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The Effectiveness of Audiovisual Media and Snakes and Ladders Games on Increasing Knowledge and Skills of Brushing Teeth in Early Childhood Jambi City

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ABSTRACT

***Background**: Dental health is the most important part of general oral health, especially during a child's growth and development. Children with dental caries experience loss of chewing ability and problems with digestion, resulting in disruption of growth and development. Dental caries in children is still a fairly high prevalence problem in Indonesia.* ***Objectives**: This research aimed to see the effect of audiovisual media to Increasing Knowledge and Skills of Brushing Teeth in Early Childhood.* ***Methods**: This study used a pretest-posttest control group design. The subjects of this study were PAUD students in Jambi City with a 1:1 ratio of respondents, where the experimental group was 40 students and the control group was 40 students. Primary data can be collected through various methods, such as surveys, interviews, direct observation, or scientific experiments. Data analysis employed the paired t-test.* ***Results**: The measurable test shows a p-value of 0.000 < 0.05. It indicates that the understanding of the students in the intervention group and the control group differs significantly. The analysis's findings indicate a significant difference between the students' skills in the intervention group and the control group, with a p-value of 0.000 <0.05.* ***Conclusion**: Audiovisual media and snake and ladders games are effective in increasing knowledge and skill of brushing teeth in early childhood.*

***Keywords**: childhood, media, teeth*

INTRODUCTION

Oral health is an indispensable aspect of the body's overall well-being, as it directly affects the health of the entire organism. Not only does it affect the ability to eat and speak, but it also has a far-reaching impact on physical, mental and social health. This phenomenon is partly caused by people's behavior patterns that tend to ignore the importance of maintaining oral hygiene. This behavior often becomes a habit that is difficult to change and becomes part of the cultural norm. In the context of children, the importance of oral health is not only related to their physical health, but also affects other aspects of overall health (Sari,2023).

However, oral health is often neglected and is not considered a top priority in health issues. According to data from the Basic Health Research in 2018, 54% of children aged 5 to 9 had dental problems such as cavities or discomfort, while 41.4% of children aged 10 to 14 had the same issues. Likewise, with the national caries condition where in the age group 5-9 years the prevalence of caries is 92.6% and in the age group 10-14 years the prevalence of caries is 73.4% (Kemenkes R1, 2018).

Health promotion strategies emphasize the importance of education to increase knowledge, awareness and understanding. Health promotion involves effective communication to deliver health messages to the public. In order to provide the right education, a media is needed that can convey messages so that the intent and purpose of the education provided can be well-received.

According to the results of research conducted by Norvai (2017), it was found that the practice of brushing teeth properly and regularly can reduce the risk of dental caries in children. Research conducted by Novita (2024) also found one of the factors that cause dental caries is tooth brushing behavior in children. It is

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important to teach and emphasize tooth brushing skills to children at school age because at this time they tend to be more able to accept and internalize basic values.

The use of simulation methods can facilitate the absorption of knowledge, improve knowledge, attitudes and skills by providing an example of a good model. This method utilizes an interactive and engaging approach to convey information, making the learning process more enjoyable and easier to understand. Through simulations using the snakes and ladders game media, concepts about oral health can be presented visually and concretely (Oktaviani, 2022). Children can see concrete examples of how to maintain proper oral hygiene through this game.

Audiovisual is another method that can be used to educate children related to oral health at an early age (Febriany, 2021). The use of audiovisual media in dental health education and brushing habits in children is not just an option, but has a crucial role in shaping understanding and healthy behavior related to dental health. Through various media such as videos, animations, and interactive applications, children are introduced to important concepts about maintaining dental hygiene in a more visual and interesting way. Videos and animations are able to illustrate the process of brushing teeth with details that are difficult to explain through words alone. Children can clearly see the proper technique in brushing teeth, including the movements to be made and the areas to be considered. With this clear visualization, they can practically understand how to perform proper dental care.

Given the importance of developing fun educational media for children, especially related to improving tooth brushing behavior, this study aims to find "The Effectiveness of Audio Visual Media and Ladder Snakes on Increasing Knowledge and Skills for Brushing Teeth in Early Childhood in Jambi City."

METHODS

We will carry out experimental study as our methodology. The purpose of this study is to determine whether playing snakes and ladders games and using audiovisual materials significantly improves young children's dental brushing knowledge and abilities. A pretest-posttest control group design was employed in this investigation. To ascertain whether there is a difference between the experimental group and the control group at the outset, two groups are chosen at random and given a pretest (Sugiyono, 2017). The control group will receive a simple counseling intervention with dental phantoms, while the treatment group will receive an intervention in the form of using audio visual media and snakes and ladders games as an additional learning method. By comparing these two groups, we will evaluate the effectiveness of using these media in improving children's tooth brushing knowledge and skills. The independent variables in this study are the use of audiovisual media and snakes and ladders game, while the dependent variable is the knowledge and skills of early childhood tooth brushing after the intervention.

PAUD students in Jambi City served as the study's participants. There were 40 students in the experimental group and 40 in the case group, with a 1:1 respondent ratio. Primary data were used in this investigation. Primary data are information that researchers first obtain directly from the source for certain study objectives. There has never been any prior processing or use of this data for other reasons. Numerous techniques, including surveys, interviews, in-person observation, and scientific experiments, can be used to gather primary data (Hardani et al., 2020).

In the data collection stage, this study began by conducting an initial assessment of the knowledge and skills of brushing teeth in early childhood in both subject groups. After that, the intervention was carried out by applying the use of audiovisual media and snakes and ladders games in the treatment group, while the control group would use a simple counseling intervention method with dental phantoms. After the intervention period was completed, a final assessment was conducted to re-measure tooth brushing knowledge and skills in both groups, making it possible to evaluate the impact of the intervention.

This research has passed the ethical test with number 3097/UN21.8/PT.01.04/2023.

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RESULTS AND DISCUSSION

In order to determine whether there is a difference between the students' knowledge, attitudes, behavior, and OHIS scores on the pretest and posttest, the data analysis stage will use the paired t-test test on normally distributed data based on the normality test using Kolmogorov-Smirnov (sig>0.05). The Wilcoxon test is an alternate test that is employed when the data is not regularly distributed. A difference between the pretest and posttest findings is indicated if the p-value is less than 0.05.

To see the contrast between the post-test of participants who were given mediation within the shape of an instructive demonstrate and the posttest results of participants within the control bunch, analysts utilized the autonomous t-test for regularly disseminated information and the Mann-Whitney test for non-normally conveyed information.

Table 1. Normality Test

Variable		Kolmogorov-Smirnov
Experiment		
Knowledge	Pretest	.003
	Posttest	0.000
Skill	Pretest	0.000
	Posttest	0.000
Control		
Knowledge	Pretest	0.000
	Posttest	0.000
Skill	Pretest	0.000
	Posttest	0.000

***Wilcoxon Test**

Based on the table above, it can be seen that all variables are not normally distributed. All variables will be tested using the Wilcoxon test to see if there is a difference between the pretest and posttest results.

Table 2. Experiment

Variable	Mean	SD	*P-value*	N
Knowledge*				
Pretest	3.00	1.10	0,00	40
Posttest	7.13	0.68		40
Skill				
Pretest	2.35	1.00	0,000	40
Posttest	6.62	0.77		40

The table indicates that the mean pretest knowledge is 3.00 with a deviation of 1.10, whereas the mean post-intervention knowledge is 7.13 with a deviation of 0.68. The test results indicate a p-value of 0.000, confirming a significant difference in students' knowledge pre and post intervention. The mean skill value was 2.35 and it had a standard deviation of 1.00. Following the intervention, the mean score on the posttest was 6.62, accompanied by a standard deviation of 0.77. The analysis results show a p-value of 0.000, indicating a significant difference in students' skills before and after the intervention as it is less than 0.05.

Table 3. Control

Variable	Mean	SD	*P-value*	N
Knowledge*				
Pretest	3.13	1.,04	0.00	40
Posttest	4.90	0.95		40
Skill				
Pretest	2.70	0.72	0.000	40
Posttest	5.25	0.84		40

In the table above, the average pretest knowledge of the control group is 3.13 with a standard deviation of 1.04 while the average knowledge after the intervention is 4.90 with a standard deviation of 0.95. The statistical test results show a p-value of 0.000 <0.05, which means that there is a significant difference between students' knowledge before and after the intervention in the control group. The mean pretest of skill variables was 2.70 with a standard deviation of 0.72. After the treatment, the average posttest score was 5.25 with a standard deviation of 0.84. Based on the results of the analysis, the p-value is 0.000 <0.05, which means that there is a significant difference between students' skills before and after the intervention in the control group.

Table 4. Results between Behavior Group and Control Group

Variable	Mean	SD	*P-value*	N
Knowledge*				
Intervention	7.13	0.68	0.000	40
Control	4.90	0.95		40
Skill				
Intervention	6.62	0.77	0.000	40
Control	5.25	0.84		40

*Mann-Whitney Test

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The intervention group has an average knowledge of 7.13 with a standard deviation of 0.68, compared to the control group which has an average knowledge of 4.90 with a standard deviation of 0.95 as shown in the table. The statistical analysis indicates that the p-value of 0.000 is less than 0.05, indicating a notable disparity in the knowledge levels of students in the intervention group compared to those in the control group. The mean skill level for the intervention group was 6.62, with a standard deviation of 0.77. The control group has an average of 5.25 and a standard deviation of 0.84. According to the analysis results, the p-value is 0.000 <0.05, indicating a notable distinction in students' skills between the intervention and control groups.

The Effectiveness of Audiovisual Media in Teaching Young Children Toothbrushing Skills

Audiovisual media has proven to be a valuable tool in teaching health-related behaviors to young children, including proper toothbrushing techniques. By using both visual and auditory elements, audiovisual resources such as animated videos, songs, and short stories can engage children's attention and simplify complex information, such as the steps of effective toothbrushing. According to a study by Ghaffari et al. (2018), children exposed to audiovisual media demonstrating proper dental hygiene behaviors show significant improvement in both knowledge and skills related to brushing techniques. The multisensory approach helps children not only understand the "how" but also the "why" of toothbrushing, contributing to better habit formation.

Mayer's *cognitive theory of multimedia learning* supports this, suggesting that when educational content is presented through both images and sound, children retain information more effectively than with text alone. For young children, audiovisual media with vivid visuals and engaging audio can make learning about dental hygiene both entertaining and memorable, which is crucial for building foundational health habits (Mayer, 2009).

The Use of Snakes and Ladders to Reinforce Toothbrushing Habits in Young Children

Snakes and ladders is an engaging, low-tech method that can be customized to promote learning about toothbrushing habits. By incorporating questions or instructions about brushing techniques on each game square, the game can be transformed into an educational tool that reinforces children's understanding of correct brushing practices. In a study conducted by Kumar et al. (2017), the game of *snakes and ladders* was shown to significantly improve young children's knowledge about oral health by creating an enjoyable learning environment (Kumar et al, 2017).

The structure of the game, with "snakes" representing poor brushing habits and "ladders" symbolizing good practices, can help children understand the consequences of good versus poor dental hygiene. According to Vygotsky's *social development theory*, play encourages social interaction and cognitive development in young children, making games like *snakes and ladders* especially effective for teaching self-care routines (Vygotsky, 1978). This game-based approach also promotes motivation and engagement, as children are more likely to stay focused and retain information learned through interactive activities.

CONCLUSION

Health education using audiovisual media and snake and ladders games can increase the knowledge and skill of brushing teeth in early childhood. So audiovisual educational and snake and ladders games media can be used by teachers or parents to educate children about dental health and train children's tooth brushing skills.

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