



## THE EFFECT OF ANIMATED VIDEOS ON TEETH BRUSHING ON SCHOOL CHILDREN'S KNOWLEDGE OF MAINTAINING DENTAL AND ORAL HEALTH

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### ABSTRACT

Dental caries remains a common health problem among children in many countries, including Indonesia, with a fairly high incidence rate. According to data from Riskesdas (2018), 81.5% of children aged 3-4 years in Indonesia suffer from dental caries. Lack of knowledge and poor oral hygiene practices can increase the risk of dental health problems. Educational media in the form of animated videos are considered effective because they stimulate visual and auditory senses, thereby aiding children's understanding. This study aims to evaluate the effect of an animated video on proper toothbrushing techniques on students' knowledge levels at SDN Bontoramba 1 Makassar. It is hoped that the implementation of such media can enhance children's awareness and knowledge about oral and dental care, thereby positively impacting their quality of life. This study aims to determine children's level of knowledge about dental and oral health care before receiving education through animated videos, then analyze changes in knowledge after the education, and assess the effect of animated videos on children's motivation to maintain dental and oral health. The research used a quasi-experimental design with a pre-post test approach. This study involved 36 elementary school students, consisting of 16 girls and 20 boys. The respondents were assessed before watching the educational animation video and then reassessed after the educational intervention through the video. Based on the McNemar test analysis, 29 students who initially had poor knowledge improved to good after watching the animated educational videos, and no students showed a decline from good to poor. The statistical test results showed a significance value of  $p < 0.001$ , which is less than the criterion limit of 0.05. There was a significant difference between the results before and after the intervention. These findings indicate that the use of animated educational videos has a significant effect on improving students' knowledge of how to brush their teeth to maintain dental and oral health.

Keywords: animated educational video; elementary school student knowledge; how to brush your teeth

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## INTRODUCTION

According to WHO survey data from 2018, approximately 60-90% of children in various parts of the world suffer from dental caries. The highest prevalence is found among children in America and Europe, while the Eastern Mediterranean and Pacific regions show lower rates (Uribe et al., 2021). The regions with the lowest rates of dental caries are Southeast Asia and Africa. Meanwhile, data from the 2018 Riskesdas survey shows that in Indonesia, the rate of dental caries in children aged 3-4 years reaches 81.5%. Globally, it is estimated that around 2.3 billion individuals suffer from permanent dental caries, and more than 530 million children are affected by primary dental caries (Adyatmaka & Patel, 2020; Uribe et al., 2021).

In Indonesia, the use of educational animated videos as a learning tool has been proven to have a positive impact on improving school children's understanding of proper toothbrushing techniques (Alzena et al., 2024; Fitri et al., 2024; Rusmiati et al., 2024). This visual-based media is considered effective because it conveys material in an interesting, easy-to-understand manner that is suited to children's learning styles. Children tend to show higher levels of focus and enthusiasm when learning through animated videos compared to traditional methods (Dwi A et al., 2023; Shofia et al., 2025). This increased understanding is expected to influence better toothbrushing habits, thereby helping to maintain dental and oral health from

an early age. Therefore, animated educational videos are an important approach in dental health promotion programs in schools (Alzena et al., 2024; Febria et al., 2022).

Based on data obtained in South Sulawesi, the use of animated educational videos on how to brush teeth has been proven to have a positive impact on improving school children's knowledge of maintaining dental and oral health (Aisyah AR et al., 2023; Nurhamidah et al., 2024). Animated media is considered effective because it presents information in an interesting and easy-to-understand way for children, making it easier for them to understand the importance of maintaining dental and oral hygiene. Education through videos is one method that can raise awareness of dental health in school-age children from an early age (Ningsih et al., 2024).

The use of animated video media in learning to improve toothbrushing skills in children with intellectual disabilities is expected to create a uniform understanding and attract students' attention (Rusmiati et al., 2024). As a result, children with intellectual disabilities find it easier to focus and the material is not quickly forgotten, allowing information to be received and understood more effectively (Lozano et al., 2018). The presence of animated videos makes lessons about brushing teeth more enjoyable for children. In addition, animated videos are able to display moving objects with natural or appropriate sounds, so that this media can convey information, explain processes, teach skills, and influence students' attitudes effectively (Yanti et al., 2017).

Children often face significant challenges in maintaining oral hygiene due to a lack of adequate education, limited ability to practice oral hygiene habits, and a lack of knowledge about oral health care (Mohammed, 2024; Mustafa et al., 2024). Improvements in understanding, attitudes, and behaviors related to oral hygiene can be achieved through dental health education. Oral health education is a program that aims to instill healthy habits related to oral health in individuals (Doichinova & Mitova, 2014). The main focus of this education is to bring about behavioral changes that encompass knowledge, attitudes, and habits that support a healthy lifestyle (Lestaris et al., 2023).

Counseling or Oral Health Education (PKG) is an educational program aimed at individuals and community groups with the goal of achieving optimal oral health (Sosial et al., 2023). The use of learning strategies that involve multiple senses through educational tools can facilitate understanding of educational objectives. Cartoon animation as a teaching method is an engaging form of audio-visual communication for oral health education (Georgieva, 2024). Audio-visual media can convey information or knowledge more effectively through dynamic images and music, thereby stimulating the senses of sight and hearing. The involvement of various senses in receiving information increases the chances of understanding the message being conveyed (Manulang et al., 2024).

The use of audiovisual animation in the learning process is one approach that attracts children's interest. Audiovisual is a method of conveying information that combines visual images reinforced with sound (Kale et al., 2024). This medium involves both sight and hearing simultaneously. Activating both senses in receiving information can affect a person's level of understanding of the material presented (Georgieva, 2024). The use of video media in the learning process can improve the efficiency of time and space usage, as well as convey messages more effectively. This allows students to quickly interact and communicate the material provided (Nur Azmi Alwi & Putri Lestari Agustia, 2024). In using educational videos, respondents received content about cognitive development that was presented in an easy-to-understand and enjoyable way, thereby motivating children to learn. The material

presented in the videos was easy to understand because it was packaged through a combination of images and sound (Rosanti Bilotango et al., 2023).

Oral health is an important aspect of overall health, which is also a major factor in the normal growth and development of children (Dimitrova, 2018). Problems with teeth and mouth can affect a child's growth and development, thereby impacting their quality of life. This condition should not be ignored, especially during a child's growth period, as it plays an important role in ensuring that nutritional needs are met (Dimitrova, 2018; Tenenbaum A et al., 2023). Teeth and mouth are parts of the body that function as the entrance for food and drink, so they play a very important role in determining the nutritional intake received. If dental health is compromised, the process of nutrient absorption in the body can be inhibited and cause a decline in overall health (N'Gom & Woda, 2002) (Gondivkar et al., 2019).

Dental and oral health problems can lower a child's confidence in socializing, even making them reluctant to smile when compared to children with healthy teeth and mouths. Physically healthy children tend to receive positive responses from their environment, which in turn creates a sense of comfort and helps maintain and increase their self-confidence (Alharbi et al., 2023; Gomes et al., 2017). The results of research conducted by (Nurhamidah et al., 2024) The effectiveness of educating children on tooth brushing using interactive video media to improve student knowledge at MIN 25 Aceh Besar shows that counseling using interactive video media has an influence on student knowledge levels (Claudia et al., 2021). Before the counseling session, 32 out of 38 students (84.2%) had inadequate knowledge, while 6 students (15.8%) demonstrated good knowledge. After the counseling session using interactive video media, all 38 students (100%) showed improvement, with good knowledge (Dewi et al., 2022; Rahmawati et al., 2021; Wibowo et al., 2024).

Research conducted by (Azrina et al., 2007) involved a preliminary study of 10 students with intellectual disabilities at SLB AL Hidayah Mejean, Madiun Regency, which examined their toothbrushing habits and the condition of their teeth and oral health. The study results showed that 6 out of 10 students had cavities, while the other 2 students had dental caries. Regarding toothbrushing habits, 6 students reported that they only brushed their teeth once a day, in the morning, while the other 4 students brushed their teeth twice a day, after breakfast and before bedtime (Pérez-Portilla et al., 2023; Ravoori et al., 2022). Based on initial observations conducted through a survey at SDN Bontoramba 1, researchers found nine children with different conditions, including four children with cavities and yellow discoloration of the teeth, two children with symptoms of pus-filled blisters on the feet, two children with long and dirty nails, and one child with lice eggs in their hair. The purpose of this study was to determine the effect of animated educational videos on children's knowledge of dental health care at SDN Bontoramba 1 Makassar.

## **METHOD**

The research design uses an experimental approach with pre-test and post-test methods, which measure the condition of respondents before they receive educational intervention and then reassess them after the intervention to see the changes that have occurred. This technique aims to evaluate the effectiveness of the intervention directly on the research subjects. This study involved 36 elementary school students, consisting of 16 girls and 20 boys. The respondents were assessed before watching the educational animation video and then reassessed after the educational intervention through the video.

## **RESULT**

This study was conducted at SDN Bontoramba 1 for approximately one month, from March 26 to April 26, 2025. Sampling was carried out using purposive sampling, in which samples

were selected based on specific criteria set by the researcher. The research data was obtained through observation sheets filled out directly by the researcher. This study used an experimental method with a pre-test and post-test design to analyze the impact of using animated educational videos on how to brush teeth on the knowledge of students at SDN Bontoramba 1 Makassar in maintaining dental and oral hygiene. Data collection was conducted using an observation sheet that measured students' knowledge levels using the Gutman scale. The collected data were then statistically analyzed using IBM SPSS version 27 with the McNemar test at a significance level of 5% (0.05).

Table 1.  
Frequency Distribution of Respondents' Gender Characteristics

Gender	f	%	Valid Persen	Cumulative Percent
Women	16	44.4	44.4	44.4
Men	20	55.6	55.6	100.0

Table 2  
Frequency Distribution of Respondents' Ages

Age	f	%	Valid Persen	Cumulative Percent
6	5	13.9	13.9	13.9
7	2	5.6	5.6	19.4
8	4	11.1	11.1	30.6
9	3	8.3	8.3	38.9
10	4	11.1	11.1	50.0
11	6	16.7	16.7	66.7
12	6	16.7	16.7	83.3
13	3	8.3	8.3	91.7
14	3	8.3	8.3	100.0

Table 3  
Frequency Distribution of Characteristics of Respondents

Class	f	%	Valid Persen	Cumulative Percent
1	6	16.7	16.7	16.7
2	6	16.7	16.7	33.3
3	6	16.7	16.7	50.0
4	6	16.7	16.7	66.7
5	6	16.7	16.7	83.3
6	6	16.7	16.7	100.0

Table 4  
Frequency Distribution of Knowledge Data Based on Pre- and Post-Tests

Knowledge	Pre Test	Pre Test	Post Test	Post Test
Poor	32	86,11%	3	11,11 %
Good	4	13,89%	33	88,89%

Table 5  
Results of Normality Tests for Pre- and Post-Test Knowledge

Variabel	Shapiro-wilk	SIG	Keterangan
Pre Test	0,885	0,001	Tidak Normal
Post Test	0,872	0,001	Tidak Normal

Table 6  
Results of Pre- and Post-Test Knowledge Comparison Tests

Knowledge	post test insufficient	A good final exam	Total
Poor pre-test	3	29	34
Good pre-test	0	4	4

Based on the tables presented, it can be concluded that this study shows a significant increase in knowledge among students at SDN Bontoramba 1 after being given an intervention in the form of an animated educational video on how to brush teeth properly. Demographic data shows that respondents were diverse in terms of gender, age, and grade, with an even distribution. The pre-test results showed that most students had low knowledge levels, but after the intervention, the majority of students were in the good knowledge category. The normality test indicated that the data was not normally distributed, so the analysis continued with the non-parametric McNemar test, which demonstrated a significant increase in students' knowledge ( $p < 0.05$ ). Thus, the use of educational animated videos is effective in improving students' knowledge about maintaining oral and dental health.

## DISCUSSION

This study aims to examine the impact of using animated videos on toothbrushing techniques on improving children's knowledge of oral and dental health at SDN Bontoramba 1 Makassar. The study was conducted from April 8 to 21, 2025, involving 36 students and educators as supervisors during the activity. Participants consisted of students from grades 1 to 6, aged 6 to 12 years, who shared similar characteristics, as this period marks the transition from a child's previous stage of play in kindergarten to the elementary education stage at school. Before the educational animation video was shown, most students (86.11%) demonstrated inadequate knowledge about how to brush their teeth properly. Only 13.89% of students had good knowledge. After the educational session, there was a significant improvement, with 88.89% of students falling into the good category and only 11.11% still falling into the inadequate category (Ravoori et al., 2022). The results of the McNemar test analysis indicate a statistically significant difference in the level of knowledge of students before and after watching the animated educational video on how to brush teeth (Nurhamidah et al., 2024).

The McNemar test results showed that there were 29 students who previously had a low level of knowledge, but after being given animated educational videos, their knowledge level improved to good. In addition, there were no students who experienced a decline in knowledge from the good category to poor after the intervention (Nurhamidah et al., 2024). This indicates that the use of animated educational videos is effective in improving students' knowledge without causing a decline in those who already have good knowledge (Dimas Qondias et al., 2024).

Based on the results of statistical analysis, a significance value of  $p$  less than 0.001 was obtained. With a  $p$ -value less than 0.05, it can be concluded that there is a significant difference between the pre-test and post-test scores. This indicates that the use of animated educational videos has a real impact on improving students' knowledge of proper toothbrushing techniques and the importance of maintaining oral and dental health. In other words, animated video media has proven to be effective in enhancing students' understanding of how to properly care for their teeth and mouth.

Research conducted by (Dimas Qondias et al., 2024) in the Journal of Pediatric Health Education shows that interactive animated media is very effective in conveying health information to young children. In addition, Halimah & Yusuf (2022) revealed that education using animated videos can improve children's focus and memory, especially regarding toothbrushing habits (Maulidina & Kurniawati, 2024). This is also supported by findings

(Sutrisno, 2021) which states that children find it easier to understand educational material through visual media because it suits their learning style, which is more dominant in visual and kinesthetic aspects. Thus, the use of animation as a medium for children's health education is very appropriate for improving understanding and positive habits from an early age.

Previous research supports the positive influence of using Animated Video Media (AVI) on students' dental and oral health (Aisyah AR et al., 2023) found that counseling with AVI significantly improved the dental and oral health behavior of fourth-grade students, with a p-value of 0.000. Furthermore (Nurhamidah et al., 2024) In their study, they showed that health education using animated videos can improve children's knowledge and skills in brushing their teeth, as evidenced by p 0.003. In 2024, Nurhamidah and her team researched the effects of animated videos on how to brush teeth on the knowledge and attitudes of students at Riad Madani Private Elementary School in Percut Sei Tuan District. The results of this study showed significant changes in the knowledge and attitudes of third-grade students, with a p-value of 0.000, confirming the effectiveness of this media.

Audio-visual media can convey knowledge or information more effectively through a combination of dynamic images and music, engaging both sight and hearing. Engaging multiple senses when receiving information increases the chances of understanding the message better ( et al., 2024). The use of audiovisual animation in the learning process is an interesting and effective method, especially for children. This medium presents information with visual representations combined with sound to enrich the learning experience. Thus, sensory involvement in receiving and processing information plays an important role in deepening understanding of the material presented (Kale et al., 2024).

Researchers assume that age is an important factor influencing elementary school students' knowledge of health maintenance, particularly dental and oral health. This is consistent with research (Sabbagh, 2020) which shows a significant relationship between age and a person's level of knowledge. As people get older, they tend to have better mindsets and maturity, which are influenced by the social values around them. Therefore, aging plays a big role in increasing understanding of health.

## **CONCLUSION**

A study conducted at SDN Bontoramba 1 from March 26 to April 26, 2025 concluded that students had an adequate level of knowledge about effective tooth brushing. These results are based on testing 36 respondents using the McNemar test, which showed a significant difference in students' knowledge before and after watching an animated educational video about brushing teeth. Of the 29 students who initially had insufficient knowledge, all now have a good understanding after this intervention, with no decrease in knowledge among the other students. With a significance value of  $p < 0.001$  (less than 0.05), statistical analysis confirmed a significant difference between the pre-test and post-test results. This confirms that animated educational videos are an effective tool for improving students' knowledge of dental and oral hygiene and health.

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