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Explosion Teeth Box Promotion Based-Media Model Towards Changing Tooth Brushing Behavior among Primary School Students

Melani Agis Marludia*, Masrifan Djamil[1], Rasipin[2], Suharyo Hadisaputro[3] , Bedjo Santoso[4]

Master of Applied Dental Health Therapist, Health Ministry of Health Polytechnic Semarang
Jl. Tirto Agung, Pedalangan, Banyumanik, Semarang

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Correspondence author:
Melani Agis Marludia
E-mail:
melanieagismarludia.mam@gmail.com

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Abstract. Dental and oral health problems in primary school students are in the high category. This is because efforts to improve the dental health behavior of school children are still not optimal. One effective prevention of these problems through the act of brushing your teeth diligently, thoroughly, and regularly. Proper dental health education is given to primary school students in the form of media packaged by learning while playing. Media promotion explosion teeth box is expected to change the behavior of brushing your child's teeth. The study aimed to develop the suitable and to examine the effect explosion teeth box promotion-based-media model to improve tooth brushing among primary school students. Research and Development (R&D) and product/model trials (quasi-experimental pre-test and post-test design-was applied in this study). The subjects of class III primary school students such as the intervention group and the control group. Experts validated the results of the model design. The results found that the average validation of explosion teeth box experts was 86.66 (very feasible) as a medium for promoting dental health in primary school students shown by the p-value (0.001). This model effectively increased tooth brushing (p=0.001) and decreased the index debris score (p=0.001) compared to the control group. The application of an explosion teeth box, which was carried out for ten days, effectively improved brushing teeth in primary school students compared to the control group.

Keyword: Primary school students, explosion teeth box, changing tooth brushing behavior.

INTRODUCTION

Dental and oral health are part of overall health because it cannot be separated from general bodily health. Dental and oral health problems widespread in most of the world's population are dental caries, which negatively impacts a person's quality of life (1, 2).

The World Health Organization (WHO) in 2016 stated the incidence of caries in children is relatively high, at 60- 70% (3). Also, the 2013 *American Academy of Pediatric Dentistry* (AAPD) states the prevalence of dental caries in children under 12 years in developed countries such as the United Kingdom by 32% and the United States by 28.9%(4).

This is not much different from the condition of dental caries in Indonesia. The results of Riskesdas the incidence of dental caries increased significantly from 2013 in children aged 5-9 years by 25.8%, and in 2018 amounted to 54.3%(5, 6).

The research results in Central Java by Anisah 2018 stated the number of active dental caries was 41.3% (7). Government efforts to tackle oral and dental health problems can involve integrated activities according to the World Health Organization (WHO) launching the *"Global School Health Initiation"* to improve student health through school health programs. The activities are carried out to emphasize the development of a healthy environment and individual health practices. In Indonesia, the government has made efforts to promote and preventive programs through Dental and Oral Health Efforts (UKGS), which are expected to improve the oral health of primary school students (8, 9).

One form of approach to providing dental health education to primary school students through the explosion of teeth box media is packaged into an academic education carried out by learning while playing. This theory has been put forward since 1969 and is still used by many practitioners. Dental health management strategies in primary school students using the media explosion teeth box are a basis to foster awareness of dental and oral health care to achieve optimal health degrees (10, 11).

Explosion teeth box has a goal to enhance cognitive development and can easily dig up new information. The excellence of the media has a game component that can be used as a place to incorporate dental health concepts introduced to students so that they can be used as creative and innovative media of knowledge (12).

Explosion teeth box is box-shaped. When the box is opened, it will form a box of blooms that make it look attractive and bring up components in the form of writing, pictures, and decoration following the theme that has been modified in such a way (13).

RESEARCH METHODS

This study applied research and development (R&D) to develop the models of learning the health of teeth and mouth on the student's school basis. Method Research and Development (R&D) is a research method that is used to produce the product and test effectiveness product such. Procedures Research and Development (R&D) consists of 5 steps main including 1) the collection of information; 2) design wake models; 3) validation expert and revision; 4) test models; and 5) the results of the model.

Collecting information, namely identifying and analyzing problems experienced in the implementation of primary school students education programs about dental health through

qualitative descriptive methods with observation and interviews with the health office, education office, head of the community health center, dentist, dental nurses, teachers, and parents. The data collected from information collection is used to design an explosion teeth box based on promotional media tailored to the needs of the Dental and Oral Health Efforts (UKGS) implementation.

Expert validation test is used to test a product's feasibility before it is used for the public. Experts such as health promotion experts, media experts, and primary school education experts carried out internal testing.

The research design used was a quasi-experiment. (pre and post-test with control group design). The research was conducted at SDN 02 Pedalangan Semarang City as an intervention group and SDN 03 Semarang City as a control group.

The data collection technique uses a questionnaire, then revises the use of the explosion teeth box based on promotional media to change tooth brushing behavior in primary school students. Testing is carried out to produce a product/model suitable for use.

The sampling technique was purposive sampling, amounting to 50 children divided into two groups, namely the intervention group of 25 children and the control group of 25 children. Statistical tests measured tooth brushing and index debris scores. The research data used a ratio scale so that the normality test used the Shapiro-Wilk test. Statistics to analyze variable data in paired regular data groups using the Friedman test. In the paired abnormal data group in pairs using the Test Wilcoxon and groups using the Wilcoxon test and unpaired group using the test Mann–Whitney test.

RESEARCH RESULT

A. Information Collection

Results of information gathering done by interview and systematic literature review concluded that to establish the independence of primary school students in increasing the action of brushing their teeth, it is necessary to provide appropriate and supported educational methods. This is in accordance with Musyaroh's research (2017). Providing education to primary school students must be reasonable and following aspects of its development (14).

Learning models to improve brushing teeth that are suitable to achieve this are explosion teeth box. This is in accordance with the research of Dewi SRP (2017). The media was successful in developing the action of brushing teeth combined with the game.

B. Expert Validation

Table 1. Expert Validation Results Expert Validity

Expert Validity				
Name	**Score**	**Average**	**Category**	**P-Value**
Health Promotion Expert	85.27			
Media Expert	90.18			
Primary School		86.66	Very decent	0.000
Students education expert	84.55			

**Interclass Correlation Coefficient*

Table 1. the results of research from expert validators known worthiness score of 86.66 with a very feasible category. The result of expert validity shows that the p-value = 0.000, which means that the media explosion teeth box is relevant and suitable as a dental health education model for primary school students.

C. Test Try Model

Tabel 2. Test Normality Data student school basis in group intervention and group control.

Variables	**International Group**		***P-value***	**Control Group**		**P-*value***
	The mean	**SD**		**The mean**	**SD**	
Action						
Pre-test	3.76	1.30	0.000	3.44	0.65	0.000
Post-test 1	7.28	0.89	0.006	3.76	0.83	0.002
Post-test 2	7.56	0.76	0.002	4.00	0.76	0.000
***Index debris* Score**						
Pre-test	1.45	0.35	0.336	1.97	0.22	0.562
Post-test 1	0.94	0.41	0.61	1.92	0.27	0.415
Post-test 2	0.94	0.41	0.61	1.88	0.23	0.176

******Shapiro-Wilk*

Table 2. Results of the test normality the data of primary school students in the intervention group and the control group showed that the value of p-value >0.05, so it can be concluded that the data is not distributed normally, then using the test non-parametric. The total score shows that the data is normally distributed, then using the parametric test.

Table 3. Test the effectiveness of paired data for action variables and index debris scores in the intervention and control groups.

Paired test*					
Variable	**Group**	**Mean ±SD Pre-test**	**Mean ±SD Post-Test1**	**Mean ±SD Post-Test2**	**P-Value**
Action	Intervention	3.76± 1.30	6.96± 0.88	8.08± 0.90	0.000
	control	3.64± 0.70	3.28± 0.45	3.56± 0.58	0.119
Index debris score	Intervention	1.45± 0.35	0.94± 0.41	0.55± 0.32	0.000
	control	1.97± 0.22	1.92± 0.27	1.90± 0.24	0.075

Table 3. Testing the effectiveness of data pairs variable actions that value p-value intervention group is p=0.000 (<0.05) mean that the explosion teeth box effectively improves the action rubbing the teeth on a student school basis. P-value group control is p = 0.119 (>0.05) means that the model extension using flashcards does not increase the action rubbing teeth student school basis.

The results of testing the effectiveness of data pairs variable score debris indexes that p-value group intervention is p= 0.000 (<0.05) means the explosion teeth box effectively increase the score debris index on a student school basis. P-value group control is p= 0.075 (>0.05) means that the model extension using flashcards do not increase the score debris index on a student school basis.

Table 4. Test the effectiveness of post- hoc paired action variables and index debris scores in the intervention and control groups.

Paired post hoc test						
Variables	**International Group The Mean**	**SD**	***P-value***	**Control Group The mean**	**SD**	**P-*value***
Action						
Pretest-posttest1	3.76	1.30	0.000	3.64	0.70	0.060
Posttest1-Posttest2	6.96	0.88	0.000	3.28	0.45	0.090
Pretest-posttest2	8.08	0.90	0.000	3.56	0.58	0.593
Index debris Score						
Pretest-posttest1	1.45	0.35	0.000	1.97	.22	0.081
Posttest1-Posttest2	.94	0.41	0.000	1.92	0.27	0.605
Pre-test-posttest2	0.55	0.32	0.000	1.90	.24	0.058

**Post Hoc-Wilcoxon*

Table 4. The results of post-hoc variable action indicate that the value of action at the pre-test-post test 1 experienced an increase significantly, evident in the group intervention p-value of 0.000 ($p>0.05$), while the group control value p-value of 0.060 ($p<0.05$). Value actions on post-test 1- post test 2 experienced an increase significantly, evident in the group intervention p-value of 0.000 ($p<0.05$) while in the group control are not experiencing growth is significant, proven value p-value of 0.090 ($p>0.05$). Value action on pre-test- post-test 2, experienced an increase significantly, evident in the group intervention p-value 0.000 ($p<0.05$), whereas in the group control is not experiencing growth is significant, proven p-value 0.593 ($p>0.05$).

The results of post-hoc score of debris index showed that the value of score debris indices at the pre-test - post-test one increase significantly, evident in the group intervention p-value of 0.000 ($p<0.05$), while the group control p-value 0.081 ($p>0.05$). Value score debris index in post-test 1 - post test 2 experienced an increase significantly, evident in the group intervention p-value of 0.000 ($p<0.05$) while in the group control is not experiencing growth is significant, proven p-value of 0.605 ($p>0.05$). Value score debris index at the pre-test - post-test 2 experienced an increase significantly, evident in the group intervention p-value of 0.000 ($p<0.05$) while in the group control is not experiencing growth is significant, proven p-value of 0.058 ($p>0.05$).

D. Model Results

In the form of media promotion explosion teeth box, the results of the model are the output of the development of learning methods and dental and oral health media in primary school students.

Figure 1. Explosion Teeth Box

DISCUSSION

The information-gathering results concluded that to form the independence of primary school students in changing the behavior of brushing their teeth required efforts to provide appropriate educational methods and supported by various learning media that can attract the attention of primary school students able to carry it out. The learning model in changing teeth-brushing behavior that is suitable to realize this is an explosion teeth box.

The result of the explosion teeth box design is a box/cube media to facilitate students in the process of dental and oral health education, especially in changes in tooth brushing behavior. In developing this media, research refers to the Borg and Gall development model in Yulianti (2014): information gathering, model design, expert validation and revision, trial models/products, and model/product results. In the learning process using the media explosion

teeth box with 25 primary school students, the researchers asked students to form 5 groups, each consisting of 5 students. Next, the researchers distributed one explosion teeth box to each group. Students already look enthusiastic and happy to participate in learning activities during the learning process, seen from students' better attention.

Expert validation results show that the p-value = 0.000, which means the explosion teeth box is relevant as a dental health education model for primary school students. The expert validation process is essential in developing a product/model to produce a product/model useful in improving education quality (15). This is consistent with Sharma's (2016) research stated that the right media would support the learning process of tooth brushing practice (16).

According to Jerome Bruner, the results of the media promotion of explosion teeth box by cognitive theory states that individual cognitive development occurs through three stages that are determined by the way he sees the environment. That stage includes enactive, iconic, and symbolic. Students learn by using concrete objects. There are pictures and thematic material symbols. Learning is student-centered and provides hands-on experience. Also, the media is in accordance with the interests, needs, and characteristics of primary school students (17).

The media is effectively used as a learning aid that is loaded so that the content of education and games can be combined harmoniously and attract primary school students' responses. This is consistent with ER Sipnaturi's research (2020). The learning process is a state, strategy, and main elements that influence the right atmosphere for learning by using a good presentation style or method (18)

CONCLUSION

Based on the study results, it can be concluded that the explosion teeth box is proven to be more effective in increasing changes in tooth brushing behavior in primary school students.

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