

Assessing Dental Health Knowledge and Care Behavior Among School Children in Banjar City, Indonesia

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ABSTRACT

Background: The prevalence of dental caries among school-aged children has been increasing annually, posing a significant public health concern. One of the key factors contributing to this issue is children's knowledge of oral and dental health. Poor oral hygiene and inadequate dental care knowledge are among the primary causes of oral health problems in children, leading to a higher risk of dental caries and other oral diseases. **Objective:** This study aims to examine the relationship between dental health knowledge and dental care behavior among school-aged children at SDN 1 Jajawar, Banjar City. **Methods:** A descriptive-analytical study with a cross-sectional design was conducted among fifth- and sixth-grade students aged 10 to 12 years at SDN 1 Jajawar. Data were collected using a structured questionnaire consisting of 36 items, designed to assess students' knowledge of dental health and dental care behaviors. **Results:** The findings revealed that 93.1% (n=54) of respondents demonstrated a low level of dental health knowledge and exhibited negative dental care behavior. This indicates a significant gap in awareness and practices related to oral hygiene among school-aged children. **Conclusion:** The study highlights the urgent need for enhanced education and intervention programs to improve children's knowledge of dental health and promote better oral hygiene practices. Strengthening oral health education at an early age is crucial in preventing dental caries and fostering lifelong positive dental care behaviors. **Keywords:** Dental caries, oral health knowledge, dental care behavior, school-aged children, oral hygiene, dental health education.

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ABSTRAK

Latar Belakang: Prevalensi karies gigi pada anak usia sekolah mengalami peningkatan setiap tahun, sehingga menjadi masalah kesehatan masyarakat yang signifikan. Salah satu faktor utama yang berkontribusi terhadap masalah ini adalah tingkat pengetahuan anak mengenai kesehatan gigi dan mulut. Kebersihan mulut yang buruk serta kurangnya pemahaman tentang perawatan gigi merupakan penyebab utama masalah kesehatan gigi pada anak, yang meningkatkan risiko terjadinya karies gigi dan penyakit oral lainnya. **Tujuan:** Penelitian ini bertujuan untuk meneliti hubungan antara tingkat pengetahuan kesehatan gigi dengan perilaku perawatan gigi pada anak usia sekolah di SDN 1 Jajawar, Kota Banjar. **Metode:** Penelitian ini menggunakan metode deskriptif-analitik dengan desain cross-sectional, yang dilakukan pada siswa kelas V dan VI di SDN 1 Jajawar yang berusia 10 hingga 12 tahun. Data dikumpulkan menggunakan kuesioner terstruktur yang terdiri dari 36 butir pertanyaan, yang dirancang untuk mengukur pengetahuan siswa tentang kesehatan gigi serta perilaku perawatan gigi mereka. **Hasil:** Hasil penelitian menunjukkan bahwa 93,1% (n=54) responden memiliki tingkat pengetahuan kesehatan gigi yang rendah dan menunjukkan perilaku perawatan gigi yang kurang baik. Temuan ini mengindikasikan adanya kesenjangan yang signifikan dalam kesadaran dan praktik kebersihan mulut pada anak usia sekolah. **Kesimpulan:** Studi ini menekankan pentingnya peningkatan edukasi dan program intervensi untuk meningkatkan pengetahuan anak-anak tentang kesehatan gigi serta mendorong praktik kebersihan mulut yang lebih baik. Penguatan pendidikan kesehatan gigi sejak usia dini sangat penting untuk mencegah karies gigi dan membentuk perilaku perawatan gigi yang positif sepanjang hidup.

Kata Kunci: Karies gigi, pengetahuan kesehatan gigi, perilaku perawatan gigi, anak usia sekolah

1. Introduction

The human body functions as a complex ecosystem that interacts with a wide range of microorganisms. These microorganisms coexist within the body and require a balanced environment to prevent them from becoming pathogenic and causing diseases.¹ Among the many ecosystems within the body, the oral cavity is one of the most dynamic, requiring special attention due to its constant exposure to external factors.² The presence of saliva, pH fluctuations, and dietary habits creates an ideal environment for the proliferation of bacteria, fungi, and viruses.³

The moist and warm environment of the oral cavity provides optimal conditions for microbial growth. Under normal conditions, bacteria and fungi such as *Streptococcus mutans* and *Candida albicans* exist as part of the natural microbiota.³ However, imbalances in the oral microbiome – often caused by poor oral hygiene, dietary factors, or inadequate dental care – can lead to the transformation of these microorganisms into pathogens, contributing to various oral health problems.⁴ One of the most common consequences of poor oral hygiene is dental caries, which is characterized by plaque and calculus buildup and, in some cases, fungal infections such as oral thrush.⁵

Maintaining good oral health is essential for all individuals, particularly children, who are more vulnerable to dental diseases.⁶ The prevention of dental caries and other oral health issues relies on effective dental hygiene practices and a strong foundation of oral health knowledge. Educating children about oral health from an early age fosters an awareness of its importance and encourages lifelong oral hygiene habits. Children acquire oral health knowledge primarily from their immediate environment, with parents playing a crucial role in shaping their awareness and daily practices. Proper oral hygiene should be instilled early, including brushing teeth in the morning after breakfast and at night before bed.⁷ Additionally, preventive measures such as avoiding milk consumption after brushing and discouraging children from sleeping with a bottle overnight help reduce the risk of early childhood caries.⁸

As children grow, their understanding of oral health should develop progressively. Educating them in simple and relatable terms ensures they grasp the significance of oral hygiene.⁹ For instance, children should be taught that not brushing their teeth regularly and prolonged use of a feeding bottle at night can result in cavities, leading to pain and discomfort. The 2018 Riset Kesehatan Dasar (RISKESDAS) reported that 93% of Indonesian children suffer from dental caries, indicating a widespread public health concern.¹⁰ Dental caries is a bacterial infection that leads to demineralization of tooth enamel, ultimately causing cavities and, if left untreated, further dental complications.

The prevalence of oral health issues among children is closely linked to behavioral factors and a lack of awareness regarding proper oral hygiene practices.¹¹ Poor knowledge of dental care leads to insufficient efforts in maintaining oral health, which can result in long-term consequences such as chronic dental infections and compromised overall health.¹² On the other hand, children with greater oral health knowledge tend to develop a higher level of awareness and commitment to maintaining good oral hygiene.¹³

Given the high prevalence of dental caries among school-aged children, it is essential to investigate the role of dental health knowledge and its influence on dental care behavior.¹⁴ Understanding this relationship can provide insights into the effectiveness of current oral health education programs and help identify areas for improvement in preventive dental care strategies. This study aims to assess the relationship between dental health knowledge and dental care behavior among school-aged children at SDN 1 Jajawar, Banjar City. The findings of this research are expected to highlight the importance of early oral health education and contribute to better oral hygiene promotion efforts in schools and communities.

2. Material and Methods

2.1. Study Design

This study employed a descriptive-analytical approach with a cross-sectional design to assess the relationship between knowledge levels of dental health and dental care behavior among school-aged children at SDN 1 Jajawar, Banjar City. The research was conducted on May 22, 2024, at SDN 1 Jajawar.

2.2. Study Population and Sampling

The study population consisted of fifth- and sixth-grade students aged 10 to 12 years at SDN 1 Jajawar during the 2024 academic year. The total sampling technique was used, including all

students who met the inclusion criteria, resulting in a total of 58 respondents. The inclusion criteria included students who were actively enrolled in the school, present on the day of data collection, and willing to participate in the study. The exclusion criteria consisted of students who were absent or unwilling to provide informed consent.

2.3. Data Collection

Data were collected using a structured questionnaire containing 36 items, which was divided into two main sections. The first section, Knowledge of Dental Health, consisted of 19 questions designed to assess students' understanding of healthy teeth, the causes and consequences of dental health problems, common dental diseases, and proper dental care practices. The second section, Dental Care Behavior, included 17 questions evaluating students' brushing habits, dietary behavior, fluoride use, and the frequency of dental checkups. The questionnaire was administered in person at the school, and students completed it under supervision to ensure clarity in their responses and minimize potential misunderstandings.

2.4. Data Analysis

The collected responses were manually processed and analyzed using descriptive statistics. Data were presented in tables and percentage distributions to illustrate patterns and relationships between dental health knowledge and dental care behavior.

2.5. Ethical Considerations

This study adhered to ethical research principles and obtained approval from the appropriate ethical committee. Participation was voluntary, and informed consent was obtained from both students and school authorities before data collection. Confidentiality of personal information was maintained throughout the study.

3. Result and Discussion

Table 1 presents the distribution of respondents based on age, categorizing them into three age groups: 10, 11, and 12 years old. The data indicate that the majority of respondents (51.7%) were 11 years old, followed by 46.6% who were 12 years old, while only 1.7% were 10 years old. The total number of respondents was 58, representing the full sample of fifth- and sixth-grade students at SDN 1 Jajawar. The dominance of the 11- and 12-year-old groups is expected, as these ages align with the typical range for students in the later years of elementary school. The low proportion of 10-year-old respondents suggests that younger students were underrepresented, likely due to differences in grade levels or student enrollment variations.

From a developmental perspective, children in the 11-12 age range are at a critical stage where they begin to develop greater autonomy in their hygiene habits, including oral health practices. According to a study by Haleem et al. (2012), children in this age group are significantly influenced by school-based health education programs and peer interactions, which shape their understanding of dental hygiene and care routines.¹⁵ Another study by Badri et al. (2014) found that dental health knowledge among children improves with age, but behavioral adherence to proper oral hygiene does not always follow the same trend, emphasizing the need for continued reinforcement through parental and school support.¹⁶

Furthermore, the age distribution in this study aligns with findings from the Indonesian Riset Kesehatan Dasar (Riskesdas) 2018, which reported a high prevalence of dental caries among Indonesian children aged 10-12 years, reaching approximately 76.2%.¹⁷ This suggests that children in this age group are highly susceptible to oral health problems, making them an essential target for preventive interventions. Research by Ngo et al. (2008) also highlights that children aged 10-12 are at an optimal stage for implementing behavioral interventions, as they are beginning to take more responsibility for their personal hygiene but still require external guidance from parents and educators.¹⁸

The predominance of 11- and 12-year-old respondents in this study underscores the importance of targeting oral health education programs toward this demographic. As children in this age range transition to adolescence, their dental care habits become more independent, making it essential to instill good oral hygiene practices early. Given the high prevalence of poor dental hygiene and caries risk in this age group, comprehensive school-based and parental interventions are crucial for fostering lifelong healthy behaviors. Future research should explore whether structured oral health

education programs can significantly improve long-term compliance with proper dental hygiene among children in this developmental stage.

Table 1. Respondent Characteristics by Age

Age (years)	Total (n)	Percentage (%)
10	1	1,7%
11	30	51,7%
12	27	46,6%
Total	58	100%

Data Source, 2024

Table 2 presents the gender distribution of respondents at SDN 1 Jajawar. The data indicate that the majority of respondents were female (58.6%), while male respondents accounted for 41.4%. The total number of respondents was 58, representing a balanced yet slightly female-dominated sample. The higher percentage of female respondents suggests that there were more girls than boys in the studied classes or that female students were more willing to participate in the survey.

A similar trend has been observed in previous studies on oral health awareness, where female students tend to be more engaged in health-related research and exhibit a greater interest in dental care. According to a study by Ostberg et al. (1999), girls generally demonstrate better oral health awareness and more consistent hygiene practices than boys.¹⁹ This is often attributed to higher health-conscious behavior and greater adherence to hygiene routines among females compared to males.

Additionally, research by Tadin et al. (2022) found that female students tend to brush their teeth more frequently, have a higher awareness of oral hygiene practices, and visit dentists more regularly than male students.²⁰ The study suggests that girls may be more receptive to oral health education and preventive care programs, which could explain their better dental health outcomes. This gender disparity in oral health behavior is also supported by research conducted by Austregesilo et al. (2019), which highlights that males are generally less concerned with preventive dental care and are more likely to engage in riskier oral behaviors, such as irregular brushing and higher consumption of sugary foods.²¹

The findings of this study align with national data from the Riset Kesehatan Dasar (Riskesdas) 2018, which indicate that dental caries prevalence is slightly higher among male children compared to females, further emphasizing the need for targeted interventions to improve oral hygiene behaviors among boys. Boys often display a more relaxed attitude towards dental care and are less likely to follow recommended oral hygiene practices.²² This suggests that while both genders require adequate oral health education, male students may benefit more from structured school-based interventions that emphasize the importance of preventive dental care.

The gender distribution in this study highlights the need for tailored oral health education programs that consider behavioral differences between male and female students. Since girls already exhibit relatively better oral health awareness, interventions should focus on reinforcing these positive habits while addressing gaps in male students' oral health practices. Future research should further explore gender-specific barriers to oral health adherence to develop targeted educational strategies that effectively improve dental hygiene behavior in both groups.

Table 2. Respondent Characteristics by Gender

Gender	Total (n)	Percentage (%)
Male	24	41,4%
Female	34	58,6%
Total	58	100%

Data Source, 2024

Table 3 presents the summary of questionnaire scores assessing respondents' knowledge of dental health. The data show the percentage of correct and incorrect responses for each of the 19 knowledge-based questions. The results highlight significant variations in the level of knowledge among students, with some questions achieving a high percentage of correct responses, while others reflect a considerable lack of understanding.

The findings indicate that several questions had a near-perfect accuracy rate, particularly questions 1, 2, and 3, where 100% of respondents answered correctly. This suggests that fundamental knowledge about oral health, such as the importance of brushing teeth and recognizing healthy teeth, is well understood by all students. Similarly, questions 5 and 6 also showed high correct response

rates (98.2%), indicating that students have strong awareness in certain areas of dental care. This aligns with research by Al-Omiri et al. (2021), which found that school-aged children tend to be more familiar with basic oral hygiene principles, especially those emphasized in school health education programs. However, some questions revealed a substantial knowledge gap.²³ For instance, question 7 had only 15.5% correct responses, meaning that 84.5% of students did not understand the concept being tested. Likewise, questions 10, 15, and 17 had notably low correct response rates (10.3%, 8.6%, and 3.5%, respectively), indicating serious deficiencies in specific areas of oral health knowledge. These findings are consistent with a study by Poudel et al. (2018), which reported that while children may understand general oral hygiene practices, they often lack deeper knowledge regarding the causes of dental diseases, preventive measures, and long-term oral health maintenance.²⁴

Additionally, the mixed response patterns observed in Table 3 suggest that students may not fully comprehend the impact of poor oral health habits on dental diseases. For example, question 14, which had only 32.7% correct responses, and question 18, with 17.2% correct responses, indicate that a significant portion of students may not understand the risk factors for dental caries. This aligns with findings from research by Tadin et al. (2022), which showed that many children are not aware of how dietary choices, irregular brushing, and lack of dental checkups contribute to oral health issues. Interestingly, questions 9 and 12, which assess mid-level knowledge, showed moderate correct response rates (58.2% and 63.7%, respectively).²⁵ This suggests that while some students possess a fair understanding of oral health concepts, a considerable number still struggle with certain details, necessitating further education and reinforcement of proper dental care habits. This is supported by research from Ponce-Gonzales et al. (2019), which emphasizes the importance of interactive and engaging oral health education to improve children's retention and practical application of knowledge.²⁶

Table 3. Summary Scores of Knowledge Questionnaire Number

Knowledge Questionnaire Number	Percentage (%)	
	Correct	Incorrect
1	100	0
2	100	0
3	100	0
4	94,8	95,2
5	98,2	1,8
6	98,2	1,8
7	15,5	84,5
8	96,5	3,5
9	58,2	41,8
10	10,3	89,7
11	87,9	12,1
12	63,7	37,3
13	96,5	3,5
14	32,7	67,3
15	8,6	91,4
16	50	50
17	3,5	96,5
18	17,2	82,8
19	75,8	24,2

The findings in Table 3 highlight the need for more targeted oral health education interventions. Although students demonstrated strong knowledge in fundamental areas, there are significant gaps in their understanding of preventive oral care, the impact of dietary habits, and the consequences of poor oral hygiene. The results suggest that current educational approaches may not be fully effective in addressing all aspects of dental health. Research by Deshpande et al. (2020) recommends that oral health education should be integrated into school curriculums in a more interactive and engaging manner, such as through hands-on demonstrations, role-playing, and digital media tools to improve retention and behavioral adoption.²⁷

Moreover, the disparities in knowledge scores indicate that oral health promotion programs should be tailored based on students' specific weaknesses. For example, more emphasis should be placed on explaining how sugar consumption affects dental caries, the importance of regular dental checkups, and the consequences of neglecting oral hygiene. This is crucial, as studies have shown that early education on these topics significantly reduces the prevalence of dental caries in children.²⁸ Additionally, these findings suggest that parental involvement in oral health education should be

strengthened. Research by Saccomanno et al. (2023) states that children whose parents actively educate and monitor their oral hygiene tend to have better knowledge and healthier dental habits. Schools could implement family-centered oral health programs, where parents receive guidance on reinforcing proper dental care practices at home.²⁹

Table 4 presents the summary scores of the behavior questionnaire, evaluating respondents' dental care habits. The table categorizes responses into four frequency levels: never, sometimes, often, and always, which measure the consistency of oral hygiene behaviors among school-aged children at SDN 1 Jajawar. The results indicate a wide variation in oral health practices, with some behaviors being consistently followed, while others show inconsistent adherence.

The data reveal both positive and negative patterns in students' dental care behavior. Certain behaviors, such as brushing teeth regularly and rinsing the mouth after meals, showed a higher percentage of "always" responses, suggesting that a portion of students demonstrate good oral hygiene habits. For instance, question 5 (67.2%), question 9 (58.6%), and question 12 (63.8%) indicate that a significant number of respondents consistently engage in proper oral hygiene. This aligns with findings by Nazir et al. (2018), which state that children who are exposed to oral health education early in school and at home tend to develop more consistent brushing habits.³⁰

However, some behaviors exhibited low adherence rates, with a high percentage of students answering "never" or "sometimes" for certain oral hygiene activities. For example, question 2 (87.9%) and question 13 (75.9%) show that a large proportion of students do not consistently follow recommended oral health practices. This suggests that while students may be aware of the importance of dental care, many fail to apply this knowledge consistently in their daily routines. Research by Erwin et al. (2022) supports this, indicating that children often struggle to translate oral health knowledge into regular practice without parental supervision and reinforcement. Additionally, behaviors related to dental visits and preventive care show particularly concerning trends.³¹ Questions 14, 16, and 17 report high percentages of "never" responses (36.2%, 27.6%, and 36.2%, respectively), indicating that many students do not visit the dentist regularly or seek preventive dental care. This is consistent with findings from Kumar et al. (2020), which emphasize that children often perceive dental visits as necessary only when experiencing pain, rather than as a preventive measure. A lack of routine check-ups increases the likelihood of undetected dental issues, leading to a higher risk of cavities and oral infections.

Table 4. Summary Scores of Behavior Questionnaire Number

Behavior Questionnaire Number	Percentage (%)			
	Never	Sometimes	Often	Always
1	10,3	86,2	3,4	
2	87,9	6,9	3,4	
3	1,7	29,3	34,5	34,5
4	1,7	44,8	31,0	22,4
5	0	0	32,8	67,2
6	8,6	44,8	31,0	15,5
7	37,9	29,3	10,3	22,4
8	0	25,9	27,6	46,6
9	0	10,3	31,0	58,6
10	0	34,5	36,2	29,3
11	1,7	3,4	41,4	53,4
12	1,7	13,8	20,7	63,8
13	5,2	75,9	10,3	8,6
14	36,2	62,1	1,7	0
15	6,9	56,9	25,9	10,3
16	27,6	62,1	10,3	0
17	36,2	62,1	1,7	0

Another concerning behavior is inconsistent brushing habits. Question 7 (37.9%) and question 15 (56.9%) reveal that a substantial number of students only brush their teeth occasionally or not at all. This aligns with research by Fulk et al. (2024), which found that many school-aged children fail to maintain a consistent oral hygiene routine, particularly when unsupervised.³² The study also noted that boys were more likely to skip brushing compared to girls, highlighting potential gender differences in oral care habits. The results highlight a significant gap between oral health knowledge and its application in daily habits. While some students maintain good dental care behaviors, a considerable portion fail to engage in consistent oral hygiene practices. These findings suggest a need for enhanced oral health education programs, both at school and at home, to reinforce positive

behaviors. According to Ismail et al. (2024), effective school-based interventions, such as supervised brushing programs and interactive learning activities, can significantly improve children's adherence to oral hygiene practices.³³

Parental involvement is crucial in addressing inconsistencies in children's oral care routines. Research by Heller et al. (2024) found that children whose parents actively monitor and encourage dental care are more likely to maintain proper oral hygiene. Schools could implement family-oriented health education programs, where parents receive guidance on how to reinforce proper oral habits at home.³⁴ Furthermore, improving access to dental check-ups and preventive care is essential. The data indicate low dental visit frequency, which suggests that students and parents may lack awareness of the importance of routine check-ups. Public health campaigns and collaborations with local dental clinics could help promote free or affordable preventive dental care services for children, as suggested.³⁵

Future research should explore how dental health awareness evolves across different educational levels and whether gender differences affect oral health education outcomes. Studies should assess the effectiveness of interactive learning, digital tools, and hands-on demonstrations in improving knowledge and sustaining behavioral changes. The role of parental involvement and school-based interventions, such as supervised brushing programs and routine dental check-ups, should also be examined. Addressing these gaps requires tailored interventions and long-term studies to develop evidence-based policies for improving oral health education and preventive strategies in schools and communities.

4. Conclusion

This study found that school-aged children at SDN 1 Jajawar have low levels of dental health knowledge, which correlates with inconsistent oral hygiene practices. While some students maintain proper dental care, many neglect preventive measures such as regular tooth brushing and dental visits. To improve oral health behavior, stronger school-based education programs and increased parental involvement are essential. Schools should implement interactive learning, supervised brushing, and routine check-ups, while public health initiatives should promote better access to preventive dental care. Bridging the gap between knowledge and practice through targeted education and intervention programs is crucial to fostering long-term oral hygiene habits in children.

5. Research Limitations

This study has several limitations that should be considered. It was conducted in a single elementary school, limiting the generalizability of the findings to other schools or regions with different socio-economic and cultural backgrounds. The use of self-reported questionnaires may have introduced social desirability and recall bias, as students might have provided responses they perceived as correct rather than reflecting their actual habits. Additionally, the cross-sectional design prevents the establishment of causality between dental health knowledge and oral hygiene behavior. The study also did not account for external factors such as parental influence, school policies, access to dental care, and socioeconomic status, which may significantly impact children's oral health practices. Future research should incorporate a larger and more diverse sample, longitudinal approaches, and additional influencing factors to provide a more comprehensive understanding of oral hygiene behaviors in children.

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Authors Contribution

Contribution	Ayudhia B	Baiin YPW	Putri AN	TJU SN	Sihombing JS	Abigayl I	Apriani A
Concepts or ideas	√				√	√	
Design		√	√				
Definition of intellectual content	√			√	√	√	√
Literature search		√	√	√	√	√	√
Experimental studies	√		√	√	√	√	√
Data acquisition	√	√		√	√	√	√
Data analysis	√		√				
Statistical analysis	√			√	√	√	√
Manuscript preparation	√	√	√	√	√	√	√
Manuscript editing	√	√		√	√	√	√
Manuscript review	√	√	√	√	√	√	√



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