

ORIGINAL ARTICLE

The Use of the Modified Twister Educational Game Application as Dental and Oral Health Education Media

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ABSTRACT

Introduction: An effective method for implementing dental and oral health education in children is learning while playing. Through the use of educational games, it is expected that they can improve children's behavior by motivating and forming a pleasant learning environment. **Objectives:** To determine the effect of the modified twister educational game on students' dental and oral health behavior. **Methods:** This research was a pre-experimental study with one group pretest-posttest method. It was conducted for one day at an elementary school in Bekasi, Indonesia. The sample was selected using quota sampling. The intervention took the form of a modified twister educational game downloaded via the link provided. Data analysis was performed using the Wilcoxon test. **Results:** It showed that there was a significant difference between the students' dental and oral health behavior before and after the intervention (p -value <0.05). **Conclusion:** There was an effect of modified twister educational games on changes in students' dental and oral health behavior.

Keywords: Educational games; Behavior; Dental; Oral Health

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INTRODUCTION

Basic Health Research conducted by the Ministry of Health of the Republic of Indonesia in 2018 recorded that the proportion of dental and oral problems was 57.6% and only 10.2% received services from dental-medical personnel. This high proportion of dental and oral problems can be influenced by the behavioral factors of the community who do not care about the cleanliness of their oral cavity (1,2). It is considered a concern because dental and oral health is an integral part of the overall health of the body that cannot be separated (3).

Dental and oral health reflects the experience of dental and oral care behavior (4). Behavior itself is an experience and interaction that is manifested as knowledge, attitudes, and actions (5). Lack of knowledge will lead to less behavior, therefore an approach to increase knowledge related to dental and oral health can be done as an effort to build a higher health (1,6,7).

Education that is carried out for primary school-age children is an effort that can be done to improve behavior related to dental and oral health. This is because primary school-age is the beginning of behavior formation in the late childhood period and is also known as creative and critical age, playing age, group age, and adjustment age (8,9). How children perceive the concept of intelligence also impacts their response to challenge, persistence, and performance (10). The method and an effective learning method influences success in educational effort, and one of the effective learning method for children is learning while playing (11). Besides that, according to WHO, poor oral hygiene can have a negative effect on children's performance at school and impact their future academic success. Oral health problems also reduce people's ability to smile, eat, and talk, and have a detrimental effect upon their social and mental health (12).

Educational games are games that integrate and combine subject matter with game components and have the dual capacity of promising adaptive teaching from an intelligent guidance system and making learning more enjoyable (13,14). For those who are using educational game, engagement drives moment-by-moment use, as well as the learning

that occurs during play and preferably transfers afterwards. Thus, they often then show positive attitudes towards activities including interest, optimism, enthusiasm, and curiosity (15).

The modified twister educational game in this study is packaged as an application and made by combining quiz-type games that evoke children’s involvement as well as an interesting form of twister game display. Quiz and some principles of gamification have been used in education for many years, primarily in school-aged pedagogical environments. Quiz has been played for a long time and is a great way to create self-assessment tests with the main objective of successfully answering questions. Quiz-games also provide clear objectives, an important factor in the learning experience (16,17,18). While twister is an old American game produced by the Milton Bradley Company and Winning Moves, which consists of boards and carpets of various colors (19).

In connection with the pandemic era when orders appeared to keep distance and avoid crowds, researchers were interested in conducting research on the effect of educational games on students’ oral health behavior online. The study was conducted on students with an age range of 9-10 years, according to WHO recommendations (20). The educational game chosen is a modified twister educational game developed by researchers and packaged in an application form.

MATERIALS AND METHODS

Ethical Clearance

This study was approved by the Malang Health Research Ethics Committee in State Polytechnic of Health, Indonesia with registration number 943/KEPK-POLKESMA/2020.

Sample

The research was conducted in one of the elementary schools in Bekasi, Indonesia. It is a pre-experimental study with a one group pretest posttest design method.

The population was entirely 4th grade students of SD Al Ma’moer Bekasi. The samples were selected using quota sampling and obtained by 30 students.

Research Procedures

The research was conducted online at SD Al Ma’moer Bekasi for one day on February 6, 2021. Students who received the guardian’s approval to become samples then were asked to download the modified twister educational game application and prepare to take part in the research. The research was initiated by filling out a pre-test questionnaire for dental and oral health behavior, which consisted of a knowledge, attitudes and actions questionnaire. After that, an online intervention was carried out through a modified twister educational game.

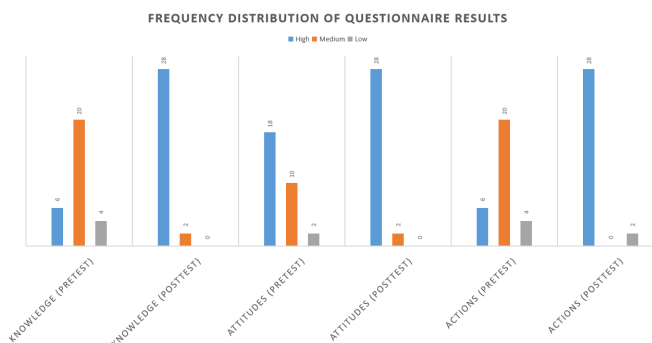


Figure 1 : Frequency Distribution of Questionnaire Results. There were differences in the distribution of respondents’ results based on the score categories between the pre-test and post-test questionnaires. In the knowledge pre-test, it was found that the distribution of the results of the most respondents was in the medium category (20 respondents), while in the post-test it was found that the distribution of the results of the most respondents was in the high category (28 respondents). For the attitude questionnaire, both in the pre-test and post-test, it was found that the distribution of the most respondents’ results was in the high category (18 and 28 respondents). And for the action questionnaire, in the pre-test, the distribution of respondents’ results was found in the medium category (20 respondents), while in the post-test, the distribution of respondents’ results was found in the high category (28 respondents).

Table 1 : The Effect of Modified Twister Educational Game on Students’ Dental and Oral Health Behavior

Questionnaire	Mean	Median (Min-Max)	P-value
Knowledge	Pre-Test	63.3	60 (40-80)
	Post-Test	94.6	100 (70-100)
Attitudes	Pre-Test	76.7	80 (50-90)
	Post-Test	93.3	100 (60-100)
Actions	Pre-Test	66.7	70 (50-80)
	Post-Test	94.6	100 (50-100)

The game takes place with an estimated time of 15 minutes. The final stage of the research was carried out after the intervention was completed in the form of filling out a post-test questionnaire on dental and oral health behavior. The data obtained were analyzed using the Wilcoxon test.

RESULTS

Table I shows the differences in the scores of the oral health behavior questionnaire which are consisting of the knowledge, attitude, and action questionnaires. It also shows the results of the analysis test using the Wilcoxon test. Broadly speaking, it is clear that there is an increase in the domains of knowledge, attitudes, and actions before and after the intervention using a modified twister educational game. For the knowledge questionnaire, there is an increase in the mean score of 31.3, where the pre-test means is 63.3 with a median of 60 and a post-test average of 94.6 with a median of 100. For the attitude questionnaire, there is an increase in the mean score of 16.6, where the pre-test average was 76.7 with a median of 80 and the post-test average is 93.3 with a median of 100. For the action questionnaire, there is an increase in the average score of 27.9 where the average pre-test is 66.7 with a median of 70 and the post-test average is 94.6 with a median of 100.

The analysis performed using the Wilcoxon test revealed that there was a significant difference between the two groups if p -value <0.05 was obtained. From Table I, it is known that statistically the p -value obtained for the behavior questionnaire consisting of the questionnaires for knowledge, attitudes, and actions, respectively, is 0.000. This shows that there is a significant difference between the dental and oral health behavior of students before and after the intervention with a modified twister educational game.

DISCUSSION

Health-related game research has improved since 2005 and several reviews and systematic reviews have been carried out to review its effectiveness (21). Using educational games as a learning medium usually has rules that force players to think so that it seems less fun, therefore modification is needed, so that the media remains attractive to children (22).

In order to improve health behavior, the use of educational games has been previously carried out by Irbah et al. (2020) using *Permainan Engklek*, and Pradipta et al. (2020) using the educational game called *Make a Match*. The results of the two studies stated that educational games influence behavior change (23,24).

Behavior change is essentially the same as the learning process that starts from stimuli (25). Therefore, the use of modified twister educational game media in this study acts as a stimulus hoping to influence student behavior. The modified twister educational game combines the quiz method with the twister display, which is then packaged in an application form. The educational game presents questions and clarification statements with an attractive appearance, which combines writing with pictures. Where it is known, according to Ghea (2018), that children prefer pictorial media than media that is only filled with writing forms (26).

The use of attractive media is clearly needed in educational efforts because children's interests have a major influence on outcomes (27). According to Nurhayati (2020), based on observations, student with smartphones mostly use it for social media and playing games. Therefore, educational games that are packaged as applications are also a good option to attract student interest. In addition, the use of educational games as a learning medium also increases the activeness because it invites students' interest so that they have a willingness to learn (28).

The results using the Wilcoxon test showed that there were significant differences in dental and oral health behavior, including knowledge, attitudes, and actions before and after intervention using the modified twister educational game (p -value <0.05). This change is possible because the modified twister educational game has easy game rules and a relaxed and fun situation. Students can play this game anywhere and anytime, so the game invites their enthusiasm, and this makes the learning process independent and highlights the creative side and initiative so that students are more focused and easier to concentrate. Using educational games in the learning process is also a spontaneous activity without the stress that can provide new information. This creates a not monotonous learning process, where an active and interactive atmosphere will trigger not only enthusiasm but also interest and concentration so that information is more easily accepted (11,29,30). In addition, the use of modified twister educational games which are audio-visual media and involve the senses of sight and hearing in the playing process also makes the information received easier to digest, where it is known that 30% of information is obtained through vision, while the other 10% is obtained through hearing (31).

Education is an activity carried out by spreading messages and instilling confidence so that people are not only aware, know, and understand, but are also willing and able to do something following health recommendations. The learning process is a process

of observing, reading, imitating, trying it yourself, listening and following orders (32,33). Behavior change is evidence that a person has learned, and this change shows that a person who is previously clueless about something became knowing and understanding. Change itself can only occur as a response to a new and fun things (34). Along with the behavior change, it is expected that there will be a conformity with the students' oral health status, which changes for the better.

CONCLUSION

There is an effect of twister modification educational games on changes in students' oral health behavior. This can be seen through the increase of questionnaire scores where before the intervention the average student behavior was in the medium category, while after being given the intervention it was found that the average student behavior was in the high category.

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