

## THE EFFECT OF SNAKE LEADER CARD 3M BEHAVIOR GAME ON KNOWLEDGE OF DENGUE HAEMORRHAGIC FEVER PREVENTION IN CHILDREN

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## ABSTRACT

### Introduction

Dengue Hemorhaege Fever (DHF) is a life-threatening disease mediated by mosquitoes with dengue virus. Prevention efforts suggested with this study was through education using *snake leader card* game with 3M behavior.

### Method(s)

This research design is Pre Experimental Design with One-Group pretest-posttest. With 45 sample collected using total sampling from elementary school student in grade IV, V, and VI from National Elementary School 1 Samsam.

### Result(s)

Pretest result showed the level of knowledge in the “very good” category only 6.7% from the participant, but the posttest result showed significant improvement in the “very good” category to 97.8% of total participant. Non-parametric test using *Wilcoxon* test showed significant p-value (< 0.05). Result showed that there’s an significant effect of snake leader card game on knowledge in preventing DHF in children.

### Conclusion(s)

Snake leader card game on knowledge in preventing DHF in children can be used as an alternative intervention for health promoters and health care workers in educating children about preventif DHF.

## INTRODUCTION

Dengue hemorrhagic fever (DHF) is a type of disease transmitted from the bite of Aedes Aegypti Mosquito. From the mosquito's bite, Langerhans cells, immune cells located in the lining of human skin, can become infected with the dengue virus and spread throughout the body (Roy & Bhattacharjee, 2021).

Clinical symptoms of DHF are dynamic and consist of three phases, the Febris Phase of high fever from 2 to 7 days, the incubation period of the virus varies from day 1 to day 3 where there'll be a drop in body temperature which can be an early sign of shock. Days 4 to days 7 are the critical phase for DHF patients. And after day 8 to days 10, DHF enter external incubation period where the patient will experience a recovery phase (Wang et al., 2020). The main factor of DHF outbreak usually are tropical and subtropical climate, the cleanliness of the home and it's surrounding environment also affects the breeding of mosquitoes (Wang et al., 2020).

Indonesia with it's tropical climate where DHF was common health case. In 2017, there were 12.675 DHF cases with 87 deaths, in 2018 there were 6.168 cases with 43 deaths. In 2019 there were 27.403 cases with 236 deaths, in 2020 there were 15.819 cases with 121 deaths. The proportion of cases mainly from age 5-14 years old with 33.08% of all total cases (Kementerian Kesehatan Republik Indonesia, 2021). Bali have a high number of DHF cases with potential to increase. The latest data from 2022 showed that there were 132 cases per 100.000 population (Dinas Kesehatan Provinsi Bali, 2022). Tabanan as one of district in Bali have relatively high cases with the highest year in 2016 with 918 cases, and in 2020 there were 340 cases and in 2022 there were 366 cases. 56 of the cases happened in UPTD Puskesmas I Kerambitan. 12 of those 56 cases were children with 2 death cases. And in 2023 there were 51 people infected with DHF virus, 15 of them were children.

One of the prevention efforts to DHF virus was by eradicating mosquito nests and 3M behavior (Menguras, Menutup, Mengubur or Draining, Closing, and Burrying). Children's knowledge in preventing DHF can be improved with *snake leader card* game with 3M behavior.

The *snake leader card* game is an interesting way to educate children because children learn while playing the game. The right educational media for children to care about their environment with the aim of preventing DHF in the school (Ibrahim et al., 2023).

Preliminary studies by observing students at National Elementary School (SDN) 1 Samsam and discussions with the school's principal and selected students found 6 student contracted DHF. Discussions with 45 students showed that only 3 students knew about DHF. And all of the students did not know the application of 3M behavior. The lack of knowledge about DHF showed that students not being aware of the risk on their environment becoming a breeding ground for mosquitoes. Research suggest that using *snake leader card* can help student learn while playing the game.

## METHODS

This Research used a Pre-Experimental study design. Conducted at SDN 1 Samsam from march to april 2024. The population in this study were elementary school students in grade IV, V, and VI of SDN 1 Samsam, totaling to 45 participants. Sampling technique used in this research was total sampling where researcher used all the population (Sugiyono, 2017). Questionnaire used in this research had been tested the reliability and the validity on February 23, 2024 with 30 respondents from grade V and grade VI of SDN 2 Samsam. Normality test was conducted before bivariate analysis by using *Kolmogorov Smirnov* test, the result showed the data was not normally distributed so bivariate analysis was continued using the *Wilcoxon* test. This research has obtained ethical approval from the Chairperson of the Denpasar Polytechnic Health Research Ethics Commission with number: DP.04.02/F.XXXUU.25/0225/2024.

## RESULTS

The characteristics of respondents based on age can be observed through the following table:

Table 1. Analysis of Respondents by Age

N o	Age	N	Percentage (%)
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1	9-10 years old	19	42,2
2	11 years old	11	24,4
3	12-13 years old	15	33,3
Total		45	100

Analysis of Respondents by Gender			
No	Gender	N	Percentage (%)
1	Male	24	53,3
2	Female	21	46,7
Total		45	100
Analysis of Respondents by Grade			
No	Grade	N	Percentage (%)
1	IV	18	40
2	V	8	17,8
3	VI	19	42,2
Total		45	100

Based on the data described in table 1, most of the participant was 9 to 10 years old (42.2%) and male (53.3%). Respondent from grade IV was 18 students (40%), grade V was 8 students (17.8%), and grade VI was 19 students (42.2%).

Questionnaire was used to get the level of knowledge in participant, below are listed the level of knowledge before and after the intervention with *snake leader card* game with 3M behavior.

Table 2 Pre-Post Test Score Distribution of Students' Knowledge on DHF Prevention

No	Category	Pre-Test		Post-Test	
		N	Percentage (%)	N	Percentage (%)
1	Good	3	6,7	44	97,8
2	Sufficient	20	44,4	1	2,2
3	Insufficient	22	48,9	0	0
	Total	45	100	45	100

Table 2 showed an increase in students' knowledge level in the good category. Where before intervention, the "Good" category only have 3 respondents (6.7%). And after the intervention, there was an significant increase in

"Good" category where 44 respondents (97.8%) obtain that level of knowledge.

The effect of *snake leader card* game media on students' knowledge in DHF prevention was examined using Wilcoxon test, which can be seen below.

Table 3 Rank Test Uji Wilcoxon

No	Post Test-Pre Test Score	Negati ve Ranks	Positi ve Ranks	Ties	Tot.
1	N	0	45	0	45
2	Mean Ranks	0	23		

  

	Sum of Ranks
Post Test-Pre Test Score	1035
Z	-5,851
Asymp. Sig. (2-Tailed)	0,000

Interpretation of the Wilcoxon test shows all the respondents get positive data where there is an increase in knowledge scores across all respondents after the intervention with *snake leader card* game with 3M behavior. In *Ties* where the result showed 0, means that there are No. respondents who get the same score in the pre-test and post-test. Non parametric test obtained p-value of 0.000 or less than 0.05 which are significant. So based on the statistical result, it can be concluded that there is a significant effect of improving students' knowledge in preventing DHF by using *snake leader card* game with 3M behavior as the main intervention at SDN 1 Samsam.

## DISCUSSIONS

Respondents in this study mostly age 9 to 10 years old. According Masnarivan et al. (2023), school age were the most appropriate phase to be given knowledge and understanding related to healthy living habits. Including efforts to prevent DHF. Age was an aspect that can affect someone's knowledge, mindset, and attention span. Where the increasing of age go hand in hand with the development of their mindset and attention span, which in turn also improve their knowledge.

Research conducted by Rahmawati et al. (2022), stated that the insights gained by elementary school students can be disseminate to their family and surrounding environment. When the public awareness increases, it can lead to decrease in DHF cases. By educating elementary school students, it is expected to have an impact on increasing health and productive living behavior.

Participants' age range associated with primary school education. Children between the age of 9 and 12 are considered to be in late childhood stage. Where the usually in grades IV, V, and VI of primary or elementary school. At this stage, children exhibit certain qualities such as strong emphasis on everyday life, high curiosity, drive to learn, and a realistic mindset. Children show great enthusiasm for certain subjects and regard their scores as an indikator of their academic progress. At this age, children also enjoy forming peer groups to engage in play activities. Where they establish their own set of rules within group. Age affects someone's capacity in capturing and digesting information. With age reaching maturity, the better their capacity to catch information. Age 9 to 12 years old have a high level of curiosity and learning. Which are suitable to be given useful knowledge and information, including health-related information.

Research participants mostly male 24 participants (53.3%). Cahyani et al. (2023) mentioned the theory that a man tends to carry out something in accordance with his mind. In this case, it means that man think and act more rationally. This is what affects the level of knowledge and behavior. In addition, it is also mentioned that man have a higher interest in the surrounding environment which makes it easier to receive information.

This theory is different from research conducted by Hendri et al. (2020) that in theory women tend to have better knowledge related to diseases and their transmission mechanisms. This happens because women have more sensitivity to recognize the disease and seek to prevent transmission of the disease. Meanwhile, Insanawati et al. (2023) mentioned that gender did not affect students' knowledge related to

DHF. In their study, all respondents experienced an increase in knowledge scores after being given intervention. Many factors influence a person's level of knowledge. Such as age, interest, information, and individual experiences (Cahyono, 2019). Usually gender does not affect individual knowledge, but rather their behavior. So, in this case, the researcher concludes that gender does not have a direct influence on the level of knowledge.

This study found a significant effect in intervention by using educational media games *snake leader card* game with 3M behavior on student knowledge in preventing DHF at SD Negeri 1 Samsam, where appropriate learning media can increase respondents' knowledge. In line with the results from Wulandhari et al. (2023), stating that the media used in education is very instrumental in providing information and education to the target. Children are in the right age group to be agents of change regarding health behavior. Health education in schools is an activity that conveys messages to provide a principle. Based on this, children will understand, know, and be willing to follow health-related directions. Children in elementary school develop interest in their daily lives, have a high sense of curiosity and want to learn. Media-based learning improve the presentation of facts, concepts and principles, making them more tangible and easy to demonstrate (Sabila et al., 2021).

Result form this research also in line with research conducted by Ningsih and Putri (2023), where an increase in the average knowledge of students related to DHF after being given intervention. Knowledge has an important role in shaping one's attitude in disease prevention. The better the knowledge, the better the opportunity to form a good attitude. Elementary school students are vulnerable to knowledge and attitudes that affect their behavior in preventing DHF. Involving a learning media is an effective way to increase students' knowledge.

Curiosity motivates individuals to began on new efforts or activity, which ultimately results in the acquisition of greater information than previously possessed (Cahyono, 2019). In this case, providing media-based education can

improve interest, motivation and stimulate students both intellectually and psychologically. The purpose of learning media was to convey messages that can effectively stimulate students' motivation during their learning process and leads to successfull results (Sabila et al., 2021).

Aisyah et al. (2021) found a significant increase in knowledge, attitudes and also the practice of dengue prevention after given intervention in form of animated video. The result showed the importance of health promotion media in changing someone knowledge, attitudes and behavior or actions toward a better health behavior. Other related studies were also examined by Setioputro et al. (2022), where the result showed an effect of health education for bandaging with audiovisual media on public high school students' knowledge of bandaging. Furthermore, they found that using media for education is very effective to change individual knowledge. Antara et al. (2023) also observed that poster media had a significant effect on increasing nurses' knowledge of the Australasian Triage Scale.

Students' knowledge related to DHF prevention after being given intervention with the *snake leader card* game with 3M behavior mostly scored on good. Therefore, it is expected that the knowledge learned can be applied into a positive attitude to realize DHF prevention efforts. The results of the bivariate analysis showed in the Positive Ranks section, the results show that 45 students get positive data, which means that there is an increase in knowledge scores in all students after being given intervention.

Research conducted by Malik et al. (2021) found that providing PHBS education with snakes and ladders media had a positive impact on the knowledge of elementary school students. In addition, educational games engaged the liveliness and enthusiasm of students to receive the materials. One of the materials was to prevent infectious diseases such as DHF. Innovation in using learning media such as snakes and ladders game help children to not feel bored and engage with learning information well.

Media is one of the factors that influence the knowledge of educational targets. Media has a function to make it easier for someone to understand information that was previously considered complex. The use of media seeks to provide information effectively, provide stimulation and motivation to students during the learning process and ensure success in achieving learning target (Sabila et al., 2021).

## CONCLUSIONS

This study proves that there is an effect of providing education by utilizing innovative learning media in the form of snake leader cards on elementary school students' knowledge about DHF prevention. This is evidenced by the increase in knowledge scores before compared to after education. This study is expected to be used as an alternative health intervention for health promoters in delivering information about DHF, so as to prevent DHF in children.

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