



The Effect of Dental Health Education Using Calendar Media on the Oral Hygiene Index Simplified (OHI-S) Scores in Children

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ABSTRACT

Oral hygiene problems remain a significant health challenge among elementary school children in Indonesia, one of which is measured using the Oral Hygiene Index Simplified (OHI-S). Dental health education using calendar media is considered effective in improving children's understanding and practices related to oral hygiene. This study aimed to determine the effect of dental health education using calendar media on OHI-S scores among 5th-grade students at SDN 19 Pontianak Utara. A quasi-experimental design with a pre-test and post-test approach was employed involving 56 students selected through total sampling. OHI-S assessments were conducted before and after the three-week educational intervention. The results showed that only 2 students (3.6%) were categorized as having good OHI-S scores before the intervention, whereas after the intervention the number increased to 38 students (67.9%), indicating a significant improvement in oral hygiene. These findings demonstrate that calendar media can serve as an engaging and easy-to-understand educational tool that enhances children's toothbrushing behavior. In conclusion, dental health education using calendar media is proven effective in reducing OHI-S scores and can be recommended as a supportive strategy for school-based oral health programs.

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INTRODUCTION

Oral health is essential for overall health, particularly in children (Bramantoro et al., 2021; Patel et al., 2021; Krol & Whelan, 2023; Minervini et al., 2023; Saccomanno et al., 2023). The World Health Organization (World Health Organization, 2022) reports that oral health problems such as dental caries and gum disease are among the most common health issues globally, including in Indonesia. These conditions are more likely to occur in children under 12 years of age due to unhealthy eating habits, limited knowledge about dental care, and low awareness of the importance of maintaining oral hygiene. In Indonesia, oral health problems remain prevalent, with around 57% of children experiencing dental caries and 1.4% having poor OHI-S scores according to the Basic Health Research (Badan Penelitian dan Pengembangan

Kesehatan, 2019). These figures highlight the need for greater public awareness regarding oral health. Engaging and easy-to-understand health education is considered an effective approach for teaching children.

Several efforts to maintain oral health include promotive, preventive, and curative actions (Amedari et al., 2022; Sokolov et al., 2023; Chamut et al., 2024; Chan, et al., 2024; Reca et al., 2024). Health promotion aims to improve community capacity through learning, with school-based health promotion intended to enable students to understand ways to improve their dental health. One approach is to strengthen children's motor skills through proper tooth brushing, which is essential for maintaining oral hygiene (Liasari et al., 2023). Health education itself is a learning activity aimed at disseminating information and fostering awareness, willingness, and capability to adopt health-related recommendations (Sharma, 2021; Kreps, 2023; Ngadilah et al., 2023; Garavito et al., 2024; Mahmudah, & Santoso, 2025). Dental health education for children must also be adapted to their developmental stages, and its success depends on clear and effective communication between educators and audiences (Arsyad & Hidayati, 2018).

According to Nurmala (2018), health education aims to increase knowledge and encourage healthy behavior change, while Ningsih and Sari (2021) emphasize that the media used can help children understand information better. One engaging tool for delivering oral health messages is an educational calendar, which can help children remember key dental care information. Furthermore, Oral Hygiene Index Simplified (OHI-S) is a useful indicator for assessing oral hygiene and evaluating the effectiveness of educational programs through changes in OHI-S scores before and after intervention (Kusumaningsih & Sulastri, 2023).

However, despite the importance of effective health education media, there is still limited research examining the use of educational calendars as a structured tool to improve oral hygiene behavior among school-aged children. The gap in existing studies lies in the lack of evidence on whether calendar-based education can produce measurable improvements in oral hygiene status using OHI-S indicators. A preliminary survey at SDN 19 Pontianak Utara shows a high OHI-S rate of 80%, indicating poor oral hygiene among students. Therefore, the novelty of this study lies in evaluating the impact of educational calendar media on children's oral hygiene using objective OHI-S measures in a real school setting. This study aims to determine the effect of dental health education using calendar media on improving the OHI-S scores of 5th-grade students at SDN 19 Pontianak Utara.

METHOD

This study employed a quasi-experimental approach with a pre-test and post-test design, which is a method that provides a controlled intervention on the independent variable and then measures its impact on the dependent variable. This design allows the researcher to intentionally and systematically modify certain conditions in order to observe and determine the effects produced by the intervention.

The study was conducted at SDN 19 Pontianak Utara from April to May 2025. The sampling technique used was total sampling, involving all 56 fifth-grade students as research respondents. The research instruments included a questionnaire and an OHI-S (Oral Hygiene Index-Simplified) examination form. OHI-S data were obtained through direct oral hygiene examinations conducted on each respondent before and after the dental health education using calendar media.

The collected data were then processed and analyzed by comparing the OHI-S scores in the pre-test and post-test stages according to the quasi-experimental design. In addition, respondents were categorized based on gender, age, OHI-S categories before the intervention, OHI-S categories after the intervention, and cross-tabulation of OHI-S categories before and after the dental health education using calendar media.

RESULTS AND DISCUSSION

Table 1. Distribution of Respondents by Sex, Age

Variable	Frequency	Percentage
Sex		
Male	30	53.6%
Female	26	46.4%
Total	56	100%
Age		
10	1	1.8%
11	48	85.7%
12	5	8.9%
13	2	3.6%
Total	56	100%

Based on Table 1, a total of 56 students from SDN 19 Pontianak Utara participated in the study, consisting of 30 males (53.6%) and 26 females (46.4%). The majority of respondents were 11 years old, with a total of 48 students (85.7%).

Table 2. OHI-S Category Before and After Dental Health Education Using Calendar Media

OHI-S Category	Frequency	Percentage
Before		
Good	2	3.6%
Fair	48	85.7%
Poor	6	10.7%
Total	56	100%
After		
Good	38	67.9%
Fair	18	32.1%
Poor	0	0%
Total	56	100%

Table 2 shows that most respondents (48 students, 85.7%) were in the fair OHI-S category before receiving dental health education. Based on Table 2, after dental health education using calendar media, the number of students in the good OHI-S category increased significantly to 38 students (67.9%).

Table 3. Cross-Tabulation of OHI-S Category Before and After Dental Health Education Using Calendar Media.

OHI-S Before	Good	Fair	Poor	Total
Good	2	0	0	2
Fair	30	18	0	48
Poor	6	0	0	6
Total	36	18	0	56

Table 3 shows that the two students previously categorized as *good* remained in the same category. Of the 48 students in the *fair* category, 30 improved to *good* while 18 remained *fair*. All six students originally categorized as *poor* improved to *good*, and none remained in the poor category.

Table 4. Mean OHIS Scores Before and After the Intervention.

Measurement Time	N	Mean OHIS	Standard Deviation	Standard Error
Before	56	2.3946	0.69568	0.09296
After	56	1.3527	0.50717	0.06777

Table 4 shows that the mean OHIS score before the intervention was 2.39 and decreased to 1.35 after the intervention. This reduction indicates an improvement in the participants' oral hygiene following the intervention.

Table 5. Paired t-Test Results.

Measurement Pair	t	p-value
OHIS before–after	17.667	0.000

Table 5 shows that the Paired t-Test yielded a t-value of 17.667 with a p-value of 0.000, indicating a statistically significant difference between OHIS scores before and after the intervention ($p < 0.05$). Thus, the intervention provided was proven to be effective in improving the oral hygiene of the study participants.

DISCUSSION

This study involved 56 fifth-grade students from SDN 19 Pontianak Utara. The demographic data indicate that most respondents were male (53.6%) and the majority were 11 years old (85.7%), based on school attendance records. Prior to the intervention, most students were categorized as having fair oral hygiene (85.7%), with only two students classified as having good oral hygiene. The predominance of the fair category may be attributed to students having previously received dental health education but not consistently applying proper oral hygiene practices in their daily routines. Inconsistent oral hygiene behaviors can adversely affect oral health conditions and potentially interfere with students' concentration during learning activities.

Following the delivery of dental health education using calendar media, the number of students in the good category increased substantially to 38 students (67.9%). This notable improvement suggests that the intervention had a significant impact on enhancing students' oral hygiene practices. The improvement is likely related to the visual cues and repetitive reminders offered by the calendar, which reinforced daily toothbrushing habits and promoted behavioral consistency.

The results of the cross-tabulation analysis further support this conclusion. All students who were initially categorized as poor improved to the good category, and more than half of those previously categorized as fair also shifted to the good category. Notably, no students remained in the poor category after the intervention, demonstrating the strong effectiveness of calendar-based education.

The improvement is also reflected in the OHIS score changes. Before the intervention, the mean OHIS score was 2.39, which falls within the category of poor oral hygiene. After the intervention, the mean score decreased to 1.35, indicating a marked reduction in debris and calculus accumulation on tooth surfaces and consequently an improvement in students' oral hygiene status. A lower OHIS score represents better oral hygiene (Putri, Pujiastuti, & Prasetya, 2025). Educational interventions and structured oral hygiene practices have been shown to improve brushing behavior and skills, thereby directly contributing to plaque reduction (Sabilillah & Daniati, 2025). Oral health education is also known to influence behavioral change, particularly when provided through structured and continuous approaches (Munawaroh et al., 2025).

The Paired t-Test analysis yielded a t-value of 17.667 with a p-value of 0.000, confirming that the reduction in OHIS scores was statistically significant. This indicates that the observed improvements were attributable to the intervention rather than chance. These findings are consistent with previous literature demonstrating the effectiveness of educational interventions in improving oral hygiene status, particularly in populations with limited baseline knowledge (Sabilillah & Daniati, 2025).

The use of calendar media proved effective as a visual educational tool, enabling students to better understand, recall, and apply proper oral hygiene practices. This aligns with the findings of Khafid & Salsabila (2024), who reported that visual educational media—such as posters shared through digital platforms—significantly reduced OHI-S scores among

elementary school students. Visual aids facilitate comprehension and enhance retention of health messages among children.

Additionally, school-based oral health education has been shown to produce long-term positive effects on students' oral health knowledge and habits. Bramantoro et al. (2021) emphasized that regular and structured educational activities involving teachers, parents, and students can significantly improve oral health status. When used consistently, calendar media have the potential to reinforce sustained behavioral changes, especially when integrated into comprehensive school health programs.

Previous research by Duhita et al. (2022) also supports the effectiveness of calendar-based educational tools, indicating that calendars can serve as more effective communication media compared to leaflets due to their visual attractiveness and daily visibility.

Overall, the findings of this study are consistent with existing evidence demonstrating that well-designed visual educational media can effectively enhance children's awareness and behavior related to oral hygiene. The use of calendar media in this study successfully reduced OHI-S scores, resulting in 67.9% of students achieving the good oral hygiene category and no students remaining in the poor category after the intervention. Therefore, calendar media are recommended as an engaging and easy-to-understand educational tool with strong potential to support long-term behavioral change when integrated into school-based oral health programs.

CONCLUSION

Dental health education using calendar media proved effective in improving the oral hygiene of 5th-grade students at SDN 19 Pontianak Utara. After the intervention, the children's oral hygiene showed clear improvement, with many students experiencing better OHI-S categories compared to before the counseling was provided. These findings indicate that calendar media can serve as an effective and easy-to-understand educational tool to support improved oral hygiene behavior among elementary school children.

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