



MAGIC PAPER MODELS AS AN EFFORT TO INCREASE THE VALUE OF PTI IN ELEMENTARY SCHOOL CHILDREN

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ABSTRACT

Prevention of dental and oral diseases has been widely done with preventive and curative promotional efforts, but these efforts have not succeeded in increasing the performance treatment index's value. This is seen from the percentage of caries of children aged 9-11 years by 44%, with a performance treatment index of children of 4-5%. Elementary school children need media that can help understand, maintain, and prevent dental and oral diseases. The media is created in an interesting form so that children can learn while playing. Produce magic paper models created by designing relevant/feasible media of health promotion for children. Their application can improve the dental health behavior of elementary school children better. The research method used is Research and Development (R&D) and test model using quasi-experiment design (pre and post-test with control group design). Variables in this study are Performance treatment index values. The study subjects were divided into 2 groups, namely: an intervention group of 25 children with magic paper models and a control of 25 children with picture storybook media. The data were tested using pairs, paired different tests, proportion tests, and regression tests. Result: Magic paper models relevant/feasible as a health promotion media for elementary school children application for 21 days effectively increase the performance treatment index value (p= -0.013). Media magic paper models created with the design of relevant/feasible as a health promotion media for children and its application Keyword Magic Paper Models, performance treatment index value improve the performance index of elementary school children better.

Keyword: Magic Paper Models, Nilai performance treatment index.

Introduction

To dental caries is one of the dental and oral health problems until now. The increasing prevalence of caries worldwide and in Indonesia is still a priority for dental and oral health problems, especially school-age children. Dental caries is a hard tissue disease characterized by damage to emails and dentin due to bacteria's metabolic activity in plaques that cause demineralization. Dental caries, if left untreated, will cause more severe periodontal infections. Introduction To dental caries is one of the dental and oral health problems until now. The increasing prevalence of caries worldwide and in

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emails and dentin due to bacteria's metabolic activity in plaques that cause demineralization. Dental caries, if left untreated, will cause more severe periodontal infections¹. Dental caries is one of the dental and oral health problems until now. The increasing prevalence of caries both in the world and in Indonesia is still a priority for dental and oral health problems, especially school-age children. Dental caries is a hard tissue disease characterized by damage to emails and dentin due to bacteria's metabolic activity in plaques that cause demineralization. Dental caries, if left untreated, will cause more severe periodontal infections^{1,2}.

Basic Health Research Survey (RISKESDAS) on the national prevalence of dental and oral health problems in Indonesia obtained caries prevalence data of 43.4% in 2007, the data continues to be reviewed and obtained the results of caries prevalence of 53.2% in 2013, and caries prevalence results of 57.6% in 2018. The accumulation of dental caries in Indonesia reached 72.1% and the DMF-T index of 4.85 (high)³. The prevalence of children who experience caries based on age characteristics at 5-9 years of age is 21.6%, ages 10-14 years are 20.6%, and 43.4% of 15 years of age and above who have active and untreated caries. One of the causes of the high prevalence of dental caries due to poor dental health maintenance behavior, this is evidenced by the population Indonesia which has good behavior towards dental and oral health is only 2.3%, the percentage of children aged >10 in the PTI (Performance Treatment Index) is very low at only 4-5%^{4,5,6}.

The low value of PTI can be influenced by the maintenance behavior of dental and oral hygiene can cause problems to the health of the teeth and mouth. Health behaviors include knowledge, attitudes, and actions related to the concept of healthy and sick and prevention efforts. Knowledge, attitudes, and actions are factors that can influence one's awareness in maintaining oral and dental health⁷. A study revealed a

significant link between the level of knowledge of dental and oral health with the incidence of dental caries. Knowledge and attitudes are interconnected in the formation of the ability to perform a particular action. Lack of knowledge about dental and oral hygiene is one of the causes of children ignoring dental and oral health problems. Factors that affect low knowledge include poor sources of information, so that the importance of dental and oral health education is implemented^{8,9}. Dental and oral health education provided to elementary school children will be successful by paying attention to children's activities in school, what activities children like when in school, and which activities are more noticed by the child when the teacher explaining to children by reading stories, playing a game or learning while singing, efforts can be given by the ability of the child. From the child's enthusiasm, the child prefers to find out things that the child did not know before by the way the child learns it, and the child enjoys learning while playing to know more about what the child did not know before¹⁰. Learning while playing is one way to improve children's learning behavior and interest because the material's delivery is done by interesting methods and by the children's love and, of course, appropriate for elementary school children. Therefore it is needed media that can help children in dental health knowledge^{11,12}. One form of approach to providing dental health education to children's behavior through media is by children's interests, one of which is by using magic paper models packaged into an educational education conducted by telling stories and playing. Learning while telling stories and playing is for new behavior changes and reduces unwanted behavior so that the child can learn to motivate himself. This theory has been put forward since 1969 and is still used by many practitioners¹³. Health behavior management strategy in children by telling stories using magic paper models media is the basis for starting treatment to

develop children who want to run dental and oral health care so that good and healthy oral health is achieved ¹⁴.

Magic paper models in the form of paper folds are modified in such a way with images that have been designed by the storyline that will be given to the child. The storyline can provide information to children about the benefits of maintaining oral and dental health and the consequences if the child neglects the health of the teeth and mouth so that it is expected that children can understand well the flow of dental health education that can improve children's behavior regarding oral and dental health ¹⁵.

Method Research

The method used in this research is Research and Development (R&D) with quasi-experiment control group pre-test and post-test design. This research aims to create magic paper models as innovations in the promotion of oral and dental health. The research and development procedure includes 5 steps, as follows: 1) information gathering, 2) model design, 3) expert validation and revision, 4) model trial, and 5) model results in ¹⁶. Sampling techniques with purposive sampling amounted to 50 elementary school children divided into 2 groups: the 25 elementary school children intervention group and 25 elementary school children control group. A statistical test does performance treatment index measurement data.

The research data used a ratio scale so that normality tests were carried out using Shapiro-Wilk. Statistical tests to analyze paired variable data in the intervention and control groups, if normal data using Repeated measure ANOVA test, were not normal using the Friedman test.

Results

Information Collection Research

Results of information collection obtained conclusions that the media promotion of dental and oral health can be improved, among others: 1) Media

provided in the form of innovative media and playable by children, 2) Support from the health office and local health centers for health promotion, 3) Need support from all school residents, 4) The collaboration of dental and oral therapists and school teachers so that the creation of good cooperation to provide innovation to elementary school children and 5) health workers make a schedule to provide education and health services.

Design-Build Model

Design magic paper models compiled into a health promotion media to improve elementary school children's performance index made into an innovative, creative, and easy medium for elementary school children in the learning process. The media model's application can make it easier for elementary school children to understand the dental and oral health education information listed in the media to be able to take a good attitude and action when the child already understands and knows about dental and oral health education.

Expert Validation

Table 1. Expert validation statistical test

	n	F(%)	Total	Category	p-value
relevant	3	100	86.67	Very worthy	0,018
irrelevant	0	0			

**interclass correlation coefficient*

Expert validity results showed a total score of 86.67 and a very decent category, which means that magic paper models are relevant/worthy of being used as a medium of dental health promotion in grade 5 elementary school children. **Test Model**

Table 2. Test normality of intervention group and control group data Table

No	Variable	P-Value	
		Intervention (n:25)	Control (n:25)
1	PTI Pre-test	0,001	0,001
2	PTI Post-test 1	0,001	0,001
3	PTI Post-test 2	0,001	0,001
4	PTI Post-test 3	0,001	0,001

5	PTI <i>Post-test</i> 4	0,001	0,001
6	PTI <i>Post-test</i> 5	0,001	0,001

***Shapiro-wilk**

Normality test results showed that the intervention group and control group's performance treatment index values were

mostly abnormally distributed with a p-value value of <0.05. It can be concluded that the distributed data is not normal, then it will be continued with nonparametric tests.

Table 3. Test data paired intervention and control groups

Variable and Group	Mean ± SD Pre-test	Mean ± SD Post-test 1	Mean ± SD Post-test 2	Mean ± SD Post-test 3	Mean ± SD Post-test 4	Mean ± SD Post-test 5	<i>p-value</i>
Paired T-Test *							
Intervention	0,00±0,001	0,27±0,883	0,86±1,756	0,95±1,864	2,27±3,693	2,50±4,009	0,033
Control	0,00±0,001	0,00±0,001	0,23±1,066	0,68±2,338	1,36±3,513	0,45±1,471	0,275
Paired Post Hoc Test **							
Intervention	Pretest-posttest 1	Posttest 1-posttest 2	Posttest 2-posttest 3	Posttest 3-posttest 4	Posttest 4-posttest 5		
Control	<i>P-value</i>	<i>P-value</i>	<i>P-value</i>	<i>P-value</i>	<i>P-value</i>		
	0,157	0,059	0,026	0,015	0,015		
	1,000	0,317	0,194	0,793	0,214		
Independent T-Test ***							
Intervention	Pretest Mean ± SD	Posttest 1 Mean ± SD	Posttest 2 Mean ± SD	Posttest 3 Mean ± SD	Posttest 4 Mean ± SD	Posttest 5 Mean ± SD	
Control	0,00±0,001	0,27±0,883	0,86±1,765	0,95±1,864	2,27±3,693	2,50±4,009	
<i>P-Value</i>	0,00±0,001	0,00±0,001	0,23±1,066	0,68±2,338	1,36±3,513	0,45±1,471	
	1,000	0,153	0,156	0,354	0,221	0,054	
Independent T-Test Value Change (Δ) ***							
Intervention	Pretest-posttest 1	Pretest-posttest 2	Pretest-posttest 3	Pretest-posttest 4	Pretest-posttest 5		
Control	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
<i>P-Value</i>	0,24±0,831	2,80±10,112	1,24±2,538	2,00±3,536	2,20±3,841		
	0,00±0,001	0,20±1,000	1,00±2,887	1,20±3,317	0,40±1,384		
	0,153	0,156	0,354	0,221	0,054		

The result of the paired data effectiveness test shows that the p-value of the intervention group is 0.033 (*p-value*<0,05). It models magic paper models effective against the increase in the PTI value of elementary school children. The Control group p-value is 0.275 (*p-value*>0,05) means that the picture story media is not effective against increasing the PTI value of elementary school children.

The results of post hoc paired data showed that the pti value of children pretest-posttest 1, posttest 1- posttest 2, posttest 2- posttest 3, posttest 3- posttest 4, posttest 4- posttest 5 experienced a significant increase in the value (*p-value*<0,05), control group on the pretest-

posttest 1, posttest 1- posttest 2, posttest 2- posttest 3, posttest 3- posttest 4, posttest 4- posttest 5 did not experience significant changes with the value (*p-value*>0.05).

The paired data effectiveness test results showed that the p-value of the intervention group and the control group were (*p-value*>0,05) means that magic paper models and picture storybook media are not effective in increasing the PTI value of elementary school children.

Data effectiveness test results are not paired change values (Δ) Pretest-posttest 1, Pretest-posttest 2 score, Pretest-posttest 3, Pretest-posttest 4, Pretest-posttest 5 are significantly meaningless (*p-value*>0.05), which means that magic paper models and

illustrated storybook media do not effectively increase the PTI value of elementary school children.

Model

Model or magic paper models are the output of learning and dental health media implementing magic paper models through gamification-based education methods carried out by grade 5 elementary school children. Media magic paper models are different from other media. Children can play various forms, and wherein each form has an image that can be told because it has the advantage of magic paper models owned by children.

Discussion

Based on the results of the study obtained the conclusion that to form the independence of elementary school children in behaving dental health required learning media that can involve children in carrying it out, by the opinion of Novitasari (2017), the delivery of health materials through health education programs with interesting education is a necessity that continues to be needed by children, to be able to develop and raise awareness of children in the importance of healthy behavior to maintain the health of their teeth and mouth¹⁷. The model that is suitable for this is the media magic, paper models.

Expert validity results showed a total score of 86.67 and a very decent category, which means that magic paper models are relevant/worthy of being used as a medium of dental health promotion in grade 5 elementary school children. The validation of important experts is carried out in the development of models/products to produce models/products that are useful in improving the quality of education. According to Richey's research (2012), the necessary equipment in development research is experts (expertise) used as a determination theory and validity of model¹⁸. Therefore, development research will be

carried out properly if it involves a large number of participants.

Raising awareness to children as early as possible does require a lot of effort both from parents and the environment. The school is an organized community, so it is easy to reach in the school's framework. School children are a compassionate group to receive changes or reforms because the group of school children is in growth and development. Children are sensitive to the stimulus at this level. It is easy to be guided, directed, and instilled good habits, including changing bad behavior to maintain oral and dental health¹⁹.

Interventions in dental and oral health education can be given to elementary school children. Still, in the process, it is necessary to provide educational media and health promotion that can help elementary school children deliver dental and oral health materials; according to research afif Hamdalah (2013), to provide effective lessons is not enough if only provide information. Still, it will be exciting if students are given supporting media for learning so that learning is not easily saturated and children easily understand lesson²⁰.

Effective to improve the attitude of elementary school children, control groups, PTI grades of elementary school children with p-value Magic paper models are used as a promotional media for new findings because it has a different advantage with other media, namely magic paper models have a variety of forms that can be played by children wherein each form has an image that can be told by children, children can tell stories using language that they understand besides children can understand children's dental health materials are also able to develop their imagination in storytelling and also children can develop motor very well because it plays a variety of forms in magic paper models²¹.

Magic paper models are applied to students with stages: education, demonstration, simulation, and evaluation. The education, demonstration, and

evaluation stages were given by researchers assisted by the nearest health center health officers and UKS teachers. The simulation will be done by children who will be practiced with imagination and language according to the abilities possessed by children²².

The success of magic paper models media is also seen from the increase in elementary school children's PTI scores. The results of the test effectiveness of paired variable data showed the test value Friedman PTI value of elementary school children in the intervention group showed that the p-value value is <0.05 means magic paper models media effective to improve the attitude of elementary school children, control group, PTI grades of elementary school children with p-value >0.05 means that illustrated storybook media is not effective against increasing the PTI value of elementary school children. The PTI scores of elementary school children have increased because they have been taught to understand how the risk of cavities if not treated properly. This means that illustrated storybook media is not effective against increasing the PTI value of elementary school children. The PTI scores of elementary school children have increased because they have been taught to understand how the risk of cavities if not treated properly.

This means that magic paper models are not effective against increasing the PTI value of elementary school children. The Control group of data effectiveness test results are not paired. Mann-Whitney test value is p-value >0.05 , which means that magic paper models are not effective against increasing elementary school children's PTI value. Control group of data effectiveness test results are not paired shows Mann-Whitney test value is p-value >0.05 , means that illustrated storybook media is not effective against improvement, PTI value of elementary school children. In the intervention group, effectively increasing the knowledge, attitude, actions, and value of PTI

elementary school children due to the excess of magic paper models media provide a lot of stimulus in the learning process to elementary school children²³.

Conclusion

Magic paper models created with the design of relevant/feasible as a media of health promotion for children and its application can increase PTI elementary school children's value. Table of conclusion: Magic paper models created with the design of relevant/feasible as a media of health promotion for children and its application can increase PTI elementary school children's value.

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