



Effect of Health Education Media MEGI (Coloring and Brushing Teeth) on Dental and Oral Hygiene in Elementary School Students

Ghiza Sekar Regina^a, Siti Fatimah^{a,1*}, Eliza Herijulianti^a, Rr. Megananda Hiranya Putri^a

^a Department of Dental Health, Politeknik Kesehatan Kemenkes Bandung, Bandung City, West Java, Indonesia

¹ sitifatihmah.jkg@gmail.com*

* Corresponding Author

ARTICLE INFORMATION

Article History:

Received: October 8, 2023

Revised: October 17, 2023

Published: November 30, 2023

Keywords:

Media Health Education

MEGI (Coloring and Brushing Teeth)

Oral Hygiene

ABSTRACT

School-age children are one of the vulnerable groups to oral health problems, such as dental caries and gum inflammation. These issues are often caused by children's lack of understanding of the importance of maintaining oral hygiene. Providing education using engaging media can be done as an effort to enhance children's understanding of daily oral health care. This study aims to determine the influence of the MEGI (Coloring and Brushing Teeth) health education media on dental and oral hygiene in elementary school students. This research is a quasi-experimental study with a one-group pre-post-test design. The research sample consists of second-grade elementary school students selected using total sampling techniques. Education is provided using the MEGI health education media. Data collection on dental and oral hygiene is recorded using the Plaque Free Score index. Research data is analyzed with Paired T-test. The results show that the mean dental and oral hygiene of students increased between before (14.25) and after (66.14) being given education using the MEGI health education media. The Paired T-test result obtained a p-value of $0.00 < \alpha < 0.05$, indicating a significant influence of the MEGI health education media on dental and oral hygiene in elementary school students. The MEGI health education media can be used as one of the counseling media options to improve dental and oral hygiene in elementary school students. For future research, it is recommended to provide continuous education to children, and oral hygiene examinations should be conducted periodically.

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INTRODUCTION

In accordance with Law Number 17 of 2023 concerning Health, it defines 'health' as the state of well-being of an individual, encompassing physical, mental, and social aspects, and not merely the absence of disease to enable productive living (President of the Republic of

Indonesia, 2023). Oral health is closely related to overall body health and well-being, where dental health can provide significant benefits to prevent diseases and enhance the quality of an individual's life (Saccomanno et al., 2023).

Dental and oral health issues are particularly prevalent among school-age children. The most common dental problem affecting children globally is dental caries (Benzian, Garg, Monse, Stauf, & Varenne, 2017). According to the Basic Health Research of 2018, the national prevalence of dental caries among Indonesian children aged 5 to 9 is 54.0% (Ministry of Health, 2018). In West Java Province, the prevalence of dental caries among children aged 5 to 9 is even higher than the national average and other age groups, reaching 55.52% (Ministry of Health, 2019). This indicates the need to address dental caries issues in this age group.

Dental caries is a multifactorial disease, influenced directly by factors such as teeth, diet, bacteria in biofilm plaque, and time (Fejerskov & Kidd, 2008). Caries prevention can be achieved through plaque control, mainly by brushing teeth properly. In practicing proper tooth brushing, individuals need knowledge about the frequency, timing, and correct brushing techniques (Featherstone, 2018; Widjanarko, Hadi, & Marjianto, 2022). The Basic Health Research results for West Java Province indicate that 95.29% of children aged 5 to 9 brush their teeth every day, but only 1.66% do so correctly (Ministry of Health, 2019). Therefore, efforts are needed to increase children's knowledge about maintaining dental hygiene through health education.

Providing education on dental and oral hygiene is best started early for school-age children. Although health education may not be easily understood by children, continuous and gradual health education will enhance their cognitive domain. Improved cognition will guide individuals in forming new behaviors, creating a foundation for a healthy lifestyle (Ali & Mintjelijungan, 2016; Hariyani, Setyowati, Aristyanti, & Setijanto, 2020). Implementing healthy behaviors, such as tooth brushing, in daily life becomes a way to improve dental and oral hygiene in elementary school children (Geetha Priya, Asokan, Janani, & Kandaswamy, 2019).

The transmission of messages in health education activities is effectively conveyed using media. Media is a demonstrative tool that helps clarify an application, making it easily understood and remembered longer in an individual's mind (Jatmika, Maulana, Kuntoro, & Martini, 2019). In this study, the media used is a researcher-designed visual aid called the MEGI (Coloring and Brushing Teeth) health education media. According to Siregar, Harahap, and Aidha (2020), media containing many images can capture the audience's attention and have the advantage of clarifying information delivery. Additionally, the research findings of Ali and Mintjelijungan (2016) indicate that providing dental health education using media, coupled with tooth brushing demonstrations, yields more effective results in improving children's dental and oral hygiene. Ferdi and Sari (2022) argue that direct practice significantly supports enhancing children's understanding of the correct way to brush teeth.

Preliminary studies conducted by the researcher through interviews with several second-grade students at SDN 408 Sirnamanah revealed that almost all students could not practice proper tooth brushing according to the procedures outlined in the School Dental Health Effort Guidelines (UKGS). This study aims to determine the influence of the MEGI (Coloring and Brushing Teeth) health education media on dental and oral hygiene in elementary school students.

METHOD

This research is a quasi-experimental study with a one-group pre-post test design. The research sample was taken using a total sampling technique, where all 28 second-grade students of SDN 048 Sirnamanah, Bandung City, were designated as the research sample. The research was conducted from March to April 2023. Prior to this, the research had obtained ethical clearance from the Research Ethics Commission of Health Polytechnic Ministry of Health Bandung with No. 55/KEPK/EC/II/2023.

Education was provided using the MEGI health education media (coloring and brushing teeth) created by the researcher. MEGI media is a two-dimensional image consisting of images of the facial and palatal/lingual surfaces of the teeth, along with illustrations of how to brush each surface.

Data collection on dental and oral hygiene was recorded using the Plaque Free Scores index from Grant, Stern, and Everett (1979). The Plaque-free Score Index was conducted by examining the mesial, distal, buccal, and lingual surfaces of the teeth that had been previously stained with a disclosing solution. Areas of teeth not stained with the disclosing solution were marked with a minus (-), while stained areas were marked with a plus (+). After examining and assessing all teeth, the plaque index could be calculated by adding the surfaces not stained with the disclosing solution divided by the total surfaces of the teeth examined, then multiplied by one hundred percent (Eastabrooks, 2015).

The research was conducted in several visits. During the first visit, the researcher explained the research and provided informed consent to the teacher/class guardian to be filled out by the parents/guardians of the students. In the second visit, students were given disclosing solution to reveal plaque on the tooth surfaces. Then, students were asked to brush their teeth as they normally do daily, followed by an examination of the Plaque Free Score. Subsequently, the researcher colored the tooth surfaces that were not clean or still had plaque using a red marker on the MEGI media. The MEGI media, colored by the researcher, was shown to the students, highlighting the areas of tooth surfaces that were not clean. The researcher then provided education and demonstrated the correct way to brush teeth. After that, students were asked to practice brushing their teeth using the MEGI media. The MEGI media could be taken home by the students to review the education provided by the researcher. The final visit was conducted 7 days after providing education using the MEGI media, where students were again given disclosing solution, asked to brush their teeth, and the final Plaque Free Score examination was conducted.

The data obtained from the examination were tested using parametric analysis. The normality test results showed that the data were normally distributed ($p=0.190 > 0.05$), fulfilling the conditions for parametric analysis using Paired T-test.

RESULTS AND DISCUSSION

Table 1. Characteristics of Research Respondents.

Characteristics Respondent	n (%)	Mean±SD Plaque Free Score	
		Before	After
Age			
8	21 (75)	14,9314±3,23221	68,0067±9,24757
9	7 (25)	12,2257±3,36313	60,57868±10,60764
Gender			
Male	16 (57,1)	13,9881±3,10049	67,0431±9,88176
Female	12 (42,9)	14,6108±3,91254	64,9583±10,35997
Total	28 (100)		

Table 1 presents the characteristics of respondents based on age and gender. Based on the age of the respondents participating in this study, the majority of students are 8 years old, totaling 21 respondents (75%). The characteristics of respondents based on gender show that the majority of students participating in this study are male students, totaling 16 respondents (57.1%).

Table 2. Descriptive Statistics of Dental and Oral Hygiene using Plaque Free Score Index before and after intervention.

Plaque Free Score	Mean	SD	SE Mean
Before	14,256	3,417	0,646
After	66,150	9,954	1,881

Table 2 shows the descriptive statistics of dental and oral hygiene using the Plaque Free Score Index, indicating an improvement among respondents. Before receiving education using the MEGI health education media, the mean Plaque Free Score was 14.256, and after education using the MEGI health education media, the mean Plaque Free Score was 66.150.

Table 3. Results of Paired T-test Analysis.

Plaque Free Score	Mean	SD	t	p-value
Before – After	51,895	9,664	-28,415	0,000

Table 3 shows the results of the Paired T-test analysis, with a p-value of $0.000 < \alpha 0.05$, indicating a significant influence of the MEGI health education media (Coloring and Brushing Teeth) on dental and oral hygiene in elementary school students.

Based on the characteristics of age and gender, the research results show an increase in the Plaque Free Score index before and after providing education using the MEGI media, indicating an improvement in dental and oral hygiene. According to Benadof, Polk, and Documet (2015), childhood is the best time to shape attitudes, behaviors, and habits related to tooth brushing. At the age of 4-9 years, children begin to independently practice brushing their teeth without parental assistance. During this period, children start developing control over the movements involved in tooth brushing and understanding the importance of maintaining their own dental health in daily life. However, if a child is not proficient in brushing their teeth, parents may need to assist in cleaning their teeth to ensure plaque removal.

The results of the Plaque Free Score index indicate an increase between before and after the intervention using the MEGI media in elementary school students. Oral hygiene conditions are highly influenced by individual behavior in maintaining dental and oral cleanliness. These behaviors are influenced by predisposing factors obtained from health education, media, or health information (Riadi, Hadi, & Hidayati, 2020). This indicates that health education needs to consider various aspects, including the use of appropriate health media tailored to the target education group. Although there was an increase in the Plaque Free Score index in this study, the individual students' Plaque Free Scores did not reach the target of 100% plaque-free due to the limited research time. Therefore, the evaluation (post-test) was only conducted once. According to the study by Sahiti, Kamatham, and Saikiran (2019), to assess the improvement in tooth brushing skills, researchers can conduct multiple evaluations at regular intervals, such as at 7, 14, and 28 days. Positive changes require a process that occurs gradually and cannot happen instantly.

Education is a long-term investment in shaping healthy lifestyles for individuals or communities. In the short term, health education will only result in changes in knowledge. Changes in knowledge occur after individuals perceive specific objects. Information about an object is sometimes subjective, and each person may interpret it differently (Jumilah, Jauhari, & Rhida, 2017; Raco, 2010). Therefore, the selection of the appropriate type of media plays a significant role in assisting the target audience in capturing health information (Aisah, Ismail, & Margawati, 2021).

The results of this study show that providing education using the MEGI health education media has an impact on dental and oral hygiene in elementary school students. This can be attributed to the choice of media used, where the MEGI media consists of images, generally appealing to children. Visual media is a two-dimensional and attractive medium that closely resembles real-world objects in terms of shape and color. Additionally, visual media stimulates children to remember the dental health information provided, promoting quick knowledge retention. These findings align with the study by Veriza, Riyadi, and Seisaria

(2020), stating that visual media in the form of images can enhance children's tooth brushing behavior, especially if the presented images are attractive and capture the children's interest in learning. According to Jatmika, Maulana, Kuntoro, and Martini (2019), the arrangement of media composition in terms of color, letters, and size becomes an art that fuels the curiosity of children as the target audience for health education. Veriza, Riyadi, and Seisaria (2020) added that image-based media can be easily observed, helping children remember and understand the presented information. Geetha Priya, Asokan, Janani, and Kandaswamy (2019) stated that regular health education with specific time intervals is effective in improving children's tooth brushing behavior. Good tooth brushing behavior has been proven to improve the condition of dental and oral hygiene in school-age children."

CONCLUSION

Providing education using MEGI health education media affects dental and oral hygiene in elementary school students. MEGI health education media can be used as one of the counselling media options to improve dental and oral hygiene of elementary school students. In research, it is still necessary to provide continuous education and repeated oral hygiene examinations at certain time intervals, in order to see the application of knowledge to daily dental hygiene attitudes and behaviour, so that the Plaque Free Score index of students can reach the target of 100% plaque free. For future research, it is recommended to provide continuous education to children, and oral hygiene examinations should be conducted periodically.

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