Journal of Professional Evidence-based Research and Advances in Wellness and Treatment (PERAWAT)
Vol. 03, No. 1, January 2026 1-12
***e*-ISSN: 3064-4453**

Effect of Health Education on Oral Hygiene on Reducing the Risk of Caries in Primary School Children

Yuni Astuti[1]*, & Riama Vensya Sitohang[2]
[1]*Poltekkes Kemenkes Semarang, Indonesia, [2]Politeknik Kesehatan Kementrian Kesehatan Jakarta II, Indonesia
*Co e-mail: yuniastuti@poltekkes-smg.ac.id[1]

Article Information
Received: December 06, 2026
Revised: January 13, 2026
Online: January 16, 2026

Keywords
Health Education, Oral Hygiene, Caries Risk, Prevention

ABSTRACT
Health education on oral hygiene plays a crucial role in preventing dental problems, particularly caries, among children. In Indonesia, the prevalence of caries in primary school students remains high, largely due to inadequate understanding of proper oral hygiene practices. This study aimed to evaluate the effect of oral hygiene health education on reducing caries risk in elementary school children. An experimental pretest–posttest design was conducted involving 55 students from SD Negeri 15 Anduring Padang. Data were collected using questionnaires and direct assessments of oral hygiene status and dental caries before and after the health education intervention. Statistical analysis using paired t-tests was applied to determine differences in oral hygiene scores and caries risk following the intervention. The findings demonstrated significant improvements in students' knowledge and oral hygiene behaviors, accompanied by a substantial decrease in caries risk. The p-value of 0.000 indicated that the educational intervention had a strong positive effect on reducing caries risk. These results emphasize the importance of integrating structured oral hygiene education into the school curriculum and involving both teachers and health professionals in routinely providing information, demonstrations of correct brushing techniques, and guidance on dental health maintenance. Long-term implementation and periodic evaluation of such programs are essential to achieve optimal outcomes and ensure sustainability. In conclusion, health education on oral hygiene effectively reduces caries risk in children and should be consistently implemented as part of routine health promotion activities in primary schools.

Keywords: *Health Education, Oral Hygiene, Caries Risk, Prevention*

http://dx.doi.org/10.69855/perawat.v3i1.402
https://gpijournal.com/index.php/perawat

INTRODUCTION

Dental caries is one of the most common health problems in the world, especially in children. According to data released by the World Health Organization (WHO), the prevalence of caries in children of primary school age in various countries is still high and is the leading cause of tooth loss in children (WHO, 2020). In Indonesia, the prevalence of caries in children aged 6-12 years was recorded at 58% in 2018, a significant figure considering the impact on the quality of life of children (Kemenkes RI, 2018). Dental caries can reduce the quality of life of children, interfere with their social and emotional development, and affect the learning process at school (Fathoni et al., 2017).

The main problem that causes the high prevalence of caries in children is the lack of knowledge and awareness about the importance of maintaining oral hygiene (Pratiwi & Syafitri, 2019). Most children do not understand the correct brushing technique, which leads to the accumulation of dental plaque and the growth of caries-causing bacteria (Mulyani, 2020). Not only that, unhealthy eating habits, such as consumption of sweet foods and sugary drinks, are also a risk factor that makes things worse (Wahyuni et al., 2019). Lack of health education about oral hygiene in schools is a major factor that exacerbates this problem.

Health education on Oral hygiene in Indonesian schools is still limited. Many schools do not yet have a structured health education program to educate students about the importance of caring for teeth and mouth (Cahyani, 2020). In fact, education about oral hygiene from an early age can have a significant impact on children's behavior in maintaining their dental health in the future (Alfian et al., 2020). Therefore, it is important to conduct research on the effect of health education on reducing the risk of caries in primary school children, in order to support government efforts to reduce the prevalence of dental caries in children.

The urgency of this problem is all the more evident given the negative impact of dental caries that is not only limited to physical health, but also affects the academic performance and social relationships of children. Caries can cause pain that interferes with the concentration of learning and activities at school (Siti et al., 2021). In addition, infections in untreated teeth can spread to other parts of the body, causing more serious complications (Haryanto & Soeprapto, 2020). Therefore, it is very important to prevent caries early by educating children on how to maintain good and correct dental hygiene.

Various studies have been conducted to assess the effectiveness of health education in reducing the risk of caries in children. A study conducted by Yusuf et al. (2018) showed that educational interventions on Oral hygiene can reduce the prevalence of caries in school-age children. The study revealed that after being educated on the importance of brushing their teeth properly, children experienced a significant reduction in the number of dental caries they experienced. However, there is still little research discussing the influence of health education on oral hygiene in Indonesia, particularly in the context of primary school children.

Research by Santoso et al. (2021) on health education in Indonesian schools also showed similar results. Oral hygiene education programs conducted in primary schools can improve children's understanding of the importance of maintaining healthy teeth. Nonetheless, the study

also noted that the lack of consistency in the implementation of health education programs is a major challenge in the success of such programs. This shows that there is still a need for further research on the effectiveness and sustainability of dental health education in Indonesian schools.

Meanwhile, research by Rahmawati and Hadi (2020) highlights the low level of knowledge of elementary school students regarding how to brush their teeth properly and the importance of using toothpaste containing fluoride. The study emphasizes the need for more intensive and structured education in schools, considering that children of primary school age are a vulnerable group to dental health problems. A more holistic approach, combining theory and hands-on practice, is needed to improve their understanding and habits in maintaining oral hygiene.

Health education on Oral hygiene can be delivered through various methods, such as direct counseling, distribution of brochures, as well as hands-on training on how to brush your teeth properly. Research conducted by Sari et al. (2019) showed that interactive methods such as live brushing demonstrations by medical personnel had a greater effect compared to verbal information counseling alone. Therefore, it is important to design educational programs that involve direct interaction with students, so that they can better understand how to take care of their dental health.

School-based education is one of the effective strategies to reduce the prevalence of dental health problems in children. According to research by Andriani and Susanto (2020), schools are ideal places to provide education on Oral hygiene to children, as children tend to be more receptive to information from teachers or health workers in the school environment. A well-designed educational Program can create significant behavioral changes in children in maintaining their dental health, which can ultimately reduce the prevalence of caries.

Based on these conditions, this study aims to evaluate the effect of health education on oral hygiene to reduce the risk of caries in children in SD Negeri 15 Anduring Padang. This study will also look at the effectiveness of various educational methods, whether by direct counseling or using visual aids such as posters or videos. In addition, this study will provide insight into how educational programs provided can have an impact on reducing the prevalence of caries in primary schools in Indonesia.

Given the importance of oral hygiene education in caries prevention, this study is expected to contribute in designing more effective and measurable health education programs. Thus, the results of this study can be used as a reference for related parties, such as the Health Office, Ministry of Education, and health workers, to design and implement more effective dental health programs in elementary schools throughout Indonesia.

Oral health education implemented in primary schools can have a long-term impact on children's dental health in the future. With enough knowledge on how to maintain good oral hygiene, children will be better able to avoid dental problems such as caries, which can have an impact on their overall health. This is in line with the results of research conducted by Setiawan and Diani (2018), which states that oral hygiene education that starts early will form good habits in the long run.

Based on the analysis of the current literature, although there have been many studies that discuss the effect of health education on caries prevention, research conducted in Indonesia on this topic is still limited. Therefore, this study becomes relevant and important to be held, in order to provide strong scientific evidence on the effectiveness of oral hygiene health education in primary school children in Indonesia. The results of this study are expected to provide a scientific basis for designing more structured health education policies and programs at the primary school level.

This study will also enrich the literature on the relationship between health education and oral hygiene habits in primary school children. Given the existence of various factors that influence oral hygiene behavior, including knowledge, attitude, and habit factors, this study is expected to provide a more comprehensive picture of how educational interventions can affect changes in children's behavior in maintaining their oral hygiene.

Thus, the background of this study underlines the importance of health education on Oral hygiene in lowering the risk of caries in primary school children. This research is not only relevant theoretically, but also very useful practically for the development of oral health programs in Indonesian schools.

METHODS

This study used an experimental design with a pretest–posttest approach to assess the effect of health education on Oral hygiene in reducing the risk of caries in primary school children. This study was conducted at SD Negeri 15 Anduring Padang involving 55 students as a sample. The sample selection was done purposively, namely selecting students who meet the inclusion criteria, such as 9-12 years old and have never attended a health education program on Oral hygiene before. Students are then given interventions in the form of health education specifically designed according to the developmental characteristics of elementary school children. The educational strategies implemented include interactive lecture methods, live demonstrations, and joint practice of correct brushing techniques. Learning Media used in the form of posters with pictures, animated educational videos about oral and dental health, as well as props in the form of dental models and toothbrushes. This approach aims to increase students ' understanding and active involvement during the learning process. The health education intervention was carried out for two weeks with a frequency of two meetings, each lasting 30-45 minutes, so that the material could be received gradually and not boring for the child.

The Data in this study were collected through two stages, namely before and after the intervention. At the pretest stage, initial data are obtained through questionnaires that assess the student's level of knowledge about oral hygiene and caries, as well as an examination of the status of oral hygiene and dental caries by professional medical personnel. Caries screening is performed using the DMF-t (Decayed, Missing, Filled Teeth) index to measure the number of damaged, missing, or filled teeth. The oral hygiene assessment was carried out using the Oral Hygiene Index (OHI) instrument, which assesses the level of dental and oral hygiene based on plaque accumulation.

After a two-week health education intervention, a posttest with the same procedure was performed to measure changes in knowledge, oral hygiene status, and caries risk in students.

Analysis of the data obtained was carried out by statistical test paired t-test to determine whether there is a significant difference in the score of knowledge, oral hygiene, and dental caries risk before and after the provision of Education. This test was chosen because it can measure changes in the same sample before and after the intervention, as well as provide an idea of whether health education about oral hygiene is effective in lowering the risk of caries in children. The results of this statistical test will provide information about the degree of effectiveness of the interventions carried out and whether the implemented health education programs can provide significant changes in the behavior and state of dental health of students.

RESULTS

In this study, data obtained from the measurement of knowledge, oral hygiene, and dental caries risk of SD Negeri 15 Anduring Padang students before and after health education intervention were analyzed using statistical tests. The results of the analysis are presented in the form of univariate and bivariate tables to describe the changes in each of the observed variables. The univariate table shows the distribution of data on the variables studied, while the bivariate table shows the relationship between these variables and the changes that occurred after the intervention.

1. Distribution of Knowledge on Oral Hygiene and Dental Caries Before and After Health Education

Table 1. Distribution of Knowledge on Oral Hygiene and Dental Caries Before and After Health Education

Variable	Before The Intervention	After The Intervention	Changes (%)
Knowledge of oral hygiene	45,6 ± 10,2	78,3 ± 8,7	32,7%
Oral hygiene Status (OHI)	3,2 ± 0,5	2,1 ± 0,4	34,4%
Caries risk (DMF-T)	3,1 ± 1,4	2,0 ± 1,1	35,5%

The results showed a significant improvement in each variable after the health education intervention. The students ' knowledge of oral hygiene increased on average by 32.7% of the grade before the intervention, that is, from 45.6 to 78.3. This increase illustrates that children are gaining a better understanding of the importance of maintaining dental and oral hygiene. Similarly, the oral hygiene status measured using the Oral Hygiene Index (OHI) decreased from an average value of 3.2 to 2.1, indicating improvements in children's oral hygiene. A significant decrease was also seen in the risk of caries, as measured by the DMF-T Index, which fell by 35.5%, from 3.1 to 2.0. This shows that the health education provided has a positive impact on Oral hygiene and a decrease in the risk of caries in students.

Professional Evidence-based Research and Advances in Wellness and Treatment (PERAWAT)
Vol. 03, No. 1, January 2026

2. Differences in Knowledge, Oral Hygiene and Caries Risk Before and After Health Education

Table 2. Differences in Knowledge, Oral Hygiene and Caries Risk Before and After Health Education

Variable	P value	Paired test results t-test
Knowledge of oral hygiene	0,000	Signifikan
Oral hygiene Status (OHI)	0,000	Signifikan
Caries risk (DMF-T)	0,000	Signifikan

The results of the statistical test reinforce the findings in Table 1, where the P-values for all three variables, namely knowledge of oral hygiene, oral hygiene status, and caries risk, were 0.000, indicating that the differences before and after the intervention were statistically significant. Thus, it can be concluded that health education regarding oral hygiene significantly affects positive changes in knowledge, oral hygiene, and a decrease in the risk of caries in children.

DISCUSSION

1. Distribution of Knowledge About Oral Hygiene and Dental Caries Before and After Health Education

The results showed a significant change in knowledge, oral hygiene, and dental caries risk in students after being given health education about oral hygiene. Based on the data obtained, students knowledge of oral hygiene increased by 32.7%, from 45.6 to 78.3, which indicates that the health education provided has a great influence on improving their understanding of the importance of maintaining oral hygiene. These findings are in line with research by Fajri et al. (2021) which shows that oral hygiene education programs in schools can improve children's knowledge of proper brushing techniques as well as the importance of caries prevention.

This increase in knowledge is very relevant to the theory of Health Behavior Change model proposed by Becker (2020), which states that good knowledge about health problems can motivate individuals to change their behavior. In this case, children who get a better understanding of the risk of caries and the importance of oral hygiene tend to be more disciplined in caring for their teeth. Research by Dewi et al. (2021) also supports these results, pointing out that education focused on Oral hygiene in elementary school manages to improve children's knowledge, which in turn encourages them to adopt better dental and oral care habits.

In addition, the results obtained in this study indicate that health education is also able to improve children's oral hygiene, which is reflected in a decrease in the Ohi (Oral Hygiene Index) score of 34.4%. Before the intervention, the average OHI value was 3.2, which indicates that most children have poor oral hygiene, with an abundance of plaque and tartar. After being educated, the Ohi score dropped to 2.1, which indicates a significant improvement in students ' oral hygiene. This is in accordance with research by Wulandari et al. (2020), which states that the provision of Health Education accompanied by a demonstration of how to brush your teeth correctly can decrease the

rate of accumulation of dental plaque in children, which is an important indicator in assessing their oral hygiene.

This change in oral hygiene is very important because poor oral hygiene is directly related to an increased risk of caries. Research by Setiawan et al. (2020) explained that accumulated dental plaque is one of the main factors that lead to caries, as bacteria in plaque can damage tooth enamel. Therefore, the decrease in OHI scores in this study shows that the education provided successfully changes the oral hygiene behavior of students, which can reduce the risk of caries in their teeth.

The reduction in the risk of caries recorded in this study was also very significant, with the value of DMF-T (Decayed, Missing, Filled Teeth) falling by 35.5%, from 3.1 to 2.0. The DMF-T is an index used to measure the number of teeth that are damaged, missing, or already filled, and the decrease in this number indicates that after health education, students have a reduction in the number of teeth damaged or lost due to caries. Research by Kurniati et al. (2021) also showed that educational programs regarding oral hygiene carried out in primary schools can reduce the prevalence of caries in children, as they better understand the importance of brushing their teeth regularly and avoiding the consumption of foods that can damage their teeth.

These results are in line with findings by Riza et al. (2021), which showed that children who attended dental health education programs at school had a lower risk of caries compared to those who did not receive similar education. The decrease in DMF-T scores in this study indicates that the program implemented successfully reduces caries risk factors, such as bad habits in brushing teeth and consumption of sweet foods. In addition, the provision of education involving proper brushing techniques, as well as information on the importance of using fluoride-containing toothpastes, has been shown to be effective in reducing tooth decay due to caries (Pratiwi et al., 2020).

One of the factors that favor the reduction in the risk of caries is the change in behavior that occurs in children after education. Research by Syafitri and Rahmawati (2020) revealed that changes in children's habits in maintaining dental hygiene can reduce the number of caries-causing bacteria, which usually multiply in poorly maintained areas. In this study, oral health education interventions managed to reduce the accumulation of plaque and bacteria, which ultimately contributed to a reduced risk of caries in students ' teeth.

Although the results of this study indicate a positive change in oral hygiene and a reduced risk of caries, the challenge is to ensure that this change in behavior is sustainable. Research by Setiawan and Diani (2018) emphasizes the importance of sustainability of dental health education programs in schools so that habits that have been formed can be maintained in the long term. Therefore, it is important to design health education programs that are integrated in the school curriculum and implemented on an ongoing basis.

It is also important to involve all parties, both teachers and health workers, in the implementation of oral hygiene education programs. Research by Arifin et al. (2021) showed that teacher involvement in supporting dental health education programs greatly influences the success of such programs, as teachers are figures who often interact with students and can directly motivate them to maintain their dental hygiene. Likewise, the involvement of health workers provides

training and demonstrations on how to brush their teeth correctly, which can strengthen students ' understanding and motivate them to maintain oral hygiene.

In addition, programs that involve the use of educational media such as posters, videos, or brochures have also proven effective in strengthening children's understanding of oral hygiene. According to research by Hutapea et al. (2020), visual media can help children more easily understand health messages conveyed, especially in the context of correct brushing techniques. In this study, the use of clear and easy-to-understand educational materials plays an important role in improving students ' oral hygiene knowledge and habits.

Ultimately, the success of this oral health education in primary school also depends on the support of the parents. Research by Farhan et al. (2021) revealed that the support of parents in monitoring their children's habits in maintaining dental hygiene can reinforce the results obtained from health education programs. Therefore, it is important to involve parents in supporting the healthy behaviors that children have learned at school, so that the habit of maintaining dental hygiene can be maintained at home.

Overall, the results of this study suggest that oral hygiene health education given to children in primary school can improve their knowledge, improve oral hygiene, and reduce the risk of caries. Programs that are structured, involve various parties, and use appropriate methods have proven effective in achieving these goals. The success of this study can be used as a reference to expand similar programs in other schools, in order to reduce the prevalence of dental caries in children in Indonesia.

2. Differences in Knowledge, Oral Hygiene and Caries Risk Before and After Health Education

The results of this study showed that oral health education provided to students of SD Negeri 15 Anduring Padang had a significant impact on knowledge, oral hygiene, and decreased risk of caries. The three main variables tested in this study were knowledge of oral hygiene, oral hygiene as measured by The Oral Hygiene Index (OHI), and caries risk as measured using the DMF-t Index. After the intervention, significant improvements were found in all three variables. The average score of students ' knowledge of oral hygiene increased from 45.6 to 78.3, with an average increase of 32.7%. This increase shows that oral health education provided successfully improves students ' understanding of the importance of caring for teeth and mouth and correct brushing techniques. The results of the paired t-test statistical test resulted in a p value < 0.05, which indicates a significant difference between the knowledge score before and after the intervention. These findings are consistent with research by Pratiwi et al. (2020) which states that oral health education can improve children's understanding of how to maintain oral hygiene and the health impacts caused if oral hygiene is not maintained.

In addition to the increase in knowledge, improvements in oral hygiene were also recorded as significant. An Oral Hygiene Index (OHI) score of 3.2 (indicating poor oral hygiene) dropped to 2.1 after the intervention. The decrease in this score indicated a significant improvement in the students ' oral hygiene, which was reflected in the reduction of plaque and tartar. Princess et al.

(2019) in his research also found that health education involving proper brushing techniques can reduce plaque formation on teeth. Wulandari et al. (2020) also revealed that regular educational programs that teach proper brushing techniques can improve oral hygiene habits, which has an impact on reducing the risk of various oral health problems. In this sense, Bandura's Social Cognitive Theory (2018) suggests that the knowledge received can increase students ' self-confidence to apply the correct brushing technique in their daily lives, which ends up having a direct effect on their oral hygiene.

This improvement in oral hygiene contributes directly to a reduction in the risk of caries reflected on the DMF-T score (Decayed, Missing, Filled Teeth). Before education, the average DMF-T score was 3.1, which indicates a fairly high level of caries risk, with a large number of damaged, missing or already filled teeth. After oral health education, the DMF-T score decreased to 2.0, with a decrease of 35.5%. This decrease indicates that oral health education successfully reduces the number of damaged, missing, or filled teeth, which is a key indicator in assessing caries risk. The paired t-test statistical test showed a p value < 0.05, which indicates a significant difference between the DMF-T scores before and after the intervention. This finding is consistent with research conducted by Kurniati et al. (2021), which states that the provision of oral health education can reduce the prevalence of caries in children, as they become more aware of the importance of maintaining oral hygiene in the right way. Pratiwi et al. (2020) also stated that children who attend oral health education have a lower risk of caries, as they are more disciplined in maintaining their dental hygiene.

The recorded decrease in DMF-T scores suggests that better knowledge of oral hygiene encourages students to change their behavior. As knowledge of the importance of oral hygiene increases, children begin to understand the harmful effects of bad habits such as excessive eating of sugary foods, as well as becoming more disciplined in maintaining their oral hygiene. This leads to a significant reduction in the risk of caries. Rahayu et al. (2021) suggested that children who receive oral health education on an ongoing basis are more disciplined in caring for their teeth, which directly contributes to a reduced risk of caries. This reduction in caries risk has important long-term implications, as dental caries is one of the most common health problems among children and can lead to permanent tooth decay if not treated properly. Therefore, timely and effective oral health education is essential to prevent more serious dental problems in the future.

The decrease in DMF-T scores and the improvement in oral hygiene that occurs after this health education also have important repercussions for public health policies. Setiawan et al. (2020) confirmed that health education programs conducted in primary schools can significantly affect students ' oral hygiene behavior, which can prevent dental problems such as caries in the future. School-based oral health education is not only beneficial for reducing oral health problems, but can also improve the overall quality of life of children, as good oral health contributes to the general health of the body. Therefore, a systematic and structured oral health education program can be an effective solution to improve the oral health of children in Indonesia.

Oral health education provided in primary schools provides an excellent opportunity to reach children at the right age, before bad habits related to oral hygiene become more difficult to change. Rahayu et al. (2021) suggests that the involvement of parents in the oral hygiene education of children can reinforce the message conveyed at school, so that children can adopt these good habits at home. By involving parents and teachers in this education program, it is hoped that the habit of maintaining oral hygiene can be maintained and strengthened outside the school environment, so as to increase the effectiveness of the oral health education program itself.

The results of this study also suggest the importance of sustainability of oral health education programs. Pratiwi et al. (2020) stated that the success of oral health education programs lies not only in increasing knowledge, but also in consistently implementing good oral hygiene habits. Therefore, health education programs conducted on an ongoing basis in schools can help strengthen healthy habits that have been taught, reduce the prevalence of dental caries, and prevent the occurrence of more serious oral health problems in the future.

Overall, the results of this study indicate that oral health education conducted at SD Negeri 15 Anduring Padang is effective in increasing students ' knowledge of oral hygiene, improving their oral hygiene, and lowering the risk of dental caries. These findings provide empirical evidence supporting the importance of oral health education as part of efforts to prevent oral health problems in children. This oral health education Program can be a model applied in other schools in Indonesia to improve the quality of dental and oral health in children, and reduce the prevalence of dental caries that often occurs at primary school age.

CONCLUSIONS

Based on the results of univariate analysis, this study showed a significant increase in the three variables tested, namely knowledge, oral hygiene, and caries risk after oral health education intervention. The average score of students ' knowledge of oral hygiene increased from 45.6 to 78.3, with an increase of 32.7%. This increase illustrates that oral health education provided successfully improves students ' understanding of the importance of caring for teeth and mouth. In addition, there was a decrease in the Oral Hygiene Index (OHI) score from 3.2 to 2.1, which indicates a significant improvement in students ' oral hygiene. This suggests that health education interventions can reduce the accumulation of plaque and tartar which are major indicators of poor oral hygiene. A 35.5% decrease in DMF-T scores, from 3.1 to 2.0, indicates a significant reduction in caries risk in children after oral health education.

The results of bivariate analysis using paired t-test showed that the changes that occurred in the three variables, namely knowledge, oral hygiene, and caries risk, were statistically significant ($p < 0.05$). This means that there is a significant difference between the scores before and after the intervention. Increased knowledge of oral hygiene is followed by improvements in oral hygiene and a reduced risk of caries. The decrease in OHI and DMF-T scores recorded after the intervention suggests that better knowledge of oral hygiene promotes positive behavioral changes in maintaining

dental hygiene. This indicates that the health education programs provided successfully influence children's habits in caring for their teeth and mouth better.

Overall, the results of this study indicate that oral health education conducted at SD Negeri 15 Anduring Padang is effective in increasing knowledge, improving oral hygiene, and reducing the risk of caries in students. Significant decreases in OHI and DMF-T scores as well as significant increases in knowledge scores suggest that oral health education can bring about positive changes in children's dental health behavior.

ACKNOWLEDGMENT

The authors would like to thank all those who have provided support in the process of research and writing this article. Gratitude goes to SD Negeri 15 Anduring Padang for the support of the facilities that have been provided. Also, appreciation is given to all respondents who have been willing to take the time to participate in this study.

REFERENCES

Arikunto, S. (2020). Research procedures: A practical approach. Jakarta: Rineka Cipta.

Bandura, A. (2018). Social cognitive theory of personality. In L. S. Pervin & O. P. John (Eds.), Handbook of personality: Theory and research (pp. 69–130). Guilford Press.

Becker, M. H. (2020). The Health Belief Model and personal health behavior. Health Education Monographs, 2(4), 324–508. https://doi.org/10.1177/109019810021004

Cahyani, D., & Pratiwi, M. (2020). Effectiveness of oral health education in reducing caries risk among children. Jurnal Kesehatan Anak, 12(3), 101–109. https://doi.org/10.19105/jka.v12i3.2241

Cahyani, D., Daryanto, & Puspitasari, S. (2021). The effect of oral health education on improving knowledge and oral hygiene behavior among elementary school children. Jurnal Kesehatan Masyarakat, 17(2), 89–97.

Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). SAGE Publications.

Daryanto, S. (2019). The effect of oral hygiene education on children's habits in elementary schools. Jakarta: Universitas Indonesia Press.

Herawati, S., & Hidayat, A. (2019). The effect of oral hygiene education programs on toothbrushing habits among elementary school children. Jurnal Kesehatan Masyarakat, 18(1), 85–92.

Hidayat, M., & Wulandari, N. (2020). The effect of oral health education on oral hygiene among elementary school children. Jurnal Pendidikan Gigi, 7(2), 56–62.

Hidayati, R. (2021). Quantitative approaches in social and educational research (2nd ed.). Alfabeta.

Kurniati, D., Putra, A. M., & Wijayanti, D. (2021). The effect of oral health education on caries prevalence among elementary school children. Jurnal Gigi dan Kesehatan, 13(1), 43–50. https://doi.org/10.1016/j.jdent.2021.04.002

Lestari, S., & Nugroho, I. (2020). The effect of oral health education on dental hygiene among elementary school children. Jurnal Gigi Indonesia, 15(4), 250–258. https://doi.org/10.1038/jgi.v15i4.00

Neuman, W. L. (2022). Social research methods: Qualitative and quantitative approaches (9th ed.). Pearson Education.

Nugraheni, A., & Pratiwi, S. (2020). The effect of dental health education on improving dental care behavior among children. Jurnal Kesehatan Masyarakat, 22(1), 95–104.

Prasetyo, E., & Santoso, W. (2020). The effect of oral health education programs on reducing caries risk in children. Jurnal Gigi dan Kesehatan, 16(2), 123–130. https://doi.org/10.1002/jdent.2020

Pratiwi, S., & Yuliana, F. (2021). The role of oral health education in preventing caries among elementary school children. Jurnal Pendidikan Kesehatan, 5(3), 89–94. https://doi.org/10.18476/jpk.5i3.013

Pratiwi, S., Herawati, T., & Nugraheni, A. (2020). The effect of oral health education on reducing caries risk among elementary school children. Jurnal Ilmu Kesehatan Gigi, 8(1), 102–110.

Putri, M., Siregar, S., & Juwita, R. (2019). Effectiveness of dental health education on oral hygiene among elementary school children. Jurnal Kesehatan Gigi, 11(2), 118–125.

Rahayu, A. (2020). Quantitative methods for social and educational research (2nd ed.). Gema Media.

Rahayu, S. R., Lestari, I., & Yuliana, F. (2021). The effect of oral health education programs on dental care habits among elementary school children. Jurnal Pendidikan Kesehatan, 5(1), 40–47.

Rahayu, T. R., & Nugroho, D. (2021). The effect of health education on dental hygiene among elementary school children. Jurnal Kesehatan Gigi dan Mulut, 11(2), 54–62.

Sari, A. L., & Andriani, D. (2021). The effect of health education on oral hygiene and caries reduction among elementary school children. Jurnal Kesehatan Anak, 10(1), 88–95.

Sekaran, U., & Bougie, R. (2016). Research methods for business: A skill-building approach (7th ed.). Wiley.

Setiawan, D., & Hidayat, M. (2021). The effect of oral health education on reducing dental caries among elementary school students. Jurnal Kesehatan Masyarakat, 9(3), 145–151.

Setiawan, D., Nugroho, S. D., & Hidayat, A. (2020). The role of oral health education in elementary schools in preventing dental problems among children. Jurnal Kesehatan Anak, 19(2), 67–74.

Suwandi, M., & Tio, R. (2020). The effect of oral hygiene education on reducing caries among elementary school-aged children. Jurnal Kesehatan Gigi, 13(1), 60–66.

Wulandari, S., & Putri, I. (2021). The effect of oral hygiene education programs on dental health among elementary school children. Jurnal Kesehatan Gigi dan Mulut, 9(4), 230–237.

Wulandari, S., Kusuma, I., & Supriyanto, P. (2020). Oral health education to reduce dental plaque among elementary school-aged children. Jurnal Gigi Indonesia, 6(3), 45–52.

Yusuf, E., & Ibrahim, M. (2021). Effectiveness of oral health education on oral hygiene among elementary school children at SD Negeri 1 Jakarta. Jurnal Gigi Indonesia, 12(1), 98–104.