



Smart Book Media Education on Preventing Dental Caries

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ABSTRACT

Dental caries problems are experienced by most elementary school children in Indonesia. Lack of children's knowledge about preventing dental caries affects their behavior in maintaining dental and oral health. Efforts to prevent dental caries can be done by providing dental and oral health education to children through learning media aids, namely smart books. The purpose of the study was to see the effect of smart book media education on preventing dental caries in elementary school students. The type of research used was pre-experiment with a One Group Pre-Test Post-Test Design. The sample was taken by random sampling, the sample size was based on the Isaac and Michael formula with an error rate of 5% and 37 elementary school students in grade 5 were obtained. The variables in the study were smart books and dental caries prevention. Smart book media has been tested and declared feasible by media experts and material experts. Hypothesis testing using Wilcoxon Sign Rank. The results of the study showed an increase in caries prevention behavior in all students (100%) from the aspects of Knowledge, Attitude and Action after being given education through smart books. Wilcoxon Sign Rank analysis showed that there was a significant influence of the results of smart book education on dental caries prevention behavior in the aspects of Knowledge, Attitude, and Action 0.001 ($p < 0.05$). The use of smart books as an educational medium has been proven to be able to increase dental caries prevention behavior effectively in elementary school children. Elementary school students become more aware of the efforts that must be made to prevent caries.

INTRODUCTION

The results of the 2018 Basic Health Research (Riskesmas) report, 57.6% of Indonesian people still experience problems with dental and oral health. Dental caries problems are experienced by children aged 10 to 14 years with a total of 73.4%. Children aged 10 to 14 years have not been able to pay attention to their dental and oral hygiene so that it can cause dental caries problems. As many as 96.5% of children aged 10 to 14 years have brushed their teeth every day, but only 2.1% brush their teeth at the right time (Kemenkes RI, 2020).

Dental health problems arise due to lack of knowledge and understanding of the importance of maintaining the condition of teeth and mouth. Cavities can arise due to food residue left on the surface of the teeth and not cleaned. One of the factors that causes children to experience tooth decay is because of behavior (Setiari, 2017). Elementary school children's knowledge about the importance of maintaining dental health still needs to be improved. Lack of knowledge about foods that are at risk of tooth decay is one of the factors. This is evidenced by the many children who still like to consume sweet foods without caring about their dental health conditions (Hardika, 2018).

This problem can be overcome by making efforts to prevent dental caries through dental and oral health education for children. This education can be given using aids in the form of learning media. The application of educational media in learning can increase students' interest and motivation to learn, create order, increase understanding and develop values in students (Audie, 2019). Smart books are one type of educational tool that can be used to help students understand the importance of preventing tooth decay. Smart books are dental and oral health teaching materials that are packaged in the form of books. cetak. The advantage of smart books lies in their attractive and informative appearance, making it easier for children to understand the contents of the information. Teachers at school can use this book as teaching material in class (Fitri, 2023).

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The study entitled "Smart Book Media Improves Learning Outcomes of Elementary School Grade I Students' Basic Skills" shows that smart book media can increase student interest so that students' basic skills improve. Smart book media can provide meaningful experiences to students that will make their memories stronger and have a good impact on their learning outcomes (Mariantini, 2022). In line with the research entitled "The Influence of Smart Book Media on Toothbrushing Knowledge in Children Aged 4-5 Years" states that early childhood understanding in brushing teeth is significantly influenced by smart book media. The purpose of this smart book media is to provide education on how to maintain dental health and avoid diseases that can be caused by improper tooth brushing methods (Satriana, 2019).

This study is different from other researchers' studies that use smart book media in three-dimensional prints to provide students with an understanding of dental and oral health maintenance behavior. According to the study, smart book media will be made in the form of a book containing content about preventing dental caries and poured into fun activities for children that contain commands so that this book becomes more interactive. This smart book modification is what differentiates it from previous studies and aims to provide education to 5th grade elementary school students in Patengan Village, Bandung Regency.

METHOD

The type of research is pre-experiment with One Group Pre-test Post-test Design. The research sample was determined by random sampling technique, the sample size was taken based on the formula developed by Isaac and Michael with a 5% error rate, obtained 37 elementary school students in grade 5. The independent variable in this study is Smart Book Media and the dependent variable is Dental Caries Prevention which includes aspects of Knowledge, Attitude, and Action.

The measuring instruments used in this study were knowledge questionnaires, attitude statement questionnaires, and tooth brushing action observation sheets. Before the data collection process, respondents were given a consent form that must be signed by their parents. The research was carried out for 21 days consisting of three stages, namely the first 7 days for the introduction of smart book media by filling in the activities listed in the book, the second 7 days for repetition by providing education on dental caries prevention through smart book media, the third 7 days for consolidation by rereading the contents of the smart book media and correcting incorrect answers. The pretest value measurement was carried out on the 1st day and the posttest value measurement was carried out on the 21st day.

The smart book media for preventing dental caries has been tested for its feasibility by material and media experts using the presentation formula for the media feasibility test and the media and material feasibility test. The feasibility category is based on the following criteria: 1) <21% = very unfeasible, 2) 21-40% = Not feasible, 3) 41-60% = quite feasible, 4) 61-80% = feasible and 5) 81-100% = very feasible. The results of the feasibility test assessment by 3 material experts and smart book media experts on dental caries prevention in this study obtained a material feasibility score of 94.6 and a media feasibility score of 86.3, meaning it is very feasible to use. The smart book media design given to respondents can be accessed at the following link: <https://bit.ly/MediaBukuPintar>. The hypothesis test in this study used the Wilcoxon Sign Rank Test to see the effect of smart book media education on the prevention of dental caries in grade 5 elementary school students in Patengan Village, Bandung Regency. This research has obtained ethical clearance from the KEPK team of Poltekkes Kemenkes Bandung with number 54/KEPK/EC/I/2024.

RESULT

This study was conducted on 37 respondents from three elementary schools located in Patengan Village, Rancabali District, Bandung Regency from February 19 to March 10, 2024. The elementary schools consisted of SDN Rancabali with 18 respondents, SDN Sindangreret with 13 respondents, and SDN Patengan with 6 respondents. Respondents were 5th grade elementary school students who were cooperative and willing to be respondents for 21 days.

Table 1. Frequency Distribution of Respondent Characteristics by Gender and Age

Characteristics	Frequency	Percentage
Gender		
Male	14	37.8
Female	23	62.2
Total	37	100
Age		
10 year	3	8.1
11 year	29	78.4
12 year	5	13.5
Total	37	100

Table 1 shows that female gender is the largest respondent group, namely 23 people (62.2%), while in terms of age, the 1 year old age group is the largest with 29 respondents (78.4%)

Table 2. Frequency Distribution of Dental Caries Prevention Behavior Before and After Smart Book Media Education

Category	Before		After	
	Frequency	%	Frequency	%
Knowledge				
Good	23	62,2	37	100
Enough	14	37,8	0	0
Less	0	0	0	0
Attitude				
Good	21	56,8	37	100
Enough	16	43,2	0	0
Less	0	0	0	0
Action				
Good	9	24,3	37	100
Enough	28	75,7	0	0
Less	0	0	0	0

Table 2 shows that there was an increase in dental caries prevention behavior in all students (100%) from the aspects of Knowledge, Attitude and Action after being given education through smart books.

Table 3. Difference in Average Value of Dental Caries Prevention Behavior Before and After Smart Book Media Education

Variable	Mean	Criteria
Knowledge		
Pre-test	80,08	Good
Pos-test	93,76	Good
Difference	13,68	
Attitude		
Pre-test	78,11	Good
Pos-test	95,65	Good
Difference	17,54	
Action		
Pre-test	73,97	Enough
Pos-test	94,22	Good
Difference	20,25	

Table 3 shows that the highest increase in dental caries prevention behavior in elementary school students occurred in the action aspect from before education with a value of 73.97 to 94.22 after education using smart book media.

Table 4. Results of the Wilcoxon Statistical Test Before and After Smart Book Media Education

Variable	Negative Ranks	Positive Ranks	Ties	p-Value
Knowledge Pre-test Knowledge Post-test	0	34	3	0,001
Attitude Pre-test Attitude Post-test	0	36	1	0,001
Action Pre-test Action Post-test	0	37	0	0,001

The results of the Wilcoxon sign rank test in table 4 obtained a p-value of $0.001 < (0.05)$ in the aspects of Knowledge, Attitude and Action levels, this states that smart book media education has an effect on preventing dental caries.

DISCUSSION

Dental caries in elementary school children can be caused by behavioral aspects. Children's lack of awareness of dental and oral care can have a negative impact on the child's quality of life in the long term. Therefore, efforts to prevent dental caries from an early age are very important by educating and forming habits of maintaining good oral hygiene (Nugraheni, 2019). Efforts that can be made are to promote dental health in schools as an effective environment for teaching and learning activities. Schools are the initial stage in forming children's habits to care for dental health regularly through health education efforts that are organized (Riolina, 2017).

Human behavior is influenced by experience and interaction with the environment which is manifested in Knowledge, Attitudes and Actions (Notoatmodjo, 2010). Health behavior refers to a person's response to various health-related matters such as health services, illness and disease conditions, eating and drinking patterns, and environmental conditions (Janewati, 2023). The results of the study showed that the behavior of preventing dental caries in the aspects of Knowledge, Attitude, and Action increased with good criteria.

The use of smart books as a learning medium in this study succeeded in increasing respondents' knowledge about preventing dental caries. The results of the assessment of respondents' knowledge showed a value with good criteria. Education about preventing dental caries in children including its causes and prevention is the main key to maintaining their dental health. This knowledge can encourage children to apply good habits such as brushing their teeth regularly so that their dental health is better maintained. Children's active participation in the learning process will result in a stronger understanding and encourage permanent behavioral changes than behavior that is not based on understanding (Nubatonis, 2019). Education is an aspect that influences a person's level of knowledge. This aspect is obtained to obtain information, such as knowledge related to health so that it can improve the quality of life. Health education is part of an overall effort to achieve well-being that aims to change living behavior to be healthier (Jannah, 2020). This study is in line with the study entitled "The Use of BUKPIN Media on Elementary School Students' Dental and Oral Health Maintenance Behavior". The average knowledge of respondents increased from 16% to 66% after the intervention (Fitri, 2023).

The results of the study showed that most students had given a statement of agreement which means supporting efforts to prevent dental caries, so that the results of the attitude assessment were obtained with good criteria. Understanding dental caries will motivate children to have a positive attitude towards preventing it. This positive attitude will encourage children to seek information about various efforts to prevent dental caries so that this attitude becomes the basis for children to develop good habits in maintaining their dental health. Attitude measurement can be done directly involving questions to respondents about their opinions on an object and involving responses or answers to the objects given (Ni'mah, 2017). A person's attitude can be formed through a learning process that involves information, observation, and direct experience with a particular object (Nurhasanah, 2023). This study is in line with the study entitled "The Effect of Health Counseling on Students' Attitudes in Dental Care at SDN 601 Menanggal Surabaya". The results of the study showed that the respondents' attitudes had improved between before and after the intervention. Only 9 respondents (27.2%) had a good attitude towards dental care, but after being given counseling, 23 respondents (69.7%) had a good attitude towards their dental care (Suryaningsih, 2020). Another study entitled "Use of BUKPIN Media on Elementary School Students' Dental and Oral Health Maintenance Behavior" showed that the average value of respondents increased from 87% to 97% after being given education. (Fitri, 2023).

Most of the students in this study showed an increase in their brushing results so that good criteria were obtained. The level of dental and oral hygiene of a person can be observed from their behavior in caring for their teeth. The better the behavior, the more well-maintained the teeth and mouth. Conversely, the worse the behavior, the dirtier the condition of the teeth and mouth (Adam, 2022). Children's dental and oral hygiene is greatly influenced by their behavior in caring for their teeth and mouth (Notoatmodjo, 2007). This study is in line with the study entitled "The Influence of Health Education on the Attitudes and Behavior of Personal Hygiene of Teeth and Mouth of School-Age Children at Payung State Elementary School" which found that there was a significant change in the behavior of respondents before and after the intervention because there was an increase, namely from 36.1% to 69.4% (Sulastri, 2018). Another study entitled "The Influence of Health Promotion on Personal Hygiene Behavior in Maintaining Dental and Oral Health at Madrasah Ibtidaiyah Negeri 3 West Aceh" showed that there was an increase in respondents' dental health maintenance behavior from 27.42% to 37.96% (Luthfi, 2022).

The value of the Action aspect experienced a higher increase from the sufficient to good criteria with a difference of 20.25, because before being given education, respondents did not know the right actions to prevent tooth decay. After learning the right tooth brushing technique through smart books, respondents were taught tooth brushing techniques directly through demonstrations. This can help respondents to better understand the steps to brush their teeth correctly. The results of the Wilcoxon sign rank analysis on the Knowledge, Attitude, and Action aspects of preventing student tooth decay before and after being given education stated that there was a significant difference with a p value of 0.001 (<0.05). The increase in students' tooth decay prevention behavior in the Knowledge, Attitude, and Action aspects in this study occurred because respondents had been given education about preventing tooth decay through smart books. Prevention of tooth decay in the Knowledge and Attitude aspects showed good criteria between before and after education was given. This is because respondents have seen animated videos about preventing tooth decay from their parents' social media accounts. Information about various things including how to educate and care for children in this digital era is very easy to obtain through social media. This encourages parents to apply the information they have obtained to their children. The results of direct observation and observation show that most children have received information related to dental and oral health from their parents, although only basic knowledge. The increase in dental caries prevention behavior in students is influenced by smart book media which is used as a means of learning. Learning media such as smart books have the ability to convey messages and stimulate the minds and attention of students. Smart book media is effectively used to achieve learning objectives so that it can improve basic skills in students (Mariantini, 2022). Students will feel more motivated and enthusiastic to learn because they are encouraged by the fun activities of the smart book (Alfina, 2022).

Interactive smart book media that involves students in promoting dental health, especially about preventing dental caries is a practical media that is easy for students to understand. The application of smart book media as a teaching aid can help elementary school age students in efforts to improve dental and oral health

CONCLUSION

Smart book media education intervention has an effect on preventing dental caries in elementary school students. Smart books can be an effective strategy in efforts to prevent dental caries in elementary school children.

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