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THE EFFECT OF MOBILE TRIGGERING METHOD ON MOSQUITO NEST ERADICATION BEHAVIOR

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ABSTRACT

Background: *Dengue hemorrhagic fever (DHF) occurs every year and takes its toll. People are not motivated and have not made PSN a culture. The problems encountered are how the process of developing, the feasibility, the stages, and the impact of the mosquito nest eradication educational model have on the knowledge, attitudes, and behaviors of the community. The purpose of this development is to produce an educational model "Triggering PSN Mobile," while the specific objectives are to describe the development process, determine feasibility, describe the stages, and find out the effect of the educational model for eradicating mosquito nests on the knowledge, attitudes, and behavior of the community.*
Method: *This research method is quantitative research with a research and development (R&D) design. This research uses a one-group pretest and posttest design. The focus of this study is to test the effectiveness of the educational model with the PSN reminder application in increasing the culture of eradicating mosquito nests in the city of Jambi. The variables studied include knowledge, attitudes, and behavior*
Result: *The results of this study resulted in the PSN Mobile Triggering educational model, which is a field triggering model followed by Android-based triggering, which has been declared feasible after going through the validation stages of 100% health promotion experts, 94.55% IT experts, 92% educational technology experts, and 80 practitioners. % and 93.85% one-on-one trials, 95% small group trials, and 96% large group trials. The PSN Mobile Triggering Product is effective in increasing the knowledge, attitude, and behavior of the jumantik rumah to 100% in the implementation of mosquito nest eradication*
Conclusion: *The conclusion obtained is that the educational model is feasible and effective to use to increase the knowledge, attitude, and behavior of Jumantik Rumah in carrying out the eradication of mosquito nests.*

Keywords: *Eradication of mosquito breeding grounds, triggering education, Android- based application, Dengue Hemorrhagic Fever (DHF)*

INTRODUCTION

Cases of dengue fever (DBD) in Jambi City are still high, where in 2024, Jambi City experienced a significant spike in the number of cases of Dengue Fever (DBD). The Jambi City Health Office recorded more than 600 cases of DBD until the end of December 2024, with one death.

The increase in the number of cases is compared to 2023, which recorded 312 cases with seven deaths. The spike in dengue cases in 2024 was mainly influenced by the rainy season which increased the population of Aedes aegypti mosquitoes, as well as low public awareness in carrying out Mosquito Nest Eradication (PSN)

Alam Barajo District in Jambi City experienced the highest number of Dengue Hemorrhagic Fever (DHF) cases. Data from the Rawasari Health Center and Kenali Besar Health Center showed that in 2023, Rawasari Health Center recorded 28 DHF cases, while Kenali Besar Health Center recorded 40 cases. The total number of DHF cases in Alam Barajo reached 68, with two of them resulting in death. In addition, in January 2024, the Jambi City Health Office reported 56 DHF cases (News, 2025).

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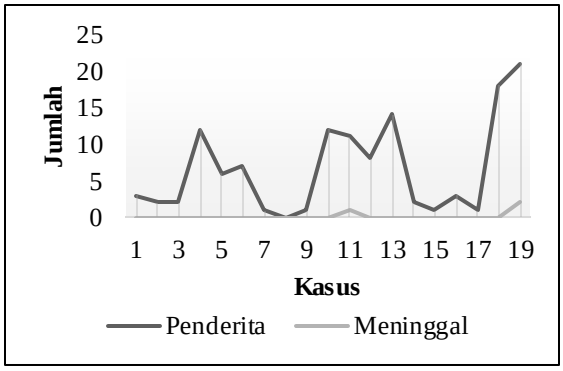

Figure 1. Dengue Haemorraghic Fever (DHF) Cases

The highest number of DHF cases can be seen in graph 1.1 in the Rawasari Health Center Work Area with a total of 21 cases, 2 of which died, while graph 1.2 shows that the highest number of cases is in Mayang Mangurai sub-district with a total of 17 cases and 1 of which died. The highest number of DHF cases in Mayang Mangurai sub-district is in RT 40 with 3 DHF cases.

Efforts to reduce DHF are not carried out in full PSN activities, PSN is not carried out allegedly because the community is not motivated to carry out PSN (Anandika, 2020), therefore in this study the researcher used a triggering method which was combined with mobile devices to arouse community behavior in carrying out PSN. PSN (Chandra, 2023).

METHODS

The statistical test in this study is the McNemar hypothesis test used to test the research hypothesis with a one group pretest-posttest design with the measurement scale of both variables being categorical.

Data were analyzed using univariate and bivariate methods. Univariate data analysis was conducted to determine the PSN culture in house mosquito larvae control. Bivariate analysis was conducted to determine the differences between before and after PSN triggering education was given.

The N-Gain Score test is carried out by calculating the difference between the pretest and posttest values or the gain score, based on these results, the effectiveness of implementing a particular method can be known. N-Gain is the last stage to determine the effectiveness of using Educational Products in improving the behavior of Jumantik Rumah N-Gain Results of respondents.

RESULTS AND DISCUSSION

RESULTS

Table 1. Respondent Behavior Results

	Number of Respondents answered correctly		
	≤ 10	11 - 20	≥ 21
Drain the water reservoir at least once a week	√	-	-
Closing the water tank	√	-	-
Folding used items such as used buckets and used cans	√	-	-
Add abate powder to the water tank that cannot be brushed properly once every two months.	√	-	-
Monitor all water containers or those that can hold water once a week	√	-	-
Installing wire mesh on air vents	√	-	-
Don't leave dirty clothes hanging behind the door	√	-	-
Keeping larva-eating fish	√	-	-
Spraying insecticide or using mosquito coils or using mosquito nets when sleeping or using long-sleeved clothes or mosquito repellent lotion regularly	√	-	-
Do not litter/recycle plastic, ceramics, cans etc. which have the potential to contain used water carelessly.	√	-	-

From the results of the questionnaire with a rating scale of 0 to 10, it is known that before the intervention, the jumantik had an average

attitude score of 1.57 with the lowest score of 0 and the highest score of 6. After the intervention, the average jumantik behavior score was 10, where all had the highest score, namely 10.

From the results of the Wilcoxon statistical test, a Probability value (P-Value) of 0.00 was obtained, which means that at 5% alpha there was a difference in the average behavioral scores of mosquito larvae before and after the intervention.

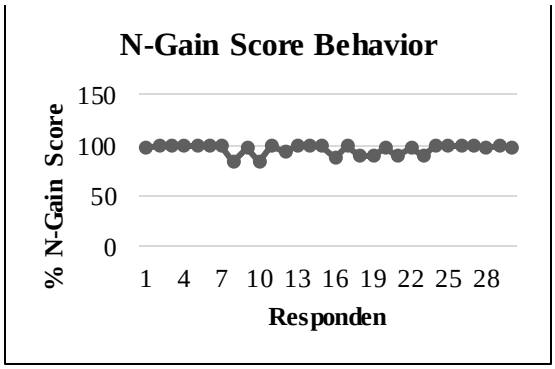

Figure 2. N-Gain Score Behavior

Based on the results of the N-Gain score test calculation, it shows that the average value of the N-Gain score on house mosquito larvae that were given health education using the PSN education model was 96.22 or 96.22%, this value is included in the effective category. With a minimum N-Gain score of 83.33% and a maximum of 100%. Based on the average N-Gain percentage results, it can be concluded that the PSN education model product is effective in improving the Behavior of House Mosquitoes

Based on the pre-test results, less than 10 respondents answered 10 questions correctly, the rest answered incorrectly.

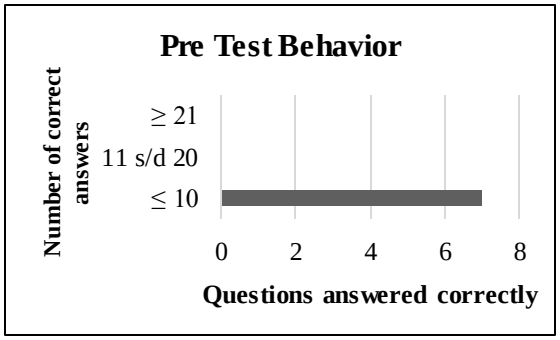

Figure 2. Pre Test Behavior

From the graph image 4.25, the Behavioral Results data obtained from all the respondents' correct answers during the pre-test were below 10 points, whereas after the post-test, all the answers were answered correctly by the respondents as can be seen from the graph image 4.26 below:

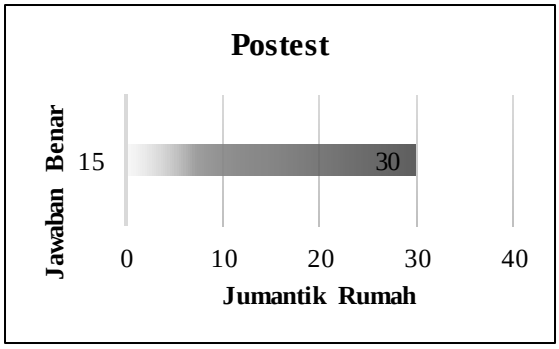

Figure 4. Pre Test Behavior

Based on the table above, it is known that the behavioral components of home Jumantik before and after the intervention experienced an increase, which can be seen in Graph 4.27.

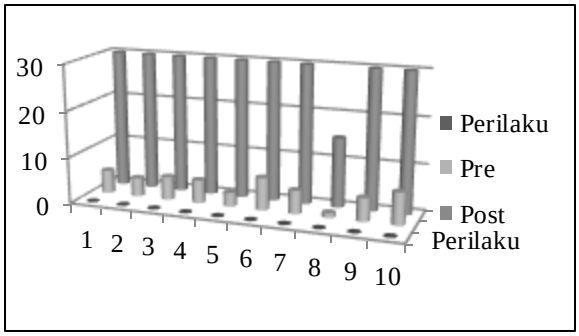

Figure 5. Respondents Behavior

The graph shows an increase in behavior before and after the intervention using the Mosquito Nest Eradication (PSN) education model. The worst behavior before the intervention was not keeping fish that eat larvae, which was 3.33% and the highest was installing wire mesh on air vents (23.33%), after the intervention all behaviors increased by 100% except keeping fish that eat larvae (50%).

Based on the results of the N-Gain score test calculation, it shows that the average value of the N-Gain score on house mosquito larvae that were given health education using the PSN education model was 96.22 or 96.22%, this value is included in the effective category. With

a minimum N-Gain score of 83.33% and a maximum of 100%. Based on the average N-Gain percentage results, it can be concluded that the PSN education model product is effective in improving the Behavior of House Mosquitoes

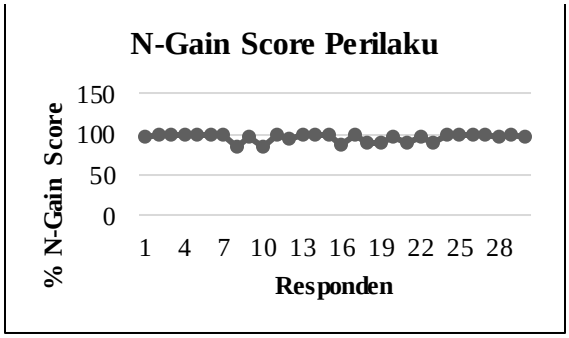

Figure 5. N-Gain Behavior Score

DISCUSSION

1. Perceived behavioral strategies of PSN behavior

After the intervention using the Dengue Fever (DBD) Prevention Education Model based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior, the strategy for obtaining behavioral changes was felt to be grouped into 3 groups. (Indriyani et al., 2016) yaitu:

a. Giving strength/power or encouragement

In this case, behavioral changes are forced on the target or community so that they are willing to do (behave) as expected. This method can be taken by including regulations or laws regarding PSN that must be obeyed by house mosquitoes. By becoming one of the efforts to produce fast behavior, however, this change will not necessarily last long because the behavioral changes that occur are not or have not been based on self-awareness so that they are accompanied by triggers so that they are more effective for house mosquitoes. This is in accordance with research (Taniansyah et al., 2020) which in their research proved that policies/regulations are not factors that can change PSN behavior in the community. For the effectiveness of these encouragements and policies, house mosquitoes are also given encouragement from within themselves influenced by the elements of feeling that are created during the triggering process.

b. Providing information

By providing information about PSN and will increase public knowledge about Mosquito Nest Eradication Efforts in their respective home environments. With the knowledge embedded in the Dengue Fever (DBD) Prevention Education Model based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior, it raises their awareness, and makes house mosquito larvae behave according to the knowledge they have, this is also proven by (Listyorini, 2016) that the higher the availability of information provided, the better the community's behavior will be.

c. Discussion and Participation

Perceived behavioral strategies and PSN behaviors are obtained from interventions at the stages of thinking about and trying new behaviors and continuing to carry out behaviors obtained from the content of Alarms, Checklists, Understanding DHF, How DHF is Transmitted, DHF Symptoms, Assistance for Sufferers, Life Cycle of DHF Transmitting Mosquitoes, Characteristics of Ae Aegypti Mosquitoes, Breeding Places and Prevention of DHF in the PSN Mobile Education Product.

d. Active towards PSN behavior

Jumantik Rumah after implementing the intervention of using the Dengue Fever (DBD) Prevention Education Model based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior was triggered to carry out 3M Plus activities consisting of:

1) Draining/cleaning places that are often used as water reservoirs such as bathtubs, water buckets, drinking water reservoirs,

refrigerator water reservoirs and others.
2) Tightly closing water reservoirs such as drums, jugs, and so on.
3) Reusing or recycling used goods that have the potential to become breeding grounds for mosquitoes that transmit dengue fever.

The plus is other DHF prevention activities, such as:

a) Sprinkle abate powder on water reservoirs that are difficult to clean
b) Use mosquito repellent or mosquito repellent
c) Use mosquito nets when sleeping
d) Keep fish that eat mosquito larvae
e) Plant mosquito repellent plants
f) Adjust the light and ventilation in the house
g) Avoid the habit of hanging clothes in the house which can be a resting place for mosquitoes, etc.

This is in line with research (Budiman, 2016) in his research, community activities in PSN activities such as cleaning used buckets and cans will result in a high mosquito larvae free rate.

There is an impact on increasing knowledge, attitudes and behavior of the community after being given an education model for preventing Dengue Hemorrhagic Fever (DHF) based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior, the community has better knowledge, attitudes and behavior, triggering is a method that has been proven successful in changing community behavior such as in the stunting prevention program (Directorate of Environmental Health, Ministry of Health and Millennium Challenge Account Indonesia, 2016; Ministry of Health, 2018) the stop defecating in the open program (Indriyani et al., 2016) and the Mosquito Nest Eradication program in preventing Dengue Hemorrhagic Fever. (Anandika, 2020; Chandra et al., 2022; Dikha Pistiyati Ramdani, 2016; Lacruz, 2014; Mangidi et al., 2019)

However, in its sustainability, it turned out that it was still not optimal, the community returned to behaving poorly because proper monitoring and monitoring were not carried out (Chandra et al., 2021), in this study, monitoring and monitoring were carried out in the form of direct private assistance to house jumantik through the PSN application alarm which reminds house jumantik every Sunday morning at 8 am, during the monitoring period by researchers assisted by health center cadres, it was proven that house jumantik consistently carried out PSN once a week.

The active indicator of behavior is obtained from the intervention at the stage of continuing to do behavior and celebrating success obtained from the content of Alarm, Checklist, Understanding DHF, How DHF is Transmitted, Symptoms of DHF, Assistance for Sufferers, Life Cycle of DHF Transmitting Mosquitoes, Characteristics of Ae Aegypti Mosquitoes, Breeding Places and Prevention of DHF in the PSN Mobile Education Product so as to increase knowledge, attitudes and behavior of PSN in home mosquito larvae.

CONCLUSION

1. There is an increase in behavior before and after the implementation of the Dengue Fever (DBD) Prevention Education Model based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior
2. The PSN mobile Triggering Model is effective in improving the behavior of house jumantik
3. The results of this study are important to increase the motivation of house jumantik to implement PSN in their respective home environments, assisting the activities of Jumantik cadres at the Health Center so that the home environment is free from Mosquito Nests

4. Suggestions for Product Utilization
   The Dengue Fever (DBD) Prevention Education Model based on Triggering with Interactive Multimedia Mobile Learning on Mosquito Nest Eradication (PSN) behavior can be used by practitioners in the fields of Health Promotion and Environmental Health in an effort to improve PSN behavior in House Jumantik.

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CONFLICT OF INTEREST

In implementing this research, the obstacles found were the lack of enthusiasm of the community and their lack of motivation to gather when socialization and field triggering were carried out.

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