DHF Educative Game

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DENGUE HEMORRHAGIC FEVER (DHF) EDUCATIVE GAME TO IMPROVE KNOWLEDGE AND SKILL OF ELEMENTARY SCHOOL CHILDREN IN DHF PREVENTION

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ABSTRACT

Background: *The Ministry of Health of the Republic of Indonesia released data on the number of dengue fever sufferers in Indonesia on January 29, 2019 there are 13,683 cases and increased to 16,692 cases on February 3, 2019. The Director General of Disease Prevention and Control said that 90% of cases of dengue fever were children under age of 15 years.The Ministry of Health noted the number of cases of dengue hemorrhagic fever (DHF) in January 2019 increased to 121.8% compared to January last year. This study aims to examine the effect of educational games on increasing the knowledge and skills of elementary school age children about the prevention of dengue fever.* ***Methods:*** *To test the hypothesis, this study uses experimental research methodology to determine the results of treatment of a particular group to produce an innovation and recommendations for prevention of dengue fever in children.* ***Results:*** *This educational game can increase children's interest in learning to prevent dengue fever and improve their ability to prevent dengue fever. Educational games methods for elementary school age children can influence children's understanding and skills in preventing dengue fever at the age of elementary school children. This study was able to describe the effect of educational game with clean and healthy behaviour that more effective to prevent the incidence of dengue fever in elementary school-aged children.* ***Conclusion:*** *This educational game needs to be continuously applied and developed to reduce the incidence of dengue fever in children under 15 years of age. In the future, researchers should have to developed more modern design it can be like a virtual game that more atractive for the children. So, the goals of this research can be achieved.*

Keywords : *Game, Mosquito, Elementary school children*

INTRODUCTION

Tropical and subtropical regions, especially Southeast Asia, Central America, and Caribbean are endemic areas of dengue fever. Dengue virus which is included in the family Flaviridae and genus Flavivirus is a dengue fever agent that has four serotypes namely Den-1, Den-2, Den-3 and Den-4 [1], transmitted to humans through the bite of infected mosquitoes, specifically Aedes aegypti and Ae albopictus mosquitoes [2]. Which is found in almost all corners of Indonesia [3]. Whereas humans are the natural hosts of dengue fever. Clinical manifestations will appear such as dengue fever, dengue fever and dengue high fever accompanied by shock or dengue shock syndrome as a result of infection caused by the dengue virus [4]. Which is transmitted *by Aedes aegypti* and *Aedes albopictus mosquitoes* [5].

Aedes aegypti has two subspecies, namely *Aedes aegypti formosus* and *Ae. aegypti queenslandensis*. The first subspecies live in the tropics which are known to be effective in transmitting the dengue virus, while the second subspecies lives freely in Africa. The first subspecies are more dangerous than the second subspecie [9]. DHF cases tend to continue to increase and in some subtropical and tropical areas the cases have never decrease [11]. This disease causes a lot of deaths in children [10] 90% of them attack children under 15 years [12]. Dengue cases in Indonesia almost occur every year, especially at the beginning of the year, outbreaks occurred in 2004 with the deaths of more than 800 people [13]. The number of deaths is decreasing in the following year but the number of dengue cases continues to increase. As in 2008 as many as 137,469 people experienced dengue and 1,187 people died [14]. Dengue fever is associated with warm weather and high humidity factors [15] that can stimulate the ability of mosquitoes to bite [16] and vector breeding [17].

The spread of population to rural areas, shifts in age groups, social and biological determinants of race and sex that are vulnerable affect health services [22]. The pattern of increasing cases of dengue den-3 infection is epidemiologically related to the rainy season because rainwater storage will be a breeding ground for mosquitoes [18] [19] [20] [21].

Educative game activities with the name " DHF Eradicating Generation " is a health education aimed at primary school-aged children to improve their knowledge and skills about recognizing hazards and preventing the Aedes aegypti mosquitoes by using the development from several existing concepts games. "DHF Fighting Generation" activities are important because Indonesia is a tropical country that allows various types of vector diseases to develop well, one of which is Aedes agypti mosquito which can cause Dengue Hemorrhagic Fever.

Dengue Hemorrhagic Fever (DHF) is one of the infectious diseases caused by the dengue virus originating from the Aedes aegypti mosquito. Based on data from the Ministry of Health of the Republic of Indonesia, since it was first discovered in 1968, Indonesia has experienced dengue outbreaks for several times, namely in 1973, 1977, 1978, 1983, 1988, 1996, 1998, 2007, and 2009. The highest DHF cases in the last ten years was in 2009 with 154,855 cases and 1,384 people who died. The increase in the number of cases is more than twice as much as in 1998 [6].

Various efforts have been made by the Ministry of Health of the Republic of Indonesia, including through the provision and improvement of health care facilities, the Mosquito Nest Eradication (PSN) movement through 3M (draining baths, closing water reservoirs, and burying used goods that can hold rainwater), and forming *Jumantik*cadres (larvae monitorer). The role of *Jumantik* in the community includes carrying out larva monitoring activities, eradicating mosquito nests periodically and health education [7].

Empowerment of elementary school students needs to be done in view of dengue cases that can cause extraordinary cases in elementary school-age children. It is expected that elementary school students can become health cadres starting from their school environment. From the school environment will be formed behavior of healthy living from an early age, so that in the future elementary school students are able to develop the knowledge that they was gained. The larva monitoring students initiated by the government were integrated into the School Health Unit (*Unit Kesehatan Sekolah*) in each school [8]. The *Jumantik* cadres (larvae monitorer) program is currently still not running well because there are no monitoring and evaluation in each school. The government still does not have the right and effective concept to empowered students to eradicate the mosquito nest.

From this background through this scientific program, the author will make a positive and sustainable activity in an effort to improve the role of students in eradicating *Aedes aegypti* Mosquitoes with the title "DHF Eradicating Generation". An activity using fun games methods for elementary school students so that they can form healthy living habits. Activities that will be carried out in the form of learning with the concept of health games and practice in the field.

This activity " DHF Eradicating Generation " is useful for:

1. Can improve the understanding of elementary school students related to the importance of healthy living habits and various problems that can be caused by mosquitoes.
2. Can be used as a means to instill a sense of love, belonging, and a sense of responsibility for environmental cleanliness. Especially for children of primary school age so that health cadres can be formed.
3. Prevent the occurrence of diseases caused by Aedes aeygpti mosquitoes such as DHF.
4. Increasing the role of the community especially elementary school students in managing dengue.

This "DHF Eradicating Generation" activity is targeted to:

1. Participants in this activity have been able to understand the dangers posed by mosquitoes, how to prevent them, and can conduct larva surveys independently both outside and inside the school.
2. In the long term, this activity can reduce the development of mosquitoes in the community and school environment and improve health cadres.
3. This activity can be carried out sustainably, so that it can be used as a pioneer in planting awareness of the importance of alertness to vector diseases caused by Aedes aegypti mosquitoes in elementary school-aged children.

METHODS

The type of the research is experimental study with the 5th grade students of 1st State Elementary School Kandangan as respondent. There are 40 children that separated randomly in two groups as a sample in this research (20 children each group). The participant or respondent joining all of the program in this research from the start until the end and no body has drop out.

The independent variable in this research are the 5th grade students of 1st State Elementary School Kandangan which are divided into group A and group B. While the dependent variable in this study was a type of puzzle game and a combination of monopoly-snake and ladders. The method of implementation carried out in the dissemination of " DHF Eradicating Generation" consists of the DHF Eradicating Generation class and the Independent DHF Eradicating Generation.

DHF Eradicating Generation Class is an educational method aimed at providing knowledge about the importance of alertness to hazards caused by Aedes aegypti mosquitoes and efforts to reduce the spread of vector diseases originating from Aedes aegypti mosquitoes. In the implementation of DHF Eradicating Generation Class method is divided into 3 sessions, namely:

1. Small but Deadly

Small but Deadly is an introduction topics about mosquitoes such as characteristics, hazards caused, modes of transmission, and prevention from an early age. In this session students are also given an understanding of the concern for the environment and the importance of healthy living habits carried out by giving motivation. By motivating these children it is hoped that there will be enthusiasm that is intended to support knowledge related to the prevention of mosquitoes. Participants in this activity are group A and group B.

2. Sweet Moment of DHF Eradicating Generation

Class education in theory can sometimes lead to boredom for children. Therefore, the Sweet moment of DHF Eradicating Generation can be a fun educational alternative to elementary school children. Sweet moment of DHF Eradicating Generation is learning through screening films about mosquitoes which are conceptualized according to elementary school age children. Participants in this activity are group A and group B. In this session, especially group A students will also play games "Adventure of DHF Eradicating Generation" in the form of a game to arrange puzzles about efforts to prevent mosquitoes of Aedes aegypti. This session will end with singing and dancing together with the song "One House One Jumantik Movement" (*Gerakan Satu Rumah Satu* Jumantik) for all groups of students A and group of students B.

3. DHF Eradicating Generation Action

Learning in the Small but Deadly and Sweet Moment of the DHF Eradicating Generation session was felt to have not yet thoroughly explored the knowledge of the dangers of Aedes aegypti mosquitoes and the importance of early prevention. Therefore, in the DHF Eradicating Generation Action session students were introduced to the eradication of mosquito nests through 3M or *Menguras, menutup, dan mengubur* (drain, close, and bury), also Clean and Healthy Life Behavior or *Perilaku Hidup Bersih Sehat* (PHBS) as measures to prevent the danger of mosquitoes. Group A and group B students will be taught how to do the eradication of mosquito nests (PSN) Movement and larva surveys independently, in the hope that they can become agents of change.

In this session specifically for group A students, the learning material provided will be interspersed with a game that children love, namely *Antinyamuk* Adventure. This game is a game that combines the game of monopoly and snakes and ladders, where in this game there are various materials about the dangers of Aedes aegypti mosquitoes and how to prevent them. This game is expected to be an effective first step to improve children's understanding, interest and memory so that in the future they will have basic knowledge that can be applied and developed in the future.

In this session, the learning material will be interspersed with a game that is loved by children, namely Antinyamuk Adventure. This game is a game that combines the game of monopoly and snakes and ladders, where in this game there are various materials about the dangers of Aedes aegypti mosquitoes and how to prevent them. This game is expected to be an effective first step to improve children's understanding, interest and memory so that in the future they will have basic knowledge that can be applied and developed in the future.

The Independent DHF Eradicating Generation is a field practice activity carried out after the DBD Fighting Generation class has been carried out. This activity was carried out directly in the 1st State Elementary School Kandangan. The Independent DHF Eradicating Generation includes :

1. Hand Washing Together Movement

   To realize clean and healthy behavior in school, students will be taught how to wash their hands properly. This effort is expected to be applied both inside and outside the school so that it can prevent disease, improve health, and play a role in realizing a healthy Indonesia.

2. Anti-Mosquito Plant Planting

   Planting is done after students are given knowledge about mosquito repellent plants and how the process of planting as a closing series of activities "Adventure of DHF Eradicating Generation ".

RESULTS

The implementation result of this study from 5th grade students in 1st State Elementary School Kandangan shows data that the educational play method greatly influences their understanding and skills in preventing dengue fever. The relationship between the dependent variable and the independent variable can be explained through the data as follows:

Table1: Pretest and Posttest Results

	Pretest Correct Answer> Posttes Correct Answer	Pretest Correct Answer< Posttes Correct Answer
Group A	95% children	5% children
Group B B	35% children	65% children

As many as 95% of group A children were able to answer the posttest questions more than the answers when it came to the pretest. Whereas in group B students there were only 65% of children who were able to answer the posttest questions more correctly than to answer correctly the pretest.

Table 2 : Results for Anti-mosquito Plants Oral Question

	Able to mention five mosquito repellent plants	Not be able to Able to mention five mosquito repellent plants
Group A	85% children	15% children
Group B	45% children	55% children

As many as 85% of group A students were able to mention three out of five mosquito repellent plants, while group B students only had 45% of children who were able to mention three of five mosquito repellent plants.

Tabel 3 : Results of 3M's Program Oral Questions

	Able to explain 3M's program	Not be able to explain 3M's program
Group A	90% children	10% children
Group B	65% children	35% children

Data shows that 90% of group A students were able to explain 3M's efforts, while group B students were only 65% who were able to explain 3M's efforts.

Table 4: Results of Skills Practices

	Able to practice jumantik activities independently	Need guidance when practicing jumantik activities
Group A	70% children	30% children
Group B	40% children	60% children

Some 70% of group A students are able to practice jumantik activities independently, while group B students are only 40% who are able to practice jumantik activities independently.

DISCUSSION

In addition to getting the theoretical efforts to prevent dengue fever, group A students also received an educative puzzle game and a combination of monopoly-snake ladders. While group B students did not get educative game treatment. All students performed a pretest to find out their initial knowledge before being classified in group A and group B randomly. After getting different treatments between groups, it turned out that the data showed that group A had more students who were able to answer the posttest questions correctly. In addition, when all group members are given verbal questions related to the material presented, group A has more students who are able to answer questions than students in group B. When more practice of group B larvae observers have more to be accompanied than group students A more independent.

Of course this clearly is the treatment that is different in group A and group B with members of the same group, namely the fifth grade elementary school students will give different results of knowledge and skills. The respondent on this research join all of the same program except the educational group that only implemenate in group A. All of the student in group A learn about mosquito nest eradication by playing monopoly-snake ladders, but students in group B do not playing monopoly-snake ladders. The results of this study indicate that educational games are able to provide greater influence on dengue fever knowledge being compared to just lectures or presentations.

Practically the results of this study can be applied to improve the effectiveness of health promotion related to prevention of dengue fever in primary school-aged children. The government can try to develop recreational education through educational games such as the monopoly- snake ladders game in this study to improve health status and prevent the high incidence of dengue fever in elementary school children.

This study has several limitations. First, the researcher tried to use two educational educational tools directly for students in group A. Given the possibility of influencing the types of educational games to students' understanding, further research could be further simplified. Second, the division of student groups into A and B is done randomly without regard to intellectual abilities that differ between students. So that this certainly will greatly affect the results of the obtained data.

CONCLUSION

This study was able to describe the effect of educational game with clean and healthy behaviour that more effective to prevent the incidence of dengue fever in elementary school-aged children. This educational game needs to be continuously applied and developed to reduce the incidence of dengue fever in children under 15 years of age. Learning methods while playing for children of primary school age in order to understand the efforts to prevent dengue fever are proven to be able to improve children's understanding and skills. In the future, researchers should have to developed more modern design it can be like a virtual game that more atractive for the children. So, the goals of this research can be achieved.

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