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Smart Dice Educational Game as a Strategy to Prevent COVID-19 Transmission

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ABSTRACT
COVID-19 causes pneumonia, acute respiratory syndrome, kidney failure, and even death. Transmission is very easy and fast in all age groups, children have the same risk as infected adults. This greatly affects the subsequent growth and development of school-age children. Strategies to prevent infection transmission such as improving knowledge, attitudes, and health actions. For this reason, an interesting and innovative method is needed without reducing the meaning of the information conveyed, namely smart dice educational games. The purpose of community service is to increase knowledge, change attitudes towards positivity, improve psychomotor skills, become healthy living behaviors and agents of change in their environment. Methodology with transmission prevention counseling through simulation of smart dice educational games using a designed mat, one game involves four students accompanied by one teacher, and students play according to the instructions given. Community service activities were attended by 6 teachers, 103 students at SD Muhammadiyah 01 Medan. The results of the knowledge aspect: There was a very significant increase in the category of good knowledge after the use of smart dice educational games, from 1.94% to 60.19%. Attitude aspect: There was a significant change in student attitudes from the majority agreed (77.67%) to 100%. Furthermore, the action aspect: there was a drastic increase in good preventive actions after the intervention, from 0% to 81.55%, demonstrating the effectiveness of the method in encouraging positive behavior. Integrate engaging and interactive educational approaches in delivering health information to children.

Keyword: COVID-19, Smart Dice, Educational Game

1. Introduction

COVID-19 is an acute respiratory infectious disease with symptoms of fever, cough, shortness of breath and X-ray shows extensive pneumonia infiltrates in both lungs [1], and in severe cases COVID-19 can cause pneumonia, acute respiratory syndrome, kidney failure, and even death. Transmission of this disease is very easy and fast, causing an increase in patients with COVID-19.

The number of COVID-19 patients in Indonesia in March 2021 was 1,501,093 with 40,581 people died. The increase in the number of people with COVID-19 also occurred in Medan city, causing all areas of Medan city to be in the red zone. COVID-19 occurs in all age groups where children have the same risk as adults when infected with COVID-19 and the number of children infected with COVID-19 continues to increase [2].

Cases of COVID-19 in children by age group are Age 0-2 years (PAUD): 23,934 cases, Age 3-6 years (kindergarten): 25,291 cases, Age 7-12 years (elementary school): 49,962 cases, Age 13-15 years (junior high school): 36,634 cases, Age 16-18 years (SMA): 45,888 cases and Indonesia holds the highest record in Asia Pacific with a child mortality rate of 2.5 percent caused by COVID-19. Based on the number of cases, children aged 7-12 years (elementary school) have the highest incidence rate [2].

Elementary school children are at risk of being exposed to the COVID- 19 virus on the way to school, while at school, and on the way back home. School-age children are at risk of transmitting the COVID-19 virus to parents and families who are comorbid or not. This will greatly affect the subsequent growth and development of school-age children.

Strategies to prevent the spread of this outbreak with strict infection control such as increasing health knowledge. Increasing the knowledge of school-age children must be accompanied by changes in behavior, to support this process requires interesting and innovative methods without reducing the meaning of the information to be conveyed, namely using educational games [3]. This can increase knowledge, change attitudes towards positivity, improve psychomotor / actions that can be directly carried out in efforts to prevent and handle COVID-19 correctly according to the level of understanding of school-age children, this simulation carried out is expected to be adopted into healthy living behavior in everyday life and become agents of change in their environment as agents of renewal that must be involved from an early age.

2. Methods

The method of community service used is counseling on the prevention of transmission through simulation of smart dice educational games designed using a base that has been designed, where one game involves four students accompanied by one teacher, and when playing students are asked to simulate according to the instructions given.

The implementation of community service was carried out in the field of SD Muhammadiyah 01 Medan which is located right in the middle of the school surrounded by all classes so that it can be witnessed from a distance by other students and can maintain social distancing as shown in Figure 1.

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Figure 1. Place of Implementation of Smart Dice Educational Game

2.1 Equipment

The equipment used in community service consists of

a. Game mat; 4x4 meters in size containing 16 boxes containing information related to the prevention of COVID-19 transmission.
b. Plastic dice with a size of 40 x 40 cm; A tool used to determine the number of steps of the play.
c. Game guide book; Contains an explanation of the smart dice educational game
d. 16 healthy cards; Cards consist of numbers 1-16, containing information related to the prevention of COVID-19 transmission according to the box on the game mat

e. Evaluation format; To see the extent of students' knowledge of preventing COVID-19 transmission
f. Mask, soap and running water
g. Temperature checker (thermometer)

2.2 Procedures and Implementation Rules

Procedures and rules for the implementation of community service consist of

a. The base is spread out on a flat surface
b. The dice are placed on the first square
c. All participants in the game have washed their hands, checked their temperature and worn masks.
d. Wearing socks (shoes opened)
e. Players throw the dice in turns, the highest number plays first
f. The game starts from the START plot
g. Then the plays of each player are carried out in turn according to the number of dice into the boxes in numerical order.
h. Each player who has rolled the dice must pass through each box according to the number of dice he gets.
i. The player will get a healthy card according to the box where it stops.
j. Players who have received a healthy card must read the information on the card to other players.
k. Players who stop at the COVID-19 disease box indicate that the player has been infected with COVID-19 disease. So that players are required to retreat as many arrows as there are in the box. After the player retreats, the play will be given a health card containing information about the disease and must read the information to other players.
l. If a player stops at a box containing a vaccine, the player will get a vaccine pin and be declared immune to the COVID-19 disease as well as a health card containing information about the vaccine.
m. Players who stop at the box containing the action logo are required to simulate the information obtained in the health card.
n. The staircase up indicates the player must climb the stairs to a higher box according to the box designated.
o. Community service participants must use complete health protocols such as wearing masks and washing their hands, healthy children (normal temperature 36.5^{o}C - 37.5^{o}C) and willing to play.

Figure 2. Pedestal of Smart Dice Educational Game

Figure 3. Dice of Smart Dice Educational Game

3. Result and Discussion

Community service activities for students and teachers in an effort to prevent transmission of COVID-19 with smart dice educational games were carried out on June 16, 2021 by lining up all participants with a distance of one meter from each participant on the SD Muhammadiyah 01 Medan school field. This activity was attended by 6 (six) teachers, 103 students and the community service team by first conducting a pre-test to all participants regarding knowledge and skills to prevent transmission of COVID-19.

The implementation of the activity is divided into 3 (three) parts, namely opening, core activities, and closing. The opening activity is to explain the name of the game, objectives, participant requirements and procedures and rules of the smart dice educational game. The core activities are broadly divided into 2 (two) parts, namely the first explanation and simulation of hand washing, mask use and temperature measurement. Where participants are guided by each community service team to simulate health protocols in 3 (three) different posts. The first post the community service team explained and simulated the six steps of good and correct hand washing. The second post, the community service team explained and simulated the use of masks, types of masks, and how to use masks properly and correctly. The third post participants were given an explanation of normal and abnormal temperature material, as well as a simulation of correct temperature measurement using a digital thermometer.

The second part of the core activity of the smart dice educational game is that the participants are taken to the smart dice educational game mat that has been spread out on the school field. Each round of the game is only carried out by one group consisting of four participants, one teacher and one companion, namely community service team personnel as well as guides in the game.

Before the game starts, the companion, namely the community service team personnel as well as the guide in the game, gives directions regarding how to play, namely before starting the game the participants determine the order of playing first by taking turns throwing the dice, and the order is determined from the highest to lowest number obtained by the player. Furthermore, the first player with the highest number throws the dice and steps on the box on the game mat according to the number of numbers obtained. Then the first player gets a healthy card containing information related to preventing the transmission of COVID-19, and so on for all players to get healthy cards according to the numbers and information that have been determined.

Healthy cards contain COVID-19 information that varies per card such as understanding, causes, ways of transmission, symptoms, diagnosis, prevention, when to go to health services to get COVID-19 treatment and treatment. The player who has received the card will read the contents of the healthy card to other members. Then the second player will repeat what the first player did and so on until one player reaches the finish line. At the end of the game, the players will compete to answer questions from the game supervisor related to the material on preventing transmission of COVID-19 in a healthy card. The player with the most correct answers wins the game.

The closing activity consists of all participants taking a post test on efforts to prevent transmission of COVID-19 and providing opportunities for participants to express their experiences while participating in the smart dice educational game activities and participants' plans to be carried out in efforts to prevent transmission of COVID-19 at school and at home.

Below is the documentation of the Community Empowerment activity: Students and Teachers in Efforts to Prevent Transmission of COVID-19 with Smart Dice Educational Games during the Pandemic Period at SD Muhammadiyah 01 Medan.

Figure 4. Opening Activity

Figure 5. Health Protocol Explanation and Simulation

Figure 6. Simulation of Smart Dice Educational Game

The table below will describe the pre and post test results of participants in efforts to prevent the transmission of COVID-19 with smart dice educational games

Table 1. Frequency Distribution of Knowledge, Attitudes and Actions to Prevent Transmission of COVID-19 with Smart Dice Educational Game for students of SD Muhammadiyah 01 Medan n (103 students)

Aspects	PreTest		Post Test	
	n	%	n	%
Knowledge				
Good	2	1,94 %	62	60,19 %
Fair	50	48,54 %	20	19,42 %
Less	51	49,52 %	21	20,39 %
Total	103	100 %	103	100%
Attitude				
Agree	80	77,67 %	103	100%
Disagree	23	22,33 %	0	
Total	103	100%	103	100%
Action				
Good	0	0	84	81,55 %
Fair	6	5,83 %	14	13,59 %
Less	97	94,17 %	5	4,86 %
Total	103	100%	103	100%

Based on pre and post test data on Prevention of COVID-19 Transmission with Smart Dice Educational Games for students of SD Muhammadiyah 01 Medan on the aspect of knowledge, it was found that 1). Significant increase in good knowledge: There was a very significant increase in the category of good knowledge after the use of the Smart Dice Educational Game. The percentage increased from 1.94% to 60.19%, indicating that this method is effective in improving students' understanding of the aspects of COVID-19 prevention. 2). A decrease in the percentage of moderate and insufficient knowledge: While good knowledge increased dramatically, the percentage of sufficient knowledge decreased from 48.54% to 19.42%, and insufficient knowledge also decreased from 49.52% to 20.39%. This shows that the focus of this learning method is more on improving deeper understanding. 3). The impact of the learning method: The Smart Dice Educational Game

proved to be effective in delivering COVID-19 prevention information to elementary school students. The use of an interactive and fun approach may have helped increase information absorption and strengthen understanding [4,5,6].

Data analysis related to the use of the Smart Dice Educational Game to influence the attitudes of students of SD Muhammadiyah 01 Medan to prevent transmission of COVID-19 obtained 1). Significant attitude change: The data showed significant changes in students' attitudes after using the Smart Dice Educational Game. Initially, the majority (77.67%) agreed with the prevention of COVID-19 transmission, but after the intervention, 100% of them showed an agreeable attitude. This reflects the positive impact of the learning method in influencing attitudes. 2). Influence of learning methods: educational games, in this case, the Smart Dice Educational Game, proved effective in changing students' attitudes regarding COVID-19 prevention. The interactive and fun approach to learning may have helped reinforce positive attitudes towards prevention measures. 3). Attitude consistency: The fact that all students showed an agreeable attitude after the intervention indicates consistency in attitude change. This suggests that the learning method was able to stimulate a uniformly positive response among students [7,8,9].

Data analysis related to the use of the Smart Dice Educational Game to influence the attitudes of Muhammadiyah 01 Medan Elementary School students to prevent transmission of COVID-19 was obtained 1). Increase in good action: There was a drastic increase in the good action category after the Smart Dice Educational Game intervention, from 0% to 81.55%. This shows the effectiveness of this method in encouraging better actions related to COVID-19 prevention. 2). Decrease in less action: The percentage of lack of action dropped significantly from 94.17% to 4.86%, indicating that the educational game has successfully reduced the level of ignorance or lack of preventive action. 3). Direct Impact: The Smart Dice Educational Game appears to provide students with a strong understanding of the steps that need to be taken in preventing the transmission of COVID-19, such as the definition, symptoms, and actions that should be taken.

4. Conclusion

The Smart Dice Educational Game has been shown to be an effective tool in improving knowledge, attitudes and actions to prevent COVID-19 among elementary school students, with the potential to improve preparedness to deal with similar health situations in the future.

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