



RESEARCH ARTICLE

# Factors Affecting the Level of Dental and Oral Cleanliness (OHI-S) Among Primary School Age Children at UPT SPF 111 KASSI BUTA KEC. Kajang District. Bulukumba

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ARTICLE INFO	ABSTRACT
Received: Oct 12, 2024	Oral hygiene is important for health but is often neglected, leading to caries and periodontal disease. Factors such as brushing habits, diet, knowledge, parental role, teacher support, and access to health services influence the dental hygiene of school-age children. Analyse the factors that influence the level of oral hygiene (OHI-S) in primary school students. This study used an analytical survey design with a cross-sectional approach conducted from August to October 2024. The study subjects included 54 fourth and fifth grade students selected by total sampling technique. Data were collected through a standardised questionnaire and dental examination. Data analysis used Chi-square test and logistic regression. A total of 35.2% of students had good dental hygiene, while 64.8% were at a moderate level. Factors significantly associated with dental hygiene were knowledge ( $p = 0.017$ ), tooth brushing action ( $p = 0.000$ ), the role of teachers ( $p = 0.044$ ), and access to health services ( $p = 0.037$ ). In contrast, attitude ( $p = 0.294$ ), diet ( $p = 0.655$ ), and the role of parents ( $p = 0.519$ ) showed no significant association. Logistic regression results showed that access to dental health services was the most influential factor, with an odds ratio (OR) of 8.0 (95% CI: 1.252-51.137, $p = 0.028$ ). Factors that influence students' dental hygiene include knowledge, brushing actions, the role of teachers, and access to health services. Future interventions need to emphasise school-based education and increased access to dental health services in the community.
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## INTRODUCTION

Health is an optimal physical, mental, spiritual, and social condition that enables individuals to live productive lives socially and economically. As an integral part of general health, oral health cannot be ignored. Oral health problems, such as tooth decay and periodontal disease, can cause functional and aesthetic impairment and affect overall health. The teeth and mouth are the entry point for various microorganisms into the body, so their hygiene has an important role in preventing various diseases (Uamei et al., 2023).

According to the Centers for Disease Control and Prevention (CDC), more than half of children and adolescents aged 12-19 years, as well as almost all adults, have experienced permanent tooth decay (Naavaal & Kelekar, 2018). In Indonesia, the 2018 Basic Health Research (Riskesdas) data showed an increase in the prevalence of oral problems from 25.9% in 2013 to 57.6% in 2018. The highest prevalence was found in the 5-9 years age group (54%), indicating the need for further preventive and educational strategies to reduce the rate. In addition, only 2.8% of Indonesians

brush their teeth properly, despite 94.7% doing so daily, indicating a gap in effective oral hygiene practices (Sarwendah et al., 2023).

The high prevalence of oral health problems is influenced by several factors, including suboptimal brushing habits, consumption of foods high in sugar, limited access to dental health services, and low public knowledge about the importance of oral hygiene (Ariyanto, 2019). Primary school-aged children are particularly vulnerable to this problem due to their high consumption of sugary foods and poor oral hygiene. The accumulation of plaque and food debris on the tooth surface is often the beginning of caries and periodontal disease (Larasati et al., 2022).

Environmental factors, such as the role of parents and teachers, also play an important role in maintaining children's dental health. Parents are expected to provide guidance, motivation, and facilities that support proper tooth brushing habits in children. In addition, teachers as educators have the responsibility to teach and monitor dental hygiene practices at school. Research shows that children who receive guidance and appreciation from teachers tend to be more motivated to maintain their oral hygiene (Rosmawati, 2022).

Assessment of oral hygiene can be done using the Oral Hygiene Index Simplified (OHI-S) index developed by Green and Vermillion. This index measures the level of oral hygiene based on the accumulation of debris and calculus on the teeth (Sidabutar et al., 2022). OHI-S is an important indicator to evaluate oral hygiene and the factors that influence it, such as tooth brushing attitudes and actions, diet, the role of parents and teachers, and access to dental health services.

Bulukumba Regency, especially in Kajang District, is an area that still faces great challenges in maintaining oral health. Based on the 2018 Riskesdas data, the proportion of dental problems in the population aged >3 years in Bulukumba reached 58.41%. This high number indicates the need for strategic efforts to improve oral health, especially in primary school-aged children who are vulnerable to this problem. Data from the Bulukumba District Health Office noted that in 2007 there were 3,498 cases of tooth extraction and 174 cases of dental fillings, indicating a high level of tooth decay in the region.

This study aims to explore and analyse factors that influence the level of oral hygiene (OHI-S) among primary school-aged children in UPT SPF 111 Kassi Buta, Kajang Sub-district, Bulukumba District, in 2024. By understanding these factors, it is hoped that more effective interventions can be designed to improve the oral health of children in the area, supporting the national caries-free Indonesia 2030 programme.

## **METHODOLOGY**

This study used an analytical survey method with a cross-sectional design. Data were collected using standardised questionnaires and screening sheets, which ensured the completeness and accuracy of the information obtained. The location of this study was UPT SPF 111 Kassi Buta, one of 45 primary schools in Kajang sub-district, which has a total of 170 students. The research was conducted from August to October 2024, including data collection, processing, and analysis. The study population included all grade IV and V students in the school, with a total of 54 students. The total sampling technique was used to include all students in the population as research subjects, resulting in accurate representation in the data analysis.

The variables studied include independent variables in the form of knowledge, attitudes, tooth brushing actions, diet, the role of parents and teachers, and access to dental health services. Meanwhile, the dependent variable measured was the level of oral hygiene based on the Oral Hygiene Index Simplified (OHI-S), which was categorised into good, moderate, and poor levels. Primary data was obtained from a questionnaire that collected information related to respondents' characteristics, tooth brushing habits, diet, and support from parents and teachers. Secondary data

included information related to the number of students and prevalence of oral health problems in Indonesia based on the 2018 Riskesdas report.

Validity and reliability tests were conducted to ensure the reliability of the research instruments. Validity was tested using Pearson correlation analysis with a significance level of  $p < 0.05$ , showing that all questionnaire items were valid because the calculated  $r$  value was greater than  $r$  table. Instrument reliability was measured using the Cronbach Alpha method, which resulted in Alpha values  $\geq 0.6$  on all variables, indicating that the instruments had good internal consistency. Data analysis was conducted using univariate, bivariate, and multivariate approaches. Univariate analysis was used to describe the distribution of data on each variable. Furthermore, bivariate analysis was conducted using the Chi-square test with a significance level of  $\alpha = 0.05$  to evaluate the relationship between independent and dependent variables. Multivariate analysis was performed using logistic regression to identify the variables that contributed the most to OHI-S scores.

This research has received approval from the Health Research Ethics Committee of the Faculty of Public Health, Hasanuddin University with number 1958/UN4.14.1/TP.01.02/2024. The research process was carried out in accordance with the principles of research ethics, including guaranteeing the confidentiality of respondents' data and ensuring safety during the research.

## RESULTS AND DISCUSSION

### RESULTS

Respondents in this study were fourth and fifth grade students of UPT SPF 111 Kassi Buta Kec. Kajang Kab. Bulukumba, totalling 54 students. Based on Table 1 regarding the characteristics of respondents, it is known that respondents aged 8 years were 3 people (5.5%), those aged 9 years were 12 people (22.2%), respondents aged 10 years were 25 respondents (46.3%), respondents aged 11 years were 9 people (16.6%) and respondents aged 12 years were 5 people with a percentage (9.2%).

**Table 1 Distribution of Respondents' Characteristics**

Respondent Characteristics	n=54	Percentage (%)
Age (years)		
8 Years	3	5,5
9 Years	12	22,2
10 Years	25	46,3
11 Years	9	16,6
12 Years	5	9,2
Gender		
Male	31	57,4
Women	23	42,6

*In general, the respondents in this study were male as many as 31 people with a percentage of (57.4%) and 23 women (42.6%).*

**Table 2 Frequency and Percentage Distribution of Factors Affecting Dental and Oral Hygiene (OHI-S) in Students**

Variables	Description	Frequency (n)	Percentage (%)
Dental Hygiene and	Medium	35	65

<b>Mouth (OHI-S)</b>			
	Good	19	35
	<b>Total</b>	54	100
<b>Tooth Brushing Knowledge</b>	Bad	13	24
	Good	41	76
	<b>Total</b>	54	100
<b>Tooth Brushing Attitude</b>	Bad	13	24
	Good	41	76
	<b>Total</b>	54	100
<b>Tooth Brushing Action</b>	Bad	19	35
	Good	35	65
	<b>Total</b>	54	100
<b>Diet</b>	Bad	2	4
	Good	52	96
	<b>Total</b>	54	100
<b>Teacher's role</b>	Low	18	33.3
	High	36	66.7
	<b>Total</b>	54	100
<b>The Role of Parents</b>	Low	4	7
	High	50	93
	<b>Total</b>	54	100
<b>Access to Dental Health Services</b>	Bad	15	28
	Good	39	72
	<b>Total</b>	54	100

The majority of students had moderate oral hygiene (64.8%), while only 35.2% had good dental hygiene. In terms of tooth brushing knowledge, most students had good knowledge (75.9%), but there were 24.1% whose knowledge was considered poor. The same was also seen in the attitude towards tooth brushing, with 75.9% of students showing a good attitude, while the other 24.1% had a poor attitude. In terms of tooth brushing action, most students (64.8%) performed the correct action, although another 35.2% still showed bad habits. For diet, most students (96.3%) had a good diet, while only 3.7% had a poor diet. Support from parents was also significant, with 92.6% of students having a high parental role, potentially supporting good dental hygiene, while only 7.4% had a low parental role. Access to dental health services was also quite good, with 72.2% of students having good access, although another 27.8% faced limitations (Table 2).

**Table 3 Relationship between factors affecting dental hygiene in students**

Category	Moderate Dental Hygiene		Good Dental Hygiene		Total		p-value
	n	%	n	%	n	%	
<b>Knowledge</b>							0.017
Bad	12	22.20%	1	1.90%	13	24.10%	
Good	23	42.20%	18	33.30%	41	75.90%	
<b>Attitude</b>							0.294
Bad	10	18.50%	3	5.60%	13	24.10%	
Good	25	46.30%	16	29.60%	41	75.90%	
<b>Action</b>							0
Bad	19	35.20%	0	0%	19	35.20%	

Good	16	29.60%	19	35.20%	35	64.80%	
<b>Diet</b>							0.655
Bad	1	1.90%	1	1.90%	2	3.70%	
Good	34	63%	18	33.30%	52	96.30%	
<b>Teacher's role</b>							0.044
Low	15	27.80%	3	5.60%	18	33.30%	
High	20	37%	16	29.60%	36	66.70%	
<b>The Role of Parents</b>							0.519
Low	2	3.70%	2	3.70%	4	7.40%	
High	33	61.10%	17	31.50%	50	92.60%	
<b>Access to Health Services</b>							0.037
Bad	13	24.10%	2	3.70%	15	27.80%	
Good	22	40.70%	17	31.50%	39	72.20%	

The relationship between factors affecting dental hygiene can be seen in Table 3 where good knowledge is associated with better dental hygiene ( $p = 0.017$ ), while attitude has no significant effect ( $p = 0.294$ ). Good tooth brushing action was strongly associated with better dental hygiene ( $p = 0.000$ ). Diet had no significant effect ( $p = 0.655$ ), but high teacher role increased good dental hygiene ( $p = 0.044$ ). Parental role was not significant ( $p = 0.519$ ), while good access to health services was associated with better dental hygiene ( $p = 0.037$ ).

Based on the results of the relationship between the above factors, multivariate analysis tests can be carried out, namely tooth brushing knowledge, actions, access to health services and the role of teachers (Tabel 4).

**Table 42 Multivariate Test Results**

Variables	B	W	Adj. OR	95%CI	P-Value
Tooth Brushing Knowledge	2,367	3,788	10,667	0,984-115,683	0,052
Tooth Brushing Action	21,266	0,000	17208	0,000	0,988
Access to Health Services	2,079	4,827	8,000	1,252-51,137	0,028

The variable that affects dental hygiene is access to health services. Access to health services has a p-value of 0.028 ( $<0.05$ ) with OR = 8.000 (95% CI 1.252 - 51.137), indicating that students who get adequate dental hygiene have a chance of 8.000 times to get access to health services compared to students who do not get health access. The table above also shows that the access to health services variable is the most influential independent variable on oral hygiene (OHI-S) of students at UPT SPF 111 Kassi Buta Kec. Kajang Kab. Bulukumba Year 2024. with an OR value of 8,000.

## DISCUSSION

Knowledge is the basis for behaviour. A person is said to lack knowledge if in a certain condition they are unable to recognise, explain and analyse a situation. This affects awareness of the importance of maintaining oral hygiene. Research shows that good knowledge about dental health can encourage individuals to maintain better dental hygiene. At UPT SPF 111 Kassi Buta, students with good knowledge reached 75.9%, indicating that they understand how to brush their teeth properly. However, despite this high level of knowledge, the habit of brushing teeth properly is still not optimal.

This is in line with L. Green's theory which states that knowledge is an internal factor that influences behaviour, but knowledge alone is not enough to change a person's habits or behaviour. Good knowledge must be supported by other external factors, such as ingrained habits and self-motivation to act. Previous research conducted at SMPN 3 Selemadeg Timur Tabanan also showed that although students' knowledge of dental hygiene was quite good, their dental hygiene was still in the moderate category (Arifin Senjaya & Adi Tresna Yasa, 2019).

Attitude is a person's internal reaction or response to an object or stimulus. A positive attitude towards dental health can encourage good behaviour in maintaining oral hygiene. However, in reality, positive attitudes are not always reflected in optimal real actions. This study shows that tooth brushing attitude does not have a significant relationship with oral hygiene (OHI-S). The analysis results show a P value of 0.294, which means that there is no relationship between attitude and dental hygiene. These results are in line with research conducted by Zikri et al. (2019) who also found no relationship between attitudes towards dental hygiene and OHI-S results. A good attitude towards dental hygiene often has no direct effect on proper brushing habits, mainly due to habits formed since childhood and environmental factors. Although a person knows that brushing twice a day is a good habit, the habit may not be practised due to lack of encouragement or reminders. Habit and environmental factors, such as routines formed at home or school, play an important role in dental hygiene habits.

The act of brushing teeth is the most obvious aspect of maintaining oral hygiene. This study shows that the act of brushing teeth has a significant relationship with oral hygiene ( $p = 0.000$ ). These results support the findings by Liana & Arbi (2019), who stated that real action in maintaining dental hygiene is very important. Although a person has good knowledge and attitudes about dental health, good brushing habits do not necessarily occur without real action. The act of brushing regularly, especially before bed and after meals, contributes to better dental hygiene. Therefore, there needs to be an effort to turn knowledge and attitudes into more consistent actions in daily life.

Diet is a factor that is often associated with oral hygiene. Several studies have shown that a high sugar diet can lead to decreased dental hygiene and increase the risk of dental caries. However, this study showed that there was no significant relationship between diet and dental hygiene ( $p = 0.655$ ). This result may be influenced by other factors, such as eating habits at home, brushing habits after meals, and parental supervision of children's dental hygiene habits. Research by Mahriani et al. (2022) also found that even though the diet is good, it does not always indicate good dental health status. This suggests that healthy eating behaviour alone is not enough to guarantee good dental health if the habit of brushing teeth is not implemented regularly.

The role of teachers in maintaining students' dental health is very important, especially in educating and guiding students to form healthy habits. Teachers not only provide material on the importance of maintaining dental hygiene through health lessons, but also act as good behavioural examples for students. Supervision of students' tooth brushing habits at school can ensure that students implement these healthy habits. However, this study shows that the role of teachers in maintaining students' dental health at UPT SPF 111 Kassi Buta is still lacking, with analysis showing a P value of 0.044 which indicates a relationship between the role of teachers and students' dental hygiene. This finding is in line with research conducted by Pay et al. (2021) which shows that the role of the teacher has a significant influence on students' dental hygiene behaviour. Teachers as facilitators can help raise students' awareness about the importance of maintaining dental hygiene, as well as provide facilities to support healthy habits such as providing toothbrush facilities at school or holding dental examinations at school.

In addition, access to dental health services also plays an important role in maintaining oral hygiene. Previous studies have shown that lack of access to dental health facilities can hinder optimal dental care efforts. The results of this study showed that there was a significant relationship between access

to health services and students' dental hygiene ( $p = 0.037$ ). This suggests that students who have limited access to dental health services are less likely to have regular dental check-ups. Research by Sri Muria Ningsih (2018) also showed that primary school students tend not to visit dental health facilities even though they have dental health problems such as cavities or toothache. Decreased access to dental health services is often related to socioeconomic factors and lack of encouragement from parents to have their children's teeth checked. Therefore, it is important for schools and communities to work together to improve access to dental health services to support better dental hygiene habits.

## LIMITATIONS OF THE STUDY

In this study, researchers were able to identify obstacles or limitations in conducting research, namely in this study when examining OHI-S students, many students were not cooperative because they thought that tooth extraction would be carried out but with repeated explanations delivered by researchers so that students already understood better. At the time of filling out the questionnaire, the respondents were grade IV and V students in elementary school, and the sitting position was close together in one class so that when filling out the questionnaire it was possible for respondents to see the answers of other respondents. There are also some students who are still not fluent in reading so they are assisted by researchers and their classmates. The researcher's efforts in supervising the questionnaire filling have been carried out, but due to the condition of the room and the respondents who are still children, the respondents are still difficult to manage.

## CONCLUSIONS

Based on the results of research at UPT SPF 111 Kassi Buta, Kajang District, Bulukumba Regency, it was found that tooth brushing knowledge has an effect on oral hygiene (OHI-S) in elementary school students, while tooth brushing attitude did not show a significant effect. The act of brushing teeth was shown to have a positive influence on oral hygiene, while diet had an effect although not always significant. The role of teachers also had an effect on dental hygiene, with teachers providing education and good examples, although the role of parents did not show a significant effect. The most influential factor on dental hygiene is access to dental health services, which encourages students to take care of their teeth more regularly.

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