

Analysis of the Relationship between the Eradication of Mosquito Nests and the Implementation of 3M Plus with the incidence of dengue fever in the working area of the Beringin Raya Public Health Center, Bengkulu City

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ABSTRACT. Dengue Hemorrhagic Fever (DHF) is a disease caused by the bite of the *Aedes aegypti* mosquito which is infected with a dengue virus. In 2019 there were 30 cases of dengue hemorrhagic fever in the work area of the Beringin Raya Public Health Center, Bengkulu City, consisting of 17 male cases and 13 female cases and there were no cases of death due to dengue hemorrhagic fever. The purpose of the study was to determine the relationship between the eradication of mosquito nests and the implementation of 3m Plus with the incidence of dengue fever in the working area of the Beringin Raya Public Health Center, Bengkulu City. This study uses a survey method with a case control design. The research sample was 36 cases and 36 controls. The analysis was carried out using the Chi-Square test. The results of univariate analysis showed that respondents who did PSN 3M Plus were 31 people (43.1%) less and 41 people (56.9%). Meanwhile, the results of the bivariate analysis showed that there was a significant relationship between PSN 3M Plus and the incidence of DHF ($p < 0.05$). It is hoped that the puskesmas will be able to provide health education about the importance of carrying out PSN 3M Plus to reduce the incidence of DHF.

Keywords: PSN 3M Plus, Dengue Hemorrhagic Fever

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a disease caused by the bite of the *Aedes aegypti* mosquito which is infected with a dengue virus. This virus can attack infants, children and adults. Dengue fever can appear throughout the year and can attack all age groups. This disease is related to environmental conditions and people's behavior. WHO estimates that there are 2.5 billion or 40% of the world's population at risk of dengue disease, especially those living in urban areas in tropical and sub-tropical countries, currently it is also estimated that there are 390 million dengue infections that occur worldwide each year (WHO, 2015).

In 2019, there were 138,127 cases of dengue fever. The number increased when compared to 2018 of 65,602 cases. Deaths due to DHF in 2019 also increased compared to 2018 which was 467 to 919 deaths. The incidence rate of dengue fever in 2019 was 51.48 per population. This figure shows an increase compared to the previous two years, namely 2016 and 2017 when the incidence rate of DHF was 26.1 and 24.75 per 100,000 population, respectively. The provinces of North Kalimantan, East Kalimantan and Bali have the highest Incidence Rates among 34 other provinces, namely 239, 180.66, and 114.8 per 100,000 population, while Bengkulu Province is right

below East Nusa Tenggara with an Incidence Rate of 74.25 per 100,000 population (Indonesian Ministry of Health, 2019).

Data from the Bengkulu Provincial Health Office in 2019 showed that there were 1,479 cases of dengue fever, consisting of 802 men and 677 women. Meanwhile, 13 people died from 7 men and 6 women. The DHF Case Fatality Rate (CFR) in Bengkulu Province in 2019 was 1%. The most cases occurred in Kepahiang district, which was 358 cases, thus the incidence rate of morbidity was 73.7 per 100,000 population (Bengkulu Provincial Health Office, 2019).

Data from the Bengkulu City Health Office shows that in 2019 there were 301 cases of dengue fever in the Bengkulu city area, consisting of 158 male cases and 143 female cases with an Incidence Rate of 78.2 per 100,000 population. There were 3 cases of death consisting of 2 male cases and 1 female case with a CFR of 1.0% (Bengkulu City Health Office, 2019). In 2019 there were 30 cases of dengue hemorrhagic fever in the work area of the Beringin Raya Public Health Center, Bengkulu City, consisting of 17 male cases and 13 female cases and there were no cases of death due to dengue hemorrhagic fever (Beringin Raya Health Center, 2019). In 2020 there were 6 cases of dengue hemorrhagic fever in the work area of the Beringin Raya Public Health Center, Bengkulu city consisting of 2 men and 2 women and there were no cases of death due to dengue hemorrhagic fever. people are afraid to check with Puskesmas services because of the COVID-19 pandemic situation (Beringin Raya Health Center, 2020).

Environmental-based disease is a disease phenomenon that occurs in a community group, which is related, rooted in, or has a close relationship with one or more environmental components in a space where the community lives or has activities for a certain period of time (Ariani, 2016). The disease can be prevented or controlled, if the environmental conditions associated with the disease are eliminated. According to WHO, dengue is still a major health problem in all tropical and sub-tropical regions of the world. In recent years there has been an increase in the spread of dengue cases in urban and semi-urban areas, so this has become a major concern for international public health. A state of complete health, physically, mentally and socially, not only free from disease. Maintaining health is very important so that humans can survive and carry out activities actively and productively by making efforts to avoid disease.

The risk factors that cause DHF include the knowledge and attitudes of the community about DHF and environmental factors such as the behavior of implementing the mosquito nest eradication program. Prevention of DHF can be done by changing people's behavior to prioritize a clean lifestyle to avoid various kinds of diseases.

Eradication of mosquito nests and 3M Plus itself is a program that contains activities to drain water reservoirs, close water reservoirs tightly, bury and

getting rid of used goods, monitoring the presence of larvae and continuing environmental management such as increasing awareness of environmental hygiene and so on. The higher the public awareness to carry out the 3M plus movement and the awareness to manage the environment, the dengue cases will decrease automatically. Community behavior such as the habit of collecting water for daily needs such as collecting rainwater, well water, making bathtubs or drums as breeding grounds for mosquitoes, the habit of storing goods

- used goods or not checking the environment for the presence of water stored in containers (Respati, 2016).

The results of previous research conducted by Priesley, Reza and Rusdji (2018) showed that there was a relationship between PSN 3M Plus behavior and the incidence of DHF in Andalas Village with a p-value of 0.001 and an OR value of 5.842. This means that if the behavior

of PSN 3M Plus is done badly, the chance of getting DHF is 5.842 times compared to those who have good PSN 3M Plus behavior.

Based on the background of the problems described above, the researchers are interested in researching "Analysis of the Relationship of Mosquito Nest Eradication and Implementation of 3m Plus with DHF Incidence in the Work Area of the Beringin Raya Public Health Center, Bengkulu City"

METHODS

This study uses a survey method with a case control design. Sampling used a total sampling technique of 36 cases and 36 controls. Data was collected using a questionnaire to the respondents. Data analysis was carried out by univariate analysis and bivariate analysis using the Chi-Square Test.

FINDINGS AND DISCUSSION

Finding

Analisis Univariat.

Table 1. Overview of the 3M Plus PSN Frequency Distribution in the Work Area of the Beringin Raya Public Health Center, Bengkulu City

No	PSN 3M Plus	frequency	Percentage (%)
1	Less	31	43,1
2	Good	41	56,9
	Sum	72	100

Table 1. shows that of the 72 respondents in the Work Area of the Beringin Raya Public Health Center, Bengkulu City, there are 31 people (43.1%) with less PSN 3M Plus and 41 people (56.9%) with 3M Plus Good PSN.

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Table 2. The Relationship between PSN and the Implementation of 3M Plus with DHF Incidence in the Work Area of the Beringin Raya Public Health Center, Bengkulu City

PSN 3M Plus	Incidence Of Dengue Hemorrhagic Fever						OR (95% CI)	
	Case		Control		Total		χ^2	p
	f	%	f	%	f	%		
Less	21	58,3	10	43,1	31	43,1	6,977	0,017
Good	15	41,7	26	56,9	41	56,9		
Total	36	100	36	100	72	100		

Table 2. shows that of the 36 respondents with DHF (cases) there are 21 people with less PSN 3M Plus and 15 people with good PSN 3M Plus. Meanwhile, from 36 respondents who were not patients with DHF (controls), there were 10 people with less PSN 3M Plus and 26 people with PSN 3M Plus both at the Beringin Raya Public Health Center, Bengkulu City. The

results of the Chi-Square test are known to be 6.977 with a p-value of 0.017. Because the p value <0.05 , there is a significant relationship between PSN 3M Plus and the incidence of DHF at the Beringin Raya Public Health Center, Bengkulu City. This result is reinforced by the OR value of 3.640, which means that respondents with PSN 3M Plus are less at risk of experiencing DHF incidence by 3.640 times compared to respondents with good PSN 3M Plus.

Discussion

The results of the univariate analysis showed that of the 72 respondents in the Work Area of the Beringin Raya Puskesmas, Bengkulu City, there were 31 people (43.1%) with less PSN 3M Plus. This can be seen from the results of interviews conducted with respondents who said that in the implementation of eradicating mosquito nests and 3M plus had a habit of rarely draining the bath, rarely closing water reservoirs, not burying used cans or throwing away items that could stagnate water so that the occurrence of mosquito larvae. Meanwhile, 41 people (56.9%) with good PSN 3M Plus can be seen from the responses of respondents who said that in the implementation of eradicating mosquito nests and 3M plus routinely draining, either bathing, always closing water reservoirs, burying used goods that can be flooded, sprinkle abate powder into the bath and sleep using a mosquito net or mosquito repellent.

Mosquito Nest Eradication (PSN) is an activity carried out to eradicate the eggs, larvae and cocoons of the *Aedes aegypti* mosquito. The PSN DHF activity is carried out to control the *Aedes aegypti* mosquito population, so as to reduce the transmission of dengue disease. Mosquito nest eradication activities are carried out in all places, both at home and in public places. PSN activities at home are carried out by all family members, while in public places are carried out by appointed officers or managers of public places. The Eradication of Mosquito Nests (PSN) is a planned and continuous movement (Kemenkes RI, 2015).

The results of this study are in line with research conducted by Priesley, Reza and Rusdji (2018) which showed that there were 7 3M Plus PSN behavior points which were only well applied to $<50\%$ of case group respondents while in the control group there were 5 3M PSN behavior points. Plus the work done by $<50\%$ of respondents. in the case group there were 52.5% who behaved badly while in the control group 47.5% who behaved badly, it can be concluded that the behavior of PSN 3M Plus in the control group was better than the case group.

The results of the bivariate analysis showed that of the 36 respondents with dengue fever (cases) there were 15 people with good PSN 3M Plus. This is because the respondents have not been maximal in carrying out 3M activities such as not burying used items that can be flooded so as to allow mosquito larvae to occur, even though draining and closing is good. And it does not balance PSN's actions with knowledge factors, such as respondents not finding out what the characteristics of the *Aedes aegypti* mosquito are in order to increase awareness of mosquito species, not finding out where the mosquitoes prefer. Meanwhile, of the 36 respondents who were not patients with DHF (controls) there were 10 people (43.1%) with less PSN 3M Plus. This is because respondents are looking for ways to prevent and transmit dengue disease, find out about the characteristics of the *Aedes aegypti* mosquito so that they can be alert, find out where the mosquitoes prefer.

The results of the Chi-Square test are known to be 6.977 with a p-value of 0.017. Because the p value <0.05 , there is a significant relationship between PSN 3M Plus and the incidence of DHF at the Beringin Raya Public Health Center, Bengkulu City. This result is strengthened by the OR value of 3.640, which means that respondents with PSN 3M Plus are less at risk of experiencing DHF incidence by 3.640 times compared to respondents with good PSN 3M Plus.

The mosquito nest eradication factor and 3m plus regarding Dengue Hemorrhagic Fever is the definition of Mosquito Nest Eradication (PSN) which is an activity carried out to eradicate the eggs, larvae and cocoons of the *Aedes aegypti* mosquito. The PSN DHF activity is carried out to control the *Aedes aegypti* mosquito population, so that it can reduce the transmission of dengue disease.

The results of this study are in line with research conducted by Priesley, Reza and Rusdji (2018) which said that there was a relationship between PSN 3M Plus behavior and the incidence of DHF in Andalas Village. If the PSN 3M Plus behavior is done badly, the chance of getting DHF is 5,842 times compared to those who have good PSN 3M Plus behavior. The results of this study are also in line with Sari and Putri (2019) showing that from the results of research on the relationship of PSN 3M Plus with the incidence of dengue in the work area of the Payung Sekaki Health Center Pekanbaru City, it can be concluded that the practice of draining the TPA, the presence of mosquito netting in house ventilation, The habit of hanging clothes, and the habit of using mosquito repellent are related and are risk factors for the incidence of DHF in the work area of the Payung Sekaki Health Center, Pekanbaru City. The habit of using insect repellent is a variable that is the strongest risk factor for the incidence of DHF.

KESIMPULAN

Of the 72 respondents in the Work Area of the Beringin Raya Public Health Center, Bengkulu City, there were 31 people (43.1%) with less PSN 3M Plus and 41 people (56.9%) with PSN 3M Plus Good. There is a significant relationship between PSN 3M Plus and the incidence of DHF at the Berwan Raya Public Health Center, Bengkulu City and respondents with PSN 3M Plus are less at risk of experiencing DHF incidence by 3,640 times compared to respondents with good PSN 3M Plus..

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