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The Implementation Eradication of Mosquito Nest 3M Plus Program in Jember Region

Nurul Mawaddah[1]*, Siti Rachmah[1], Mohammad Septyan Army June[1]

1 STIKES Majapahit, Mojokerto, Indonesia

ABSTRACT

Dengue Hemorrhagic Fever (DHF) is a viral infectious disease transmitted by mosquitoes and a public health problem worldwide. The implementation of the vector control program as an effort to prevent dengue through the Eradication of Mosquito Nest (PSN) 3M plus program in the community is still not optimal, due to a lack of community participation. The purpose of this study was to determine the effectiveness of the implementation of the PSN 3M Plus program in the Jember area. The research design used a pre-experimental design with one group pre-test and post-test design. The research sample was the people in the area who had been infected with DHF in the last 1 year at a distance of 100 meters from the sufferer, namely 50 families. The data collection technique used a community behavior questionnaire in implementing the 3M plus PSN program. Data analysis techniques were carried out using univariate and bivariate methods. The results of this study show that 40% of respondents experienced an increase in PSN behavior scores after implementing PSN 3M Plus, 44% experienced a decrease and 16% had a fixed score. Program implementation carried out through socialization efforts, the Movement 1 House 1 Jumantik (G1R1J) monitoring movement by jumantik cadres in less than 2 months was able to change the positive behavior of the community by 40%. It is hoped that the PSN 3M plus program will continue to be socialized and its implementation monitored so that the program's objectives are achieved as an effort to prevent DHF.

Keywords: behavior, dengue, eradication of mosquito nests, jumantik

Correspondence
Nurul Mawaddah,
Department of Community Nursing, STIKES Majapahit Mojokerto, Indonesia
Jln. Raya Gayaman KM.02, Mojoanyar, Mojokerto, Jawa Timur, Indonesia
email: mawaddah.ners@gmail.com

1. BACKGROUND

Dengue Hemorrhagic Fever (DHF) is an acute disease often found in tropical areas and transmitted by mosquitoes carrying the dengue virus (Kardiyudiani et al., 2019). This disease is endemic in many countries, one of which is in Southeast Asia. Prevention of DHF at this time still relies on vector control which requires active community involvement. Various

national movements have been carried out such as fogging, lavarside, PSN (pemberantasan sarang nyamuk or eradication of mosquito nests), 3M (Menutup, Menguras, dan Mendaur ulang barang bekas), juru pemantau jentik (jumantik) up to Movement 1 House 1 Jumantik (G1R1J). However, the incidence of DHF in Indonesia continues to increase with an increasing impact from time to time (Harapan et al., 2019). The expansion of areas infected with DHF is partly due to the implementation of programs in the community that are still not optimal. DHF control has been regulated in Permenkes number 50 of 2017 concerning environmental health quality and health requirements for vectors and disease-carrying animals and control. (Fahri, 2022), as well as East Java Governor Regulation No. 20 of 2011 concerning control of dengue fever in East Java province, that DHF prevention can be carried out through health promotion efforts, PSN 3 M Plus, PJB and surveillance (Gubernur Jawa Timur, 2011). Given the importance of this problem, it is necessary to intervene so that an outbreak of DHF/KLB (kejadian luar biasa or extraordinary events) does not occur, resulting in an increase in the number of sufferers and deaths.

World Health Organization (WHO) estimates that the world's population at risk of dengue reaches 2.5 billion, especially those living in cities in tropical and subtropical countries. In 2019, to be precise, from October to December, two European Union countries reported DHF cases, namely 2 cases in Spain and 9 cases in France, while a tenfold increase in 2019, namely Brazil with 71% of 247,393 cases in 2018 to 2,201,000 cases in 2019 (Fahri, 2022). While in Indonesia there were reported 87,501 cases of DHF in January 2022 (Kemenkes, 2022). In East Java, there were 977 cases of DHF in January 2022, which increased in 2021, namely 668 cases (Dinkes Jatim, 2022). Meanwhile, in Jember Regency there were 512 cases of DHF in October 2022 (K Radio Jember, 2022). In addition to Basic Health Research (Riskesdas, 2018) shows that nationally the number of households conducting PSN is 31.2% and varies at the provincial level in the range of 16.2% to 43.6%. The percentage of households implementing PSN was only 29.4% in rural areas and 32.7% in urban areas. This figure shows that PSN activities in both villages and cities are still not optimally carried out.

Factors that can influence the occurrence of dengue fever include: the home environment (distance from the house, layout of the house, type of

container, altitude and climate), and community behavior also has a big influence because community behavior can provide the carrying capacity of the environment for the development of mosquitoes. The social environment will directly affect health such as community habits that are detrimental to health such as poor PHBS (clean and healthy suction behavior), namely not routinely cleaning water reservoirs, not caring about cleaning the yard and low community participation in PSN (Fahri, 2022).

Efforts to prevent DHF transmission are carried out by breaking the chain of DHF transmission by preventing aegypti mosquito bites. Activities that can be carried out optimally by the community independently are the PSN 3M Plus program, namely PSN 3M added with additional forms of prevention efforts such as repairing channels and drains that are not smooth, raising mosquito larvae-eating fish, installing wire netting on candelas and ventilation, working together to clean the environment, checking water reservoirs, placing used clothing in closed containers, cleaning lavarsides in hard-to-drain water reservoirs, planting mosquito-repellent plants, and using mosquito repellents (Indonesian ministry of health, 2019).

One of the efforts made in controlling infection by mosquito bites through the prevention of bites and the participation of the community's role in empowerment through the PSN movement, community participation is needed in this PSN movement because human habitation is inseparable from the presence of water and water is a medium for vectors to live, optimal movement by carrying out PSN (Fahri, 2022), as well as transforming and educating the importance of being active in PSN 3M PLUS to jumantik cadres in the surrounding environment at least once a week. The purpose of this study is to determine the effectiveness of implementing the 3M PLUS PSN program on the PSN behavior of the people in the Jember Regency area.

2. METHODS

This study uses a Pre-Experimental design with a One Group Pre Test-Post Test Design approach. The population determined in this study was based on the characteristics determined in the study (Sugiyono, 2019), namely areas that have been infected with DHF. The research sample was a community in one of the Jember Regency areas that had been infected with DHF in the last 1 year at a distance of 100 meters from the sufferer, using a simple random sampling technique, a number of 50 families were obtained. The pre-test and post-test data collection

techniques used community behavior questionnaires in implementing the 3M plus PSN program (Wahyu, 2017), as well as providing interventions in the form of program implementation which was carried out in February - March 2023. Data analysis techniques were carried out univariately and bivariate using the Wilcoxon Signed Ranks Test because the data distribution was not normal. The dependent variable in this study is the implementation of the 3M Plus PSN program, namely the implementation of the government's national program intervention which is carried out by: 1) making efforts to socialize the 3M Plus PSN program through lectures and discussion methods; 2) carry out socialization and implementation of G1R1J independently at home for 2 weeks through the PSN 3M plus activity checklist sheet; and 3) monitoring with jumantik cadres through visits to the respondent's house. While the independent variable in this study is PSN 3M Plus behavior which includes knowledge, attitudes and community actions in efforts to prevent DHF through the PSN 3M Plus program.

This research was conducted an ethical review and was declared to have passed the ethical test on February 10, 2023. The research ethical test was carried out by the Majapahit STIKES health research ethics committee, and has obtained an ethical approval certificate with number 020/KEPK-SM/2023. All research respondents have also been given information on research objectives conducted by researchers and have given written consent. The researcher also asked the respondents to provide real answers and implement the 3M Plus PSN properly and in accordance with the SOP made by the researcher.

3. RESULTS

This study was conducted in one of the villages in the Jember Regency which experienced an increase in dengue cases in the last 1 year, due to the geographical location of most of the agriculture which is one of the causes of the emergence of mosquito nests due to the large number of agricultural irrigation that are not smooth and the behavior of the people who are lacking in preventing dengue. The results of this study are displayed in the form of univariate analysis which is used to analyze the existing variables descriptively by using categorical data. In addition, the form of bivariate analysis is also displayed which is used to determine the effectiveness of the implementation of PSN 3M Plus on community PSN behavior in preventing DHF.

Table 1. Respondents Characteristic

Respondents Characteristic	Total (n)	Percentage (%)
Age		
17-25 (late teens)	9	18.0
26-35 (early adult)	12	24.0
36-45 (late adult)	12	24.0
46-55 (early elderly)	6	12.0
56-65 (late elderly)	5	10.0
≥ 66 (seniors)	6	12.0
Gender		
Man	7	14.0
Woman	43	86.0
Education level		
Elementary school	29	58.0
Junior high school	8	16.0
Senior High School	12	24.0
College	1	2.0
Ethnicity		
Java	31	14.0
Madura	19	86.0
Previous information		
Once	11	22.0
Never	39	78.0

Based on table 1 of the characteristics of the respondents above, it shows that most of the respondents are adults, most are female, most are of Maduranese ethnicity, and most have never received DHF information from health workers or social media.

Bivariate analysis using numerical data groups. The statistical test was carried out by using the Wilcoxon Signed Ranks Test, because the data group has an abnormal data distribution with the results of the Shapiro Wilk test showing $p < 0.05$.

Table 2. Results of the analysis of the effectiveness of the Implementation Eradication of Mosquito Nest 3M Plus Program on community behavior

Variable	N	Median (minimum-maximum)	Mean ± SD	P
PSN behavior				
Pre	50	26.5 (8.0 – 30.0)	25.9 ± 4.3	0,985
Post	50	27.0 (7.0 – 30.0)	25.7 ± 4.9	

Table 3. Effectiveness of the Implementation Eradication of Mosquito Nest 3M Plus Program on community behavior

Variable	Criteria	N	%	P
PSN Behavior	Improved behavior	20	40.0	0,985
Pre - Post	Behavioral decline	22	44.0	
	Fixed behavior	8	16.0	

Based on Table 2 above, it shows the results of the Wilcoxon Signed Ranks Test statistic with a p-value = 0.985. Because the value of p = 0.985 is greater than (> 0.05), it can be concluded that H0 is accepted, and Ha is rejected, which means that the implementation of the PSN 3M Plus program is not effective in increasing community PSN behavior in efforts to prevent DHF. However, table 3 shows that 40% of the community's PSN behavior in preventing DHF experienced an increase in score, 44% experienced a decrease in behavior and 16% did not experience a change in PSN behavior. So it can be concluded that the implementation of the PSN 3M Plus program can change people's behavior to be positive in making efforts to prevent dengue by 40%.

4. DISCUSSION

The attitude of the community in this study before the implementation of the 3M Plus PSN as many as 11 people had experienced dengue fever and as many as 8 out of 50 people agreed about the attitude of eradicating mosquito nests using the 3M Plus PSN method so that it could influence dengue eradication activities. Due to the lack of public awareness about efforts to eradicate mosquito nests, efforts to prevent dengue fever have not run optimally.

In the knowledge stage, the community had difficulty obtaining information. It was evident that only 13 out of 50 respondents understood dengue fever prevention using the PSN 3M Plus method during observations before implementing the PSN 3M Plus. This lack of information is conveyed due to the lack of active role of the family in seeking information about the prevention of Dengue Fever so many people in the village do not know about PSN 3M Plus. This is proven because as many as 19 community data from 50 respondents understand the prevention of Dengue Fever. This is due to the lack of information on the prevention of Dengue Fever using the PSN 3M Plus method and the lack of mutual cooperation activities carried out by residents in the village.

The role of the community in the village in carrying out prevention measures for dengue fever is still lacking in the process of preventing dengue fever. This is evidenced by 19 data from 50 respondents who wish to carry out PSN 3M Plus, the role of culture and level of knowledge is one of the factors causing the prevention measures for dengue fever not to be optimally implemented.

Efforts to prevent DHF transmission are carried out by breaking the chain of DHF transmission by preventing aegypti mosquito bites. The optimal activity is

eradicating mosquito nests (PSN) by means of 3M plus, besides that it can also be done by larviciding and fogging. Apart from that, it is added in other ways (PLUS), namely changing flower water, repairing channels and gutters that are not smooth, raising mosquito larvae-eating fish, installing wire netting, don't hang clothes inside the house, sleep using mosquito nets, adjust incoming lighting, and use mosquito repellent (Yusmidiarti, 2021).

The attitude of the community after the PSN 3M Plus was carried out, it was found that of the 8 respondents who agreed at the beginning before the implementation of the PSN 3M Plus, there was only an increase of 2 respondents when examined so that it can be concluded that the increase was not significant because the main cause was a lack of information and community resources in the research village where most of them graduated from elementary school as evidenced by 58% or 29 elementary school graduates.

After the implementation was carried out, it was found that the community's knowledge about Dengue Fever found that from 13 data before the implementation of the PSN, there were 21 data that understood the prevention of dengue fever with the 3M Plus PSN method. The reasons for this less significant increase were the lack of

information obtained by the respondents and the level of education in which the majority of people only graduated from elementary school

Meanwhile, for the actions after the implementation, it was found that from 19 data that wanted to carry out before the implementation of PSN 3M PLUS, there were 21 data of respondents who wanted to carry out after the implementation of PSN 3M Plus. One of the main causes of the lack of community will in the research villages is the lack of information about the prevention Dengue Fever with the PSN 3M Plus method, the education level of which is mostly elementary school graduates and a culture of mutual cooperation that is still not running.

From the results of observations about the attitude of the community in the village during the research, it shows that there is still a lack of public awareness about the prevention of Dengue Fever, one of which is mutual cooperation efforts both as a village group and as a respondent's family group. Attitudes can affect PSN 3M Plus activities because if someone has a good attitude, the awareness to behave and behave well in eradicating mosquito nests will also be good, compared to someone with a bad attitude. According to Mohammad (2014) and Harahap (2012),

attitudes significantly influence people's behavior in eradicating mosquito nests.

From the results of an analysis of knowledge in the village during the research, the cause of the lack of community knowledge was the lack of information obtained and the education level of most of the villagers who graduated from elementary school (SD). If someone has good knowledge about eradicating mosquito nests compared to those who have less knowledge. This means that someone who has high knowledge will significantly influence PSN 3M Plus behavior. The knowledge factor has a significant relationship to mosquito nest eradication behavior (Nuryanti, 2013; Purnama, et al. 2013; Charisma, 2019).

While the results of observations regarding the behavior of eradicating mosquito nests can be concluded that they are not optimal, there are several factors including a lack of knowledge and availability of information about the process of preventing Dengue Fever and a low level of education. The study by Listyorini (2016) states that there is a relationship between the availability of information on DHF and PSN behavior by respondents.

In general, based on the Wilcoxon SPSS test, the pretest and posttest were known to show (positive) results between the pretest and posttest. There are 22 positive data (N), which means that the 22 data have increased the post-test results from the pre-test scores to the post-test scores. The mean rank or average increase is 22.65, while the total positive ranking or sum of ranks is 453.00. Based on the test output above, it is known that Asymp.Sig. (2-tailed) is worth 0.985. Because the value of 0.985 is greater than (0.05), it can be concluded that H0 is accepted, Ha is rejected, it can be concluded that there is no effect of pretest on posttest. The pretest and posttest results show that the implementation of the 3M PSN can be considered ineffective because there was no significant increase after the implementation of the 3M PSN. However, these results indicate that implementing the PSN 3M Plus program can change people's behavior in efforts to prevent DHF.

Cultivating the attitude or habituation of the PSN 3M Plus behavior culture needs to be done using various approaches, including adding the activity of doing PSN 3M Plus as an indicator in Activity Daily Living (ADL) which then needs to be carried out ADL Training. Through training a person can become aware, and respond to stimuli by increasing a positive attitude so as to change positive behavior (Mawaddah et al., A, 2020).

5. CONCLUSION

The implementation of the PSN 3M Plus program in less than 2 months through outreach, Movement 1 House 1 Jumantik (G1R1J) and the jumantik cadre movement with home visits, was able to change people's behavior in efforts to prevent DHF, namely 40% of respondents. Changes in people's behavior to be positive will certainly increase if socialization and monitoring of programs in the community is carried out continuously, so that program objectives can be achieved. Support from various related agencies, both health and government, is needed to increase public knowledge or awareness and motivation in carrying out dengue prevention efforts. Efforts to socialize the implementation of the DHF prevention program must continue to be carried out so that the community can increase their participation.

AUTHOR CONTRIBUTIONS

Substantial contributions to conception, writing and data analysis: Nurul Mawaddah, Siti Rachmah, Mohammad Septyan Army June. Data collection: Mohammad Septyan Army June. Manuscripst revisions: Nurul Mawaddah.

CONFLICT OF INTEREST

This research originates from the research roadmap of the community nursing cluster at the STIKES Majapahit Mojokerto with the Community Health Nursing.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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