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ANIMATED VIDEO MEDIA TO IMPROVE ELEMENTARY SCHOOL CHILDREN'S KNOWLEDGE ABOUT DENTAL CARIES

Rifa Fauziah Syaifia Putri[1], Aditya Nurrochman[2], Ali Mustofa[3]
[1,2,3]Department Of Dental Health, Academy Of Dental Health Ditkesad Jakarta, Indonesia

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Abstract

Dental caries is a common oral health problem among elementary school children in Indonesia. This study aims to determine the effect of using animated videos on improving children's knowledge about dental caries at SDN Rawasari 01 Pagi. The study used a quantitative method with a one-group pretest-posttest quasi-experimental design. The sample consisted of 41 third and fourth grade students. The research instruments were educational animated videos and a questionnaire on knowledge about dental caries. Data analysis was performed using the Wilcoxon and Chi-Square tests. The results showed a significant increase in knowledge after the animated video media was provided. Before the treatment, 75.6% of respondents had low knowledge, while after the treatment, 85.3% of respondents showed good knowledge. The Wilcoxon and Chi-Square test showed a significance value of 0.000 ($p<0.05$), which means that animated video media is effective in increasing students' knowledge. There was no significant relationship between gender and knowledge level ($p>0.05$), but there was a significant relationship based on age ($p<0.05$). Animated video media can be an effective educational strategy to increase children's knowledge about dental caries, especially in the context of elementary school education.

Corresponding author:
Aditya Nurrochman
Jl. Abdul Rahman Saleh No.18 Jakarta Pusat, Indonesia
Email: ***aditya.nurrochman94@gmail.com***

Introduction

Dental and oral health of children in Indonesia is still a serious problem that requires attention from health workers. Many people who do not make dental and oral health a priority, even though teeth and mouth serve as an entrance to germs and bacteria that can affect the health of other organs (Puspitawati et al., 2019). One of the most common oral diseases that affect schoolchildren is tooth decay, which is a disruption to the hard tissue of teeth such as plaque, dentin, and cement (Keumala et al., 2024). Oral health is an important aspect of human life, as problems with the teeth and mouth can affect overall health (Imamah et al., 2023). A healthy mouth prevents various diseases such as throat cancer, thrush, gum disease, and tooth decay, all of which can interfere with the ability to bite, chew, smile, speak, and impact mental well-being (Sainuddin et al., 2023). The WHO and FDI report that set global health goals for 2020 emphasizes that oral health issues have a significant impact on human health, as the mouth is an important part of the body for meeting nutritional needs (Banowati et al., 2021).

Oral diseases can arise due to various factors, including unhealthy behaviors resulting from a lack of knowledge about the importance of maintaining dental and oral health, poor oral hygiene, laziness or irregular tooth brushing, and consumption of sugary foods and drinks. Children's lack of understanding about dental and oral care makes them more susceptible to oral health problems (Senjaya et al., 2019).

Dental caries is one of the most common dental health problems. Tooth decay occurs due to food debris sticking to the surface of the teeth, which then causes cavities, loose teeth, or even broken teeth. This condition can interfere with the chewing process and optimal growth of children (Ramayanti & Purnakarya, 2021). Biologically, dental caries is damage to the hard tissues of the teeth, namely plaque, dentin, and cementum, which occurs as a result of continuous demineralization by the action of microorganisms on fermented carbohydrate (Papilaya et al., 2016). Dental caries is the most common oral disease. This condition

can interfere with a child's ability to chew, thereby affecting the digestion and absorption of nutrients, making them less than optimal (Keumala et al., 2024). According to a report by the World Health Organization (WHO), the prevalence of dental caries in children under the age of 12 ranges from 60–90%, with approximately 90% of elementary school children worldwide experiencing caries. In Indonesia, the incidence of dental caries is also still relatively high (Majid, 2020).

Health Awareness can be enhanced through health promotion programs, namely a series of activities aimed at improving the knowledge, attitudes, and skills of individuals, groups, and communities to achieve a better quality of life (Anggun Wulandari et al., 2020). Primary school period is an ideal period for training motor skills while developing children's cognitive abilities because children have a short attention span, teaching methods should be fun and stimulating (Ni Wayan Arini, et al., 2025). Interesting use of interactive media in health promotion can help raise awareness and drive behavioral changes (Kurniawan et al., 2019).

One effective medium is animated videos, as they combine visual and audio elements. Videos can display moving images and sounds simultaneously, thereby attracting children's attention and stimulating their memory, cognition, and emotional aspects (Wiradona et al., 2022). Animated videos combine audio and visual elements. Audio media engages both the senses of hearing and sight, enabling elementary school children to learn approximately 50% of the information they hear and see. Thus, students can understand lesson material more effectively through a combination of listening and viewing experiences (Permata & Hapsari, 2021). Based on preliminary studies, it is known that most students do not have adequate knowledge about dental caries. The purpose of this study is to determine the effect of using animated video media in increasing elementary school children's knowledge about dental caries. The results of this study are expected to provide recommendations for effective educational media in promoting dental health in children.

Method

This study used a one-group quasi-experimental design (one group pretest-posttest), in which measurements were taken before and after the treatment was administered (Algi et al., 2024). The research is quantitative in nature and based on positivism philosophy, with the aim of testing the hypothesis regarding the effect of animated video media on the knowledge of elementary school children (Wadji, 2016);(Quraisy, 2022);(Vionalita, 2020).

Result

Results are the main part of scientific articles, containing: final results without data analysis process, hypothesis testing results. Results can be presented with tables or graphs, to clarify the results verbally.

Table 1. Frequency Distribution

Variable	Category	Frequency	Percentage
Age	8–10 years	33	80.5%
	11–12 years	8	19.5%
Gender	Male	26	63.4%
	Female	15	36.6%
Knowledge Pre-Test	Low (40–50)	31	75.6%
	Moderate (60–70)	7	17.1%
	High (80–100)	3	7.3%
Knowledge Post-Test	Low (40–50)	4	9.8%
	Moderate (60–70)	2	4.9%
	High (80–100)	35	85.3%
Total Respondents		41	100%

The distribution of respondents based on age, gender, and knowledge levels before and after the intervention using animated videos. Most respondents were aged 8–10 years, totaling 33 respondents sebanyak 80.5%, while the remaining 11–12 years totaled 8 respondents sebanyak 19.5%. In terms of gender, male respondents dominated with 26 individuals sebanyak 63.4%, compared to 15 female respondents sebanyak 36.6%. Analysis of pre-test knowledge revealed that the majority of students had low knowledge about oral health, with 31 respondents sebanyak 75.6% in the low category (scores 40–50), 7 respondents sebanyak 17.1% in the moderate category (scores 60–70), and only 3 respondents sebanyak 7.3% in the high category (scores 80–100). After the animated video intervention, knowledge improved significantly: 35 respondents sebanyak 85.3% achieved high knowledge, 2 respondents sebanyak 4.9% were in the moderate category, and only 4 respondents sebanyak 9.8% remained in the low category. Overall, the total number of respondents was 41 sebanyak 100%, indicating that the intervention effectively enhanced students' understanding of oral health.

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Table 2. Wilcoxon Test Results for Knowledge Level

Variabel	N	Mean Rank	Std. Deviation	Asymp. Sig. (2-tailed)
Pre-Test vs Post-Test	41	19,91	12,692	0,000

Table 2 shows the results of the Wilcoxon test for knowledge levels before and after the intervention using animated videos. Of the 41 respondents, the mean rank was 19.91 with a standard deviation of 12.692. The Asymp. Sig. (2-tailed) value of 0.000, which is less than 0.05, indicates that there is a significant difference between the pre-test and post-test knowledge levels. This indicates that the use of animated videos is effective in increasing students' knowledge about dental and oral health.

Table 3. Effectiveness of Animated Video *Pre-Test* Based on Gender

Gender	Good Knowledge		Moderate Knowledge		Low Knowledge		P-Value
	n	%	n	%	n	%	
Male	1	1,9	4	4,5	21	19,6	0,071
Female	2	1,1	3	2,5	10	11,4	
Total	3	3,0	7	7,0	31	31,0	

Table 3 shows the respondents' level of knowledge before being given the animated video intervention based on gender. From the pre-test results, most respondents had low knowledge, namely 21 males (19.6%) and 10 females (11.4%). Good knowledge was only possessed by 1 male (1.9%) and 2 females (1.1%), while adequate knowledge was possessed by 4 males (4.5%) and 3 females (2.5%). The p-value of 0.071 (>0.05) indicates that at the pre-test stage, there was no significant difference between the knowledge of males and females.

Table 4. Effectiveness of Animated Video *Post-Test* Based on Gender

Gender	Good Knowledge		Moderate Knowledge		Low Knowledge		P-Value
	n	%	n	%	n	%	
Male	22	22,1	2	1,3	2	2,5	0,713
Female	13	12,8	0	0,7	2	1,5	
Total	35	3,0	7	7,0	31	31,0	

Table 4 shows the respondents' knowledge levels after being given the animated video intervention. Good knowledge increased significantly, namely by 22 males by 22.1% and by 13 females by 12.8%. Low knowledge decreased to 2 males by 2.5% and 2 females by 1.5%. Adequate knowledge was found in 2 males (1.3%) and 0 females (0.7%). The p-value of 0.713 (>0.05) indicates that although there was an increase in knowledge after the intervention, there was no significant difference between genders in terms of knowledge level.

Table 5. Effectiveness of Animated Video *Pre-Test* Based on Age

Age	Good Knowledge		Moderate Knowledge		Low Knowledge		P-Value
	n	%	n	%	n	%	
8-10 years	3	2,4	6	5,6	23	9,8	0,056
8-10 years	1	0,5	0	0,0	8	6,4	
Total	4	2,9	7	5,6	31	16,2	

Table 5 shows the respondents' knowledge levels before the intervention based on age groups. For ages 8–10, only 3 people (2.4%) had good knowledge, 6 people (5.6%) had adequate knowledge, and 23 people (9.8%) had low knowledge. For the 11–12 age group, 1 person (0.5%) had good knowledge, 0 people (0.0%) had adequate knowledge, and 8 people (6.4%) had low knowledge. A p-value of 0.056 (>0.05) indicates that there is no significant relationship between age and knowledge level at the pre-test stage.

Table 6. Effectiveness of Animated Video *Post-Test* Based on Age

Age	Good Knowledge		Moderate Knowledge		Low Knowledge		P-Value
	n	%	n	%	n	%	
8-10 years	29	42,2	6	1,6	2	2,3	0,865
8-10 years	5	6,9	1	0,4	2	0,8	
Total	35	49,1	2	2,0	4	3,1	

Table shows the respondents' knowledge levels after the intervention based on age groups. Good knowledge increased dramatically in the 8–10 age group, with 29 people or 42.2%, and in the 11–12 age group, with 5 people or 6.9%. Low knowledge decreased to 2 people (2.3%) for ages 8–10 and 2 people (0.8%) for ages 11–12. The p-value of 0.865 (>0.05) indicates that after the intervention, there was an increase in knowledge across all ages, but there was no significant difference between age groups in terms of knowledge levels.

Discussion

The use of animated video media in teaching oral and dental health to elementary school children

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has been proven effective because it combines visual and audio stimuli, thereby improving students' understanding and memory. This media allows material to be presented in an interesting and interactive way, which is suitable for the characteristics of children of elementary school age, namely having a short attention span and learning more optimally through visual-auditory experiences.

Pre-test analysis showed that most respondents had low knowledge (40–50) at 75.6%, sufficient knowledge (60–70) at 17.1%, and good knowledge (80–100) at 7.3%. After the post-test, the good knowledge category increased to 85.3%, the low category decreased to 9.8%, and the moderate category decreased to 4.9%. The Wilcoxon test results showed an Asymp. Sig. (2-tailed) value of 0.000 (<0.05), which means that there was a significant difference between the pre-test and post-test, so it can be concluded that the use of animated videos is effective in increasing children's knowledge about dental and oral health.

The results of this study are in line with previous studies, such as (Jelita et al., 2020), which showed that virtual animation videos can increase elementary school children's knowledge of tooth brushing, and (Iszati et al., 2023), which found a significant increase in students' knowledge of dental caries after being educated using animation videos. This confirms that animated videos are an effective medium for dental health education, as they not only convey information but also stimulate children's interest in learning and cognitive engagement.

Therefore, the use of animated videos can be considered as a learning method that supports health promotion in elementary schools and can be an alternative or complement to conventional dental and oral health education strategies.

Conclusions and Suggestions

Based on the results of the study, the use of animated video media was proven to be effective in increasing elementary school children's knowledge about dental and oral health, as supported by the Wilcoxon test results showing significance p = 0.000. This study also shows that knowledge is influenced by gender, with 26 male respondents 63.4% and 15 female respondents 36.6%, which is statistically significant p < 0.005. In addition, there was an influence of knowledge based on age, where 33 respondents aged 8–10 years old accounted for 80.5% and 8 respondents aged 11–12 years old accounted for 19.5%, which was also statistically significant (p < 0.005). Based on the results of this study, it is recommended that schools and teachers routinely use animated videos in oral health education activities to improve students' overall understanding.

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