



THE EFFECT OF SNAKES AND LADDERS GAME MEDIA COUNSELING IN IMPROVING STUDENTS' UNDERSTANDING OF THE VECTOR OF DANGUE HEMORRHAGIC FEVER IN SD NEGERI X KUTALIMBARU DELI SERDANG

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Abstract

Dengue fever is a global health problem that remains a serious threat, especially in tropical countries like Indonesia. Children are the most vulnerable group to DHF infection due to an imperfect immune system and limited knowledge in prevention efforts. This study was conducted to determine the effect of counseling using snakes and ladders game media in improving student understanding. This study used a quantitative approach with a one group pre-test post-test design that aims to determine the difference in values between before and after counseling. The sample in the study amounted to 60 respondents with total sampling formula. Based on the results of the study, there is an effect of counseling using snakes and ladders game media to improve students' understanding of dengue disease vectors, this can be seen from the P-value of $0.000 < 0.05$ which indicates a significant difference between before and after counseling. With this activity can be influenced to increase knowledge of dengue disease prevention.

Keywords: Aedes Aegypti, Dengue Fever, Knowledge, Snakes and Ladders

Introduction

Dengue fever (DHF) is a serious public health problem. The disease is caused by the dengue virus transmitted through the bite of the *Aedes aegypti* mosquito, which is the main vector of DHF transmission. The high incidence of DHF in various regions indicates the low knowledge and awareness of the community, including elementary school children, on the prevention and control behavior of the disease vector [1].

According to the latest data from the World Health Organization (WHO), Dengue Fever (DHF) cases in the world have shown a significant increase in recent years. As of April 2024, there were more than 7.6 million dengue cases reported globally, with approximately 3,000 to 4,000 deaths. Even by the end of 2024, WHO reported that the number of cases reached 14.3 million with more than 10,000 deaths, originating from 112 countries. This surge is mainly in the Americas, but also affects many other tropical countries, including Southeast Asia [2]. This increase is influenced by various factors such as climate change, rapid urbanization, and lack of control of the *Aedes aegypti* mosquito vector. Currently, around 3.9 billion people worldwide live in areas at high risk of dengue transmission. This data emphasizes the importance of education and effective interventions to increase understanding and prevention of the spread of dengue globally [3].

According to data from the Ministry of Health, until the 17th week of 2024 there were 88,593 dengue cases with 621 deaths in 456 districts/cities. This is up from 53,131 cases and 404 deaths at the

end of March 2024. The year 2024 set an all-time record high, with nearly 242,000 cases and around 1,400 deaths. By week 41, there were 203,921 cases and 1,210 deaths. Entering 2025, cases decreased to around 38,000 with 182 deaths. Despite the decline, the Ministry of Health emphasized the importance of continuous vigilance and prevention through 3M Plus, strengthening surveillance, vaccination, and innovations such as the Wolbachia mosquito [4].

Based on data released by the North Sumatra Provincial Health Office, in 2024 Deli Serdang Regency recorded 876 cases of Dengue Fever (DHF) [5]. This figure shows that Deli Serdang is one of the areas with a high level of DHF spread compared to other districts/cities in North Sumatra. In fact, the number of cases places Deli Serdang as one of the five districts/cities with the highest number of DHF cases in the province. This high incidence rate is an indicator that DHF is still a serious public health problem and requires special attention from various parties, including local governments, health workers, educational institutions, and the general public [6]. Continuous prevention efforts, such as education on the importance of maintaining environmental hygiene, eradicating mosquito nests, and increasing awareness about the symptoms and early treatment of DHF, are needed to reduce the spread of this disease [7]. In addition, cross-sector collaboration in health campaigns and the implementation of creative and educative intervention programs are also important steps in overcoming the high rate of dengue in the Deli Serdang area

Sekolah Dasar Negeri X Kutalimbaru is located in Kutalimbaru Village, Deli Serdang Regency, North Sumatra Province, and serves as a primary education institution serving children in the region. Based on observation, the environment of State Elementary School X Kutalimbaru has humid conditions with many puddles. This condition has the potential to become a breeding ground for *Aedes aegypti* mosquitoes, which is the main vector for the spread of dengue hemorrhagic fever (DHF).

One of the important efforts in preventing the spread of DHF is through health education from an early age. Elementary schools are strategic places to instill an understanding of the importance of maintaining environmental hygiene and recognizing disease-carrying vectors. However, the conventional approach to health education is often less appealing to children, so the material presented is not optimally absorbed [8].

The use of interesting and interactive educational media, such as snakes and ladders games, can be an alternative method of counseling that is more effective for elementary school students. Game media not only provides entertainment, but can also be a means of learning that is fun and easy for children to understand [9]. By inserting important information about dengue vectors and prevention methods into the game, it is hoped that students' understanding of the disease can be improved [10].

Based on this, this study was conducted to determine the effect of counseling using snakes and ladders game media in increasing students' understanding of Dengue Fever vectors at SD Negeri X Kutalimbaru, Deli Serdang. This study is expected to provide input for the development of creative and effective health education methods for elementary school children.

Method

This study uses a quantitative approach with a one group pre-test post-test design that aims to determine the difference in value between before and after counseling. The population in this study were all students in grades 4, 5, and 6 totaling 60 students. The sample in this study amounted to 60 respondents using total sampling or the entire population will be sampled. Data collection was carried out twice, namely giving pre-test before counseling and post-test after counseling. This research instrument uses a questionnaire with the criteria that if the question is correct, the score is 1 and if the question is wrong, the score is 0.

Then, the second measurement was taken after the subject was given treatment in the form of a snakes and ladders game. The measurement was carried out on the same group of subjects. The

population used in this study were 5th and 6th grade students of State Elementary School X Kutalimbaru. The form of treatment in this study is learning media in the form of a game in the form of a snakes and ladders game containing an understanding of dengue disease vectors. Then, the subject was asked to play snakes and ladders. This research instrument uses a questionnaire with the criteria that if the question is correct, the score is 1 and if the question is wrong, the score is 0.

Data analysis was carried out using the shapiro-wilk test to check whether a sample of data came from a normal distribution. After that, use the paired sample t-test if the data is normally distributed and the Wilcoxon test if the data is not normally distributed.

Results

The game was conducted in the classroom using snakes and ladders media measuring 2.5 meters x 2.5 meters. Each subject was given the opportunity to act as both a player and a pawn in the game. The game starts with rolling the dice, then the subject walks and stands on the box according to the number of numbers that appear. This rule applies equally to all participants involved. After the entire series of games is completed, the data obtained from this activity will be processed to obtain results that illustrate the effectiveness of counseling through snakes and ladders game media [11].

Table 1. Respondent Characteristics

Gender	Frequency	Percentage (%)
Man	24	40
Woman	36	60
Age	Frequency	Percentage (%)
10 years	22	36,7
11 years	24	40
12 years	14	23,3
Total	54	100

Based on the data, the majority of respondents were female (60%), while 40% were male. Based on age, most respondents were 11 years old (40%), followed by 10 years old (36.7%), and the least was 12 years old (23.3%). This shows that most participants are in the age range of 10-11 years old and are dominated by the female gender.

Table 2: Knowledge before and after counseling using the Snakes and Ladders game to prevent dengue fever

Knowledge	N	Mean	Std. Deviation	Std. Error Mean
<i>Pre-Test</i>	60	5,4000	0,90573	0,1169
<i>Post - Test</i>	60	13,9667	0,91996	0,1187

Based on table 2, it shows that knowledge before counseling has an average value of 5.4000 and after counseling the average value increases to 13.9667. This indicates an increase in students' knowledge regarding students' understanding of dengue disease vectors through counseling using snakes and ladders game media.

Table 3. Normality Test

Shapiro - Wilk	Statistic	df	sig.
Pre-Test – Post -Test	0,915	6	0,473

Table 3 of the normality test shows a sig value of $0.473 > 0.05$ which indicates that the data is normally distributed. Therefore, to see the difference in pre-test and post-test values using the paired sample t-test.

Table 4. Paired Sample T-test

Knowledge	Mean	SD	SE	P-value	N
Pre-test	8,56667	1,35755	0,17526	0.000	54
Post-test					

Based on table 3, the mean value is 8.5667 with a Std. Deviation 1.35755. The results of statistical tests using paired sample t-test showed that there was a significant difference between knowledge before and after counseling with a P-value of $0.000 < 0.05$. This indicates the effect of counseling using the Snakes and Ladders Game Media to Prevent DHF Disease conducted on students at State Elementary School X Kutalimbaru.

Discussion

The results showed a significant increase in knowledge after students received counseling through snakes and ladders game media. The mean value of knowledge before counseling was 5.40 and increased to 13.97 afterward, with a mean difference of 8.57 and a standard deviation of 1.36. The paired sample t-test yielded a p-value of 0.000 (< 0.05), indicating a statistically significant difference between knowledge before and after the intervention. This shows that the counseling method using game media is very effective in increasing students' understanding of the vectors that cause dengue disease.

Game media such as snakes and ladders creates a fun, interactive, and non-boring learning atmosphere, making it easier for students to understand and remember the material. This process supports Piaget's constructivism theory which states that children learn through active interaction with the environment and construct their own knowledge [12]. In addition, Ausubel's learning theory of meaningful learning emphasizes that learning will be more effective when new information is associated with concepts that students already have. Snakes and ladders games that are packed with educational messages make it easier for students to associate knowledge with their play experiences [13].

This study is also in line with the results of Sari et al. (2023) which showed that game-based educational methods improve students' knowledge and skills in recognizing risk factors for infectious diseases [14]. Another study by Hasanah & Mulyani (2021) proved that educational games have a positive impact on changing the healthy living behavior of elementary school students [15]. In addition, Wulandari et al. (2022) stated that health counseling using visual media and interactive games is more effective than conventional lecture methods, because it involves students' cognition and emotions [16].

This finding confirms that the use of learning media that is attractive and appropriate to the characteristics of learners, especially elementary school children, is very important in improving the effectiveness of health education. In the context of dengue prevention, this method can be an alternative strategy that is cheap, easy to apply, and able to have a long-term impact on increasing children's awareness and healthy behavior.

Conclusion

Based on the results of the study, there is an effect of counseling using snakes and ladders game media to improve students' understanding of dengue disease vectors, this can be seen from the P-value of $0.000 < 0.05$ which indicates a significant difference between before and after counseling. Counseling activities using snakes and ladders games can be said to be effective for increasing student knowledge and can prevent DHF disease vectors in children, where their immune system is still in the developmental stage.

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