

Relationship between Mother and Child Behavior in Maintaining Dental Health with the Incidence of Caries (Study of Preschool Children at Al-Masyithoh Pati Muslimat Kindergarten)

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ABSTRACT:

Background: Dental caries is still a priority issue in children's health. The high prevalence of caries in children is partly due to the lack of maternal behavior in maintaining oral health, as well as a child's diet. This study aims to analyze the relationship between mother and child behavior in maintaining dental health with the incidence of caries in children.

Methods: This type of research is analytically observational with a cross-sectional approach. The sample consisted of 73 children aged 3-5 years and the respondents were the mothers of the sample. Sampling used a proportioned stratified random sampling technique. Collecting data using observation sheets and questionnaires. Univariate and bivariate data analysis (Rank Spearman).

Results: The results showed that 75.3% of mothers had good knowledge, 100% of mothers had a supportive attitude, 68.5% of mothers had good actions, 93.2% of children had cariogenic food consumption habits, and 58.9% of children had caries in the very high category. There is no relationship between maternal knowledge (p -value $0.942 > 0.05$) and maternal attitude with caries incidence (p -value $0.816 > 0.05$), there is a relationship between maternal actions (p -value $0.000 < 0.05$) and children's habits of consuming cariogenic foods with caries incidence (p -value $0.004 < 0.05$).

Conclusion: Maternal knowledge and attitude in maintaining dental health have no relationship with the incidence of caries in children, while maternal actions and children's habits of consuming cariogenic food are related to the incidence of caries in children.

KEYWORDS: Maternal Behavior; Consumption of Cariogenic Foods; Caries;

I. INTRODUCTION

Dental caries is a multifactorial disease in which there is an interaction of four main factors called *the caries tetrad*, namely susceptible host tissue, microflora with cariogenic potential, namely *Streptococcus mutans* bacteria, substrate, and time ^{1,2}. Caries are a dental disease that is still a priority for children's health ³. Dental and oral diseases, including caries, can reduce school children's activities, causing them to miss school hours ⁴. Apart from that, caries can have an impact on other health, even if a child's toothache can reduce their appetite, parents must pay attention to their child's dental health from an early age ⁵⁻⁷.

Basic Health Research data shows that there has been an increase in the prevalence of active dental caries in Indonesia from 53.2% in 2013 to 57.6% in 2018. The proportion of problems with damaged, cavities or diseased teeth in Central Java province is characterized by age group, namely age group 3-4 years as much as 38.40% and the 5-year age group as much as 52.48%. Likewise, as many as 3,163 residents in Pati Regency have dental health problems such as damaged teeth, cavities, or disease, reaching 41.17% ⁸.

Caries occur as a result of demineralization of the hard tissue structures of teeth, namely enamel and dentin, which are closely related to the habit of consuming cariogenic foods ⁹. The lack of maternal behavior in maintaining dental and oral health in children can also affect the high prevalence of dental caries ¹⁰. Based on *Lawrence Green's* theory, behavior is influenced by predisposing factors,

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namely knowledge, attitudes, beliefs, values, social, cultural, and sociodemographic norms, enabling factors, *namely* the availability of health facilities, and reinforcing factors, namely attitudes and behavior of health workers or other officials who serve as a reference for behavior for the community¹¹. The results of the study stated that parents with poor dental and oral health knowledge were a predisposing factor for behavior that did not support children's dental and oral health¹².

Previous research states that there is a relationship between mothers' knowledge, attitudes, and actions regarding oral health and the incidence of dental caries in children under five¹⁰. Research shows that the consumption of cariogenic snacks is associated with the incidence of dental caries in preschool children^{13 14}.

Al-Masyithoh Pati Muslimat Kindergarten is one of the kindergartens in Pati Regency, precisely on the street Raya Pati-Tayu, Sawahan, Ngemplak Kidul, Margoyoso District. Based on observations, the kindergarten has a canteen that sells many cariogenic foods such as chocolate, candy, and donuts. From the results of an interview with one of the teachers, it was stated that routine dental and oral examinations had never been carried out on children and there had been no research regarding dental caries in the Al-Masyithoh Pati Muslimat Kindergarten.

The purpose of this study was to analyze the relationship between a mother's behavior (knowledge, attitudes, and actions) in maintaining dental health and the incidence of caries in children aged 3-5 years at Kindergarten Muslimat Al-Masyithoh Pati.

II. METHODS

This research is an analytical observational study with a *cross-sectional approach*. The population in the study was 166 children aged 3-5 years at Al-Masyithoh Pati Muslimat Kindergarten. Sampling in this study used a *proportioned stratified random sampling technique* with a total sample of 73 children and the research respondents were the mothers of the sample.

Data was collected at the Al-Masyithoh Pati Muslimat Kindergarten for three days on 27 November 2022, 04 December 2022, and 06 December 2022. This research has received *ethical clearance* from the Health Research Ethics Committee (KEPK) with the number 733/KEPK-FKM/UNIMUS /2022. The independent variables in this study were the mother's behavior (knowledge, attitudes, and actions) in maintaining dental health and the children's habit of consuming cariogenic food with the dependent variable being the incidence of caries in children aged 3 to 5 years at TK Muslimat Al-Masyithoh Pati.

The data collection instruments used in this study were dental caries observation sheets and questionnaires regarding maternal behavior in maintaining dental health and children's habits of consuming cariogenic foods. The questionnaire consisted of 67 statement items with knowledge, attitudes, and actions of the mother, each consisting of 20 statement items and 7 statement items regarding the child's habit of consuming cariogenic food. Test the validity and reliability of the questionnaire using *expert testing* with three experts in the field.

Data analysis used univariate analysis and bivariate analysis with the *Spearman Rank test* because all variables were not normally distributed. The normality test used is the *Kolmogorov Smirnov Lilliefors Significance Correction test*.

III. RESULT

Mother and Child Characteristics

Most of the children aged 5 years were 53 children (72.6%), and the majority were male, namely 37 children (50.7%). The majority of mothers' ages were in the 21-40 year age range, namely 56 mothers (76.7%) and none were ≤ 20 years old. Most of the respondents had at least a high school education, namely 48 mothers (65.8%) and only 1 mother had an elementary school education (1.4%). The majority of respondents did not work, namely 56 mothers (76.7%). (Table 1)

Table 1. Frequency Distribution of Mother and Child Characteristics

No.	Characteristics	Frequency	Percentage (%)
1.	Child Age		
	3 years	5	6,8
	4 years	15	20,5
	5 years	53	72,6
2.	Gender of Child		
	Man	37	50,7
	Woman	36	49,3
3.	Mother's Age		
	≤ 20 years	0	0
	21-40 years	56	76,7
	≥ 41 years	17	23,3
4.	Mother's Education Level		
elementary school	1	1,4	

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	Junior High School	17	23.3
	Senior High School	48	65,8
	Higher education	7	9.6
5.	Mother's Occupational Status		
	Work	17	23.3
	Doesn't work	56	76,7

Table 2. Frequency Distribution based on Mother's Behavior (Knowledge, Attitudes, and Actions) in Maintaining Dental Health, Children's Habits of Consuming Cariogenic Foods, and the Incidence of Caries in Children

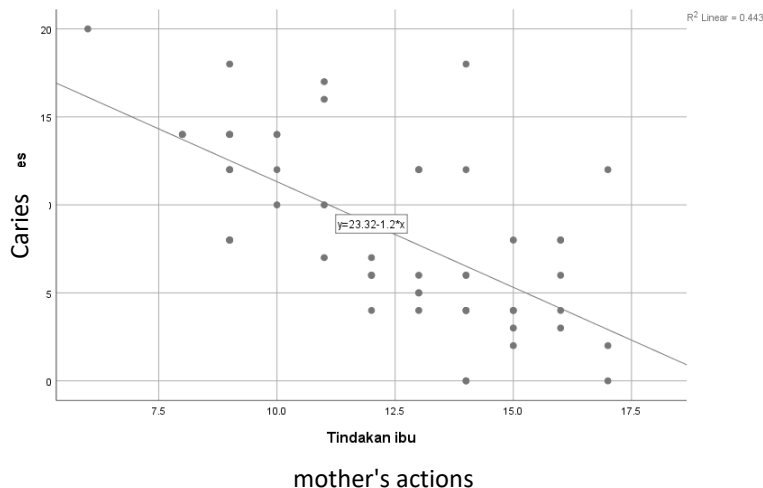
No.	Variable	Frequency	Percentage (%)
1.	Mother Knowledge		
	Lack of knowledge	2	2.7
	Enough	16	21,9
	Good	55	75,3
2.	Mother's attitude		
	Does not support	0	0
	Support	73	100
3.	Mother's action		
	Not good	23	31.5
	Good	50	68.5
4.	Children's Habits of Consuming Cariogenic Foods		
	Have a habit	68	93,2
	Have no habits	5	6,8
5.	Incidence of Caries in Children		
	Very low	4	5,5
	Low	2	2.7
	Currently	15	20.5
	Tall	9	12,3
	Very high	43	58.9

The majority of mothers' knowledge was in a good category (75.3%) as many as 55 respondents and only 2 respondents had lack of knowledge (2.7%). It is known that all mothers have a supportive attitude in maintaining children's dental health (100%). It is known that the majority of mothers have good actions in maintaining children's dental health (68.5%). (Table 2)

The majority of children aged 3-5 years in the Muslimat Al-Masyithoh Pati Kindergarten have the habit of consuming cariogenic food, as many as 68 children (93.2%). (Table 2). Most children experienced caries in the very high category (58.9%), and only 2 children (2.7%) experienced dental caries in the low category. (Table 2)

There is no significant relationship between mother's knowledge in maintaining dental health and the incidence of caries in children aged 3-5 years at the Muslimat Al- Masyithoh Pati Kindergarten (p -value $0.942 > 0.05$) and the correlation coefficient obtained $r = 0.009$ means the strength of the relationship very weak. (Table 3). The results of the correlation test obtained a p -value of $0.816 (> 0.05)$, meaning that there was no significant relationship between the attitude of mothers in maintaining dental health and the incidence of caries in children aged 3-5 years at Kindergarten Muslimat Al-Masyithoh Pati and the correlation coefficient was obtained $r = -0.028$ means the strength of the relationship is very weak. (Table 3)

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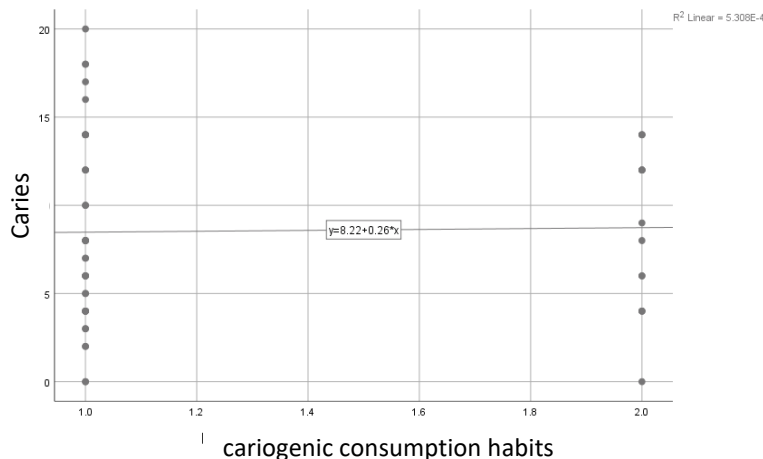
Graph 1. Scatter diagram of the relationship between maternal actions in maintaining dental health and the incidence of caries in children

Table 3. Spearman Rank Correlation Test Results

No.	Variable	Correlation Coefficient (r)	p-value	Information
1.	The relationship between maternal knowledge and the incidence of caries in children	0.009	0.942 (>0.05)	No connection
2.	The relationship between maternal attitudes and the incidence of caries in children	-0.028	0.816 (>0.05)	No connection
3.	The relationship between maternal actions and the incidence of caries in children	0.641	0.000 (<0.05)	There's a relationship
4.	The relationship between children's habits of consuming cariogenic foods and the incidence of caries	0.330	0.004 (<0.05)	There is a relationship

Spearman Rank correlation test obtained a p-value of 0.000 (<0.05), meaning that there was a significant relationship between maternal actions in maintaining dental health and the incidence of caries in children aged 3-5 years at Al-Masyithoh Pati Muslimat Kindergarten (Table 3). The relationship between maternal actions and the incidence of caries in children has a strong relationship strength (r= -0.641) and has a negative linear pattern, meaning that the higher the mother's action score, the lower the incidence of caries in children. (Graph 1)

The results of the correlation test obtained a p-value of 0.004 (<0.05), meaning that there is a significant relationship between children's habits of consuming cariogenic foods and the incidence of caries in children aged 3-5 years at Al-Masyithoh Pati Muslimat Kindergarten. (Table 3)



Graph 2. Scatter diagram of the relationship between children's habits of consuming cariogenic foods and the incidence of caries.

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The relationship between children's habits of consuming cariogenic foods and the incidence of caries has a weak relationship strength ($r= 0.330$) and has a positive linear pattern, namely the higher the score for children's habits of consuming cariogenic foods, the higher the incidence of caries in children. (Graph 2) .

IV. DISCUSSION

Incidence of Caries in Children Aged 3-5 Years

The research results showed that the majority of children experienced caries in the very high category (58.9%). The findings in this study showed that at the *def-t* index as many as 70 children were included in the d (*decay*) category, only 4 children were included in the e category (*indicated for extraction*), and none of them were included in the f (*filled*) category. The average *def-t* index for children aged 3-5 years at Al-Masyithoh Pati Muslimat Kindergarten is 8.58. Based on the *def-t* index value obtained according to WHO, it is included in the very high category (>6.6). The number 8.58 means that on average, each child's mouth has 8 to 9 teeth affected by caries.

This is possible because based on the results of interviews with respondents, almost all children aged 3-5 years at the Muslimat Al-Masyithoh Pati Kindergarten have never visited a dentist and received dental care, and children are allowed to eat sweet foods every day. Parents' attitudes and behavior are one of the driving factors that can influence children's behavior to maintain healthy teeth and mouth ¹¹¹⁵.

The relationship between maternal knowledge in maintaining dental health and the incidence of caries in children

The results of the study showed that there was no relationship between maternal knowledge in maintaining dental health and the incidence of caries in children aged 3-5 years at the Al-Masyithoh Pati Muslimat Kindergarten. This is in line with research conducted on Taman Ceria Surakarta PAUD children which stated that there was no relationship between maternal knowledge and the incidence of dental caries in children ¹⁶. The knowledge possessed by a mother is not the only factor that causes caries in children but must be balanced with the attitudes and actions or role and attention of the mother ¹⁷⁻¹⁹. In this research, it was found that mothers with good knowledge do not necessarily have good behavior or actions and similarly mothers with sufficient or insufficient knowledge do not necessarily have bad actions (Dieng et al., 2020^{²⁰}²⁰</sup>).</sup>

The findings in this study were that the majority of mothers' knowledge was in the good category (75.3%), but there was still mother's knowledge in the sufficient (21.9%) and less (2.7%) categories. Most respondents still do not know the correct use of toothpaste when brushing their children's teeth, namely 47 mothers (64.4%). The results of the interviews show that the correct use of toothpaste when brushing a child's teeth is as long as the toothbrush bristles because it assumes that the more toothpaste is used, the cleaner and whiter the teeth will be. The right amount of toothpaste to use is a pea size, using too much toothpaste can damage tooth structure ²¹. Respondents' knowledge about how to brush children's teeth properly is also still lacking, shown by 34.2% of respondents answering that the right way to brush children's teeth is with sufficiently strong pressure until all surfaces of the teeth are brushed. Correctly brushing a child's teeth is done by brushing the entire surface of the child's teeth gently so as not to injure the gums ²². Then as many as 27.4% of respondents still thought that cleaning the surface of the tongue could increase the number of bacteria in the oral cavity. Cleaning the surface of the tongue after brushing your teeth will reduce debris, plaque, microorganisms, and halitosis, thereby contributing to overall oral hygiene ^{22,23}.

The Relationship between Maternal Attitudes in Maintaining Dental Health and the Incidence of Caries in Children

Attitude is readiness or awareness to act. Attitudes can materialize into actions if they are followed by supporting factors such as the availability of health facilities and infrastructure, as well as driving factors that strengthen the occurrence of actions or behavior such as medical personnel or other officers ²⁴⁻²⁷.

The results of the study showed that there was no relationship between the mother's attitude in maintaining dental health and the incidence of caries in children aged 3-5 years at the Al-Masyithoh Pati Muslimat Kindergarten. This is possible because almost all children who experience caries have mothers with a supportive attitude. This is in line with research conducted on kindergarten children which stated that there was no relationship between maternal attitudes and the prevalence of caries in children (*p-value* $0.324 > 0.05$) ²⁸. In this study, it was found that all mothers had a supportive attitude in maintaining dental health, but not all of them had good actions in maintaining children's dental health.

The findings in this study showed that all respondents had a supportive attitude in maintaining children's dental health (100%). However, from the results of the questionnaire, there was still a lack of attitude regarding toothbrush care, namely most respondents strongly agreed with the statement that a child's toothbrush was replaced when the bristles bloom (54.8%), and strongly agreed with the statement that if children brush their teeth every day during morning shower and afternoon shower (28.8%). Toothbrushes are recommended to be replaced after 2-3 months of use because the bristles are no longer functioning optimally so they can injure the gums (²³. Brushing your teeth should be done at least twice a day, namely in the morning after breakfast and at night before going to bed because brushing your teeth too often can damage the tooth enamel structure which in turn makes the tooth nerves more sensitive ²¹.

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Relationship between maternal actions in maintaining dental health and the incidence of caries in children

The results of the research show that there is a relationship between maternal actions in maintaining dental health and the incidence of caries in children aged 3-5 years at the Al-Masyithoh Pati Muslimat Kindergarten. This is in line with research conducted on toddlers at PAUD Putra Sentosa which stated that there was a relationship between maternal actions and the incidence of caries in children¹⁰. In this study, it was found that mothers with good actions were not necessarily followed by good knowledge and attitudes. Based on the results of interviews, several respondents stated that poor actions in caring for children's dental health were due to economic reasons, and lack of support from the family, and some had the perception that children's teeth did not need attention because they would be replaced with permanent teeth.

The findings in this study were that the majority of respondents had good actions in maintaining children's dental health (68.5%), but there were still mothers who took poor actions (23%). All respondents still do not have the awareness to check their children's teeth at the dentist every 6 months (100%), and only check their children at the dentist when the child complains of toothache (87.7%). A visit to the dentist is recommended every 6 months to monitor the health of the child's teeth and mouth from year to year, apart from that it aims to prevent caries and early detection of diseases in the oral cavity, as well as to ensure the health of the child's teeth and mouth in the future (29). Some respondents also did not get used to their children brushing their teeth after eating chocolate (87.7%) with the reason that the child refused. Sticky food easily sticks to teeth so if left for a long time it will cause the development of microorganisms, getting children into the habit of brushing their teeth after eating chocolate can prevent caries from occurring.³⁰

As many as 78.1% of respondents did not replace their children's toothbrushes every 3 months because most respondents replaced their children's toothbrushes when the brush was completely damaged or lost. Proper toothbrush care is to replace the toothbrush after 2-3 months of use because the bristles no longer function optimally and can injure the gums.²³. As many as 76.7% of respondents did not clean the surface of their children's tongues after brushing their teeth. Cleaning the surface of the tongue with light pressure is recommended after every brushing because it can contribute to overall dental and oral hygiene^{22,23}. Apart from that, there are still many respondents who do not brush their children's teeth twice a day, namely in the morning after breakfast and at night before bed (75.3%) because if they brush their teeth at night the child already sleepy so the child is allowed to fall asleep in the oral cavity. dirty one. *The American Dental Association* (ADA) states that brushing your teeth should be done regularly, at least twice a day, namely in the morning after breakfast and at night before bed.

Relationship between children's habits of consuming cariogenic foods and the incidence of caries

Another factor that can cause caries in children apart from the mother's behavior is the child's diet, namely the habit of consuming cariogenic foods. Frequent consumption of cariogenic foods can result in a decrease in salivary pH, damage the structure and composition of the teeth, and cause dental caries^{2,31,32}.

The results of the research show that there is a relationship between children's habits of consuming cariogenic foods and the incidence of caries in children aged 3-5 years at the Al-Masyithoh Pati Muslimat Kindergarten. The results of this study are in line with research that has been conducted on preschool children in Magetan Regency, namely that there is a relationship between the consumption of cariogenic foods and the incidence of dental caries³³. This is possible because the majority of children who have the habit of consuming cariogenic foods will experience dental caries.

The findings in this study were that almost all children had cariogenic food consumption habits (93.2%), indicated by children always buying snacks such as *snacks*, wafers, biscuits or candy at school or around the house every day (74%), children drink water after eating sticky and sweet foods such as chocolate, candy and ice cream (74%) but only do it when the child wants to, meaning that if the child refuses then the mother allows the child not to drink water after eating sticky and sweet food. As many as 30.1% of children often eat candy, cotton candy, or lollipops, 28.8% of children often eat cakes, donuts, or bread, and 24.7% of children always buy snacks in large quantities in a week or month.

V. CONCLUSIONS

There is no relationship between the knowledge and attitudes of mothers in maintaining dental health with the incidence of caries in children aged 3-5 years at Kindergarten Muslimat Al-Masyithoh Pati. There is a relationship between mothers' actions in maintaining dental health and children's habits of consuming cariogenic food with the incidence of caries in children aged 3-5 years at Kindergarten Muslimat Al-Masyithoh Pati.

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