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Analysis of the Role of Health Education in the Prevention of Dengue Fever in Remote Areas of Puskesmas Kota Padang Rejang Lebong Regency Bengkulu Province

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ABSTRACT

Dengue fever (DHF) is still a major public health problem in tropical areas, including Indonesia, due to high morbidity rates and environmental factors that support mosquito breeding. This study aimed to analyze the role of health education in increasing awareness and behavior of dengue prevention in communities in remote areas in the working area of Puskesmas Kota Padang, Rejang Lebong Regency, Bengkulu Province. Using a one-group pretest-posttest pre-experimental design, 90 respondents were purposively selected and assessed for changes in knowledge and behavior before and after the intervention. The intervention included health education on dengue prevention, with a focus on the 3M Plus method: drain, cover, recycle, and use larvicide. The results showed a significant increase in the proportion of respondents with good prevention behavior, increasing from 15.6% at pretest to 91.1% at posttest (p-value = 0.000). This indicates that health education significantly improved community knowledge and encouraged positive behavior change in dengue prevention. However, sustained community involvement and support from the government are required to sustain this improvement. These findings emphasize the importance of structured health education programs in reducing dengue transmission and suggest further research to explore long-term behavioral adherence and integration with public health policies

Keyword: *Dengue; Health Education; Preventive Behavior*

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INTRODUCTION

Geographically, Indonesia is located between the Asian Continent, the Australian Continent, the Pacific Ocean and the Indian Ocean, and is crossed by the equator, giving Indonesia a tropical climate. The tropical climate influences factors such as rainfall, temperature, humidity, lighting and wind, all of which favor the development of biota, including disease vectors. In tropical climates, the development of disease vectors tends to increase, making Indonesia an endemic area for a number of infectious diseases. One of the most prevalent diseases in Indonesia is Dengue Fever (DHF), which is caused by the bite of the dengue virus-infected Aedes aegypti mosquito. The disease was first discovered in Surabaya in 1968, with 58 people infected and 24 of them died. Since then, the disease has spread to various regions, and by 1980, all provinces in Indonesia had been infected with DHF (Yuningsih, 2019).

Dengue is a disease caused by the dengue virus, which belongs to the Arthropod-borne Virus group of the genus Flavivirus and family Flaviviridae. The virus is transmitted to humans through the bite of vector mosquitoes of the genus Aedes, such as Aedes aegypti and Aedes albopictus.DHF can occur throughout the year and affects individuals of various age groups. The spread of the disease is strongly influenced by environmental conditions and community behavior (Yosvara & Atzmardina, 2020).

Based on data obtained from the Bengkulu Province Central Bureau of Statistics (BPS), the Dengue Fever (DHF) morbidity rate in Rejang Lebong Regency has fluctuated in recent years. In 2023, the dengue morbidity rate per 100,000 population was recorded at 102.00. This figure shows a significant increase compared to 2022 which only recorded 36.20 cases per 100,000 population. Previously, in 2021, the dengue morbidity rate in Rejang Lebong had reached 127.00 which was the highest rate in the last three years. Meanwhile, in 2019, the dengue morbidity rate in the area was 114.00. This fluctuation shows the importance of consistent prevention and control efforts to reduce the dengue morbidity rate in Rejang Lebong Regency.

Based on the Rejang Lebong District Health Office report in 2020, it was recorded that out of 21 Puskesmas in Rejang Lebong, especially in Curup, there were three Puskesmas with the highest number of DHF cases. Perumnas Health Center was recorded as the first with 23 cases, followed by Curup Health Center with 21 cases, and Talang Rimbo Health Center also with 21 cases (Dinkes Rejang Lebong, 2020).

The increase in dengue cases and the expansion of affected areas from time to time is caused by several factors, including the advancement of transportation facilities, increasing population density, lack of public concern for the cleanliness of the residence and environment, and the spread of the Aedes aegypti mosquito as the main vector for the spread of dengue disease which is almost found in all corners of the country. In addition, the existence of four types of dengue viruses that circulate throughout the year also contributes to the spread of this disease (Genis, 2016).

"PSN needs to be increased especially during the rainy and transitional seasons, because increased rainfall can increase the breeding places of mosquitoes that transmit dengue, so that it

often causes extraordinary events (KLB) especially during the rainy season. "Mosquito Nest Eradication (PSN) is an important effort to control dengue hemorrhagic fever (Aji, 2024)

Health counseling is an educational activity that aims to disseminate health messages, strengthen beliefs, and increase knowledge, awareness, and understanding of the community to be willing and able to make changes related to health. According to Effendy (2012), the purpose of health counseling is to achieve positive behavioral changes in individuals, families, and communities in maintaining healthy behavior and creating a healthy environment. In addition, counseling also aims to encourage active community participation in efforts to realize optimal health status, by forming healthy behaviors that include physical, mental, and social aspects. This is expected to reduce morbidity and mortality rates (Fabiana, 2019).

Based on research conducted by Takeb & Sabat (2023), the results of counseling and education provided to 66 households in Tunu Village showed that respondents' knowledge was divided into two categories, namely good and less good. Data collected from before (pre) and after (post) counseling showed an increase in the percentage of respondents who had good knowledge (pre=40.2%; post=95.4%), good attitudes (pre=42.5%; post=78.2%), and good behavior (pre=46%; post=52.9%). Statistical test results on knowledge and attitude variables showed significant differences ($p < 0.05$), while in the behavior variable there was an increase from 46% to 60.9%. This shows that the counseling and education method has successfully increased knowledge and positive attitudes related to malaria and mosquito larvae prevention. This increase in positive attitude is expected to encourage the community to take early preventive measures against malaria caused by mosquitoes (Takeb & Sabat, 2023).

Based on this, researchers are interested in knowing the role of health education in preventing dengue fever in remote areas of the Kota Padang Health Center working area, Rejang Lebong Regency, Bengkulu Province.

METHODS

This study uses a pre-experiment design with a One Group Pretest and Posttest Design, which aims to measure changes that occur in the experimental group after treatment. The sample used in this study amounted to 90 people who were selected purposively. The treatment given was in the form of integrating the 3M Plus movement which consists of draining bathtubs, closing water reservoirs, burying used goods, and sprinkling abate powder in water reservoirs. Before the treatment was given, an initial measurement (pretest) was conducted to determine the initial condition of the participants towards the habit of preventing diseases transmitted by vectors such as mosquitoes. After the treatment was given, a final measurement (posttest) was conducted to see the changes in behavior that occurred in the research participants. The results of the pretest and posttest will be analyzed to determine the effectiveness of the application of the 3M Plus movement in increasing awareness and changes in disease prevention behavior.

RESULTS

Before the implementation of health education, a pretest was conducted to measure the initial knowledge of the participants, followed by the delivery of material which included the definition of DHF disease, symptoms, treatment methods, and preventive measures that can be taken. After the delivery of the material, followed by giving a posttest to measure changes in participants' knowledge. The results of this service activity are in the form of an analysis that describes the comparison of the average value of community knowledge before and after the implementation of health education related to dengue prevention.

Table 1. Differences in efforts to prevent dengue fever before and after health counseling health counseling

	Pretest		Posttest		
Prevention of dengue	n	%	n	%	P-Value
Good	14	15,6	82	91,1	
Poorly	76	84,4	8	8,9	0,000
Total	90	100	90	100	

Based on the data presented in the table, it can be seen changes in dengue prevention behavior before and after counseling. In the pre-test, it can be seen that only 15.6% of participants had good dengue prevention efforts, while 84.4% had poor prevention efforts. However, after the health counseling (post-test), there was a significant change where the number of participants who made good dengue prevention efforts increased sharply to 91.1%, while those with poor prevention efforts dropped to only 8.9%.

This change can be seen as evidence that health counseling is effective in increasing community knowledge and awareness about the importance of dengue prevention, especially in implementing the 3M Plus movement. The statistical test results showed a p-value of 0.000, indicating that there was a significant difference between the conditions before and after counseling. Since the p-value is less than 0.05, it can be concluded that health counseling has a significant influence in improving dengue prevention efforts in the community.

According to Ali (2010), health counseling is an integrated activity in every health effort, which aims to change individual behavior in order to live a healthy life through communication, information and education. This is in line with research by Firawan (2013), which states that health counseling provided to respondents can provide additional information and increase respondents' confidence to behave better in maintaining health, as also found in research by (Reni Ranteallo et al, 2021).

The results showed that respondents' knowledge increased after receiving health education provided by researchers, proving that health education can affect a person's knowledge. So with this means that it is in accordance between the facts and the existing theory.

DISCUSSION

Based on the results presented in Table 1, before being given health counseling (pre-test), there were 14 people (15.6%) who showed good dengue prevention efforts. Factors influencing this include the respondents' level of education, as well as information received from various sources, such as social media, the internet, and family. Meanwhile, 76 people (84.4%) had poor DHF prevention efforts. This condition was caused by the respondents' lack of knowledge about how to prevent DHF, because they had never participated in health counseling, as well as laziness factors that hinder the implementation of healthy living behaviors.

After the health counseling (post-test), the results showed a significant improvement, where 82 (91.1%) respondents now have good dengue prevention efforts, compared to only 14 (15.6%) before the counseling. This improvement can be explained by the respondents' better understanding of the materials presented during the counseling, as well as an increased awareness of healthy living. In addition, counseling materials delivered in an easy-to-understand manner and using appropriate methods also supported this change. However, there were still 8 people (8.9%) whose DHF prevention efforts were not good, which was caused by a lack of understanding during counseling, limited capacity to understand, and ingrained beliefs and customs, making it difficult to change behavior. The poor condition of the respondents' living environment was also one of the inhibiting factors.

At the pre-test stage, data processing showed that all respondents could not answer questions about dengue prevention efforts correctly. This is normal because before the counseling, respondents had not received sufficient information about dengue prevention efforts. Nevertheless, some respondents were still able to give good answers, as seen from the average answer which was quite adequate. This indicates that before the counseling, respondents had received basic information on dengue prevention, either through social media or other sources of information.

The results of this analysis are in line with Aji's research (2024), The aim of this study is to determine the effectiveness of marigold plant powder aroma as a mosquito repellent. The research was conducted in a room containing a mosquito net box with 140 mosquitoes. The results of the Chi-square analysis were as follows: P-value = 0.043 < α 0.05, indicating statistically significant effectiveness between soaking the marigold plant root powder in mosquito repellent, with an odds ratio of 4.12 times. P-value = 0.043 < α 0.05, indicating statistically significant effectiveness between soaking the marigold plant bark powder in mosquito repellent, with an odds ratio of 4.08 times. P-value = 0.043 < α 0.05, indicating statistically significant effectiveness between soaking powdered marigold flowers in mosquito repellent, with an odds ratio of 4.06 times. The suggestion is for students to familiarize themselves with this method by placing soaked powdered roots, bark, and flowers in the room to repel mosquitoes.

The results of this analysis are in line with Kurniawan's (2010) research in a study entitled "The Effect of Counseling on the Level of Community Knowledge and Density of Aedes aegypti in Bayah District, Banten Province". The study showed an increase in community knowledge about

Mosquito Nest Eradication (PSN) after being given counseling. However, the increase in knowledge was not followed by a decrease in the density and spread of Aedes aegypti mosquitoes. This finding indicates that although community knowledge has increased, the implementation of this knowledge in practice has not been fully effective in reducing the spread of the disease.

This is in line with Notoatmojo's opinion that the effect of knowledge on practice or role can be direct or through intermediary attitudes. The knowledge gained by a person is not always directly realized in the form of real action. To change attitudes into real actions or practices, supporting factors or enabling conditions are needed, such as environmental support, resources, and stronger individual motivation. Therefore, although counseling can improve knowledge, other factors also need to be considered so that changes in attitudes can be translated into real behavioral changes in disease prevention practices.

The results of this study are different from the findings obtained in the research of Dwi Sutakresna and Made Marwati (2020) entitled "Overview of the Level of Knowledge and Behavior of Family Heads Regarding Eradication of Dengue Fever Mosquito Nests (PSN DBD) in the South Kuta Puskesmas Working Area." The study showed that 82 respondents (85.42%) had good behavior in preventing DHF by doing 3M Plus. This finding is in line with research by Tri Nurul Azizah et al. (2017) entitled "Factors Associated with PSN Behavior (3M Plus) as an Effort to Prevent DHF in Sendangmulyo Village Community." The study revealed that 51 respondents (56.7%) had good behavior in preventing dengue fever.

This difference in results may be influenced by differences in research methodology, respondent characteristics, or different geographical and cultural contexts between the research sites. Nonetheless, the similarity of these two studies remains on the implementation of the 3M Plus movement as a dengue prevention strategy that has a positive impact in changing people's behavior towards health.

One of the factors that can support an increase in the level of community knowledge is the availability of effective health counseling. Health education is conducted through various methods, such as counseling, training, and providing technical assistance needed by the community. In addition, the availability of adequate health facilities for individuals, families and communities is also an important factor in supporting increased knowledge about health. Adequate facilities can facilitate community access to health information and services needed.

In addition, the attitude and behavior of community leaders and health workers play a very important role in improving community knowledge. Health education focused on religious leaders, community leaders, and health workers will be more effective because they are considered role models in the community. Positive attitudes and behaviors shown by community leaders and health workers can be a reference for the community to apply healthy behaviors in everyday life. With good examples from community leaders and health workers, the community is more motivated to change their attitudes and behaviors towards a healthy lifestyle.

The researcher's assumption shows that the majority of people have shown good behavior in the implementation of dengue prevention through 3M Plus in their daily lives. This is in

accordance with the Stimulus-Organism (SOR) theory which states that behavior change is influenced by the quality of the stimulus that interacts with the organism. In an effort to reduce the incidence of DHF, active community participation is needed to support the implementation of government programs, as stated in Circular Letter Number PM.01.11/Menkes/591/2016 concerning the Implementation of 3M Plus Mosquito Nest Eradication (PSN) with the One House One Jumantik Movement.

Mosquito larvae monitoring and the implementation of PSN 3M Plus should be carried out routinely by every family, at least once a week. Unmonitored stagnant water can become a breeding ground for Aedes aegypti mosquitoes that can lay eggs and spread the disease. Therefore, the participation of the community as a whole in the PSN DBD program is very important to reduce the risk of transmission of this disease. With the active involvement of the community in prevention efforts, the spread of DHF can be significantly minimized, which in turn will contribute to a decrease in the incidence of the disease.

CONCLUSIONS

Based on the results of the study, it can be concluded that health counseling has a significant role in improving community understanding and behavior towards dengue hemorrhagic fever (DHF) prevention in remote areas. Before counseling, only 15.6% of respondents had good dengue prevention efforts, while after counseling this figure increased dramatically to 91.1%. Statistical test results showed a significant difference between before and after counseling with a p-value of 0.000, indicating the effectiveness of the intervention. The health education provided, especially through the 3M Plus approach (drain, cover, recycle, and sprinkle abate), was proven to increase public awareness in taking dengue prevention measures. However, there are still challenges in translating increased knowledge into long-term behavior change that requires sustainable environmental and policy support. Therefore, collaboration between communities, health workers, and policy makers is needed to strengthen the overall dengue prevention strategy.

REFERENCES

Aji Rustam Rochmat, et al. (2024): "Effectiveness of the Aroma of Marigold Plant Parts on the Power of Mosquito Repellency." Power System Technology Journal. Scopus Q.1. SJR 0.98. Year 2023. ISSN 1000-3673. Paper ID: PST-0993. Vol. 48, Issue 2, Pages: 1-12. Published: July 1, 2024. http://repository.poltekkesbengkulu.ac.id/id/eprint/3218.

Aji Rustam Rochmat, et al. (2024): "The Role of Health Workers and the Community in the Effectiveness of Marigold Plants Against Mosquito Repellency (Preventive Collaboration in Handling Dengue Fever)." ISBN: 978-623-125-519-8. Publisher: Get Press Indonesia, IKAPI Member No. 033/SBA/2022, Air Pacah, Koto Tangah District, Padang, West Sumatra.

Arikuntono (2010): "Nursing Statistics." Jakarta.

Azizah, T. N., Shaluhiyah, Z., & Syamsulhuda, B. M. (2017): "Several Factors Related to PSN Behavior (3M Plus) as an Effort to Prevent DHF in the Community of Sendangmulyo Village, Semarang." Journal of Public Health (Undip), 5(3), 645-652.

Dinkes Province Bengkulu (2019): "Health Profile of Bengkulu Provincial Health Office." Bengkulu Province.

Dinkes Rejang Lebong (2020): "Report on Data from Rejang Lebong Health Center."

Fabiana, F. (2019): "Scoring of the poses was improved by post-processing with physics-based implicit solvent MM-GBSA calculations." Pages 8–31.

Genis, G. (2016): "What Your Doctor Does Not Tell You About Dengue Fever." Jakarta: PT. Mizan Publika.

Kurniawan et al. (2010): "The Effect of Counseling on the Level of Community Knowledge and Aedes Aegypti Density in Bayah District, Banten Province." Makara, Health, Vol 14, No 2, P 81-85.

Notoatmodjo, S. (2010): "Health Behavior Science." Jakarta: Rineka Cipta.

Reni Ranteallo et al. (2021): "The Effect of Health Counseling on Efforts to Prevent Dengue Hemorrhagic Fever (DHF) in Dusun Tengah Lembang Sa'Dan Andulan District Sa'Dan North Toraja Regency in 2019." Scientific Journal of Promotive Health, 6(1), 25–36. https://doi.org/10.56437/jikp.v6i1.54.

Sutakresna et al. (2020): "Description of Knowledge and Behavior of Family Heads About Eradication of Mosquito Nests in the Working Area of Kuta Selatan Health Center." Journal of Environmental Health (JKL), 10(1).

Takaeb & Sabat (2023): "Community Counseling Related to Malaria and Education on Types of Mosquito Larvae Found in Residential Areas in Tunua Village, North Mollo District." SABAJAYA Journal of Community Service, 1(2), 11–14. https://doi.org/10.59561/sabajaya.v1i2.12.

Yosvara & Atzmardina (2020): "Description of Knowledge and Attitudes Towards Dengue Fever Prevention Behaviors in Cikole Community in 2019." Tarumanagara Medical Journal, 2(1), 90–97. https://doi.org/10.24912/tmj.v2i2.7843.

Yuningsih, R. (2019): "Policies for Addressing Outbreaks of Dengue Hemorrhagic Fever in Tangerang Regency." Aspirasi: Journal of Social Issues, 9(2), 260–273. https://doi.org/10.46807/aspirasi.v9i2.1104.