

PKM Mosquito Nest Eradication Service (PSN) and Waste Bank as an Effort to Prevent Dengue Cases in Housing D'Tanjung Raya Resident Desa Karanganyar Paiton Probolinggo

Zainal Munir^(✉), Alfiatul Mukaromah², Baridatul Ulum³
Siti Hairunnisa⁴, Lazmatul Hasanah⁵, Ruzidatuz Zainiyah⁶

^{1,2,3,4,5,6}Nurul Jadid University, Probolinggo, Indonesia

zainalmunirj@gmail.com

Abstract— Dengue Fever (DHF) is caused by the dengue virus which spreads from person to person through the blood of the *Aedes aegypti* mosquito, so it is important for people to do 3M, namely draining, covering and recycling to reduce dengue cases. Dengue fever cases appear every year in Karanganyar Village, Paiton District, one of which is Krajan Hamlet (D'Tanjung Raya Resident Housing). Investigations that we carried out both from the community health center, health cadres, the community and the administrators of the D'Tanjung Raya Resident Housing, found that the environment in the housing was not well maintained and would become a breeding ground for mosquitoes. The aim of this program is to prevent dengue fever cases in 2023, through the Mosquito Nest Eradication Service (PSN) program and the centralized use of household waste in the Waste Bank at the D'Tanjung Raya Resident housing complex with thorough procedures. This PkM was carried out in September 2023. This PkM design is observational with a sample size of 50 samples or there is representation of each alley in the observation at the D'Tanjung Raya Resident housing complex. This activity program is divided into 3 stages, namely the implementation stage, the larva survey stage, and the implementation stage of the results of discussions and the benefits of having a waste bank for the community which has economic value and for the health of the surrounding environment. As a result of this activity, data was obtained that there were 10 residents' houses that were positive for mosquito larvae. Apart from that, people generally drain the bathroom only once a week, and after conducting a survey of residents and providing flyers with PSN and Waste Bank benefits.

Keywords— DBD; PSN; Rubbish.

1 Introduction

Health is the basic need of every human being to live a productive life. Prevention and maintenance of health should be given more attention than treatment. But currently this is not paid attention by the community so that health problems have not been resolved properly. DHF disease is caused by the dengue virus which is transmitted through the bite of female mosquitoes *Aedes aegypti* and *Aedes albopictus* who have been infected by the dengue virus from other dengue sufferers. D'Tanjung Raya Resident Housing located in Karanganyar

✉ Corresponding author

Village, Paiton District, Probolinggo is a fairly dense housing that is occupied by the work of the Paiton PLTU Project and the employees of the Nurul Jadid Islamic Boarding School which is known to have quite a lot of activity in their daily lives in every activity carried out by the community, where the level of concern for the cleanliness of the surrounding environment needs more attention. However, the efforts made by housing administrators are still trying to make clean Friday and clean week programs in creating a clean and beautiful environment.

The last effort is to utilize contract labor which is limited to disposing of residents' garbage placed in front of the residents' houses even on every garbage around the house. The community is divided into organic pestilence and inorganic waste, similarly, cleanliness in irrigation in housing has not been declared optimal. Preventive steps are carried out using routine fogging measures every year in collaboration with PKM Paiton. However, it fosters a sense of public concern for environmental cleanliness with PSN Actions Efforts that will be made in eradicating dengue nests, conducting training efforts in eradicating larvae with mosquito nest eradication actions and optimizing waste bank efforts that will become good habits in organic and organic waste or waste with economic value and non-economic waste.

2 Method

Activity stage: namely finding locations with the level of population data with irrigation canals, collaborating with housing, discussing the timing of PSN implementation, preparing teams and materials needed, conducting visits and conducting services and analyzing the results of surveys and initial services. Parties involved: all housing residents; **indicators of achievement**, understanding of residents about mosquito nests that need to be considered and carried out further actions, implementation time; PSN activities are every Friday and Sunday in September.

a. Execution Levels

1. Strategy

Strategies taken in the implementation of Mosquito Nest Eradication (PSN) and Waste Banks as an Effort to Prevent Dengue cases, including:

1. Looking for a location that can be used as a mosquito nest eradication and waste benefits (Perumahan D'Tanjung Raya Resident)
2. Working with the campus and the D'Tanjung Raya Resident Housing.
3. Discuss the timing and system of activities
4. Prepare the team and equipment to be used

5. Conduct visits and observations as well as education about DHF and Bnak Sampah (DHF).
6. Analyze and report on visit results

2. Preparation

Preparations made before the implementation of Mosquito Nest Eradication (PSN) and Waste Bank as an Effort

Prevention of dengue cases, including:

1. Preparation of equipment equipment that will be used for mosquito nest entrustment screening such as flashlights and teaching aids and the team prepares counseling, in the form of counseling materials
2. Team preparation to dor to dork e residents' houses in observing mosquito nests such as bathtubs and others.
3. Facilitator preparation during observation
4. Preparation of questionnaires as evaluation material.

b. Partner Participation

The service program at D'Tanjung Raya Resident Housing is packaged to provide assistance to residents in general about mosquito nest alleviation and D'Tanjung Raya Resident Housing administrators related to the Waste Bank, so that residents and administrators have one goal in suppressing the incidence of dengue outbreaks and the use of economically valuable waste and also increasing creativity in the community with waste that is processed to have good economic value.

c. Role Division

1. DPL conducts mapping of the needs of partners in community service activities that will be carried out at D'Tanjung Raya Resident Housing.
2. Members 1-2 prepare materials and teaching aids in service activities to D'Tanjung Raya Resident Housing
3. Members 3-4 provide assistance to residents and administrators who are targeted in D'Tanjung Raya Resident Housing activities
4. Members 5-6 carry out documentation and evaluation of the program which will be carried out at D'Tanjung Raya Resident.

3 Findings And Discussion

3.1 Finding

This research activity was carried out by Bachelor of Nursing Students of the Faculty of Health UNUJA, who were supervised by supervisors trained in eradicating mosquito nests and waste banks. This activity begins with observation and analysis, then the results of observation and then conducts counseling or education on the dangers of dengue fever and the benefits of family waste that are of economic value.

The process of implementing activities carried out by the student team. Observations involving students, residents and housing administrators to assess several aspects of health and benefits. After observation and analysis, then students provide rewards, motivation and health education to families and administrators to maintain and improve environmental health, specifically mosquito nest eradication and family waste utilization.

Health counseling interventions for residents and administrators were also given after observations about mosquito nests, which aimed to provide educational guidance to the community to be more optimal for the material presented related to the environmental health stage and the dangers of waste to families and the strength when family waste is used. Many of the counseling participants asked questions about the dangers of dengue fever, prevention of dengue fever and strengthening waste banks.

This Community Service will be the first step in the next activity because the mosquito nest alleviation program is a program of the Ministry of National Health in an effort to reduce deaths caused by mosquito bites. So a study will not be impossible not to do with an analysis of the impact of the PKM program that has been carried out now. Even PkM can be continued by empowering community administrators engaged in the health sector to be trained and given training on the Jentik Task Force and empowering the use of Household Waste which will generate economic value for residents of D'Tanjung Rata Resident housing.

3.2 Discussion

DHF (*dengue hemorrhagic fever*) is a disease caused by the bite of the *Aedes aegypti* mosquito. It often occurs in tropical and subtropical regions. These mosquitoes usually like shabby places such as dark places, in puddles that are not maintained, and places that are damp mosquito material like locations that tend to be shabby, dirty, and not terawat of clean. This mosquito also usually appears in the morning to evening. Factors that can cause dengue disease are agent, environmental and human factors. There are several ways to prevent dengue disease from spreading starting from the smallest things such as checking the containers next to people's homes. We see whether there are mosquito larvae or not, especially in stagnant water or diarrhea that is not covered, this is the main factor triggering

the formation of mosquito nests that can spread the Aedes Aegypti virus due to mosquito bites that attack the community due to not paying attention to environmental hygiene patterns. Residents of D'Tanjung Raya Resident of Karanganyar Village, Paiton District, Probolinggo have done several ways to prevent larvae and eradicate mosquito nests through clean Friday and clean week programs in creating a clean environment. This is done so that our environment is clean so that we cannot find small chances of larvae and these positive activities are very significant to the level of Public Health in preventing the spread of dengue virus in a mutual cooperation carried out together in mosquito nest eradication activities (PSN).

Health is the basic need of every human being to live productively and selectively, therefore to achieve an optimal level of health requires strong cooperation between individuals and groups in improving good health to society. Prevention and health maintenance should be given more attention than treatment, because prevention is better than treating something that will happen. Similarly, dengue disease caused by the dengue virus has been transmitted through the bite of female mosquitoes *Aedes aegypti* and *Aedes albopictus* who have been infected by the dengue virus from other dengue sufferers. In D'Tanjung Raya Resident Housing located in Karanganyar Village, Paiton District, Probolinggo is one of the housing that is quite dense which is occupied by many Paiton PLTU Project workers and Nurul Jadid Boarding School Employees, even the local community who are considered very busy in their daily lives. The efforts of housing administrators continue to strive to make clean Friday and clean week programs in creating a clean and healthy environment.

Especially in preventive steps carried out using routine fogging actions every year in collaboration with PKM Paiton. however, it fosters a sense of public concern for environmental cleanliness with PSN Actions or eradication of mosquito nests in the D'tanjung raya resident residential environment, as well as in minimizing larval containers that can spread if not addressed therefore, housing administrators also make efforts to form a Waste Bank which is routinely collected at the waste bank coordinator in the community, but with the form of this waste bank program does not have an impact which is negative but provides an advantage to the community as well by sorting waste that will be handed over to the waste bank which will generate economic benefits, among others by giving directions or instructions to the community to sort waste first such as between organic and inorganic waste, waste that will be handed over to the waste bank including inorganic waste that cannot be decomposed such as plastic bottle and paper waste.

The existence of dengue countermeasures can be done as early as possible, it can be seen from baths and in other puddles to find out the presence of larvae that now appear in every area, to take preventive measures against the presence of these larvae, it must be done

regularly draining and cleaning every Friday and Sunday in a place that is easily infested by dengue mosquitoes. For example, sewers, bathroom gat in every house, garbage dumps, bathtubs and puddles outside the house can also potentially be a place for *Aedes albopictus* and *Aedes aegypti* mosquitoes to live which will later cause dengue disease. Dirty clothes that are often hung are also the habitat of *Aedes albopictus* and *Aedes aegypti* mosquitoes. and certain places that have puddles and shabby places that are easily infested by mosquitoes.

With the prevention of dengue mosquitoes by cleaning and draining as described above, it can reduce the risk of dengue virus transmitted through the bite of the *Aedes aegypti* mosquito, besides that the spread of dengue virus can also be prevented by using mosquito repellent lotion that can be used at night before going to bed to reduce the spread of dengue caused by *Aedes Aegypti* mosquito bites. In addition, we also provide techniques in processing and maintaining the cleanliness of the environment, especially areas that are easily infested or become mosquito larvae nests such as diligent in cleaning or cutting water tubs in the bathroom, and avoiding puddles in the outside area of the house.

Based on information submitted by the management of the Nurul Jadid Islamic Boarding School, it was stated that the last dengue case experienced by a student occurred in 2023. The amount of the Flick Free Number (ABJ) in Islamic boarding schools has obtained figures of 71.35% and 36.3%. This figure still cannot meet the applicable standards. Based on the Ministry of Health Number 50 of 2017 concerning Environmental Health Quality Standards and Health Requirements for Vectors and Disease Carrying Animals and their control that the Larvae Free Rate (ABJ) of *Aedes aegypti* and or *Aedes albopictus* mosquito larvae is more than 95% as a percentage obtained. Therefore, other actions need to be taken in order to achieve ABJ values in accordance with quality standards that have been adjusted to achieve optimal percentage levels.

One of the steps that we can use is to use a simple mosquito trap or can be called Larvitrap. Lavitrap is a trap that can be made very easily, such as using plastic bottles that are not used, so this used bottle that we can use with a little modification first. This trap can inhibit the breeding of *aedes aegypti* mosquito larvae. Based on the above problems, the community service team of Tanjung and Karanganyar hamlets and the Nurul Jadid Islamic Boarding School environment took the initiative to carry out counseling and training actions on the simple process of making Larvitrap. The purpose of this activity is to improve the ability and skills of the community in making this Larvitrap as well as to increase the value of the free number of larvae and as an effort to prevent dengue disease, especially in the Karanganyar area and the Nurul Jadid Islamic Boarding School Environment.

In addition to the use of making Lavitrap, the method carried out in this activity is counseling carried out by the Community service team from the S1 Nursing Study Program, Faculty of Health, Nurul Jadid University, which was also attended by PKK mothers in

D'Tanjung Raya Resident Housing. The purpose of this counseling is to increase knowledge and understanding to mothers in D'Tanjung Raya Resident housing is about anticipating dengue disease through the making of Lavitrap. The Community Service Team carries out this activity through three stages, including the preparation stage, the implementation stage and the evaluation stage. The following is an explanation of each of the stages, as follows:

1. Preparatory Stage

At this stage the service team prepares the tools and materials needed, the material that will be delivered during counseling and prepares invitations for participants who will be invited to this counseling activity. The tools and materials used are scissors, used plastic bottles with a size of 1.5 liters, water mosquito gauze, and black plastic. In addition, preparing materials and materials, for the service team also coordinates with village heads, hamlet heads, and also PKK mothers in D'Tanjung Raya Resident housing related to every plan in this community service activity.

2. Execution Stage

One day before the extension activity, the service team prepares used plastic bottles by cutting each bottle into two parts so that they can be distributed to participants. When carried out with counseling, with activities beginning with the introduction of each team of service members, then continued by the presentation of each material by the speakers and extension workers together with ending in a quiz for the speakers.

3. Evaluation Phase

At the end of the counseling activity carried out by the Community service team and demonstrations related to making Lavitrap, so that the Community service team gave an evaluation of the participants' understanding related to making lavitrap with the obstacles faced during the counseling process and during the making of Lavitrap. The residents of D'Tanjung Raya Resident housing have also been given a series of motivations with the aim of increasing motivating activities to improve routine activities that have existed previously by adding activities that can make the environment around D'Tanjung Raya Resident housing look healthier and more beautiful, including in making Lavitrap.

The community service team in carrying out a series of counseling activities and making Lavitrap using used plastic bottles in the D'Tanjung Raya Resident housing, in Karang Anyar Village, Probolinggo District during September 2023. Lavitrap is a trap made with simple modifications by utilizing used plastic bottles as property that is used by having a function as overcoming mosquito breeding through the field of natural attractant use, and with the innovation of making lavitrap which is considered quite simple it has many benefits including menoroong Community in D'Tanjung Raya housing to reuse used goods that can be recycled to reduce the increase in waste levels that can cause the environment to become

slums as a breeding ground for mosquito nests that trigger the dengue virus, as a form of appropriate technology development related to control in factors and reduce the rate of growth and development of mosquito spread populations. Making Lavitrap has many benefits obtained by the community, and has advantages such as simple, cheap, and effective so that from all layers of society can apply Lavitrap making in everyday life, in the working principle of the results of the lavitrap it is considered simple because the mosquito is looking for a place as a breeding place even a place to lay mosquitoes eggs on water media that already exist in the lavitrap, in the working principle of the results of the lavitrap The eggs will turn into mosquito larvae that grow to adulthood. The adult mosquito cannot thrive because it is trapped in a lavitrap that has been attached by mosquito gauze to death in a puddle of water inside the lavitrap.

In counseling activities and the practice of making lavitrap ii is usually followed by a group of many people such as a maximum of 30 people, but mothers who have been present in participating in counseling and the practice of making lavitrap are considered quite active in every activity that starts such as there is a stage of material presentation consisting of understanding DHF, prevention of DHF, by paying attention to environmental sanitation, As well as methods in the use of simple appropriate technology to make lavitraps.

Therefore, the participants have obtained good results related to the Community Service Program carried out at the D'Tanjung Raya Resident housing related to material preparation and counseling carried out by the Community service team to make the Community understand the understanding of DHF, DHF prevention, even provide motivation to the Community to maintain sanitary hygiene to prevent the spread of DHF virus, From waste reduction utilization activities that accumulate in the environment by being handed over to the waste bank so that it can provide economic value benefits to the community by utilizing inorganic waste that is not decomposed by bacteria such as plastic bottles, or paper waste.

For the next stage, namely by giving abate to houses that have the potential to become mosquito nests and mosquito positive. At this stage we immediately visited the houses with the aim of explaining how to use abate on good to improve cleanliness in the bathroom tub and point out places that can have high potential to become mosquito nests. We also consult with supervisors regarding expectations, and this program can continue to be carried out and evaluated by the Nurul Jadid Islamic Boarding School.

4 Conclusion

This community service activity is an effort to engage in direct community field activities to improve the quality of clean and healthy life in the D'Tanjung Raya Resident housing area related to the rampant spread of the dengue virus by providing a series of

materials and motivations to the community related to dengue fever and providing counseling to the community about the understanding of dengue, prevention of dengue, and the use of organic and organic waste that works similar to the community waste bank in D'Tanjung Raya Resident housing by processing inorganic waste so that it has good economic value to the community, as well as providing a series of making lavitraps that utilize modified plastic bottle waste. In addition, this community service activity also carries out activities every Friday, namely clean Friday and Sunday to work together or mutual assistance to clean up dirty environmental areas and poor sanitation such as cleaning puddle areas, bathtubs in each house by providing education to the community, and by eradicating dengue nests and PSN, this aims to conduct training efforts in eradicating larvae.

Actions to eradicate mosquito nests so that the spread of mosquitoes with Aedes Aegypti virus levels does not spread widely include reducing the level of mosquito nest formation such as maintaining the cleanliness of the sewer area, maintaining the cleanliness of the bathtub in each house, then reducing the level of puddles in the environment and participating in implementing the Community agenda every Friday as a form of community cooperation in overcoming dengue and optimize waste bank efforts that will become good habits in organic and organic waste or waste with economic value and non-economic waste in the community in D'Tanjung Raya Resident.

In community service activities, efforts in providing educational counseling and providing knowledge in making lavitrap are efforts to overcome the spread of the dengue virus, besides this activity also recycles or modifies plastic bottle waste used for making lavitrap in the community, from the results of this activity it was obtained that all counseling participants who were present were active and committed to making countermeasures The spread of dengue virus by installing a lavitrap in every right that has the potential to become a mosquito nest at home.

5 References

- [1] A. Adyatma and R. Ibrahim, "Hubungan antara lingkungan fisik rumah, tempat penampungan air dan sanitasi lingkungan dengan kejadian DBD Di Kelurahan Tidung Kecamatan Rappocini Kota Makassar," *Makassar J. FKM Univ. Hasanuddin*, 2011.
- [2] N. Anandika, "Bab II Tinjauan Pustaka A. Demam Berdarah," p. 38;64, 2020.
- [3] R. Sumantri, "Hubungan Pemberantasan Sarang Nyamuk (Psn) dan Kebiasaan Keluarga dengan Kejadian Demam Berdarah Dengue (Dbd) di Kota Pontianak Tahun 2013," *J. Mhs. PSPD FK Univ. Tanjungpura*, vol. 1, no. 1, 2013.
- [4] S. S. Wahyuni, "Hubungan Antara Keberadaan Jentk Dan Praktik Pemberantasan Sarang Nyamuk Dengan Kejadian Demam Berdarah Dengue Di Kecamatan Tanjungpinang Timur Kota." Diponegoro University, 2007.
- [5] F. Desniawati, "Pelaksanaan 3M plus terhadap keberadaan larva Aedes aegypti di wilayah kerja Puskesmas Ciputat Kota Tangerang Selatan bulan Mei-Juni tahun 2014," 2014.
- [6] U. K. Hadi, E. Agustina, and S. H. Sigit, "Studi perilaku berkembangbiak nyamuk aedes

- aegypti (diptera: culicidae) pada berbagai tipe habitat,” 2005.
- [7] D. Mustika Jaya, “Hubungan Pemberantasan Sarang Nyamuk (Psn) Dbd Dengan Keberadaan Larva Aedes Aegypti Di Wilayah Endemis Dbd Kelurahan Kassi-Kassi Kota Makassar.” Universitas Hassanuddin, 2013.
- [8] K. Ri, “Upaya pencegahan DBD dengan 3M Plus,” *Jakarta Kementrian Kesehat. Direktorat Promosi Kesehat. dan Pemberdaya. Masy.*, 2020.
- [9] 2019 tentang SIMPUS Permenkes No. 31, “Peraturan Menteri Kesehatan Republik Indonesia Nomor 31 Tahun 2019 Tentang Sistem Informasi Puskesmas,” *Menteri Kesehat. Republik Indonesia. Peraturan Menteri Kesehatan. Republik Indonesia.*, no. 999, pp. 1–288, 2019.
- [10] S. A. Puryandini, “Hubungan Perilaku Pemberantasan Sarang Nyamuk (PSN) Demam Berdarah Dengue (DBD) dengan Tingkat Densitas Telur Nyamuk Aedes Aegypti Pada Ovitrap Di RW 01 Kelurahan Pamulang Barat Tahun 2015,” 2015.
- [11] A. Riyadi, “Pemetaan Densitas Larva Aedes Aegypti Berdasarkan Tindakan Pemberantasan Sarang Nyamuk (Psn) Dbd Di Kelurahan Ballaparang Kecamatan Rappocini Kota Makassar.” Universitas Hasanuddin, 2012.
- [12] Permenkes RI Nomor. 75, “Peraturan Menteri Kesehatan Republik Indonesia Nomor 75 Tahun 2014 tentang Pusat Kesehatan Masyarakat.” [Online]. Available: http://hukor.kemkes.go.id/uploads/produk_hukum/PMK No. 75 tentang Puskesmas.pdf

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7 Authors

Zainal Munir, team leader for the Community Service program, as well as a permanent lecturer in the Nursing Professional Education Study program, Faculty of Health, Nurul Jadid University, I am also chairman of the Board of Commissioners of the Paiton Indonesian National Nurses Association, as well as coordinator of the East Java East Region of the Child Nurses Association Indonesian National. I am also active in writing national journals and books about pediatric nursing.

Alfiatul Mukaromah, student of the Nursing Science Study Program, Faculty of Health, Nurul Jadid University.

Baridatul Ulum, student of the Nursing Science Study Program, Faculty of Health, Nurul Jadid University.

Siti Hairunnisa, student of the Nursing Science Study Program, Faculty of Health, Nurul Jadid University.

Lazmatul Hasanah, student of the Nursing Science Study Program, Faculty of Health, Nurul Jadid University.

Ruzidatuz Zainiyah, student of the Nursing Science Study Program, Faculty of Health, Nurul Jadid University.

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