

Research Article

Knowledge of Dental Oral Health and Children's Dental Hygiene In Sapen Elementary School, Yogyakarta

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ABSTRACT

Introduction: Children often experience dental and oral health problems. Dental and oral hygiene are very important factors in maintaining dental and oral health and preventing various diseases in the oral cavity. Knowledge about dental and oral health is fundamental to maintaining dental hygiene. This study examined the relationship between the level of dental and oral health knowledge and the dental hygiene of children at Muhammadiyah Sapen Elementary School, Yogyakarta.

Materials and Methods: This study utilized an observational analytical method with a cross-sectional design. Subjects were recruited using stratified sampling. Children's dental hygiene examinations were conducted using the OHI-S index. Knowledge levels were measured using a questionnaire with the Guttman scale, and the relationship between variables was analyzed using the Spearman correlation test.

Results and Discussion: The level of knowledge about dental and oral health was in the good category at 14.71%, moderate at 61.76%, and poor at 23.53%. Dental hygiene status was good at 14.71%, moderate at 64.71%, and poor at 20.58%. The Spearman correlation test obtained $p = 0.01$ ($p < 0.05$) with a correlation coefficient of 0.538, indicating a significant positive relationship between knowledge and dental hygiene.

Conclusion: There is a significant relationship between the level of knowledge about dental and oral health and children's dental hygiene at Muhammadiyah Sapen Elementary School, Yogyakarta.

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INTRODUCTION

Oral health is an integral component of overall health and well-being and is inseparable from general health. The World Health Organization defines oral health as a key indicator of general health, quality of life, and well-being, encompassing the ability to speak, smile, taste, chew, swallow, and express emotions without pain, discomfort, or disease. Oral health is characterized by the absence of dental caries, tooth loss, periodontal disease, oral infections, and other chronic conditions affecting the oral cavity and craniofacial complex that may impair functional, psychological, and social well-being.¹ Despite advances in preventive care, oral diseases remain a major public health challenge in Indonesia. Findings from the Indonesian Health Survey (SKI) 2023 indicate that approximately 56.9% of the Indonesian population continues to experience oral and dental health problems, highlighting a persistent national burden comparable to previous surveys.² Children are particularly vulnerable during their growth and development period, when oral conditions such as dental caries, plaque accumulation, calculus, oral ulcers, halitosis, and malocclusion are frequently observed and may adversely affect nutrition, speech development, school performance, and quality of life.³

Dental and oral hygiene is a condition of an individual's oral cavity that must be kept clean from various types of dirt, such as plaque, debris, and tartar.⁴ One of the causes of poor dental hygiene is behavioral factors that do not maintain dental and oral hygiene due to a lack of knowledge about dental and oral health and its care. Research conducted by Windasari et al.⁵ revealed that a lack of knowledge regarding dental and oral health is the leading cause influencing poor behavior, because behavior that shapes attitudes and actions is derived from knowledge.

Knowledge related to dental and oral health includes diet, frequency of tooth brushing, and routine dental and oral check-ups with the dentist. These factors can influence children's skills and behavior, which can be seen in their dental and oral health status.⁶ Children aged 6–12 years are in a critical period for tooth growth and mental development, so monitoring children's dental and oral health at this age is essential. It can help children improve knowledge that influences behavior as an early prevention effort against various problems in the teeth and mouth.⁷ Research conducted by Khasanah et al.⁸ on 11-year-old children showed that 55.5% had low knowledge about dental and oral health due to a lack of self-awareness and parental attention. The dental and oral hygiene level of elementary school-aged children, based on the results of research conducted in Semarang, showed that the OHI-S index was in the moderate and poor categories in 70.3% of children.⁹

Compared to other community groups, urban communities tend to be left behind in social, economic, and cultural aspects, especially in accessing education and health services.¹⁰ One elementary school located in an urban area is Muhammadiyah Sapen Elementary School, Yogyakarta. Based on the background of these problems, this study aims to examine the relationship between the level of knowledge of dental and oral health and dental hygiene in children at Muhammadiyah Sapen Elementary School, Yogyakarta.

MATERIALS AND METHODS

This study utilized an analytical observational method with a cross-sectional design. The research was conducted from February to June 2025 at Muhammadiyah Sapen Elementary School, Yogyakarta. This period included ethical approval,

administrative preparation, examiner calibration, participant recruitment, distribution and collection of parental informed consent forms, data collection, data verification, statistical analysis, and manuscript preparation. The population of this study was 60 children aged 9–11 years at Muhammadiyah Sapen Elementary School. The inclusion criteria included children attending Muhammadiyah Sapen Elementary School who were willing to be respondents and had at least two index teeth that could be examined. The study included children who were within the predetermined age range, possessed the index teeth required for the Oral Hygiene Index-Simplified (OHI-S) assessment, and had written informed consent provided by their parents or legal guardians. Participants with systemic conditions affecting oral health, those undergoing orthodontic treatment, or those who were unable to cooperate during the oral examination were excluded. Toothbrushing frequency, brushing technique, and the timing of toothbrushing prior to the examination were not used as inclusion criteria because the study aimed to assess oral hygiene status under routine daily conditions. This study used stratified sampling as the sampling technique. Ethical clearance for this study was obtained from the relevant ethics committee, and informed consent was completed by the subjects' parents before the research.

Researchers collected data on the level of knowledge about dental and oral health using a questionnaire that had been tested for validity and reliability at Muhammadiyah Sapen Elementary School. The questionnaire used the Guttman scale and consisted of 10 questions covering basic knowledge of dental and oral health, including correct tooth brushing frequency, diet, and routine dental check-ups. For the dental and oral hygiene examination, the researchers used the Simplified Oral Hygiene Index (OHI-S) examination sheet. The

OHI-S examination was performed by a calibrated examiner according to the criteria described by Greene and Vermillion. Before the examination, participants were instructed not to brush their teeth, eat, or consume beverages other than plain water for at least two hours to minimize temporary alterations in plaque and debris accumulation. All examinations were conducted during school hours in a designated examination area under adequate lighting using a disposable mouth mirror and a WHO periodontal probe while the participants were seated comfortably. The debris and calculus scores were recorded for the six index tooth surfaces specified in the OHI-S protocol, and the final OHI-S score was calculated by summing the Debris Index-Simplified (DI-S) and Calculus Index-Simplified (CI-S) scores according to the standard Greene and Vermillion method. The subjects were instructed to rinse their mouths after the examination.

Research data were input into a computer program, the Statistical Package for the Social Sciences (SPSS) version 27. The ordinal variables were analyzed for their relationship using the Spearman correlation test.

RESULTS AND DISCUSSIONS

This study was conducted at Muhammadiyah Sapen Elementary School, Yogyakarta. Sample characteristics were grouped based on age, gender, parental education, knowledge level, and dental hygiene. Initially, 60 children met the eligibility criteria and were invited to participate in the study. However, participation was voluntary and required written informed consent from parents or legal guardians in accordance with the approved ethical protocol. Of the 60 eligible children, only 34 returned signed parental consent forms and were therefore enrolled in the study.

Table 1. Subject characteristics based on age, gender, and parents' latest educational background

Subject's characteristic	Category	n	%	Total (%)
Age (year)	10	13	38.24	100
	11	7	20.59	
	12	14	41.18	
Gender	Male	14	41.18	100
	Female	20	58.82	
Parental education	Elementary school	13	38.24	100
	Junior high school	9	26.47	
	Senior high school	12	35.29	

Table 1 shows that the largest number of subjects were 12 years old (41.18%), female (58.82%), and had parents with an elementary school educational background (38.24%).

Table 2. Distribution of subjects based on tooth brushing frequency

Tooth brushing frequency	n	%
Correct	12	35.3
Incorrect	22	64.7
Total	34	100

Table 2 shows that 64.7% of subjects did not know the correct frequency of brushing teeth, which is twice a day, in the morning after eating and before bed.

Table 3. Distribution of subject knowledge levels by gender

Sex	Good, n (%)	Moderate, n (%)	Poor, n (%)	Total, n (%)
Male	0 (0.00)	9 (26.47)	5 (14.71)	14 (41.18)
Female	5 (14.71)	12 (35.29)	3 (8.82)	20 (58.82)
Total	5 (14.71)	21 (61.76)	8 (23.53)	34 (100.00)

Table 3 shows the categories of knowledge level regarding dental and oral health. A total of 21 subjects (61.76%) were found to have a moderate level of knowledge.

Table 4. Distribution of dental hygiene of subjects by gender

Sex	Good, n (%)	Moderate, n (%)	Poor, n (%)	Total, n (%)
Male	2 (5.88)	8 (23.53)	4 (11.76)	14 (41.18)
Female	3 (8.82)	14 (41.18)	3 (8.82)	20 (58.82)
Total	5 (14.71)	22 (64.71)	7 (20.58)	34 (100.00)

Table 4 shows that the most common category of dental hygiene of the subjects was found in the moderate category (64.71%), namely 41.18% in females and 23.53% in males.

Table 5. Distribution of the relationship between the level of knowledge about dental and oral health and children's dental hygiene

Knowledge level	Good, n (%)	Moderate, n (%)	Poor, n (%)	Total, n (%)
Good	2 (5.88)	3 (8.82)	0 (0.00)	5 (14.71)
Moderate	2 (5.88)	17 (50.00)	2 (5.88)	21 (61.76)
Poor	1 (2.94)	2 (5.88)	5 (14.71)	8 (23.53)
Total	5 (14.71)	22 (64.71)	7 (20.58)	34 (100.00)

Table 5 shows that most research subjects had a moderate level of knowledge with moderate dental hygiene (50%).

The Spearman correlation test obtained a significance value of $p = 0.01$ ($p < 0.05$) with a correlation coefficient of 0.538, indicating a significant positive relationship between dental and oral health knowledge and dental hygiene. This means that the higher the knowledge level, the better the dental hygiene of the children.

The results of this study indicate that 17 students (50%) had adequate knowledge about oral health, with moderate dental hygiene (Table 5). Children at this age do not yet fully understand what is correct and incorrect, or what is good and bad for proper oral health practices. At this stage, parents play a crucial role in providing children with knowledge about oral health to help them develop good dental health behaviors.

The examination results revealed that female students had better knowledge and dental hygiene than male students. A total of 14.71% of students had a good level of knowledge about dental and oral health, and female students who had good dental hygiene (8.82%) were more numerous than male students (5.88%) (Table 5). Providing information to children needs to be done in a way that is easy to understand. The result of the study might be influenced by the fact that male students are less concerned about their appearance, especially in maintaining dental and oral hygiene, than female students. This finding is supported by research conducted by Yuniarly et al.¹¹ on elementary school children, where the level of knowledge and dental hygiene in female students was assessed as better than that of male students, as female students tend to take better care of their appearance, including maintaining dental hygiene, than males.

Knowledge level categories were calculated based on the number of correct answers to the ten questions in the questionnaire. A good knowledge score was defined as having 8–10 questions correctly answered. The questions most frequently answered correctly by subjects were those on basic education about dental and oral health, while questions answered incorrectly had varying answers. This study showed that most subjects had a moderate level of knowledge about dental and oral health. Several factors influenced the level of knowledge, including region and education.¹² This study was conducted in the city of Yogyakarta. Another factor influencing children's knowledge was parental education; 64.71% of parents in this study were in the low education category. Low education levels cause parents to be less attentive to teaching the importance of maintaining dental and oral health.¹³ Another research reference conducted in North Sumatra by Sihombing et al.¹⁴ on children in Kiro Hulu-I Tanjung Morawa, North Sumatra, showed that most children had good knowledge, which was influenced by the educational background of their parents.

The study on dental hygiene revealed that 14.71% of students had good dental hygiene. The majority of students had moderate dental hygiene (64.71%) and poor dental hygiene (20.58%) (Table 4). Several factors, including behavioral factors such as tooth brushing frequency, influence dental hygiene. 50% of students still do not know the correct frequency of tooth brushing, which is brushing twice daily. This study's results align with research by Syahida et al.¹⁵ conducted at SDN Cijayana 1, Garut Regency, where 66.67% of subjects had a moderate OHI-S index, which was influenced by several factors, such as low parental education and incorrect tooth brushing frequency.¹⁵

Knowledge of the importance of maintaining a clean oral cavity is a significant factor influencing dental hygiene, as knowledge will shape a person's behavior in maintaining and preserving dental and oral health. The statistical test results obtained a significance of $p = 0.01$ ($p < 0.05$), indicating that knowledge about dental and oral health can influence dental hygiene. Most students had adequate knowledge and moderate dental hygiene. This study adds to the evidence that the better the knowledge score is, the better the child's OHI-S level will be. Conversely, the worse the knowledge score is, the worse the child's OHI-S level will be. This finding aligns with research conducted by Danendra et al.¹⁶ in South Kalimantan, which concluded that awareness of oral hygiene can be assessed by knowledge level. A high level of knowledge leads to a high awareness of dental hygiene; conversely, the lower the level of oral health knowledge is, the lower the level of dental hygiene will be. There is a difference between the results of this study and those conducted by I Gede et al.¹⁷ on students at Manado State Senior High School 9, which revealed good knowledge and OHI-S scores due to several factors, such as the urban educational environment. The target group of that study was children aged 14–17, who already have a better knowledge of oral hygiene.¹⁷

CONCLUSION

There is a significant relationship between the level of knowledge about dental and oral health and children's dental hygiene at Muhammadiyah Sapen Elementary School, Yogyakarta. The higher the level of knowledge about dental and oral health, the better the children's dental hygiene.

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