

DENTAL HEALTH KNOWLEDGE AS A PREDICTOR OF ORAL HEALTH MAINTENANCE BEHAVIOR AMONG SCHOOL-AGED CHILDREN: A CROSS-SECTIONAL STUDY IN INDONESIA

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ABSTRACT

Objective : Dental caries remains one of the most prevalent oral health problems among school-aged children worldwide and is strongly influenced by daily oral hygiene practices. Adequate oral health knowledge is considered an important factor in promoting positive dental care behaviors. This study aimed to examine the relationship between dental health knowledge and dental care behavior among school-aged children aged 10–12 years in Subang Regency, Indonesia **Method:** A quantitative cross-sectional study was conducted involving 91 elementary school students selected through purposive sampling. Data were collected using a validated and reliable questionnaire measuring dental health knowledge and oral health maintenance behavior. Descriptive statistics were used to summarize participant characteristics, while the Spearman Rank correlation test was applied to determine the relationship between the study variables. **Result :** The results showed that most participants had good dental health knowledge (51.6%) and good dental care behavior (83.5%). The mean knowledge score was 14.71 ± 3.26 , while the mean behavior score was 49.29 ± 11.28 . Statistical analysis demonstrated a strong positive correlation between dental health knowledge and dental care behavior ($r = 0.790$, $p < 0.001$). **Conclusion:** These findings indicate that higher levels of dental health knowledge are associated with better oral health maintenance practices among school-aged children. Strengthening school-based oral health education programs may contribute to improving preventive oral health behaviors and reducing the burden of dental diseases in children.

Keywords: children, health literacy, oral hygiene, preventive behavior, school health

INTRODUCTION

Oral and dental health is an essential component of school-aged children's overall health, as it affects quality of life, eating ability, sleep, and learning

concentration. One of the most common oral health problems experienced by children is dental caries. The World Health Organization (WHO) reports that approximately 90%

of school-aged children worldwide have experienced dental caries, making it a persistent global public health concern (World Health Organization, 2023). In Indonesia, the 2018 Basic Health Research (Riskesdas) reported an overall prevalence of oral and dental health problems of 57.9%, with West Java Province recording a prevalence of 57.99% and Subang Regency 53.25%, accompanied by low utilization of dental and oral health services (Ministry of Health of the Republic of Indonesia, 2018).

Dental caries among school-aged children develops gradually and is closely associated with daily habits, such as improper toothbrushing techniques, infrequent toothbrushing before bedtime, and high consumption of sugary foods and beverages. These behaviors are often influenced by children's limited understanding of the importance of maintaining oral and dental health. If left unaddressed, dental caries can lead to pain, infection, and negative impacts on children's daily activities and academic performance (Notoatmodjo, 2017; Ministry of Health of the Republic of Indonesia, 2019).

Knowledge of oral health is a crucial factor in shaping dental care behaviors. Adequate knowledge enables children to understand dental functions, causes of dental diseases, and appropriate prevention and treatment measures. According to health behavior theory, knowledge forms the foundation for the development of attitudes and behaviors; therefore, higher levels of

oral health knowledge tend to result in better health-related behaviors (Notoatmodjo, 2017). Several previous studies have demonstrated a significant relationship between oral health knowledge and dental care practices among school-aged children, indicating that children with better knowledge are more likely to brush their teeth regularly and maintain oral hygiene (Azizah et al., 2022; Simaremare & Wulandari, 2021).

Children aged 10–12 years represent an appropriate target group for promotive and preventive efforts, as they are at a cognitive developmental stage that allows optimal reception of health-related information. The establishment of proper dental care habits at this age is expected to continue into adulthood and reduce the risk of oral health problems in the future. Despite the growing recognition of oral health knowledge as an important determinant of preventive dental behavior, evidence from Indonesian school-aged children remains limited, particularly in semi-urban areas where access to oral health information and dental services may vary. Previous studies have primarily focused on describing oral health status or the prevalence of dental caries, while fewer studies have examined how knowledge contributes to the development of oral health maintenance behaviors among children. Understanding this relationship is essential for designing effective school-based oral health promotion programs. Therefore, this study aimed to examine the

relationship between dental health knowledge and dental care behavior among school-aged children aged 10–12 years in Subang Regency, Indonesia.

METHOD

Study Design

This study employed a quantitative design with a correlational analytical approach and a cross-sectional method, aiming to analyze the relationship between the level of oral health knowledge and oral health maintenance behavior among school-aged children at a single point in time.

Study Population and Sample

The study population consisted of all elementary school students aged 10–12 years at one elementary school in Subang Regency. Respondents were selected using purposive sampling based on the following inclusion criteria: elementary school children aged 10–12 years, able to read and write properly, and willing to participate in the study. Students who were absent or had permission not to participate during data collection were excluded.

The minimum sample size was calculated using G*Power version 3.1, with a significance level of 0.05, statistical power of 0.95, and a medium effect size ($r = 0.30$). The analysis indicated that a minimum of 91 participants was required for the study.

Research Instruments

Data were collected using structured questionnaires to assess oral health knowledge and oral health

maintenance behavior. The oral health knowledge questionnaire consisted of 18 dichotomous items using a Guttman scale, covering oral hygiene practices, causes of dental diseases, preventive measures, and the importance of regular dental care.

Oral health maintenance behavior was measured using 15 Likert-scale items assessing tooth-brushing practices, oral hygiene maintenance, dietary habits related to oral health, and utilization of dental health services. The scores for both variables were categorized into poor, moderate, and good levels according to the predetermined scoring criteria.

The instruments were adapted from a previously validated questionnaire developed by Fadillah (2021). Validity testing demonstrated item-total correlation coefficients exceeding the acceptable threshold, while reliability testing yielded a Cronbach's alpha coefficient of 0.87, indicating good internal consistency. Therefore, the instruments were considered valid and reliable for use in this study.

Data Collection

Data were collected using the structured questionnaires administered to eligible students who met the inclusion criteria. Prior to questionnaire completion, the researchers provided instructions to ensure that the participants understood how to complete the questionnaires. The questionnaires were completed during the designated data collection period at the study site.

Data Analysis

Collected data were analyzed using statistical software. Univariate analysis was conducted to describe participant characteristics and the distribution of oral health knowledge and oral health maintenance behavior using frequencies, percentages, means, standard deviations, and ranges, as appropriate.

The normality of the data was assessed using the Kolmogorov-Smirnov test. As the oral health knowledge and oral health maintenance behavior scores were not normally distributed, bivariate analysis was performed using Spearman's rank correlation test to examine the relationship between the two variables. Statistical significance was set at $p < 0.05$.

Ethical Considerations

This study received approval from the Health Research Ethics Committee. Before data collection, the researchers explained the purpose, procedures, and benefits of the study to the respondents and school authorities. Informed consent was obtained from the students' parents or legal guardians prior to participation. Participation was

voluntary, respondent confidentiality was maintained, and all collected data were used solely for research purposes.

RESULTS

This study was conducted in December 2025 at SDN Curugrendeng III, Subang, Indonesia. A total of 91 elementary school students aged 10–12 years participated in this study, with a mean age of 10.98 ± 0.83 years. Female students constituted a slightly higher proportion of participants (56.0%) compared with male students (44.0%). Most parents had completed senior high school education (64.8%), and the predominant parental occupation was self-employment (39.6%).

Overall, the majority of students demonstrated good levels of dental health knowledge and dental care behavior. More than half of the participants were categorized as having good dental health knowledge (51.6%), while 83.5% showed good dental care behavior. Statistical analysis revealed a strong and significant relationship between dental health knowledge and dental care behavior among elementary school students

Table 1. Demographic characteristics of participants (n = 91)

Variable	Mean ($\pm$ SD)	Min – Max
Age (years)	10,98 ($\pm$ 0,830)	10-12
	Frekuensi (F)	Persentase (%)
Gender		
Male	40	44,0
Female	51	56,0
Parental Education		
Elementary School	8	8,8
Junior High School	20	22,0

High School/Vocational School	59	64,8
University	4	4,4
Parental Occupation		
Farmer	29	31,9
Laborer	13	14,3
Entrepreneur	36	39,6
Private Employee	11	12,1
Civil Servant/State Employee	2	2,2

Table 2. Levels of dental health knowledge among students

Knowledge level	N	%
Poor	6	6.6
Moderate	38	41.8
Good	47	51.6
Total	91	100.0

Table 3. Descriptive statistics of dental health knowledge scores

Variable	Mean $\pm$ SD	Min–Max
Dental health knowledge	14.71 $\pm$ 3.26	5–18

Table 4. Levels of dental care behavior among students

Behavior level	N	%
Poor	7	7.7
Moderate	8	8.8
Good	76	83.5
Total	91	100.0

Table 5. Descriptive statistics of dental care behavior scores

Variable	Mean $\pm$ SD	Min–Max
Dental care behavior	49.29 $\pm$ 11.28	17–60

Table 6. Normality test of study variables (Kolmogorov–Smirnov)

Variable	Statistic	df	p-value
Dental health knowledge	0.249	91	0.000
Dental care behavior	0.187	91	0.000

Table 7. Correlation between dental health knowledge and dental care behavior

Variable	Spearman's rho (r_s)	p-value
Dental health knowledge and dental care behavior	0.790	<0.001

Table 1 presents the demographic characteristics of the 91 students who participated in the study. The mean age of the participants was 10.98 ± 0.83

years, with ages ranging from 10 to 12 years. More than half of the participants were female (56.0%), while 44.0% were male. Regarding parental

education, the majority of parents had completed high school or vocational school (64.8%), followed by junior high school (22.0%), elementary school (8.8%), and university education (4.4%). In terms of parental occupation, entrepreneurship was the most common occupation (39.6%), followed by farming (31.9%), labor work (14.3%), private employment (12.1%), and civil service or state employment (2.2%).

Table 2 shows the distribution of students according to their level of dental health knowledge. Of the 91 participants, 47 students (51.6%) had a good level of knowledge, while 38 students (41.8%) had a moderate level of knowledge. Only 6 students (6.6%) were categorized as having poor knowledge. These findings indicate that the majority of students demonstrated moderate to good knowledge regarding dental health.

Table 3. Descriptive Statistics of Dental Health Knowledge Scores

As presented in Table 3, the mean dental health knowledge score was 14.71 ± 3.26 , with scores ranging from 5 to 18. The findings demonstrate variability in dental health knowledge scores among the participants, although the overall distribution of knowledge levels was predominantly within the moderate and good categories.

Table 4 presents the distribution of dental care behavior among the students. The majority of participants, 76 students (83.5%), demonstrated good dental care behavior. Eight students (8.8%) were categorized as

having moderate behavior, while 7 students (7.7%) demonstrated poor dental care behavior. These findings indicate that most students had generally adopted positive dental care practices.

Table 5 shows that the mean dental care behavior score was 49.29 ± 11.28 , with scores ranging from 17 to 60. The relatively wide range of scores indicates variation in dental care behavior among the students. Nevertheless, consistent with the categorical results presented in Table 4, most participants were classified as having good dental care behavior.

Table 6 presents the results of the Kolmogorov–Smirnov normality test for dental health knowledge and dental care behavior scores. The results showed that both dental health knowledge (statistic = 0.249, $p < 0.001$) and dental care behavior (statistic = 0.187, $p < 0.001$) were not normally distributed. Therefore, a non-parametric statistical test was considered appropriate for examining the relationship between the two variables.

Table 7 presents the correlation between dental health knowledge and dental care behavior among the students. The analysis showed a strong positive and statistically significant correlation between dental health knowledge and dental care behavior ($r = 0.790$, $p < 0.001$). This finding indicates that higher levels of dental health knowledge were associated with better dental care behavior among the participants. Thus, students with

greater knowledge of dental health tended to demonstrate better dental care practices.

DISCUSSION

The results of this study indicate that most elementary school students had good levels of dental health knowledge. This finding suggests that the participants had an adequate understanding of the importance of maintaining oral and dental health from an early age. Good knowledge at the elementary school level is an important foundation for shaping positive health behaviors, as children at this age begin to understand and apply health-related information in their daily lives.

Family characteristics, particularly parental education and occupation, are likely to contribute to the development of children's dental health knowledge. Parents with higher educational backgrounds tend to have greater awareness of oral health issues and are more capable of providing information, guidance, and supervision related to proper dental care. A supportive family environment plays an important role in helping children understand and adopt appropriate dental health behaviors.

In addition to knowledge, most participants in this study demonstrated good dental care behavior. This finding indicates that children have applied positive practices, such as brushing their teeth regularly and maintaining oral hygiene. Good dental care behavior is essential for preventing various dental health problems, including dental caries, which are commonly found among elementary school-aged children.

The analysis revealed a strong and significant relationship between dental health knowledge and dental care behavior. Children with greater understanding of oral health are more likely to recognize the benefits of preventive practices and the consequences of poor oral hygiene. Increased knowledge may therefore strengthen motivation and self-awareness, ultimately leading to healthier oral care behaviors. Similar findings have been reported in studies conducted in different countries, including Malaysia, India, and Thailand, where oral health knowledge was positively associated with oral hygiene practices among school-aged children. The consistency of these findings across diverse populations suggests that knowledge remains an important predictor of preventive oral health behavior regardless of cultural and educational differences. Unlike many previous studies that primarily focused on describing the prevalence of dental caries, the present study explored the behavioral relationship between oral health knowledge and dental care practices in a semi-urban Indonesian setting. These findings provide evidence supporting the integration of knowledge-based oral health promotion programs within elementary school environments.

Although the overall results were generally favorable, a small proportion of students still exhibited low levels of dental health knowledge and inadequate dental care behavior. This finding indicates that continuous

efforts to improve dental health education are still needed. The involvement of schools, parents, and health professionals is essential in providing ongoing education and guidance to ensure that children can maintain and further improve good dental care behaviors from an early age.

CONCLUSION

This study concludes that most elementary school students have good levels of dental health knowledge and dental care behavior. The findings demonstrate a strong and significant relationship between dental health knowledge and dental care behavior, indicating that knowledge plays an important role in shaping dental care practices among children. Students with better dental health knowledge tend to demonstrate better dental care behavior in their daily lives. These findings suggest that strengthening oral health literacy should become a strategic component of school health programs to improve preventive oral health behaviors and reduce the long-term burden of dental diseases among children.

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Author Contributions

CN contributed to conceptualization, data collection, investigation, and preparation of the original manuscript draft. AH contributed to methodology development, data analysis, supervision, manuscript review and editing. All authors read and approved the final manuscript.

Conflict of Interest

The author declares that there are no financial or non-financial conflicts of interest that could have influenced the conduct or reporting of this study.

Data Availability Statement

The data used and analyzed in this study are available from the corresponding author upon reasonable request, in accordance with research ethics and participant confidentiality.

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