

D-PARE MODEL AS AN EDUCATIONAL MEDIA IN IMPROVING BEHAVIOR PREVENTION OF DENTAL AND ORAL DISEASES IN ADOLESCENTS

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Abstract. Dental health is integral part of general health. According to RISKESDAS in 2018, based on age, the proportion of caries aged 5-9 years is 67.3% and age 10-14 years is 55.6%. Various dental health service programs continue to be developed to reduce dental and oral health problems, including by improving the quality of the media used. The relevant media used today is technology-based media. Producing augmented reality models as a medium of education in improving dental and oral disease prevention behaviors in adolescents. This type of research is a mix method. The method used is Research and Development and the research design used is quasy experiment Pretest-Posttest group design. Variables in this study: Knowledge, attitudes, actions and debris index. The research project was 2 groups: Intervention 40 people given D-Pare Model and Control 40 people given Animation media . Data tested using Wilcoxon and Mann-Whitney. The hypothesis test meaningfulness criterion uses the p-value of the delta value (Δ).The D-Pare model is feasible as a dental health education media with expert validation results of 87% and a p-value of 0.000 and unpaired test results stating that this application is effective in increasing knowledge ($\Delta 5.33$), attitude ($\Delta 8.64$), action ($\Delta 2.70$) and decreasing the debris index score ($\Delta 0.587$) compared to the control group. The D-Pare model proved feasible and its application was effective as an effort to improve dental and oral disease prevention behaviors and a decrease in debris index scores in adolescents compared to the control group.

Keywords : Knowledge, attitudes, actions, debris indexes

INTRODUCTION

Dental health is an integral part of general health, meaning that individuals who experience dental health problems will have general health problems. Dental health problems that are often found in society are dental caries and periodontitis. According to The Global Burden of Disease Study in 2016, dental caries is a disease experienced by almost half of the world's population (3.58 billion people). Gum (periodontal) disease is the 11th most common disease in the world. Meanwhile in Asia Pacific, oral cancer is the 3rd most common type of cancer (Sakti, 2019).

Based on the results of the 2018 Basic Health survey, the prevalence of cavities in early childhood is still high, namely 93%, which means that only 7% of children in Indonesia are free from dental caries. When viewed based on age, the proportion is 67.3% from 5-9 years old and 55.6% from 10-14 years old. This shows that the proportion of oral cavity disease in school-aged children is quite high. The government's efforts to reduce dental and oral problems are contained in the Regulation of the Minister of Health of the Republic of Indonesia Number 89 of 2015 which states that dental and oral health services for elementary school-age children as referred to are in the form of School Dental Health Efforts (UKGS). optimal, this is evidenced by the discovery that the implementation of UKGS is only carried out once a year. This failure was influenced by several factors mentioned by Green in Fitriani, namely: (1) Predisposing factors (2) Enabling factors

and (3) Reinforcing factors 3 (Riskasdas, 2018).

According to Notoatmodjo, behavior is the result of all kinds of experiences and human interactions with the surrounding environment which are manifested in the form of knowledge, attitudes and actions. Meanwhile, according to research conducted by Santoso, behavior is a response from individuals to stimuli that come from outside or from within themselves. Actions that are carried out continuously will create habits that prove that actions that are carried out continuously will form habits that will eventually become permanent behavior (Fadillah et al., 2017).

According to Notoatmodjo, judging from the form of response to the stimulus, behavior can be divided into two, namely (1) Passive or closed form (Covert behavior), limited to attention, perception, knowledge or awareness and attitudes that occur in someone who receives the stimulus and has not been able to be observable by others. (2) Overt behavior (Overt behavior) is a response to a stimulus that is clearly visible in the form of an action or practice, which can easily be observed by others (Santoso et al., 2020).

Behavior change occurs through a process of learning, practice and experience. Success in changing behavior can be influenced by the knowledge gained from the learning process so that it is able to address problems. This effort needs to be done to provide habits so that they can improve their skills (Riyanti & Saptarini, 2009).

Dental health education (PKG) is an educational process that arises on the basis of needs in an effort to improve dental and oral health and improve living standards⁶. In providing dental health education, tools or media are needed that can be used to facilitate the delivery of material and make it easier for the public to understand what the speaker is explaining. The media that are usually used in dental health education efforts are using audio, video, and audio video media. Various dental and oral health service programs continue to be improved to reduce dental and oral health problems, especially dental caries. Health service efforts are carried out through promotive, preventive, curative and rehabilitative approaches both individually and in the community which are carried out in an integrated, comprehensive and sustainable manner (A'yun, 2022).

The development of education in the current era of globalization shows significant developments in the learning process as well as the development of methods and media. Dental health education methods are currently carried out using demonstration methods that can help the target to receive information more clearly. However, the drawback of this method is that the success in conveying information depends on the skill of conveying the material, the demonstration tools used, the place where health promotion is carried out, the cost, as well as the readiness and planning of activities that are mature and require a long time (Pawarti et al., 2021).

Efforts have been made to increase

public knowledge, especially children and adolescents who are known to be very vulnerable to dental and oral diseases, namely by conducting Dental Health Education. The success of this activity can be influenced by what methods and media are used when conducting counseling. The method that is often used today is the demonstration method which still has many weaknesses in conveying information to the target. Another weakness is that this method is usually done repeatedly so that it makes the target feel bored and lose interest in the material presented, especially for students in their teens.

MATERIALS AND METHODS

The developed media focuses on three aspects of behavior, namely knowledge, attitudes and actions of its users. The system framework design of the "D-Pare Model as an Educational Media in Improving Dental and Oral Disease Prevention Behavior in Adolescents"

This type of research is a mix method, which is a combination of descriptive and analytic research. This study uses the Research and Development (R&D) development method. According to Sugiono, the R&D method is a step in developing a new product or perfecting an existing product to be accountable. This research and development method is used to produce a product and test the effectiveness of the product (Sugiyono, 2014).

Information collection includes needs analysis by identifying and conducting dental and oral health analysis in

elementary school students.

The design of an augmented reality technology model regarding education in improving dental and oral disease prevention behavior in adolescents was developed from the ADDIE theory (Analysis, Design, Develop, Implement, and Evaluate) using data from results that have been adjusted to target needs.

Expert and revision validation tests are used to test the feasibility of the product before it is given to the public. This validation test was carried out by 3 experts, namely: experts in the field of dental and oral health promotion, media development experts, and information and technology experts. Circulating the questionnaire and then revising is a data collection technique on the feasibility of the model to be made.

This research will be conducted at Baranti 4 Public Middle School and Baranti 1 Public Middle School from March 2022 to April 2022. The choice of this location was carried out due to a lack of health promotion activities, especially dental and oral health promotion reaching these areas.

The data obtained from the questionnaire results were carried out by examining data, grouping the questionnaire, compiling the data in the form of distribution tables of knowledge, attitudes, actions and debris index scores. The management of data analysis in this study used the SPSS 24.0 for Windows program.

RESULTS AND DISCUSSION

The results of interviews with

respondents to the question: What learning media are suitable for use in providing dental and oral health education to adolescents? The conclusion drawn from the respondents' answers is that it is necessary to develop a new media that is more modern, attracts attention and is interactive so that the target does not feel bored participating in health education activities plus that today's youth are capable and reliable in operating mobile devices such as smartphones, so that perhaps a interesting media, mobile-based, easy to use, informative and interactive (Santoso et al., 2019).

The results obtained from gathering information show that the level of knowledge of adolescents about dental and oral health is still very low and when compared to the characteristics of modern adolescents with the media used it is still very far from the level of success (Suciliyana, 2020).

Adolescents, in this case junior high school students, have various characteristics. Judging from the age of those who are in the transitional stage from the childhood phase to the adolescent phase. Naughty, emotional, talkative and high curiosity are commonplace at that age. Changes in the body shape and emotions of adolescents can certainly affect the dental and oral health conditions of the adolescents themselves. Programs run by local governments and puskesmas are still lacking. Activities that focus on dental and oral health maintenance actions are only limited to screening carried out on elementary school-aged children (SD). Dental health education is still very rare.

even then it was also carried out at the elementary school age level also using simple media, namely using power point slides and also dental models. The UKGS program is also not running normally due to the lack of teacher capacity in running UKS (Kuswanto & Radiansah, 2018).

Improving adolescent dental and oral health behavior is very dependent on the promotive and preventive efforts given. This is given by taking an educational approach regarding basic things first about dental and oral health to generate curiosity and attract youth to know the importance of maintaining healthy teeth and mouth. Of course, in providing education, educational media are needed that are interesting and not boring and do not forget the quality of the media and the quality of the information that will be provided. Media development must be in line with the industrial revolution 4.0 which prioritizes computerized systems and media based on IoT (Internet of Things) that are advanced and in accordance with the times (Hidayat, 2014).

"The D-Pare Model as an Educational Media in Increasing Dental and Oral Disease Prevention Behavior in

Adolescents" was created in an effort to create promotive and preventive media in the field of dental and oral health with the intention of providing solutions to make it easier for teenagers, in this case junior high school students, to obtain information and knowledge about dental and oral diseases and what actions should be taken to prevent dental and oral diseases and can improve the behavior of junior high school students in preventing their dental and mouth diseases (Rahmawati, 2017).

There are 3 expert validators who carry out tests on the developed media, namely: Dr. Imam Sarwo Edi, S.SiT., M.Pd as the expert who tested the feasibility of the media being developed, Dr. Waljuni Astu Rahman, SKM., M.Pd as an expert on dental health education materials and Dr. Eng. Armin Lawi, S.Si., M.Eng as an IT (Information and Technology) expert. This expert validation activity is carried out by filling out an assessment questionnaire containing 20 question points that must be filled in by each expert validator. The results of the expert validation carried out are as follows:

Table 1. Expert Validation Test Results

Expert Validation					
Name	n	Score	F(%)	Average	p-value*
Dr. Eng. Armin Lawi, S.Si., M.Eng	20	85	85		
Dr. Imam Sarwo Edi, S.Sit., M.Pd	20	89	89	87%	0.000
Dr. Waljuni Astu Rahman, SKM., M.Pd	20	87	87		

Based on table 1 it is known that the results of the assessment of 3 expert

validators are known, the results of the expert validation show that the p-value is

0.000, which means that the D-Pare model is relevant and appropriate as an educational medium in the context of promotive and preventive dental and oral health in adolescents (Yani, 2018).

The model trial in this study was conducted on 80 students of grades VII, VIII and IX SMP consisting of 40 students

from Baranti 1 Public Middle School as the control group and 40 students from Baranti 4 Public Middle School as the intervention group. The general description of the respondents is presented in the following table:

Table 2. Frequency Distribution of Intervention and Control Respondent Characteristics

Variable	Intervention Group		Control Group		p-values
	n	(%)	n	(%)	
Learning Achievement (Mean±SD)	83.35±4,191		80,90±5,037		0.181*
>80	13	32.5	10	25	
<80	27	67.5	30	75	
Age(Mean±SD)	13.83±0.903		13.78±1,000		0.000**
12 years old	-	-	5	12.5	
13 years old	21	52.5	6	15	
14 years	7	17.5	18	45	
15 years	12	30	11	27.5	
Class					0.887**
VII	14	30	12	30	
VIII	9	22	9	22.5	
IX	19	47	19	47.5	
Gender					0.459**
Man	36	90	31	77.5	
Woman	4	10	9	22.5	

Based on the data in table 2, the results of the homogeneity test on the learning achievement data obtained a p-value of 0.181 ($p > 0.05$), so the data is homogeneous. The results of the Chi-Square test on age data is 0.000 ($p < 0.05$), so it can be concluded that there is a relationship between learning achievement and adolescent behavior. The results of the Chi-Square test on class data were 0.887 ($p > 0.05$), so it could be concluded that there was no relationship between class level and youth behavior. The results of the Chi-Square test on sex data were 0.459 ($p > 0.05$), so it can be

concluded that there is no relationship between gender and adolescent behavior (Istifada et al., 2018).

The results of the unpaired data effectiveness test on the pre-test index debris variable with a p-value of 0.630 ($p > 0.05$) and a post-test p-value of 0.000 ($p < 0.05$) means that the use of the D-Pare model is effective in reducing index debris score in adolescents. Judging from the change in the mean value in the intervention group to 0.783 while in the control group to 1.358 (Dewi et al., 2020).

The results of the effectiveness test of unpaired data on the value of change (Δ)

pre-post test there was a significant change of 0.000 ($p < 0.05$) in reducing the debris index score in the control and intervention groups with a difference value (Δ) in the intervention group of 0.587 and in control group of 0.087.

Gathering information resulted in the conclusion that adolescence is a transitional phase from children to adults. They still have many habits that they used to do when they were children, such as being stubborn, not independent, selfish and always curious about something new. This change occurs simultaneously with physical, social, cognitive, language and creative development. One of the problems that is often experienced by adolescents in their families is referred to as the "generation gap". This gap is caused by changes in the psychological condition of adolescents (Zuli, 2018).

Dental health problems in adolescents are not much different from dental and oral health problems in children and adults including gingivitis, periodontitis, cavities, pulpitis and also tartar. Efforts need to be made to overcome these problems, namely by forming dental and oral disease prevention behaviors in adolescents, namely by using appropriate media in an effort to achieve health education goals. The selection of methods and media in carrying out health promotion activities must be adjusted to the target so that the target can easily understand the material presented by the speaker and the media used can stimulate target interest, overcome space limitations, interact and stimulate the target's senses.

The validation results from several

experts show that the average value of the three experts is 87% with a very decent category and the p-value is 0.000 ($p < 0.05$) which means that the D-Pare model is suitable for use as a media dental and oral health education in adolescents. This is considered important in developing an educational model to assess the feasibility of the theory, concepts developed and the feasibility of the model itself so that the resulting model can be useful for its users.

The application of the D-Pare model to this intervention group can be used as a promotive and preventive media that can be used during health promotion activities that have an attractive appearance and easy-to-understand material so that adolescents can take preventive measures for dental and oral diseases independently and appropriately.

The use of educational models as media is very important because it is one of the factors in the success of health education. The results of testing the effectiveness of data on paired variables using the Wilcoxon test found that the p-value in the intervention group experienced an increase in knowledge with a value ($p < 0.05$), which means that the D-Pare model applied to the intervention group was effective in increasing knowledge in preventing dental disease and mouth in adolescents. As well as the control group that was given the animated video treatment did not experience an increase in knowledge which is known from the value ($p > 0.05$). The success of the D-Pare model can also be seen from the results of the unpaired effectiveness test using the Mann-Whitney test of knowledge pre-post test in the

intervention group with a value ($p < 0$,

The increase in knowledge that occurred in the intervention group was due to the D-Pare model being developed based on target needs and educational materials packaged into applications that were interactive, interesting and easy to understand. The material contained in the D-Pare model is in the form of understanding, causes and prevention of dental and oral diseases. This is not only in the form of writing, but is accompanied by highly interactive Augmented Reality animations. This has also been proven in Fathirma'ruf's research in 2021 that flash-based educational games are appropriate for use as learning tools.⁵⁵

Knowledge is the basis of adolescents to help overcome and solve a particular problem and one of the factors that influence knowledge, namely the receipt of information and knowledge is an important part that can shape one's behavior. ⁵⁶ Submission of material to increase knowledge can of course be influenced by the methods and media used in material conveyance. In a study conducted by Binar et al. in 2021 revealed that the increase in knowledge experienced in the research intervention group was the result of using a method of delivering material that was packaged in an attractive way using a variety of interesting audio-visual media.

The results of testing the effectiveness of action data on paired variables using the Wilcoxon test showed that the p-value in the intervention and control groups showed ($p < 0.05$) which means that the application of the D-Pare model and animated videos was effective towards

increasing the actions of adolescents in efforts to prevent dental disease and mouth. These results are also in line with the results of the unpaired test using the Mann-Whitney test which shows that ($p < 0.05$) which means the application of the D-Pare model and animated videos is effective in increasing adolescent actions in preventing dental and oral diseases, from the results of the difference both found that the application of the D-Pare model was more effective than animated video. Actions are things that are done by targets related to health, including preventive actions, curative and rehabilitative. Action is also a response from the target self to his behavior. This is in line with research conducted by Mujahidin and Sampoerna in 2018 which explained that a person's actions affect dental and oral health behavior and there were 12 respondents out of 32 respondents who had a high percentage of actions.

CONCLUSIONS

The D-Pare model is suitable for use as an educational medium for adolescents, as evidenced by the p-value of 0.0001 ($p < 0.05$). The D-Pare model is effective in increasing adolescents' knowledge in maintaining oral health compared to the control group, as evidenced by the value of $\Delta = 5.33$. The D-Pare model is effective in increasing adolescent attitudes towards maintaining oral health compared to the control group, as evidenced by the value of $\Delta = 8.64$. The D-Pare model is effective in increasing the act of brushing teeth in adolescents in maintaining oral health

compared to the control group, as evidenced by the value of $\Delta=2.70$. The D-Pare model is effective in reducing the debris index score in adolescents compared to the control group, as evidenced by the value of $\Delta=0.587$.

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