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Research Article

Characteristics and perspectives maternal actions relate to oral hygiene of primary school-age children

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Abstract

Aim: To analyze the relationship between maternal characteristics and actions to maintain children's oral health with oral hygiene in primary school-aged children

Method: This type of research is quantitative analytical with a cross-sectional approach. The population is students from SD Negeri Seberang Mesjid 1 Banjarmasin. The sample was taken using a purposive sampling technique of 5th-grade students and their mothers. Data collection on characteristics and perspectives of maternal actions used a questionnaire instrument. Meanwhile, data on oral hygiene uses the Oral Hygiene Index Simplified (OHI-S) examination sheet. Data analysis used an alternative relationship test, namely Fisher's Exact Test.

Results: Most mothers (47.1%) had actions to maintain their children's oral health in the good category. Meanwhile, most children's oral hygiene (49.4%) was in the poor category. The results of the correlation test showed (p-value) that the child's oral hygiene with the mother's education = 0.000, the mother's occupation = 0.001, the mother's exposure to information = 0.000, the family's income = 0.014, and the mother's age = 0.596. In the correlation test between the mother's actions in maintaining her child's oral health and the children's oral hygiene, it was found that p-value = 0.000.

Conclusion: There is a significant relationship between maternal characteristics which include: education, occupation, family income, and the mother's actions. Meanwhile, the mother's age is not significantly related to the mother's actions. There is a significant relationship between the mother's actions in maintaining her child's oral health and the oral hygiene of primary school-aged children.

Keywords: characteristic, perspective actions, oral hygiene

INTRODUCTION

Parents, especially mothers, have an important role in maintaining the oral health of elementary school-aged children. Parental concern can be seen from their attitude and attention to their child's oral health¹. Oral health in elementary school-aged children is one factor in children's growth and development that needs to be considered. A study states that in the last decade, health services, including dental and oral health, have prioritized prevention rather than treatment of disease². It is therefore important to realize that prevention of dental disease plays an important role in a patient's overall health care. Tooth decay that occurs in children can be one of the causes of disrupted children's tooth growth at a later age³. Preventive dental care should begin early in infancy, during the first year of a child's life to ensure a successful outcome. The main concern for dental health is damage to the primary teeth. Early childhood caries, rotten teeth in children under 6 years of age, is a multi-factorial childhood disease with socio-cultural and socio-economic determinants⁴. Dental caries is a dental health problem that is quite high in Indonesia with a prevalence of more than 80%⁵.

Data shows that 91.1% of the Indonesian population aged 10 years and over have brushed their teeth every day, but only 7.3% have brushed their teeth twice at the correct time, namely in the morning and night before bed⁵. For elementary school-age children, maintaining their oral health still depends on their parents, especially their mothers, as the person closest to their children. Starting to grow teeth is an important process of a child's growth⁶. Parents, especially mothers, must know how to care for their children's teeth and must also guide their children in how to brush their teeth properly and correctly⁷. In elementary school-age children, this is the period when teeth change from milk teeth to permanent teeth, so a child must receive serious attention from his parents. However, many parents do not consider dental health problems as a serious health problem and do not attach much importance to their children's oral hygiene. Ten out of thirty parents who have elementary school-age children still have the wrong perception about the incidence of dental caries in their children⁸.

The role of parents, especially mothers, in maintaining healthy teeth is very important in underlying the formation of behavior that supports children's oral hygiene so that children's oral health can be well maintained. Dental caries

interferes with a child's growth and development. Because the pain that arises from dental caries affects the child's appetite, thus affecting the intake of nutritious food, and ultimately affecting the child's nutritional status⁹. Apart from that, the pain caused by dental caries also really interferes with children's concentration in studying and ultimately affects their academic performance¹⁰. Therefore, the role of parents is very necessary for guiding, providing attention, providing understanding, reminding, and providing facilities to children so that in the future children can maintain the cleanliness of their teeth. Oral health education should be introduced to children as early as possible so that they can know how to maintain healthy teeth and it is hoped that parents will also play a role in supervising their children's dental hygiene by teaching them how to brush their teeth properly¹¹.

Children's oral health is one of the factors supporting the success of children's growth and development. Children's oral health affects their well-being, skills, and competencies and influences overall health outcomes¹². Apart from parental concern, school performance, in this case, oral health education in schools also has a relationship with children's good oral health^{13,14}. So parents need to collaborate with schools in increasing their perspective and concern for the health of children's teeth. In this research, factual data will be presented regarding the perspectives and concerns of parents, especially mothers, regarding children's oral health which can be used as a reference in determining solutions for children's oral health. This study aims to analyze the relationship between maternal characteristics and actions to maintain children's oral health with oral hygiene in elementary school-aged children.

MATERIAL AND METHOD

This type of research is quantitative analytical with a correlation method, analyzing the relationship between a maternal characteristic and the perspective of actions to maintain children's oral health with the children's oral hygiene. The population of this study was elementary school students attending SD Negeri Seberang Masjid 1 Banjarmasin, South Kalimantan, totaling 480 students. The sample was taken using a purposive sampling technique, namely grade 5 students and their mothers. So the sample size is 85 students and 85 mothers.

Variable characteristics and perspectives of mothers' actions in maintaining their children's oral health include: providing teeth brushing facilities, teaching them to brush their teeth properly, reminding children to brush their teeth in the morning after breakfast, reminding children to brush their teeth in the evening before going to bed, and reminding children to always rinse your mouth after eating sticky sweet foods, and check your teeth regularly every six months, measured using a questionnaire consisting of 15 question items using the recall method, and each respondent's answer is categorized on a Likert scale, with a score: Always=2, Sometimes=1, Never=0. Furthermore, the respondent's actions were categorized using the criteria: Good, if: $\text{mean}+1\text{SD} \geq X$;

Moderate, if: $\text{mean} - 1\text{SD} \leq X < \text{mean} + 1\text{SD}$; Less, if: $X < \text{mean} - 1\text{SD}$

Meanwhile, the variable level of children's oral hygiene is measured by selecting six specific index tooth surfaces that can adequately represent the front and back segments of all tooth surfaces in the oral cavity, then measured with the OHI-S Index which is categorized as good, if the OHI-S value = 0 - 0.6; moderate, if OHI-S index = 0.7-1.8; and bad if OHI-S index = 1.9 - 3.0. Data analysis used an alternative relationship test, namely Fisher's Exact Test because there was an expected count value of less than five (50%).

RESULT

Seberang Masjid 1 State Elementary School is the object of this research. Located on Jl. Kampung Melayu Darat No.32, Seberang Masjid, Central Banjarmasin District, Banjarmasin City. SD Negeri Seberang Masjid 1 Banjarmasin is one of two elementary schools in the city of Banjarmasin designated as a school that promotes independent learning¹⁵. Namely, schools that in the teaching and learning process mobilize the entire educational ecosystem to realize student-centered education. The students of SD Negeri Seberang Masjid 1 Banjarmasin have received educational intervention from a social enterprise startup that focuses on health, especially teeth and mouth, in the form of a healthcare platform with telemedicine features^{15,16}.

Based on data collection from student respondents and their mothers, data on the characteristics of respondents was obtained as shown in Table 1. Based on Table 1 regarding the characteristics of respondents, it was found that the majority of mother respondents were 30-39 years old (72.9%), which is of productive age, both physically and economically. The majority of mothers (48.2%) have a senior high school education which means that the parents' education level is at the upper middle level, which is assumed to be quite capable of receiving and analyzing health information and then being able to apply it in the education and care of children, especially for the sake of children's dental and oral health. The majority of mothers (29.4%) are pure housewives, meaning they do not have productive economic activities, even though they do it from within the home. Most respondents (38.8%) had a family income of between 3 - 3.9 million rupiah per month. This family's income is sufficient because according to the Central Bureau of Statistics, the criteria for a poor family is if the total family income is less than IDR 2.3 million per month (in 2023). Most mothers (56.5%) stated that they had received information about how to maintain the health of their children's teeth and mouth at least once, namely when there was dental health education using the Gigi.id application which was held at SD Negeri Seberang Masjid 1 Banjarmasin in December 2021. The majority of mothers' actions in maintaining the cleanliness of their children's teeth (47.1%) were in the sufficient category. Meanwhile, the oral hygiene level of students at SDN Seberang Mosque 1, Banjarmasin City, who were respondents to this research, was mostly (49.4%) in the poor category.

Table 1: Characteristic of respondent

Characteristic of respondent	Category	Frequency (%)
Mother's age	20-29 years old	7,1
	30-39 years old	72,9
	≥ 40 years old	20,0
Mother's education	Primary school	2,4
	Junior High School	14,1
	Senior High School	48,2
	College	35,3
Mother's occupation	Housewife	29,4
	Civil servants	11,8
	Private employees	20,0
	Self-employed	8,8
Family's income	1 - 1,9 million rupiah/month	7,1
	2 - 2,9 million rupiah/month	28,2
	3 - 3,9 million rupiah/month	38,8
	4 - 4,9 million rupiah/month	20,0
	≥ 5 million rupiah/month	5,9
Media exposure about how to maintain children's oral health	Never	36,5
	Once	56,5
	More than once	7,0
Actions to maintain children's oral health	Bad	38,8
	Adequate	47,1
	Good	14,1
Children's oral hygiene	Bad	49,4
	Moderate	37,6
	Good	12,9

Based on Table 2, it can be seen that the majority of mothers aged 20-29 years old (84%) who have actions to maintain their children's oral health are in the poor category. Meanwhile, the majority of mothers aged 30-39 years old (47%) had actions in the bad category. Mothers aged the same or over 40 years old, most (47%) of their actions were in the

bad category. The correlation test used is an alternative test, namely the Fisher's Exact Test, because there is an expected count value of less than five (50%), and the p-value obtained = 0.596. This shows a mother's age is not significantly related to actions to maintain her child's oral health.

Table 2: Cross-tabulation of mother's age with actions to maintain children's oral health

No	Mother's age	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	20 - 29 years old	5	84	1	16	0	0	6	100	0,596
2	30 - 39 years old	29	47	25	40	8	13	62	100	
3	≥ 40 years old	8	47	6	35	3	18	17	100	

Table 3: Cross-tabulation of mother's education with actions to maintain children's oral health

No	Mother's education	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	Primary school	2	100	0	0	0	0	2	100	0,000
2	Junior high school	11	91,7	1	8,3	0	0	12	100	
3	Senior high school	24	58,5	15	36,6	2	4,9	41	100	
4	College	5	16,7	16	53,3	9	30	30	100	

Based on Table 3, it can be seen that mothers with primary school education levels all have actions to maintain their children's oral health in the poor category. Meanwhile, for mothers whose education was in junior high school, the majority (91.7%) of their actions were in the bad category. For mothers whose education was in senior high school, the majority of their actions (58.5%) were in the bad category. For

mothers who are college graduates, most (53%) of their actions in maintaining children's oral health are in the adequate category.

Furthermore, in the Fisher's Exact Test, the p-value = 0.000 was obtained. This shows that the mother's education is significantly related to her child's oral health practices.

Table 4: Cross-tabulation of mother's occupation with actions to maintain children's oral health

No	Mother's occupation	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	Housewife	17	68	7	28	1	4	25	100	0,001
2	Civil servants	0	0	5	50	5	50	10	100	
3	Private employees	11	65	5	29	1	6	17	100	
4	Self-employed	14	42	15	45	4	13	33	100	

Based on Table 4, it can be seen that the majority of mothers who work domestically as housewives (68%) have their children's oral health practices in the poor category. Meanwhile, mothers whose jobs are Civil Servants, have actions in the fair and good categories equally (50%). Mothers whose jobs are private employees, most of their actions (65%) are in the bad category. Meanwhile, for mothers whose work is self-

employed, most (45%) of their actions are in the sufficient category.

Furthermore, in the correlation test, which used Fisher's Exact Test, the p-value = 0.001 was obtained. This shows that the mother's occupation is significantly related to the act of maintaining her child's oral health.

Table 5: Cross-tabulation of family's income with actions to maintain children's oral health

No	Family's income	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	1 - 1,9 million rupiah/month	4	66	2	34	0	0	6	100	0,014
2	2 - 2,9 million rupiah/month	16	66	8	34	0	0	24	100	
3	3 - 3,9 million rupiah/month	17	52	13	39	3	9	33	100	
4	4 - 4,9 million rupiah/month	4	24	7	41	6	35	17	100	
5	≥ 5 million rupiah/month	1	20	2	40	2	40	5	100	

Based on Table 5, it can be seen that the majority of mothers whose monthly family income is 1 to 1.9 million rupiah (66%) have actions in the bad category. Meanwhile, for mothers whose monthly family income is 2 - 2.9 million rupiah, the majority (66%) have actions in the bad category. For mothers whose family income per month is 3-3.9 million rupiah, most of their actions (52%) are in the bad category in maintaining their children's oral health. Meanwhile, for mothers whose monthly family income is 4-4.9 million rupiah, most (41%) of their actions are in the sufficient category. Then

for mothers whose monthly family income is equal to or more than 5 million rupiah, 20% of their actions are in the bad category, and 40% of their actions in maintaining their children's oral health are in the adequate and good categories.

Furthermore, in the Fisher's Exact Test relationship analysis, the p-value = 0.014 was obtained. This shows that family income is significantly related to the act of maintaining children's oral health.

Table 6: Cross-tabulation of media exposure about how to maintain children's oral health with actions to maintain children's oral health

No	Media exposure about how to maintain children's oral health	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	Never	25	81	6	19	0	0	31	100	0,000
2	Once	16	33	23	48	9	19	48	100	
3	More than once	1	17	3	50	2	33	6	100	

Based on Table 6, it can be seen that most mothers (81%) who have never been exposed to information about how to keep their children's teeth clean have actions in the poor category. Meanwhile, for mothers who had been exposed to information once, most (48%) of their actions were in the sufficient category. For mothers who were exposed to information more than once, most of their actions (50%) were

in the adequate category in maintaining their child's oral health.

Furthermore, in the Fisher's Exact Test analysis, the p-value = 0.000 was obtained. This shows that exposure to information mothers about children's oral health is significantly related to actions to maintain their children's oral health.

Table 7: Cross-tabulation of mother's actions to maintain children's oral health and children's oral hygiene

No	Mother's action	Actions to maintain children's oral health								P-Value
		bad		adequate		good		amount		
		F	%	F	%	F	%	F	%	
1	Bad	33	100	0	0	0	0	33	100	0,000
2	Adequate	8	20	27	67	5	13	40	100	
3	Good	1	8	5	42	6	50	12	100	

Based on Table 7, it can be seen that in mothers whose actions are not good in maintaining their children's oral health, 100% of their children have a level of oral hygiene in the poor category. While the mother's actions are quite good, the majority of their children's oral hygiene levels (67%) are in the adequate category. Mothers whose actions to maintain their children's oral health were in the good category, most of their children's oral hygiene levels (50%) were in the good category.

In the Fisher's Exact Test correlation analysis, the p-value = 0.000 was obtained. This shows that the mother's actions in maintaining the child's oral health are significantly related to the child's oral hygiene level.

DISCUSSION

The children's oral health is a factor that must be considered as early as possible because tooth decay at a child's age can affect tooth growth at a later age.

1. Factors that influence children's oral hygiene levels

The practice of oral hygiene by individuals is the most important preventive measure recommended, it also means that the individual has taken actual preventive measures, this oral hygiene practice can be carried out by individuals by brushing their teeth¹⁷. Brushing teeth functions to remove and disrupt the formation of plaque and debris, clean food residue stuck to the teeth, stimulate gingival tissue, and eliminate unwanted bad breath¹³. The behavior of brushing teeth in children must be carried out in everyday life without feeling forced. The ability to brush your teeth properly and correctly is an important factor for oral health care. The success of brushing your teeth is also influenced by the use of tools, the method of brushing your teeth, as well as the correct frequency and timing of brushing your teeth^{14,18}.

From an early age, elementary school students need to be educated to maintain healthy teeth. At the age of 10 - 12 years, children enter the beginning of the permanent dentition phase, although the change from primary teeth to permanent teeth is still ongoing, many permanent teeth have already emerged. At this age, they can grasp an understanding and can explain things realistically^{8,19}. Apart from that, at the age of 10-12 years they can be given responsibility for brushing their teeth. At the age of 10-12 years, they can brush their teeth systematically compared to the age group below²⁰. For this reason, oral health needs to be maintained from the start so that children have good permanent teeth.

Most students spend their daily time at home, not at school, so parents have an important role in growing and developing their children. In this case, parents play a nurturing role and provide understanding about the importance of getting used to brushing their teeth, providing examples of how to brush their teeth correctly, and telling them the right time to brush their teeth, parents must prepare the means for brushing their teeth²¹. This is to the theory put forward by Green regarding behavior change that one of the factors that influence a person's behavior is reinforcing factors, including social support, peer influence, and advice and feedback from health workers that will strengthen behavior²². One of the social supports is from parents because of their ignorance or ability and some parents have less time to supervise and communicate with their children, so children will choose sources of information from peers whose truth cannot be guaranteed.

2. Parental mentoring in students' teeth-brushing actions

Parents and family are the first social environments where a human interacts. Individuals learn not only by how they interact with their parents or other family members but also by seeing how their parents or family members interact

with them or how they interact with each other. Parents and other family members provide a model of life skills learned by the individual in the early years of life. Parents can play their role in improving good habits in brushing their teeth to prevent the high prevalence of dental caries in school-aged children^{3,23}. Parents' role, apart from supervising, is also to teach good habits and provide positive reinforcement or feedback when children implement good habits in caring for their teeth. Good habits in brushing teeth in children can be improved through teaching and reinforcing behavior from parents²⁴.

Parents must know how to care for their children's teeth and must care for their children's teeth and guide their children on how to brush their teeth properly. Successful dental care for children requires the participation of parents. The role of parents is as a figure and as a role model who will provide a good example for children in carrying out dental care. The role of parents is to guide, remind, and provide facilities so that children can maintain the cleanliness of their teeth and mouth²⁵. Apart from that, parents also play a role in preventing plaque and caries in children³. In this case, parents play an important role in paying attention to children's discipline towards their responsibility in maintaining healthy teeth. Preventing a child's dental caries requires the participation of parents and influences the maintenance of dental health and hygiene. The participation of parents is needed by school-aged children to prevent dental caries in children^{10,24}.

The cause of dental caries in children is a lack of supervision from parents when their children brush their teeth. Parents must teach personal hygiene actions of brushing their teeth before going to bed at night or brushing their teeth after waking up^{1,8}. Health education carried out by parents by teaching, and supervising when children brush their teeth shows that parents are considered responsive to children's teeth and mouth. The role of parents can be a motivation for children so that it becomes a supporting factor in the success of children's health²⁶. In this way, children's dental and oral health is maintained. The important role of parents in maintaining children's dental and oral health is so that child respondents are able and able to maintain good dental and oral health²¹. Another factor that can influence the success of children's dental health is the use of a toothbrush. So far, children rarely pay attention to the toothbrush they use and how to brush their teeth correctly. The role of parents is very necessary in providing a toothbrush that is appropriate for the child's age and demonstrating how to brush teeth correctly²⁷. Brushing techniques should be simple, understandable to the child, precise and efficient in a timely manner. Brushing your teeth in the wrong direction with too much pressure can cause tooth wear and gums to recede (gum recession)²⁸. Choosing a good toothbrush is one that is neither hard nor too soft, because toothbrush bristle tips that are too hard will injure the gums, making them susceptible to bleeding and abrasion of the tooth layer⁶.

3. The role of mothers in maintaining their children's oral hygiene

The basic health research 2018 shows that 75.0% of the Indonesian population has a history of dental caries with a prevalence level of dental severity with a national DMF-T Index of 4.6 (or 5 teeth per person)⁵. As many as 23.0% of the population were aware of problems with their teeth and mouth, and 30.0% of them received treatment or treatment from dental health professionals⁵. However, the rate of dental treatment is very low and there are many delays in treatment and most tooth decay ends in extraction. Preventing dental disease is very easy, one way is to maintain oral hygiene to remove plaque and bacteria by brushing your teeth regularly, after breakfast and dinner before bed.

A mother should have good knowledge, attitudes, and actions regarding dental and oral health to provide oral health education to her child⁴. Research by Suryawati, et al (2009) in Ciputat and Pasar Minggu Districts, Jakarta showed that 76.8% of mothers under five had little knowledge of their children's dental and oral health, 84.1% had a good attitude and 89.0% did not take enough action in business. maintaining children's dental health^{3,4}. The mother's knowledge, attitudes and actions towards maintaining oral and dental health will determine the future dental health status of her child. Starting to grow teeth is an important process of a child's growth. Parents must know how to care for their children's teeth and teach them how to care for them properly⁽²⁹⁾. Even though they still have milk teeth, a child must receive serious attention from their parents because they determine the growth of permanent teeth. However, many parents think that milk teeth are only temporary and will be replaced by permanent teeth, so they often think that damage to milk teeth due to poor oral hygiene is not a problem³⁰.

CONCLUSION

The majority of mothers' actions to maintain their children's oral health (47.1%) are in the sufficient category. Meanwhile, the school-age children's oral hygiene was mostly (49.4%) in the poor category. There is a significant relationship between maternal characteristics which include: education, occupation, family income, and the mother's actions in maintaining her child's oral hygiene. Meanwhile, the mother's age is not significantly related to the mother's actions. There is a significant relationship between the mother's actions in maintaining her child's oral health and the school-age children's oral hygiene.

DECLARATIONS

1. Conflict of Interest

There was no conflict of interest in this study.

2. Ethics approval

This series of research processes took place based on the Ethical Clearance given by the Health Research Ethics Commission of the Poltekkes Kemenkes Semarang for research with number No.549/EA/KEPK/2021. The obtained official letters were delivered to the Banjarmasin Education Authority.

3. Consent to participate

A letter explaining the purpose, method, and anticipated benefit of the study was attached to each questionnaire. Confidentiality was assured by indicating they were not requested to write their name on the questionnaire and by assuring that their responses would not in any way be linked to them.

4. Data availability

All data generated or analyzed during this study are included in this published article (and its supplementary information files).

5. Funding

This study was funded by the Poltekkes Kemenkes Semarang

6. Authorship

HN conceived and designed the analysis, ANP performed the analysis, LS wrote the manuscript, and contributed with analysis tools, and SS collected the data and wrote the manuscript.

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