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## **SMART DENTAL ALARM AS AN EDUCATIONAL MEDIA TO IMPROVE KNOWLEDGE AND ATTITUDE OF BRUSHING TEETH IN EARLY CHILDHOOD**

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### **ABSTRACT**

Dental and oral health problems early childhood is high. Dental caries for children aged 5-9 years reached 90.1% based on Riskesdas 2018. This problem is caused by the knowledge and attitude of brushing teeth is still very low. Out of 93.2 children aged 5 who brush their teeth, only 1.4 do it correctly. One way to increase the knowledge and attitudes of early childhood in brushing teeth requires an innovative media according to age as well as mentoring and parents. This study aims to develop innovative dental health education media to improve early childhood knowledge and attitudes. The research method uses design Research and Development (R&D) with the stages of gathering information, product construction, validation by experts and products. The number of samples is 33 for each group (intervention and control) with random sampling technique. Data tested using ISO 9126, *chi-square*, Shapiro Wilk, Friedman and Man-Whitney. The results of this study indicate that "Smart Dental Alarm" is more effective in increasing the knowledge and attitude of brushing teeth in early childhood than power points after measuring pre-test, post-test 1 and post-test 2 by getting a p-Value of 0.000. Smar Dental Alarm is more effective than power point media because it is equipped with various features or types of media aimed at increasing knowledge and attitudes, while power points only contain material with pictures.

**Keywords:** Early childhood, Smart Dental Alarm, knowledge and attitude of brushing teeth.

## Introduction

Early childhood is an individual in a period of very rapid growth and development. This period will form the basis for all aspects of subsequent life.<sup>1</sup> According to Brownowski (1973), provides various counsel Life for early childhood is a very appropriate time to provide for the continuation of life. including the concept of maintaining dental health. Caries is a disease that is often found in early childhood

Based on Riskesdas 2018, children aged 5-9 years who brush their teeth on time are only 1.4% of the 93.2% who brush their teeth. This has an impact on the dental and oral health of children. Caries-free children aged 5-9 years are only 9.9%.<sup>3</sup> This incident is very far from Indonesia's target of caries-free 2030.<sup>4</sup>

If the behavior of brushing teeth in Indonesia which is still very low is allowed to continue, the 2030 caries-free target will not be achieved. Achieving this target requires the development of dental health education media and parental assistance to instill good behavior in a person's self. Cultivation of behavior should be done from an early age because it is the foundation of the child's personality at a later age.<sup>5</sup>

## Research methods

The research methodology uses Research and Development (R&D). The purpose of this study is to develop an educational media for brushing teeth for early childhood. R&D is a research method used to create and test product effectiveness.<sup>6</sup>

The R&D research process goes through 5 important stages, namely: 1) Information gathering, 2) product construction, 3) expert validation and improvement, 4) product exhibition, 5) product.<sup>7</sup>The design of this study used a Quasy-Experimental Randomized Control Group Pretest and Posttest Design. The

research was conducted at Dharma Wanita Kedatim Kindergarten as an intervention group and PGRI Saroka Kindergarten as a control group in Saronggi District, Sumenep Regency. The number of samples in each group is 30 early childhood. The data normality test used Shapiro Wilk, the paired effectiveness test used Friedman and the unpaired effectiveness test used the Man-Whitney.

## Results and Discussion Information Gathering

The results of the collection of information concluded that to increase the knowledge and attitudes of early childhood, appropriate media and assistance by parents are needed.

## Model Design

Gathering the information obtained, early childhood still need parental assistance in brushing their teeth. So that researchers build a product that is Smart Dental *Alarm* in increasing the knowledge and attitude of brushing teeth in early childhood. This media is designed to assist health workers in implementing early childhood dental health programs.

## Expert Validation

Table 1. Expert Validation

No	Respondent	Score	Criteria
1	Pedagogist	97.3	Very good criteria (No Revision)
2	Promkesgi Expert	94.67	
3	IT Expert	94.6	
<b>Average</b>		<b>95.5</b>	

\* ISO 9126

The results of the assessment from the validator are known to have an average score of 95.5 with very good criteria and without revision, so that "Smart Dental Alarm" can be tested for the product.

## Test Model

Table 2. Test the homogeneity of children's characteristics.

No	Variable	Intervention		Control		Homogeneity
		N	%	N	%	
<b>Age</b>						
1	5	18	54.5	18	54.5	1,000
	6	15	45.5	15	45.5	
<b>Gender</b>						
2	Man	13	39.4	15	45.5	0.625
	Woman	20	60.6	18	54.5	

\* chi-square

The homogeneity test results show that the p-value is > 0.05, so it can be concluded that the variance of the two sample groups is the same.

Table 3. Data Normality Test

No	Variable	p-Value	
		Intervention	Control
1	Pre test knowledge	0.003	0.003
2	Knowledge Post test 1	0.000	0.000
3	Knowledge Post test 2	0.000	0.000
4	Pre-test attitude	0.002	0.004
5	Post test attitude 1	0.000	0.310
6	Post test attitude 2	0.000	0.106

\*Shapiro-Wilk

Table 3 shows that the results of the normality test for the knowledge and actions of the guardians of students mostly get p-value <0.05 (not normally distributed), then proceed with the non-parametric test.

Table 4. Test in pair the effectiveness of knowledge and attitude of brushing teeth in early childhood in the intervention and control groups

Group	Pre-Test	Post-Test1	Post-Test2	p-value
	mean±SD	mean± SD	mean± SD	
<b>Knowledge</b>				
Intervention	5.4848±1.14895	9.3636±.65279	9.8182±.39167	.000

Control	5.5152±9.3946	6.697±.72822	7.3636±.74239	.000
<b>Attitude</b>				
Intervention	18.6970±1.18545	29±1.83712	29.697±.84723	.000
Control	18.6364±1.24545	21.9091±1.64628	24.2424±2.27802	.000

\*Friedman

Table 4 shows that the results of the paired data effectiveness test obtained a p-value of 2 groups of 0.000 (p<0.05), which means that Smart Dental Alarm and Power Point media are effective in increasing early childhood knowledge and attitudes.

Table 5. Test unpaired effectiveness

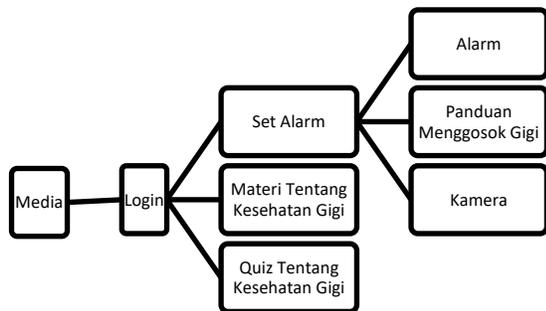
Group	Knowledge and attitude of brushing teeth in early childhood in the intervention and control groups		
	Pre-Test	Post-Test1	Post-Test2
	Mean±SD	Mean±SD	Mean±SD
<b>Knowledge</b>			
Intervention & Control	5.4545±1.04044	8.0303±1.50864	8.5909±1.36975
p-Value	.952	.000	.000
<b>Attitude</b>			
intervention & Control	18.6818±1.20459	25.4545±3.96982	26.9697±3.23429
p-Value	.925	.000	.000

\*Man-Whitney Test

Table 5 shows that the results of the unpaired effectiveness test between the 2 groups in posttest 1 and 2 got a value of 0.000 (p <0.05), which means that Smart Dental Alarm is more effective in increasing knowledge and attitudes of early childhood than Power Point media.

### Model Results

The result of this research is an Android-Based Application which is the development of dental and oral health education media



The teaching and learning process in early childhood is influenced by learning media in increasing motivation and interest in learning.<sup>8</sup> The media used in education and health promotion must be in accordance with the target because it can affect the achievement of goals.<sup>9</sup>

"Smart Dental Alarm" is a dental health education media that is used to increase the knowledge and attitudes of early childhood. Parents accompany children to understand the material and fill out quizzes about brushing teeth contained in the "Smart Dental Alarm" application.

The effectiveness of "Smart Dental Alarm" in increasing the knowledge of early childhood because the application is equipped with material accompanied by pictures so that children are interested in paying attention to the message conveyed and easier to understand. pictures are an effective medium and early childhood understands the message conveyed faster. The attitude of brushing teeth in early childhood increases because of the quiz feature or guesswork accompanied by pictures so that it is easily understood by early childhood. The guesswork given to early childhood aims to stimulate the child's thinking power and attitude in determining answers. Guessing is a method used to stimulate early childhood to think actively and critically to get answers and logical solutions.<sup>10</sup> Responding or providing answers to questions given is one part of one's attitude.<sup>11</sup>

"Smart Dental Alarm" is equipped with one of the important features in

increasing knowledge and attitudes, namely an alarm to remind children when to brush their teeth at an early age. The use of reminder alarms can make it easier for children and parents to know when to brush their teeth and educate children to be disciplined about the time set.<sup>12,13</sup>

## Conclusion

Based on the results of the study, it was concluded that Smart Dental Alarm was more effective in increasing the knowledge and attitude of brushing teeth in early childhood than power point media.

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