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Media Animated Video Versus Dental Phantom Dolls on Teeth Brushing Skills in Preschoolers: Which is More Effective?

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Original Article

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ABSTRACT

Background: The high level of dental health problems in preschool children is because preschool children have not been able to carry out independent activities in brushing their teeth. Dental health promotion efforts given to preschools must be appropriate to the child's development and developing technology. Animated videos have positive values including motion pictures that will make children's attractiveness higher and can stimulate children's understanding of cognitive, affective, and psycho-motor. Animated videos also involve the senses of sight and sound that can spur children's memory. In addition, videos have many advantages, including increasing children's motivation, training children to focus, practicing perseverance and increasing children's confidence.

Material and Methods: This study used a quasi-experimental control group pretest and posttest design. The sampling technique was a purposive sampling of as many as 66 children, who were divided into 2 groups, the animated video education on brushing teeth was the intervention group and education with dental phantom dolls was in the control group. The data were tested using Wilcoxon analysis, namely pre-post design, while to compare the mean of the treatment and control groups, the Mann-Whitney test was used, this is because the data were not normally distributed.

Results: Animated video media and dental phantom dolls proved to be significantly ($p<0.001$) effective in improving the teeth brushing skills of preschoolers.

Conclusion: Animated video media and dental phantom dolls are equally effective in improving the teeth-brushing skills of preschoolers.

Keywords: Animated Video, Dental Phantom Dolls, Dental Health Promotion, Preschool Children.

Introduction

The condition of poor oral hygiene is a problem that is often found in preschool children. In addition, deciduous tooth enamel is thinner than permanent teeth, making it more susceptible to dental caries. It is proven that the 2018 Basic Health Research reported that 92.6% of children aged 5-6 years experienced dental health problems.[1–3]

Conditions in the world are no different from Indonesia, according to WHO data, it has been reported that 9% of children worldwide (620 million) have experienced dental caries. Dental caries in children can cause inflammation and bleeding of the gums, abscess formation, tooth loss and subsequent loss of available space in the dental arch. It can also affect many aspects of children's lives. For example, it can cause bad breath, interfere with the digestive system and be a source of infection in the body, for example increasing the risk of heart attack.[4–6]

One of the causes of high dental health problems in preschool children is the inability to brush their teeth independently. It can be seen that the behavior of brushing teeth of the population aged 3 years is 2.8% who brush their teeth properly.[3] Reinforced by previous research, proving that preschoolers do not yet have the skills to brush their teeth; research by Ngatemi et al., also proves that early childhood does not yet have the skills to brush their teeth.[7,8]

Efforts to improve the dental health of preschool children through dental and oral health counseling. Health education is an effort to convey health messages with the hope that individuals, communities, groups can gain knowledge about better health so that behavior changes can occur. The counseling program is expected to be able to increase the criteria for knowledge and make people aware of the importance of maintaining dental and oral health and be able to actively participate in improving self-care efforts.[9–11]

One of the things that can be done in the process of applying learning to brush teeth is to adjust to the fun characteristics of preschoolers by using animated videos of brushing teeth. By using animated video media, children are expected to be able to focus on paying attention when the video is playing. Watching and simulating video activities, it is hoped will make it easier for them to take care of themselves and brush their teeth in daily life. According to Kantohe et al. animated video media has positive values, including motion pictures that will make children's attractiveness higher and can stimulate children's cognitive, affective, and psycho-motor understanding. Animated videos also involve the senses of sight and sound that can spur children's memory. In addition, videos have many advantages, including increasing children's motivation, training children to focus, practicing perseverance, and increasing children's self-confidence.[12–14]

Materials and Methods

This study used a quasi-experimental control group pretest and posttest design. This design is more adaptable for testing a causal relationship between two groups where random selection is not possible. This design is used to analyze the comparison of the effectiveness of animated videos and dental phantom dolls on the improvement of preschool children's brushing skills.

The sampling technique used by the researcher is purposive sampling. Purposive Sampling is a sampling technique where the researcher determines the desired sample criteria. The estimated sample size in this study using a minimum sample size calculation can use the formula for testing the hypothesis sample size on the average of two independent populations.[15] From the calculation of the sample formula, the minimum number of samples in each group is 33 samples, so the total sample used is 66 samples. The educational intervention group brushing teeth with animated videos was carried out by Ruwati III Kindergarten, while the control group for brushing teeth with phantom teeth was carried out by Dharma Putra Nusantara 86 Kindergarten and Harapan Bunda PAUD in Pondok Labu Village, South Jakarta City.

Data collection in this study is an observation sheet. The data collection tool used is an observation sheet for brushing teeth skills that have been tested for reliability validation in previous studies.[16] The observation sheet contains a sequence of task analysis of brushing teeth skills. Data collection was carried out at the

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beginning before the intervention and was measured again after the intervention. Data analysis was tested using Wilcoxon analysis and the Mann-Whitney test. The study was conducted after obtaining approval from the Ethics Committee of the Health Polytechnic of Jakarta I No. 026/KEPK/VI/2022.

Result

The results showed that the age of children in the intervention and control groups had the same proportion, mostly 5 years old, while the gender in the intervention and control groups also had the same proportion, mostly male.**(Table-1)**

Variable		Intervention		Control	
		Frequency	Percentage	Frequency	Percentage
Age	4 years	4	12.1	10	30.3
	5 years	18	54.5	12	36.4
	6 years	11	33.3	11	33.3
Gender	Male	18	54.5	17	51.5
	Female	15	45.5	16	48.5

Table 1: Frequency distribution of respondent characteristics.

The average value of children's brushing skills increased, in the intervention group increased from 5.03 to 9.18 and in the control group increased from 5.00 to 8.94. **(Table-2)**

Skills of brushing teeth	Min	Max	Mean	SD
Intervention				
Pre-test	3	7	5.04	0.810
Post-test	7	10	9.18	0.917
Control				
Pre-test	3	6	5.00	0.750
Post-test	7	10	8.94	0.899

Table 2: The average value of knowledge and skills of brushing teeth.

The results of the normality test for knowledge and skills of brushing teeth were not normally distributed, because the p-value < 0.05, the non-parametric test was continued.**(Table-3)**

Skills of brushing teeth		p-value
Intervention	Pre-test	0.001
	Post-test	0.000
Control	Pre-test	0.000
	Post-test	0.001

Table 3: Data normality test.

The results of the effectiveness test of the data before and after being given an animation video brushing teeth education showed that the p-value of the intervention group was 0.001 (p <0.05), meaning that the animated video brushing teeth education was effective in improving teeth brushing skills in preschool children. The p-value of the control group on brushing skills is 0.001, meaning that brushing teeth education with phantom dolls is effective in improving tooth brushing skills in preschool children.**(Table-4)**

Skills of brushing teeth		Mean± SD	p-value
Intervention	Pre-test	5.03±0.810	0.001
	Post-test	9.18±0.917	
Control	Pre-test	5.00±0.750	0.001
	Post-test	8.94±0.899	

Table 4: Test the effectiveness of skills of brushing teeth before and after intervention.

The results of the different brushing skills test showed that the p-value between the intervention group and the control group was 0.226 (p > 0.05), meaning that the animated video education on brushing teeth and education on brushing teeth with phantom dolls were equally effective in improving brushing skills in preschool children. **(Table-5)**

Skills of brushing teeth		Mean± SD	p-value
Intervention	Pre-test	9.18±0.917	0.266
	Post-test		
Control	Pre-test	8.94±0.899	
	Post-test		

Table 5: Different test of brushing skills in the intervention and control groups.

Discussion

The easiest way to prevent caries early is to provide dental and oral health information about cavities and to prevent it by brushing your teeth. The ability to brush their teeth in preschool children is influenced by various factors, one of which is education or education. Education is one of the tools to produce changes in humans because through education humans will be able to know everything that was not or was not known before. Counseling is one part of education. Counseling is delivered to children in various methods.[17–20]

In addition, so that dental health education can be delivered properly, it is necessary to have tools commonly referred to as media. Media is very diverse, there are in the form of visual media, audio, or even audio-visual. As in a study made by Aziz (2018), it shows that dental health education with animated video media or demonstrations is equally effective in improving teeth brushing skills. This can be caused because both of them use attractive images and are adapted to their developmental age.[21–23]

Research related to animated videos on teeth brushing skills in preschool children shows an increase in tooth brushing skills by doing animated videos in the form of score differences. The results showed that the average tooth brushing skill before dental health education in the intervention group increased from 5.03 and in the control group to 5.00. This is due to the fact that most children forget some parts of the surface to clean when

brushing their teeth. The surface part that is often missed is due to the lack of education on brushing teeth that actively involves preschool children so children are not accustomed to brushing thoroughly and often forget some parts, especially the palatal and lingual parts.

Next, the researcher made an animated video of brushing teeth made according to the media storyboard that had been made by arranging it in such a way as to produce media with a display that could attract the attention of the target. After finishing making an animated video product, the file in the form of mp4 is then given a background music video instrument that has previously been made in Audacity in order to create a more lively atmosphere, then it will be saved in mp4 format which is then used as an animated video media brushing teeth to improve children's brushing skills preschool.

Tooth brushing education was carried out in the intervention group by using animated videos, while in the control group brushing teeth demonstration using phantom doll media. For children, how to brush their teeth needs to be given an example of a good model and with as simple a technique as possible. The delivery of dental and oral health education to children must be made as attractive as possible, including through attractive counseling without compromising the content of education, and direct demonstrations. The selection of these methods and media supports increasing children's understanding, by practicing directly how to brush their teeth properly. Furthermore, respondents were given an intervention of brushing their teeth every day which was carried out for 5 consecutive days which was carried out at school.

The results showed an increase in the score of brushing skills of the respondents after being given education on brushing teeth, in the intervention group it increased from 5.03 to 9.18 and in the control group increased from 5.00 to 8.94. The increase in the difference in scores contained in table 4.2 is evidenced by the paired data test with Wilcoxon because the results of the normality test of the data are not normal. The test results showed that the effectiveness of the data before and after being given an animation video brushing teeth education showed the brushing skills of the intervention group's p-value was 0.001 ($p < 0.05$), meaning that the animated video brushing teeth education was effective in improving teeth brushing skills in preschool children. The p-value of the control group on brushing skills is 0.001, meaning that brushing teeth education with phantom dolls is effective in improving tooth brushing skills in preschool children.

Then continued the unpaired data test with Mann-Whitney, showing the p-value between the intervention group and the control group was 0.226 ($p > 0.05$), meaning that the animation video education on brushing teeth and brushing teeth education with phantom dolls were both effective in improving brushing skills teeth in preschool children.

The improvement of teeth brushing skills in respondents was due to the very interesting media and methods used and had several advantages, namely actively involving the sample so that it gave a positive response to sensing, such as; sight, hearing, sound, cognitive balance, thinking, affect, and motor or skills. In addition, the sample learns to understand activities that are not carried out in real situations, thus helping to develop abstract imagination and critical thinking.[24–26]

Animated video is a media that combines audio media and visual media to attract attention and present objects in detail and can help understand difficult material. Children prefer pictures or videos in the form of animated cartoons compared to real pictures because they attract more attention. A series of pictures and words which when combined in an educational medium will increase children's interest in learning and will increase children's imagination and memory of the material presented.[27–29]

In this case, the media in the form of animated videos is considered to best meet the criteria in terms of targets, in terms of discussing material about dental caries and prevention, in terms of the ease of getting it, and can be made as attractive as possible, because the use of animated video media can make students understand the material to be taught delivered.[30,31]

Conclusion

Based on the results of the study, it can be concluded that there animated videos brushing teeth and education brushing teeth with dental phantom dolls are equally effective in improving teeth brushing skills in preschoolers.

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