	7	14,0	16	32,0	23	46,0	0,039
Less	10	20,0	6	12,0	16	32,0	

Table 4 shows the results of the chi square test showed a significant relationship between knowledge (p = 0.035), attitude (p = 0.039) and behaviour (p = 0.039) with dental caries.

Table 5. Results of Analysis of the Relationship between Knowledge, Attitude, and Behaviour with Stunting

Variable	Stunting				Total		p-value
	Very Thin		Thin				
	n	%	n	%	n	%	
Knowledge							0.002
Good	5	10.0	8	16.0	13	26.0	
Fair	6	12.0	17	34.0	23	46.0	
Less	12	24.0	2	4.0	14	28.0	
Total	23	46,0	27	54,0	50	100,0	
Attitude							0.000
Good	3	6,0	8	16,0	11	22,0	
Fair	6	14,0	17	32,0	23	46,0	
Less	14	28	2	4,0	16	32.0	
Total	23	46,0	27	54,0	50	100,0	
Behavior							0.000
Good	2	4,0	9	18,0	11	22,0	
Fair	7	12,0	16	36,0	24	48,0	
Less	14	28,0	2	4.0	16	32,0	
Total	23	46,0	27	54,0	50	100,0	

Table 5 shows that in testing the relationship between knowledge (p = 0.0002), attitude (p = 0.000), and tooth brushing behaviour, (p = 0.000) which means that all variables have a significant relationship with stunting.

DISCUSSION

The results of the test on the variable of tooth brushing knowledge show that most respondents have sufficient knowledge, with only a few having good knowledge. This is because many children do not understand the importance of maintaining dental health. Parental involvement is crucial in taking children to health services for dental check-ups to help identify abnormalities and dental damage so that action can be taken promptly.

Parents play a significant role in caring for and maintaining dental health by reducing the frequency of dental caries. The responsibilities of parents and early childhood upbringing, including guidance and supervision, are essential to ensure good dental health (Husna, 2016). The lack of knowledge is primarily due to the absence of information about dental health, supported by research (Alfiannor, Marlinda, & Noor, 2018) showing that most children at SDN 3 Sungai Tiung Cempaka have a history of dental disease with sufficient knowledge.

Based on the data on children's attitudes towards tooth brushing, most fall into the sufficient category. According to the research, most children have sufficient attitudes, although their knowledge remains in the sufficient category. Their attitudes are influenced by personal experience, the influence of others, culture, mass media, education, and religion. The impact of this research does not align with the study (Alfiannor, Marlinda, & Noor, 2018), which in 2018 showed that children's attitudes were in the positive category.

The research results on the variable of tooth brushing behavior are estimated based on questionnaire response scores, indicating sufficient criteria, with some exhibiting good behavior. The current situation is caused by the lack of parental attention due to their busy schedules, making it challenging to monitor their children's tooth-brushing habits.

Research (Darmayanti et al., 2022) shows that tooth brushing behavior and dental caries levels have a negative relationship, meaning the better the tooth brushing behavior, the lower the incidence of dental caries. Dental caries frequently occurs in young children, particularly those aged 6-12 years. Research (Nainggolan, 2019) concludes that consuming cariogenic foods in children can cause tooth damage.

Research (Rehena et al., 2020) indicates a relationship between knowledge and the incidence of dental caries and tooth brushing habits among students at SD Negeri 5 Waai, Central Maluku. Meanwhile, research (Handayani & Arifah, 2016) shows a significant relationship between knowledge, attitude, and behavior towards dental care. This is due to the link between information, perspectives on maintaining oral health, and dental caries.

Based on the examination of the oral cavities of elementary school children in five schools in Baumata, out of 50 children, 40 permanent teeth had caries. Meanwhile, most children experience caries in their primary teeth. Findings revealed some children had 2-3 carious permanent teeth, especially molars. Many children frequently consume high-sugar foods such as chocolate, candy, and biscuits, exacerbated by the lack of awareness of maintaining dental cleanliness and a healthy lifestyle. Research (Shitie et al., 2021) clearly states that the prevalence of dental caries is high and is a common dental health condition among school children.

Examining weight and height measurements reveals a tendency towards underweight and severely underweight children. Statistical tests show a relationship between knowledge, attitude, and tooth-brushing behavior in stunted children. Research (Lutfi et al., 2021) shows a strong link between stunting and the incidence of dental caries in children aged 10-12 in Tuah Negeri District, Musi Rawas Regency. Poor knowledge and diet in children lead to poor development (Khadija et al., 2022). Findings (Shen et al., 2019) show that dental caries can hinder a child's development. Children with low body weight are highly susceptible to dental caries. The prevalence of dental caries among school-aged children is significant among underweight and overweight children. However, the relationship between dental caries and nutritional status is not statistically significant. Interventions will help improve the quality of life

and mandatory dietary patterns for school children (Bassa et al., 2023). This research aligns with the study (Rahman et al., 2016) showing a relationship between stunting status and dental caries levels in kindergarten students in Kertak Hanyar District, Banjar Regency.

Research (Olsa et al., 2018) shows a significant relationship between attitude and knowledge with stunting among elementary school students in Nanggalo District, Padang City. Stunting increases the risk of caries due to decreased saliva's supporting, cleaning, and antibacterial abilities, leading to oral cavity problems (Rahman et al., 2016). This is because children are less capable of maintaining their oral hygiene. Untreated dental damage causes pain, reduced appetite, decreased nutrient intake, and disturbed rest, which can be linked to weight loss and stunted growth (Dimaisip-Nabuab et al., 2018). Therefore, dental health education and parental support in preventing caries are crucial for children.

CONCLUSION

The conclusion is that there is a relationship between the knowledge, attitude, and behavior of students with caries and stunting. It is recommended to conduct further research on the relationship between diet, nutrient intake, and the incidence of caries and stunting.

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