

**Original Research****The Impact of Sticking Pictures to Promote Dengue Fever Prevention on Fifth-Graders' Knowledge and Attitude****Della Pangestu Wibowo<sup>1\*</sup>, Nino Adib Chifdillah<sup>2</sup>, Dian Ardyanti<sup>3</sup>, Dwi Hendriani<sup>4</sup>**<sup>1,2,3,4</sup> Department of Health Promotion Health, Poltekkes Kemenkes Kalimantan Timur, Indonesia**ABSTRACT**

**Background:** Dengue fever is an acute mosquito-borne infection caused by the dengue viruses and has become a growing public health concern globally. One of the causes is the lack of knowledge about the 3M Plus campaign, especially among children in the school-age group. The objective of this research is to identify the impact of sticking pictures as health promotion media to prevent dengue fever on elementary school fifth-graders' knowledge and attitude.

**Methods:** This research uses a pre-experimental type with a one-group pre-test and post-test design. The population of this research consisted of all fifth-grade students, followed by 39 persons chosen utilizing proportional random sampling and simple random sampling techniques. The primary data for this research were collected through the distribution and completion of close-ended questionnaires. The data analysis method was carried out using the Wilcoxon signed-ranks test.

**Results:** The results show that there is a significant impact of the use of sticking pictures as health promotion media on elementary school fifth-graders' knowledge ( $p = 0.01$ ) and attitude ( $p = 0.01$ ) towards dengue fever prevention after they were given sticking pictures.

**Conclusion:** The use of health promotion media with sticking pictures affects elementary school fifth-graders' increasing knowledge and attitude about DHF. The implication of this finding is that educators should consider integrating sticking pictures as health promotion media into their teaching methods to enhance students' knowledge and attitude towards dengue fever prevention.

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**CONTACT**

Della Pangestu Wibowo

[dellapangestuwibowo@gmail.com](mailto:dellapangestuwibowo@gmail.com)Department of Health Promotion  
Health Polytechnic East Borneo, 64  
Kurnia Makmur Street, Samarinda,  
Indonesia.

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**INTRODUCTION**

Dengue Hemorrhagic Fever (DHF) is an epidemic-spreading acute disease condition. It is transmitted by infected mosquitoes and has become a growing public health concern globally (WHO 2022). Indonesia ranked fourth in 2022 in terms of dengue cases with 94,355 cases and second in dengue fatalities with 853 cases (ECDC

2022). The highest DHF Case Fatality Rate (CFR) was found in 5 provinces, including East Borneo, which reached 0.74 with 5096 cases and 38 deaths (Kemenkes 2022).

In Samarinda City, a total of 1,366 cases of DHF and 8 deaths were reported from DHF in the same year. The WHO reveals that the majority of DHF cases occur in the pediatric population under the age of 15 years. This statement is supported by data from the Samarinda City Health Office, which shows that the age group most affected by DHF is 5-14 years old. This data indicates that out of a total of 121 reported cases of DHF, 32 cases occurred in this age group, with the highest number recorded at the Temindung Public Health Center working area (DKK Samarinda 2021).

The prevalence of DHF cases is impacted by a multitude of factors, among which is the community's ignorance regarding the government-launched campaign, called "3M Plus." This ignorance particularly comes from children or students. This indicates that there is still a lack of information dissemination related to this movement, especially among children in the school-age group. In this case, they are students.

Based on the definition given by WHO (World Health Organization), children in the school-age category refer to the group of individuals aged between 7 and 15 years. However, in Indonesia, the age category of school-aged children refers to the group of individuals aged between 7 and 12 years (Rina 2023). Schools, in addition to their role as places of learning, also have the potential to be places where diseases can spread if they are not well managed. In addition, the period of going to school may be a time for children to be vulnerable to various diseases.

The implementation of health promotion in the school environment is a strategic approach as an attempt to improve public health. This comes from the idea that the health promotion approach through the school community has proven to have higher effectiveness compared to other health promotion methods, especially in shaping healthy living behavior (Nugraheni et al. 2018). By increasing health promotion efforts in the school environment, students' knowledge and attitude related to dengue fever prevention can be formed from an early age.

Health promotion media refers to any form of tool or strategy used to communicate the desired message or information by the communicator to the target. These methods include print media, electronic media such as radio, television, and computers, as well as outdoor media. The main objective of using health promotion media is for targets to increase their understanding, which, in turn, is expected to encourage positive health behavior changes (Imron 2022).

The selection of media that is not in accordance with children's interests can lead to suboptimal results. Therefore, alternatives are needed for delivering health information that is interesting and able to involve children's participation. Health promotion media for children must be well-designed to be more attractive than media that are not designed. This is because children prefer media with simple and uncomplicated forms accompanied by attractive colors and shapes (Putri et al. 2022).

One of the methods to create interesting media that can be used is through sticking pictures. Health promotion through the use of sticking pictures contains a story with the theme of maintaining dental hygiene in which children must finish the missing words by sticking pictures that match the words (Putri et al. 2021). Illustrated stories are an effective learning tool for school-aged children.

The images presented in the story aim to provide imagination or visual images to children. This is intended so that children can absorb and understand the health messages contained in the story more quickly (Tiara et al. 2019). The objective of this

research is to identify the impact of using sticking pictures as a health promotion media to prevent dengue fever on elementary school fifth-grader's knowledge and attitudes.

## MATERIALS AND METHOD

This research uses a pre-experimental type with a one-group pretest and posttest design. This research was carried out in July 2023 at one of the elementary schools in Samarinda City, where the entire fifth-grade student population participated. Calculation of sample size uses the Lemeshow formula and anticipates a drop-out of 39 students. Sampling uses a proportional stratified random sampling technique. Proportional stratified random sampling is used to determine the number of samples for each class, namely 8 and 7 students taken from each class. Below is the sample calculation:

$$n = \frac{Z_{1-\alpha/2}^2 \cdot P(1-P)N}{d^2 \cdot (N-1) + Z_{1-\alpha/2}^2 \cdot P(1-P)}$$

$$n = \frac{1,96.0,5(1-0,5)139}{0,1^2 \cdot (139-1) + 1,96.0,5(1-0,5)}$$

$$n = \frac{68,11}{1,87} = 36,42 \text{ is rounded down to 36 respondents}$$

Anticipate sample drops out of 10%

$$n' = \frac{n}{1-f} = \frac{36}{1-0,1} = 40 \text{ respondents}$$

The researchers have obtained an ethical clearance letter with the number of certificates DP.04.03/7.1/15292/2023 from the Health Research Ethics Committee of the East Kalimantan Ministry of Health Polytechnic. Ethical clearance is a written statement provided by the Health Research Ethics Commission for research involving living beings stating that the research has met ethical requirements and has been approved to be implemented. In this research, knowledge and attitude variables were measured before and after the intervention was implemented.

Measurement of these variables was carried out on the same day and only once. The measurement process was carried out using a close-ended questionnaire where the respondent could choose from a selection of pre-written answers. The questionnaire is developed from existing theories by referring to the Regulation of the Minister of Health of the Republic of Indonesia (2016) concerning "Technical Instructions for the Implementation of PSN 3M Plus with G1R1J". The researchers then identified the theory and determined the questionnaire items that were relevant to this research.

The close-ended questionnaire uses Pearson bivariate correlation analysis to test the validity with a significant r table at 5% and Cronbach's Alpha measure to test reliability. The questionnaire's validity was determined by the researchers by comparing the calculated results obtained with the values in the *r-product moment table*, which is 0.4683. The item is considered valid if r-calculated > r-table. The results of the questionnaire acquired consist of 15 items for each variable. Out of those 15 items, 3 items are invalid, so the number of valid items is 12 items for each variable.

The value of Cronbach's Alpha is 0.745 for knowledge and 0.761 for attitude, which is higher than 0.468. It can be said that the measurement of each variable from the questionnaire is very highly reliable. The obtained measurement results were analyzed using the Wilcoxon signed rank test at a 95% confidence level.

## RESULTS

### Characteristics of Respondents

**Table 1.** Distribution frequency of respondents based on age, gender, and source of information

Characteristics	Frequency (n)	Percentage (%)	Mean	Std. Deviation
<b>Age</b>				
10 years	29	74,4		
11 years	10	25,6		
<b>Total</b>	<b>39</b>	<b>100,0</b>	<b>1,26</b>	<b>0,442</b>
<b>Gender</b>				
Male	19	48,7		
Female	20	51,3		
<b>Total</b>	<b>39</b>	<b>100,0</b>	<b>1,51</b>	<b>0,506</b>
<b>Source of Information</b>				
Family	12	30,8		
Teacher	2	5,1		
Health center	3	7,7		
Social media	2	5,1		
Electronic media (Television)	4	10,3		
Never	16	41,0		
<b>Total</b>	<b>39</b>	<b>100,0</b>	<b>3,82</b>	<b>2,211</b>

The characteristics of respondents in this research are students at the age of 10 years with a percentage of 74.4%. The majority of respondents are identified as female, with a total of 20 students. Regarding the source of information, most respondents never received information about dengue fever DHF, with a percentage of 41.0%.

### Knowledge and Attitude of Respondents Before and After Intervention

**Table 2.** Distribution frequency of respondents based on knowledge

Test	Knowledge			Mean	Std. Deviation
	High	Moderate	Low		
Pre-Test	13 (33,3%)	18 (46,2%)	8 (20,5%)	2,13	0,732
Post-Test	34 (87,2%)	5 (12,8%)	0 (0%)	2,87	0,339

According to the pre-test results before the intervention, which included 39 respondents, the majority of respondents (46.2%) are in the moderate category in terms of knowledge. Following the intervention, 34 respondents (87.2%) out of the total respondents are in the high category according to the post-test results.

**Table 3.** Distribution frequency of respondents based on attitude

Test	Attitude			Mean	Std. Deviation
	High	Moderate	Low		
Pre-Test	6 (15,4%)	25 (64,1%)	8 (20,5%)	2,05	0,605
Post-Test	33 (84,6%)	6 (15,4%)	0 (0%)	2,85	0,366

According to the results of the level of attitude before the intervention, the majority of respondents, as many as 25 respondents (64.1%), are in the moderate category. Following the intervention, 33 respondents (84.6%) out of the total number of respondents have post-test results in the high category.

### Analysis of Differences in Knowledge and Attitude of Respondents Before and After Intervention

**Table 4.** Analysis of differences in respondents' knowledge before and after intervention

Test	Knowledge			p-value
	Indicator			
	High	Moderate	Low	
Pre-Test	13 (33,3%)	18 (46,2%)	8 (20,5%)	0,001
Post-Test	34 (87,2%)	5 (12,8%)	0 (0%)	

Respondents' test results were compared before and after the intervention. Almost all respondents are in a high category level of knowledge. *The Wilcoxon signed-rank test* results indicate that there is a difference in respondents' knowledge, who are fifth-graders of elementary school, before and after intervention with media-sticking pictures (*p-value* 0.01 < 0.05).

**Table 5.** Analysis of differences in respondents' attitude before and after the intervention

Test	Attitude			p-value
	Indicator			
	High	Moderate	Low	
Pre-Test	6 (15,4%)	25 (64,1%)	8 (20,5%)	0,001
Post-Test	33 (84,6%)	6 (15,4%)	0 (0%)	

Before and after the intervention, the test results of the respondents were compared. In terms of attitudes, the majority of responders are in the high category level. *The Wilcoxon signed-rank test* results indicate that there is a difference in respondents' attitudes, who are fifth-graders of elementary school, before and after intervention with media-sticking pictures (*p-value* 0.01 < 0.05).

## DISCUSSION

The use of the sticking pictures is suitable health promotion media for preventing DHF, specifically in fifth-grade students. This is proven through the research on the impact of media-sticking pictures about dengue fever (DHF) on fifth-grade students after being given health education using media-sticking pictures. It shows that there is a change in knowledge and attitude.

Similar positive impacts of health promotion through picture storybooks on elementary school students' knowledge and attitude towards PHBS are also reported. In addition to enhancing students' understanding of PHBS, picture storybooks also help kids think more critically, improve their ability to connect words and pictures, and develop environmental awareness while adopting PHBS (Rahman et al. 2022). This situation proves that there are differences in the level of a student's knowledge and attitude before and after the intervention is retrieved using the sticking pictures media.

Before the intervention, as many as 18 children (46.2%) have a moderate category in knowledge, and as many as 25 children (64.1%) have a moderate category in attitudes. After the intervention is retrieved using sticking pictures media, almost all

respondents (87.2%) have a high category in knowledge, and most of the respondents (84.6%) are in the high category in attitude. Similar findings are reported in another research study that compares students' knowledge and attitudes before and after treatment. This shows that providing students with health education increases their knowledge and positive attitude, which in turn increases students' readiness for DHF situations (Tokan et al., 2022).

The success in preventing DHF in school children is inseparable from educational methods and the importance of the role of media because it can support the process and make it easier for students to understand learning materials. Through media, the message conveyed can be more interesting and easier to understand. During the intervention, students are interested in the activities conducted because, in addition to reading the material provided, students can practice directly. These research results are also supported by previous research that uses similar interactive methods to affect knowledge and attitude regarding DHF (Farhand et al., 2023).

The analysis of respondent characteristics based on age indicates that the mean age of the respondents is 10 years, constituting 74.4% of the total. Providing information using attractive, sticky pictures, media, and a pleasant atmosphere can make it easier for respondents to accept the information provided. This media is quite enjoyable in accordance with the cognitive development stage of school-aged children, and the majority of respondents aged 10 years are in the concrete operational stage, meaning mental activity that is focused on real or concrete events (Wardani, 2022).

The analysis of respondent characteristics based on gender indicates that most of the respondents are women, with 20 out of 39 total respondents. Generally, males have knowledge and attitudes that tend to be more negative in terms of health. In contrast, females show a stronger tendency to seek and receive health-related information because they have higher motivation (Chifdillah and Hazanah 2021). The results of the analysis of attributes of participants derived from information sources show that most respondents never received information about DHF, namely 41.0%. The results of this research are in accordance with Muniroh (2019), who discovered that a significant portion of the students never received information on certain topics, either through sources such as schools, the internet, written publications, or mass media.

A statistically significant difference in the knowledge of respondents regarding dengue prevention through the use of sticking pictures was observed between before and after the intervention. This is indicated by a p-value of  $0.00 < 0.05$  obtained from *the Wilcoxon signed rank test* analysis of differences in knowledge. These outcomes align with the findings of previous research conducted by Putri et al., (2022) which state that the provision of fairy tale book interventions can increase knowledge about oral hygiene. This is due to the use of visual media in this illustrated fairy tale book, which is very easy to understand because there are two aspects, which are the narrative text and illustrations.

The findings of this research are corroborated by research by Putri et al., (2021) which shows that the use of sticking picture media has a positive impact on children's cognitive development. This aspect of development is related to children's ability to think and their capacity to respond to stimuli given to them. The outcomes of this research also align with research conducted by Saleh et al., (2021) indicating that students' understanding increases due to the stimulus received by students about preventing COVID-19 through picture storybooks that are designed to be easier to understand and interesting, making it easier for them to remember the information.

According to the researchers' assumption, when students are involved in the sticking pictures activity, they have the opportunity to describe the steps to prevent Dengue Fever through the use of the media. Through participation in the sticking pictures activity, students' enthusiasm for learning increased significantly, and the knowledge conveyed in this activity could be indirectly conveyed through the stories that they make. This phenomenon is reflected in the improvement of students knowledge of the material.

Attitude differences prior to and subsequent to the media-sticking pictures intervention were analyzed using the Wilcoxon signed rank test. The obtained p-value of  $0.00 < 0.05$  indicates that the differences are statistically significant. The findings of this research are compatible with earlier research by Salis et al., (2023) that the utilization of picture stories in school-age children's education has a significant positive effect. This effectiveness is related to the fact that picture stories package stories with everyday situations that are easily recognized by children, so children tend to imitate and apply the information conveyed through the picture story.

The findings presented here are consistent with prior research according to Walgito in Farhand et al., (2023) which has established that knowledge is among the various components that influence an individual's demeanor. An individual's attitude is predicated on the extent of knowledge that he possesses. If someone has strong knowledge, then it is likely that their attitude will be positive. Conversely, if the knowledge is limited, the attitude is likely to be negative.

The results of this research are in accordance with Gasong et al., (2022) on the attitude variable, which shows a positive change between before and after the educational intervention. This factor illustrates the respondent's understanding of the material related to attitudes that need to be adopted in the context of dengue prevention. According to the researchers' assumption, students who have a positive attitude towards DHF prevention have a greater chance of adopting good behavior compared to those who have a less supportive attitude towards DHF prevention. This confirms that attitude plays an important role in influencing students' propensity to make decisions that support their health care.

There are some limitations in this research. First, this research was conducted only with fifth-grade students in elementary schools. Moreover, this research was conducted on a small sample. Due to limitations on the number of media for sticking pictures, respondents were split up into a few smaller groups based on the quantity of media that were available. Another limitation is that there is no comparison of this research with other methods because this research only uses an intervention group.

## **CONCLUSION**

Based on the research results, it is concluded that the age characteristics of the respondents are mostly 10 years old, totaling 29 respondents (74.4%). Most of the respondents are female; namely, there are 20 respondents (52.8%). Most of the respondents had never received information about DHF, totaling 16 respondents (41.0%). A p-value of 0.000 indicates that health education utilizing Post-it notes has an impact on the knowledge of respondents both prior to and subsequent to the intervention ( $p < 0.05$ ). A p-value of 0.000 indicates that health education utilizing Post-it notes has an impact on the attitude of respondents both prior to and following the intervention ( $p < 0.05$ ).

It is expected that future researchers will conduct further research on the effect of sticking picture media with different research methods, a wider sample, and the use of various and more comprehensive research instruments.

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