



The Relationship between Maternal Knowledge and Attitudes About Dental and Oral Health with Dental Caries Status of Children at Risk of Stunting at SDN Baumata Timur

Leny Marlina A. Pinat^{a,1*}, Christina Ngadilah^a, Yansestina Erlince Eky^a, Mery Novariapay^a, Merniwati Sherly Eluama^a

^a Department of Dental Health, Poltekkes Kemenkes Kupang, Kupang City, East Nusa Tenggara, Indonesia

¹ erlanggasteven78@gmail.com*

* Corresponding Author

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ABSTRACT

Dental issues in children, impacting proper tooth growth, highlight parental responsibility for a child's oral health. Children depend on their parents for dental care, and unaddressed dental caries can lead to growth disturbances and increased stunting rates. The 2021 SSGI study shows a 37.8% stunting prevalence in East Nusa Tenggara, surpassing the national rate of 24.4%, with 15 districts in NTT exceeding 30%. In 2022, the national stunting rate decreased to 21.6%, but East Nusa Tenggara maintained a dominant 35.3% rate, with Kupang City and Kupang Regency exceeding the national average at 25.1% and 24.1%, respectively. This study aims to explore the relationship between maternal knowledge and attitudes concerning oral health and the occurrence of dental caries in children at risk of stunting at SDN Baumata Timur. Utilizing a cross-sectional approach, 62 students were examined, and their Body Mass Index (BMI-for-age) identified those experiencing malnutrition. Subsequently, students with malnutrition underwent dental examinations, and their mothers completed a questionnaire. Among the 62 students, 25 were identified as malnourished. Data analysis, employing correlation and multiple regression tests with a significance level of $p < 0.05$, indicates that maternal knowledge is not significantly related to dental caries in children, both in permanent (DMF-T) and deciduous teeth (def-t). Conversely, maternal attitudes significantly correlate with dental caries in children in both types of teeth. Multiple regression analysis reveals no significant relationship between maternal knowledge and attitudes regarding dental health and DMF-T in elementary school children ($p > 0.05$). However, a more significant relationship exists between maternal attitudes toward dental health and def-t in elementary school children ($p=0.010<0.05$). This highlights that maternal attitudes toward children's dental health influence their behavior, particularly regarding deciduous teeth. In conclusion, while no significant relationship exists between maternal knowledge and dental caries in children, a significant association is evident between maternal attitudes and dental caries in children with malnutrition at SDN Baumata Timur.

INTRODUCTION

The oral health of children is a crucial determinant of their overall well-being, with conditions such as dental caries, periodontal diseases, malocclusion, and discoloration posing threats to their dental and overall health. Dental issues in children can impede proper tooth growth, emphasizing the responsibility of parents in maintaining their children's oral health (Oktarina et al., 2016). Dental caries, resulting from bacterial acid production interacting with the tooth, food substrate, and progressing over time, can lead to repeated pH decreases, causing demineralization and eventual caries formation. The severity of dental caries is assessed using the DMFT index (decayed missing filling teeth) for permanent teeth and the def-t index (decayed extracted filling teeth) for deciduous teeth (Lutfi, et al., 2021).

Several significant factors influence the oral health behavior of children, including parental knowledge, attitudes, cultural beliefs, and awareness of dental health. Research in Poland indicates a direct correlation between lower maternal education levels and reduced oral health knowledge (Bozorgmehr et al., 2013). A study in Karanganyar revealed that children of mothers with poor oral health knowledge had a 97.6% prevalence of dental caries, while those with well-informed mothers had a caries rate of 12.5% (Bozorgmehr et al., 2013).

Parents' inadequate understanding or neglect of their child's dental hygiene can be a risk factor for oral health problems. Some parents still adhere to the outdated belief that primary teeth need not be cleaned, as they will eventually be replaced by permanent teeth (Salsabila et al., 2021). Dental caries can result in growth disturbances, infections, inadequate nutritional intake, and insufficient stimulation, contributing to a high stunting rate. Malnutrition-induced growth failure in a child's first thousand days can have long-term effects into adulthood and old age (Abdat, 2019).

According to the 2021 Indonesian Nutrition Status Study (SSGI), the stunting prevalence in Nusa Tenggara Timur (NTT) is 37.8%, the highest among all Indonesian provinces. Although below the national stunting rate of 24.4%, 15 districts in NTT are still categorized as red, indicating a stunting prevalence exceeding 30%. In 2022, the national stunting rate decreased to 21.6%, a 2.8% drop from 2021. However, Nusa Tenggara Timur maintains the highest stunting rate at 35.3%. Stunting distribution data shows rates of 25.1% in Kupang City and 24.1% in Kupang Regency, both surpassing the national average (Kementerian Kesehatan Republik Indonesia, 2023). The research aims to analyze the relationship between maternal knowledge and attitudes regarding oral health and the occurrence of dental caries in children at risk of stunting at SDN Baumata Timur.

METHOD

This study is a *cross-sectional study*. A certificate of ethical eligibility has been granted by the ethics committee of the Poltekkes Kemenkes Kupang with number LB.02.03/1/0113/2023. This study was conducted on mothers and children of SDN Baumata Timur. A total of 62 students were sampled in this study, the students were calculated their body mass index (BMI) to determine students who were malnourished, then students who were malnourished had their dental health checked and their mothers were asked to answer the questionnaire given. Out of 62 students, 25 students were found to be malnourished. Data were collected through examination of body weight, height, Lila Anak and questionnaires to determine the knowledge and attitudes of mothers of malnourished children. the classification of maternal knowledge scores is divided into three namely good category scores, moderate categories and less categories, while maternal attitudes are divided into two namely good criteria and less criteria. The assessment of dental caries in children is divided into two, namely DMF-T and def-t assessment with a value of 0.0-1.1 = Very Low, 1.2-2.6 = Low, 2.7-4.4 = Medium, 4.5-6.6 = High, > 6.6 = Very High.

Analysis of the relationship between the independent variables (maternal knowledge and attitude) with the dependent variable (child dental caries) using bivariate analysis (Kendall's tau_b test) and multiple regression tests. The significance of this test is if the p value is <0.05 (95% confidence level).

RESULTS AND DISCUSSION

Table 1. Distribution of respondents based on child age

Age	Frequency	Percentage (%)
7 Years	4	16.0
8 Years	10	40.0
9 Years	7	28.0
10 Years	3	12.0
11 Years	1	4.0
Total	25	100.0

Table 1 It is known that research respondents who have the most age at the age of 8 years are 10 people (40%) while research respondents who have the least age at the age of 11 years are 1 (4%) people.

Table 2. Distribution of respondents based on child gender

Gender	n	Percentage %
Male	13	52
Female	12	48
Total	25	100

Table 2 It is known that there are more research respondents who are male (52%) than female (48%).

Table 3. The relationship between maternal knowledge and child dental caries (DMF-T)

		Correlations	DMF-T	Pengetahuan Responden
Kendall's tau_b	DMF-T	Correlation Coefficient	1.000	-.162
		Sig. (2-tailed)	.	.419
		N	25	25
	Respondent Knowledge	Correlation Coefficient	-.162	1.000
		Sig. (2-tailed)	.419	.
		N	25	25

Table 3 It is known that the analysis with Kendall's Tau test obtained $p\text{-value } 0.419 > \alpha 0.05$ means that there is no significant relationship between maternal knowledge about dental health and DMF-T in elementary school children.

Table 4. The relationship between maternal knowledge and child dental caries (def-t)

		Correlations	def-t	Pengetahuan Responden
Kendall's tau_b	def-t	Correlation Coefficient	1.000	.199
		Sig. (2-tailed)	.	.280
		N	25	25
	Respondents' Attitudes	Correlation Coefficient	.199	1.000
		Sig. (2-tailed)	.280	.
		N	25	25

Table 4. It is known that the analysis with Kendall's Tau test obtained $\text{Sig.} p 0.280 > \alpha 0.05$ means that there is no significant relationship between maternal knowledge about dental health and def-t in elementary school children.

Table 5. The relationship between maternal attitude and child dental caries (DMF-T)

		Correlations	DMF-T	Respondents' Attitudes
Kendall's tau_b	DMF-T	Correlation Coefficient	1.000	.480*
		Sig. (2-tailed)	.	.017
		N	25	25
	Respondents' Attitudes	Correlation Coefficient	.480*	1.000
		Sig. (2-tailed)	.017	.
		N	25	25

* Correlation is significant at the 0.05 level (2-tailed).

Table 5. It is known that the analysis with Kendall's Tau test obtained p-value $0.017 < \alpha 0.05$ means that there is a significant relationship between maternal attitudes about dental health and DMF-T of elementary school children.

Table 6. The relationship between maternal attitude and dental caries (def-t)

		Correlations	def-t	Respondents' Attitudes
Kendall's tau_b	def-t	Correlation Coefficient	1.000	.427*
		Sig. (2-tailed)	.	.020
		N	25	25
	Respondents' Attitudes	Correlation Coefficient	.427*	1.000
		Sig. (2-tailed)	.020	.
		N	25	25

* Correlation is significant at the 0.05 level (2-tailed).

Table 6. It is known that the analysis with Kendall's Tau test obtained Sig.p $0.020 < \alpha 0.05$ means that there is a significant relationship between children's attitudes about dental health with def-t elementary school children.

Table 7. The relationship between maternal knowledge and attitude with dental caries (DMF-T)

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	.882	.573		1.538	.138
	Respondent's Knowledge	-.211	.385	-.108	-.546	.590
	Respondent's Attitude	.539	.285	.373	1.892	.072

a. Dependent Variable: DMF-T

Table 7 show that the results of multiple regression test data analysis, it is known that the p-value < 0.05 so it can be concluded that there is no significant relationship between knowledge, attitudes of mothers about dental health with DMF-T of primary school children. This is evidenced by $p > 0.05$.

Table 8. The relationship between maternal knowledge and attitude with dental caries (def-t)

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardize Coefficients		
		B	Std. Error	Beta		
1	(Constant)	-1.395	1.518		-.919	.368
	Respondent Knowledge	1.632	1.020	.287	1.600	.124
	Respondents' Attitude	2.132	.755	.507	2.824	.010

a. Dependent Variable: def-t

Table 8. Based on the results of multiple regression test data analysis, it is known that the p-value <0.05 so it can be concluded that there is a more significant relationship between maternal attitudes about dental health and def-t of primary school children. This is evidenced by 0.010<0.05.

In this study, the age of the most malnourished students was 8 years old, the gender was mostly male. There is a difference in malnutrition status between boys and girls, where boys are more than girls (52%). Previous studies conducted in India, particularly in rural areas, reported a higher prevalence of underweight males than females. There is a contradictory study stating that the preference for good nutritional status is still predominantly boys, this is because the provision of better quality food and health facilities that boys prefer increases the likelihood of malnutrition in girls (Madhusudhan & Khargekar, 2020).

Body mass index (BMI) is calculated using the formula, which is body weight in kilograms divided by body height in square meter (kg/m²) to determine whether body weight is appropriate for height.

$$\text{Body Mass Index} = \frac{\text{Weight (kilograms)}}{\text{Height}^2 \text{ (meter)}}$$

Malnutrition seems to have various effects on oral tissues and subsequent developments of oral diseases. This results in altered tissue homeostasis, reduced resistance to microbial biofilm, and tissue repair capacity. Malnutrition is associated with enamel hypoplasia, dental caries, and salivary gland changes. Changes in saliva characteristics reduce saliva's defense mechanisms and its ability to counteract plaque acids (Madhusudhan & Khargekar, 2020).

The Relationship between Maternal Knowledge and Dental Caries in Children

Based on the data obtained from the research results described in Tables 3 and 4, it is known that maternal knowledge has an insignificant relationship with dental caries in children, both in permanent teeth (DMF-T) with a significance of p-value 0.419 > α 0.05 and in deciduous teeth (def-t) with p-value 0.280 > α 0.05. This is because the knowledge of mothers about dental and oral health improves over time, as mothers in the East Baumata village are frequently exposed to dental health knowledge through various types of media, including mass media, electronic media, and health services in the area. This is evident from mothers being able to answer all questions about their children's dental and oral health correctly.

Despite the substantial number of respondents who know that preventive measures can prevent dental diseases, there is a deficiency in preventive action. Many mothers do not prioritize tooth brushing, which is a fundamental preventive measure for dental and oral diseases. A study in the UK also shows similar results, where parents have good information about the causes of dental caries but are less confident about preventive methods. In this study, parents are aware of preventive measures such as fluoride, floss, and sealants, but the extent to which these tools are used remains questionable (Moses & Arunachalam, 2018).

As children age, the rate of caries in deciduous teeth decreases but increases in permanent teeth. Considering that deciduous teeth begin to fall out around the age of 6 and are gradually replaced by permanent teeth, the number of deciduous teeth and subsequent dmf-t decreases with age, while the number of permanent teeth and subsequent DMF-T increases. Overall, dental caries is a multifactorial problem depending on lifestyle, habits, and individual health behavior. Behavioral factors under individual control contribute to the disease, with one of the most significant factors being poor oral hygiene.

Additionally, a study by Adeniyi et al. reveals that malnutrition (low body weight) is a risk factor for dental damage in school-age children. On the other hand, it must be noted that the presence of dental caries in children during growth can be a factor in malnutrition, leading to weight loss and a decrease in Body Mass Index (Adeniyi et al., 2016).

The Relationship between Maternal Attitudes and Dental Caries in Children

Based on the data obtained from the research results described in Tables 5 and 6, it is known that maternal attitudes have a significant relationship with dental caries in children, both in permanent teeth (DMF-T) with a significance of $p\text{-value } 0.017 > \alpha 0.05$ and in deciduous teeth (def-t) with $p\text{-value } 0.020 > \alpha 0.05$. This is because parents understand and comprehend the prevention of dental caries in children.

Negative attitudes and insufficient motivation from parents about dental and oral health can hinder them from behaving positively, such as participating in dental and oral health care. Attitudes and motivations are needed as reinforcement or stimuli that will shape individual behavior. Motivation can strengthen and maintain desired behavior (Liza & Diba, 2020).

A study conducted by Moses & Arunachalam, 2018, states that most mothers feel that brushing can clean teeth and prevent dental caries. Therefore, mothers understand the benefits of brushing but may struggle to realize the importance of daily tooth brushing. Mothers need to teach, supervise, and check their children's teeth after brushing. This can motivate children to brush their teeth more diligently and maintain their dental health (Moses & Arunachalam, 2018).

The relationship between parental attitudes and the dental and oral health status of children, states that children still suffer from dental and oral diseases despite their mother's very positive attitude but are still lacking in controlling eating patterns. Similarly, Salamaa, et al., (2022), regarding mothers' attitudes toward the dental and oral hygiene of their children, found that the majority of mothers (70.7%) have a positive attitude towards the dental and oral care of their children (Salama et al., 2020). This result aligns with research Babu et al., (2018) in India and Mubeen and Nisar in Pakistan, reporting that 59 and 55.5% of mothers, respectively, have a positive attitude towards the oral health of their children (Babu et al., 2018) .

The Relationship between Maternal Knowledge and Attitudes with Dental Caries in Malnourished Children (DMF-T and def-t)

The research results are depicted in Tables 4 the multiple regression analysis data shows a significance value of $p < 0.05$. Therefore, it can be concluded that there is no significant relationship between maternal knowledge and attitudes regarding oral health and DMF-T in elementary school children. This is supported by $p > 0.05$, while there is a more significant relationship between maternal attitudes regarding dental health and def-t in elementary school children, as indicated by $0.010 < 0.05$. This is because a mother's attitude toward a child's dental health determines the child's behavior regarding dental health.

Consistent with previous studies stating that mothers' attitudes in maintaining the dental and oral health of children in the good category result in children having good dental health status. Conversely, mothers with less favorable attitudes have children with less favorable dental health status (Oktarina et al., 2016).

Parents, especially mothers, must possess good knowledge and awareness in maintaining the dental health of their children. Children whose parents have low knowledge

about proper oral hygiene are at a higher risk of experiencing dental caries compared to those whose parents have better knowledge (Afrinis et al., 2020)

Maternal knowledge is crucial in shaping the attitudes and behaviors of children in maintaining dental and oral health. Mothers with insufficient knowledge and attitudes about dental and oral health can increase the occurrence of dental caries in children. Thus, maternal knowledge and attitudes about dental and oral health can determine the dental and oral health status of children. Another study states that the level of maternal knowledge does not affect the number of dental caries in children. Even with higher education, most mothers do not understand the factors influencing dental caries in children, leading to unfavorable habits for children's dental health (Keumala, 2019).

Stunted children are more vulnerable to dental caries due to changes in saliva characteristics, such as a decrease in flow rate and pH. Chronic malnutrition and oral health status in children can negatively impact the oral cavities and lead to a decrease in saliva flow rate. Stunting or malnutrition in children can cause a decrease in saliva flow rate (secretion) (Abdat et al., 2020).

CONCLUSION

There is no significant relationship between maternal knowledge and children's dental caries, while there is a significant relationship between maternal attitudes and dental caries of undernourished children at SDN Baumata Timur. Suggestion is parents of children who are malnourished need to pay attention and maintain the oral health of their children and carry out routine dental health controls to the dentist or dental clinic at the health center or hospital. The mother's attitude determines the health status of the teeth and mouth in children both primary teeth and their permanent replacement teeth, where the primary teeth are a signpost for the growth of the permanent replacement teeth.

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