Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The Relationship Between Knowledge and Attitudes Toward Oral and Dental Health and Hygiene and the Incidence of Gingivitis Among Elementary School Children

Ilham Fahmi Akbar
Universitas Wijaya Kusuma Surabaya

Article Info

Keywords:
Elementary School,
Gingivitis,
Health Knowledge,
Health Attitudes,
Oral and Dental Hygiene.

ABSTRACT

Oral and dental health is an essential aspect of overall health, particularly in elementary school-aged children who are in their developmental stages. Gingivitis, or gum inflammation, is a common oral disease among children and can be prevented through proper knowledge and positive attitudes toward oral hygiene. This study aims to examine the relationship between knowledge and attitudes about oral health and hygiene with the incidence of gingivitis among fifth-grade students at SDN Dukuh Kupang V Surabaya. This analytic quantitative research used a cross-sectional approach and involved 63 respondents. Data were collected through questionnaires and analyzed using the Chi-Square test. The results showed a significant relationship between students' knowledge and attitudes toward oral health and the incidence of gingivitis ($p < 0.001$). Students with better knowledge and attitudes were less likely to suffer from gingivitis. These findings highlight the importance of early education and the development of healthy habits to prevent periodontal diseases.

Corresponding Author:
Ilham Fahmi Akbar
Universitas Wijaya Kusuma Surabaya
Jl. Dukuh Kupang XXV No.54, Dukuh Kupang, Kec. Dukuhpakis, Surabaya, Jawa Timur 60225
ilhamfahmiakbar1234@gmail.com

INTRODUCTION

Oral and dental health is an integral part of general health, particularly for elementary school-aged children who are undergoing rapid physical growth and cognitive development. Unfortunately, attention to oral hygiene is often neglected, even though the oral cavity serves as the entry point for various microorganisms that can cause systemic infections (Laili, 2021). One of the most common oral health problems found in children is gingivitis, an inflammation of the gingival tissue characterized by swelling, bleeding, and discoloration of the gums due to plaque accumulation (Komporot et al., 2019). Gingivitis can be effectively prevented through good oral hygiene and proper tooth brushing habits (Makassar, 2021; Attin in Iqbal et al., 2020).

Knowledge and attitude play an essential role in shaping health maintenance behavior, including oral and dental hygiene practices. Studies have shown that a low level of knowledge regarding oral health significantly contributes to the high prevalence of gum and dental

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

diseases, such as gingivitis, caries, and periodontitis (Senjaya & Yasa, 2019; Lidya, 2020). Children are particularly vulnerable to these conditions due to their limited understanding and still-developing motor skills, which affect their ability to brush their teeth effectively (Pontoluli et al., 2021). According to the World Health Organization (2020), the global prevalence of caries among children under the age of 18 reaches 80–90%, and Indonesia is among the countries with the highest disease burden. Data from the 2018 Basic Health Research (Riskesdas) report that approximately 57% of the Indonesian population suffers from oral health issues, with 74.1% of them experiencing gingivitis. The highest proportion occurs in children under 12 years old. In East Java, gingivitis cases were recorded at 10.52%, and in Surabaya, at 7.34% (Kemenkes RI, 2018).

Findings from various studies reinforce the idea that knowledge and positive attitudes toward oral hygiene are correlated with a lower incidence of gingivitis. A study by Mantiri et al. (2018) conducted at SDN 126 Manado found that 90.8% of students experienced gum problems, mostly in the form of mild bleeding. Meanwhile, research by Nur et al. (2023) at SD Negeri Kalanganyar 1 Banten revealed that 83% of students had poor tooth brushing habits, and 68.1% of them suffered from gingivitis, with a Fisher Exact test significance value of p = 0.009. These findings indicate that poor brushing behavior and low knowledge levels contribute substantially to the high prevalence of gingivitis. Therefore, implementing school-based oral health education programs is an essential step in breaking the chain of this preventable disease.

Given this background, the present study aims to identify the relationship between students' knowledge and attitudes regarding oral and dental hygiene and the incidence of gingivitis. The focus of this research is on fifth-grade students at SDN Dukuh Kupang V Surabaya, as they are at a critical developmental stage in forming healthy lifestyle habits, including the practice of maintaining oral hygiene.

Based on the background and theoretical framework described above, this study formulates two hypotheses to be tested statistically. The null hypothesis (H_0) states that there is no significant relationship between knowledge and attitudes about oral and dental health and hygiene and the incidence of gingivitis among elementary school students at SDN Dukuh Kupang V Surabaya. In other words, if the null hypothesis is accepted, it would indicate that neither knowledge level nor attitude plays a role in preventing or increasing the risk of gingivitis.

In contrast, the alternative hypothesis (H_1) states that there is a significant relationship between knowledge and attitudes about oral and dental health and hygiene and the incidence of gingivitis among students at SDN Dukuh Kupang V Surabaya. This hypothesis aligns with findings from previous studies, which demonstrate that improved knowledge and positive attitudes toward tooth brushing practices can significantly reduce the prevalence of gingivitis (Banowati et al., 2021; Skripsa et al., 2021). The hypothesis will be tested using the Chi-Square statistical method with a 5% level of significance to determine the relationship between the independent variables (knowledge and attitude) and the dependent variable (incidence of gingivitis). The results of this test will serve as the basis for concluding whether

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

oral health education interventions should be implemented more broadly within elementary school settings.

RESEARCH METHOD

This study employed a quantitative approach using an analytical observational design with a cross-sectional method. This design was selected to identify the relationship between knowledge and attitudes regarding oral and dental health and hygiene and the incidence of gingivitis among fifth-grade students at SDN Dukuh Kupang V Surabaya, assessed at a single point in time. The research was conducted in June 2025 with a population of 80 students. The sample was determined using the Slovin formula with a 10% margin of error, resulting in 63 respondents who met the inclusion and exclusion criteria. The inclusion criteria consisted of fifth-grade students who were willing to participate in the study, while the exclusion criteria included students who were ill or absent during the data collection period.

Data were collected using a closed-ended questionnaire containing questions related to students' level of knowledge about oral health, their attitudes or tooth brushing behaviors, and the occurrence of gingivitis. Prior to completing the questionnaire, all participants received an explanation of the research objectives and procedures and were asked to provide their consent. The collected data were then processed through editing, coding, entry, and tabulation using SPSS software. Statistical analysis was conducted using the Chi-Square test (χ^2) to determine the relationship between variables, with a significance level set at 5% ($p < 0.05$). The interpretation of the results was based on 2x2 cross-tabulations to assess whether there was a significant relationship between the independent variables (knowledge and attitudes) and the dependent variable (gingivitis incidence). This study also adhered to ethical research principles by submitting an ethical clearance request to the Ethics Committee of the Faculty of Medicine, Universitas Wijaya Kusuma Surabaya prior to data collection.

RESULT AND DISCUSSION

Research Results

General Data

This study involved a total of 63 fifth-grade students at SDN Dukuh Kupang V Surabaya who met the inclusion criteria. The general data collected focused on three main variables: knowledge level regarding oral and dental health, tooth brushing behavior, and the incidence of gingivitis. Frequency distribution results showed that the majority of respondents had good knowledge, with 36 students (57.1%), while 27 students (42.9%) had poor knowledge. Regarding tooth brushing behavior, most students (42 or 65.1%) were categorized as having good brushing habits, whereas the remaining 21 students (34.9%) exhibited poor oral hygiene behavior.

In terms of gingivitis incidence, the results indicated that 43 students (68.3%) did not experience gingivitis, while 20 students (31.7%) were identified as having symptoms of gingivitis based on the questionnaire responses. These findings suggest that although most students had adequate knowledge and positive brushing behavior, gingivitis was still present

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

among a significant portion of respondents. This highlights the need for more effective and consistent implementation of oral hygiene practices among elementary school children.

Table 1. Distribution of Respondents Based on Knowledge

Variabel	Category	Frequency (n)	Percentage (%)
Dental Health Knowledge	Good	36	57,1%
	Not Good	27	42,9%
Toothbrushing Behavior	Good	42	65,1%
	Not Good	21	34,9%
Gingivitis Occurrence	Yes	20	31,7%
	No	43	68,3%
Total		63	100%

Specific Data

This section aims to identify the relationship between students' knowledge and attitudes regarding oral and dental health and hygiene and the incidence of gingivitis.

1) Knowledge of Oral Health and the Incidence of Gingivitis

Tabel 2. Knowledge of Oral Health and the Incidence of Gingivitis

Knowledge About Oral Health	Gingivitis Incidence Rate			Total
		Yes	No	
Good	Count	1	35	36
	% of Total	1.6%	55.6%	57.1%
Not Good	Count	19	8	27
	% of Total	30.2%	12.7%	42.9%
Total	Count	20	43	63
	% of Total	31.7%	68.3%	100%

2) Chi-Square Test Results: Knowledge of Oral Hygiene and the Incidence of Gingivitis

Tabel 3. Knowledge of Oral Hygiene and the Incidence of Gingivitis Chi-Square Test

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	32.532[a]	1	<.001		
Continuity Correction	29.487	1	<.001		
Likelihood Ratio	36.788	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	32.015	1	<.001		
N of Valid Cases	63				

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

3) Tooth Brushing Behavior and the Incidence of Gingivitis

Tabel 4. Tooth Brushing Behavior and the Incidence of Gingivitis

Toothbrushing Behavior	Gingivitis Incidence Rate			Total
		Yes	No	
Good	Count	1	40	41
	% of Total	1.6%	63.5%	65.1%
Not Good	Count	19	3	22
	% of Total	30.2%	4.8%	34.9%
Total	Count	20	43	63
	% of Total	31.7%	68.3%	100.0%

4) Chi-Square Test Results: Tooth Brushing Behavior and the Incidence of Gingivitis

Tabel 5. Tooth Brushing Behavior and the Incidence of Gingivitis Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	46.540[a]	1	<.001		
Continuity Correction	42.747	1	<.001		
Likelihood Ratio	51.814	1	<.001		
Fisher's Exact Test				<.001	<.001
Linear-by-Linear Association	45.801	1	<.001		
N of Valid Cases	63				

Based on the analysis of the relationship between knowledge of oral health and the incidence of gingivitis, the results indicated a highly significant relationship. Out of the 63 respondents surveyed, the majority of those with good knowledge of oral health did not experience gingivitis, totaling 35 individuals (55.6% of all respondents). In contrast, among those with poor knowledge, 19 individuals (30.2%) were found to have gingivitis, while only 8 individuals (12.7%) did not. Meanwhile, only 1 individual (1.6%) from the group with good knowledge experienced gingivitis. The Chi-Square test resulted in a Pearson Chi-Square value of 32.532 with 1 degree of freedom (df) and a significance value of $p < 0.001$. The Continuity Correction test yielded a value of 29.487, and the Likelihood Ratio was 36.788, both of which also indicated significance levels of $p < 0.001$. Similarly, Fisher's Exact Test produced the same significance value for both two-tailed and one-tailed tests ($p < 0.001$). Thus, it can be concluded that there is a very significant relationship between the level of oral health knowledge and the incidence of gingivitis among respondents. In other words, the better a person's knowledge of oral health, the lower their likelihood of developing gingivitis.

Furthermore, to examine the relationship between tooth brushing behavior and the incidence of gingivitis, a Chi-Square analysis was also conducted. The crosstabulation results showed that most respondents with good brushing behavior did not experience gingivitis,

Jurnal Eduhealth
Volume 16, Number 03 2025 DOI 10.54209/eduhealth.v16i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

totaling 40 individuals (63.5% of all respondents), while only 1 individual (1.6%) from this group had gingivitis. In contrast, among those with poor brushing behavior, 19 individuals (30.2%) experienced gingivitis, and only 3 individuals (4.8%) did not. The Pearson Chi-Square test yielded a value of 46.540 with df = 1 and a significance level of $p < 0.001$, indicating a very significant relationship. The Continuity Correction (42.747), Likelihood Ratio (51.814), and Fisher's Exact Test all supported this result with p-values < 0.001. Based on these findings, it can be concluded that there is a very significant relationship between tooth brushing behavior and the incidence of gingivitis. In other words, respondents with good brushing habits have a much lower risk of developing gingivitis compared to those with poor brushing habits.

Overall, these findings demonstrate that both oral health knowledge and brushing behavior are significantly associated with the incidence of gingivitis. Therefore, improving oral health education and fostering proper brushing habits are critical factors in efforts to prevent gingivitis in the broader community.

Discussion

The Relationship Between Knowledge of Oral and Dental Health and the Incidence of Gingivitis

The results of this study show a significant relationship between students' level of knowledge regarding oral and dental health and hygiene and the incidence of gingivitis. Children with good knowledge tend to have healthier gums. In this study, 35 respondents (55.6%) with good oral health knowledge did not experience gingivitis (Gigi et al., 2022). Conversely, among those with poor knowledge, 19 students (30.2%) experienced gingivitis, while only 8 students (12.7%) did not. Meanwhile, only 1 student (1.6%) from the group with good knowledge showed symptoms of gingivitis.

Knowledge is a critical factor that influences health behavior, particularly in maintaining oral hygiene. Understanding the importance of brushing teeth regularly and undergoing routine dental check-ups plays a major role in preventing periodontal diseases (Skripsa et al., 2021).

Supporting findings were reported in a previous study conducted at MI Salafiyatul Huda 2 in Larangan Selatan, Cirebon, where knowledge of oral care was found to be a key factor in both preventing and contributing to periodontal disease. The study reported an average knowledge score of 23.48% before intervention (pre-test), which increased to 26.14% after oral health education was provided. The difference was statistically significant (p-value = 0.000 < 0.05), indicating that improved knowledge significantly influenced the prevention of periodontal disease (Banowati et al., 2021).

Low awareness of periodontal diseases especially gingivitis remains a concern, as gingivitis is less well-known than other periodontal conditions. Gingivitis is characterized by several common symptoms, most notably redness and inflammation of the gums or gingiva, which often go unrecognized (Rosabel Sutanto & Anggara Putranto, 2023).

This study is consistent with previous findings which have shown that a higher level of oral health knowledge among elementary students is inversely related to the incidence of

gingivitis. Therefore, increasing oral health knowledge should be a primary focus in preventive strategies, especially in school-based health programs (Vii & Negeri, 2023).

The Relationship Between Attitudes Toward Oral and Dental Health and the Incidence of Gingivitis

The results of this study also indicate a significant relationship between students' attitudes toward oral and dental health and hygiene and the incidence of gingivitis. Children with positive attitudes, such as a willingness to brush their teeth twice a day and an awareness of the importance of regular dental check-ups, were found to have a lower risk of developing gingivitis (Don et al., 2015).

Attitude is defined as a closed or internal response toward an object, often formed by knowledge, feelings, and behavioral tendencies (Putri & Setianingsih, 2016). A positive attitude toward oral health reflects an individual's willingness and awareness to engage in healthy behaviors. In the context of elementary school children, such attitudes are often closely linked to daily habits, as they are still in the developmental stage of forming character and consistent behavior patterns (Don et al., 2015).

One of the key behaviors in maintaining oral health is brushing teeth before bed and after waking up. The success of oral hygiene maintenance is also influenced by the brushing technique, frequency, and timing. Children aged 5–9 years are usually introduced to basic brushing routines, such as brushing after meals and before and after sleep, as this age group is particularly vulnerable to dental and oral health problems (Gopdianto et al., 2014).

Insufficient brushing frequency in children is often the result of a lack of early habit formation. When children are not accustomed to brushing their teeth from a young age, it affects their awareness and motivation to maintain oral hygiene. As a result, they are more susceptible to oral diseases, including gingivitis and other periodontal conditions (Gopdianto et al., 2014).

To achieve effective oral health maintenance, children must be taught proper brushing habits and techniques from an early age. Early childhood is the ideal period for instilling values that shape habits and positive health behaviors (Wiradona et al., 2015). Consistent brushing behavior serves not only as a routine but also as a preventive measure against periodontal diseases, including gingivitis.

In addition to behavior, other environmental factors also contribute to gingivitis, such as the availability of clean water, which plays a role in determining the success of oral hygiene practices, especially in certain areas where access to sanitation may be limited (Hilmi et al., 2018).

A previous study conducted in Manado also supports this finding. It identified gingivitis as one of the most common periodontal diseases among children, often characterized by a progression of symptoms starting with redness, followed by swelling, and eventually bleeding of the gingiva (Pontoluli et al., 2021). This further emphasizes the importance of promoting both knowledge and attitudes as foundational elements in the prevention of gingival disease during childhood.

CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that knowledge and attitudes regarding oral and dental health and hygiene have a highly significant relationship with the incidence of gingivitis among fifth-grade students at SDN Dukuh Kupang V Surabaya. Students with good knowledge and proper tooth brushing behavior were less likely to experience gingivitis, whereas those with lower knowledge and poor attitudes showed a higher prevalence of the condition. These findings indicate that enhancing oral health education and fostering proper tooth brushing habits from an early age are key factors in preventing gingivitis among elementary school children.

REFERENCES

Banowati, L., Supriatin, S., & Apriadi, P. (2021). Pengaruh pendidikan kesehatan terhadap peran orang tua dalam menjaga kesehatan gigi dan mulut siswa kelas I. *Jurnal Kesehatan*, 12(1), 17–25. https://doi.org/10.38165/jk.v12i1.233

Bidjuni. (2022). *Tingkat pengetahuan tentang cara memelihara kesehatan gigi dan mulut dengan kejadian gingivitis masa pubertas pada siswa kelas VII A SMP Negeri 8 Manado*. Manado: Politeknik Kesehatan Kemenkes Manado Jurusan Kesehatan Gigi.

Chaffee, B. W., & Shiffman, S. (2022). Tobacco use and gingival inflammation: A review. *Journal of Periodontology*, 93(1), 45–53.

Don, F., Lossu, F. M., & Pangemanan, D. H. C. (2015). Hubungan pengetahuan kesehatan gigi dan mulut dengan indeks gingiva siswa SD Katolik 03. *Jurnal E-GiGi*, 3(1).

Gigi, J. K., Makassar, P. K., & K, E. P. K. (2022). Penggunaan media penyuluhan audio visual dalam meningkatkan pengetahuan tentang kesehatan gigi dan mulut pada anak sekolah dasar kelas V SD Negeri Maccini 2 Kota Makassar. *Jurnal E-GiGi*, 21(1), 54–66.

Gopdianto, R., Rattu, A. J. M., & Mariati, N. W. (2014). Status kebersihan mulut dan perilaku menyikat gigi anak SD Negeri 1 Malalayang. *E-GiGi*, 3(1). https://doi.org/10.35790/eg.3.1.2015.6457

Hilmi, R. Z., Hurriyati, R., & Lisnawati. (2018). [Judul tidak tersedia]. *Jurnal Kesehatan*, 3(2), 91–102.

Komporot, F., Siagian, K. V., Pangeman, D. H. C., & Khoman, J. (2019). Efektivitas tindakan skeling terhadap perawatan gingivitis di rumah. *Jurnal E-GiGi*, 7(2), 58–64.

Laili, N. H., Imam, E. S., & Hendro, P. (2021). Gambaran pengetahuan perilaku tentang menggosok gigi pada anak. *Jurnal Ilmiah Keperawatan Gigi Surabaya*, 2721–2033.

Makassar, D. I. (2021). [Judul tidak tersedia]. *Media Kesehatan Gigi*, 20(1), 49–54.

Mantiri, A. S., & Pelealu, F. D. (2018). Gambaran status kesehatan gingiva pada anak usia 9-10 tahun di SDN 126 Manado. *Jurnal E-GiGi*, 6(1), 45–52.

Meidiana, R., Simbolon, D., & Wahyudi, A. (2018). Pengaruh edukasi melalui media audio visual terhadap pengetahuan dan sikap remaja overweight. *Jurnal Promkes*, 9(November), 478–484.

Nur, H. M., Hamdan, F., & Umami, H. A. (2023). Hubungan kebiasaan menyikat gigi terhadap kejadian gingivitis pada siswa sekolah dasar. *Jurnal Promosi Kesehatan Indonesia*, 10(1), 20–25.

Pontoluli, Z. G., Khoman, J. A., & Wowor, V. N. S. (2021). Kebersihan gigi mulut dan kejadian gingivitis pada anak sekolah dasar. *Jurnal E-GiGi*, 9(30), 21–28.

Prihandini, W. Y., & Faizah, A. (2022). Kanan rahang atas. *Jurnal Kesehatan Gigi*, 5(1), 1–6.

Putri, N. A., & Setianingsih, A. (2016). Hubungan pengetahuan dan sikap terhadap perilaku personal hygiene menstruasi. *Jurnal Ilmu Keperawatan*, 5(1), 15–23.

Skripsa, T. H., Unique, A. A., & Hermawati, D. (2021). Hubungan pengetahuan dan tindakan menjaga kesehatan gigi mulut dengan keluhan subyektif permasalahan gigi mulut pada mahasiswa kesehatan dan non kesehatan. *E-GiGi*, 9(1), 71–78. https://doi.org/10.35790/eg.9.1.2021.32676

Senjaya, A. A., & Yasa, K. A. T. (2019). Hubungan pengetahuan dengan kebersihan gigi dan mulut siswa kelas VII di SMPN 3 Selemadeg Timur Tabanan. *Jurnal Kesehatan Gigi*, 6(2).

Wiradona, I., Widjanarko, B., & Promosi Kesehatan Universitas Diponegoro. (2013). Pengaruh perilaku menggosok gigi terhadap plak gigi pada siswa kelas IV dan V di SDN Wilayah Kecamatan Gajahmungkur Semarang. *Jurnal Promosi Kesehatan Indonesia*, 8(1), 59–68.

World Health Organization (WHO). (2020). *Kebersihan mulut*.