

COMMUNITY KNOWLEDGE AND BEHAVIOR IN THE EFFORT TO CONTROL VECTORS AND DENGUE HEMORRHAGIC FEVER IN PALANGKA RAYA CITY, CENTRAL KALIMANTAN

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ABSTRACT

Community Knowledge And Behavior In The Effort To Control Vectors And Dengue Hemorrhagic Fever In Palangka Raya City, Central Kalimantan. Dengue hemorrhagic fever is a viral disease caused by the dengue virus, which is transmitted through the bite of the *Aedes aegypti* mosquito. This mosquito species breeds in clean, stagnant water where it lays its eggs. This study aims to assess the public's knowledge and daily practices regarding vector control for dengue fever. An observational study with a cross-sectional design was conducted using a structured questionnaire distributed via Google Forms. The study involved 113 respondents, with 68.1% being under 17 years old. Regarding general awareness, 78.8% (89 individuals) reported being very familiar with dengue fever. In terms of causative knowledge, 88.5% (100 respondents) correctly identified the disease as being caused by the dengue virus transmitted through the bite of *Aedes aegypti*. For water storage practices at home, 51.3% reported using buckets, 38.1% used bathtubs, and 20.4% used showers without storage. A total of 57.5% identified buckets as potential mosquito breeding sites. Regarding the frequency of cleaning water containers, 46.9% reported doing so weekly. For mosquito control methods, 70.8% stated they used aerosol-based mosquito sprays as part of their routine prevention efforts. Overall, the findings indicate that the community demonstrates a relatively good level of knowledge and proactive behavior in controlling the vector of dengue hemorrhagic fever in their daily lives and environments.

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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a disease caused by the dengue virus, which is transmitted through the vector *Aedes aegypti* [1-3]. According to the World Health Organization [4], among insect-borne viral infectious diseases, DHF is considered one of the most common [4]. Dengue Hemorrhagic Fever is a disease that can lead to clinical bleeding disorders, cause a drop in blood pressure that may result in death, and potentially trigger outbreaks (Extraordinary Events) in Indonesia [5,6]. Approximately 70% of dengue cases occur in the Asian continent [7]. In 2021, the number of dengue cases in Indonesia reached 103,509 [8,9], and this increased to 143,184 cases in 2022. In Central Kalimantan Province, the number of DHF cases in 2019 reached 1,786 [4]. According to [8], in 2020 there were 669 reported cases of DHF in Central Kalimantan. Specifically, in Palangka Raya City, 89 cases were recorded in

2020, and 46 cases in 2021 (10). This number increased significantly in 2023; according to Dr. Andjar Hari Purnomo, Head of the Palangka Raya City Health Office, from January to August 2023, DHF cases had reached 176.

Aedes aegypti mosquitoes require clean water to lay their eggs; thus, any area with stagnant water has the potential to become a breeding site. High rainfall intensity also increases the availability of standing water^[12-14]. In residential and household environments, water containers such as bathtubs, buckets, flower vases, and water jars may serve as breeding grounds for *Aedes aegypti* mosquitoes^[15,16]. According to Nurjana, mosquito eggs can develop into adult mosquitoes within approximately 10 to 12 days.^[17]

Efforts to control Dengue Hemorrhagic Fever (DHF) have been widely communicated and implemented by the government, including by the Palangka Raya City Government. Such efforts include vector control strategies such as Regular Larvae Monitoring (Regular Larvae Monitoring (RLM) and focused fogging to eliminate dengue vectors^[10,18]. According to Wahyono^[19], vector control measures for DHF include Mosquito Nest Eradication (Mosquito Breeding Site Eradication (PSN), the use of natural larvicides, mosquito repellents, and government-led fogging programs.

Vector control efforts can be more successful and optimal when accompanied by positive community behavior. The combination of effective vector control and good public behavior is expected to reduce DHF transmission. Public awareness of environmental health is essential for improving the quality of life in a region. Community behavior regarding environmental health significantly influences the environmental condition, whether positively or negatively. This paper discusses the knowledge and behavior of the community in controlling DHF vectors.^[20,21] The aim of this article is to examine the level of knowledge and the practical efforts undertaken by the community in controlling DHF vectors in their daily lives and surrounding environments.

MATERIALS AND RESEARCH METHODS

This study was an observational study using a cross-sectional approach. The instrument used was a questionnaire regarding Dengue Hemorrhagic Fever (DHF) and its control efforts, which was distributed via the Google Forms platform.

The sample in this study consisted of individuals within households who were randomly selected in the city of Palangka Raya, which served as the sampling location. The study was conducted from September to December 2023. A total of 113 respondents were successfully collected.

Data collection was carried out through the completion of a questionnaire consisting of questions on general identity (name, gender, age, phone number, occupation, and residential address), basic knowledge about DHF, and knowledge related to mosquito control inside the home. Respondent privacy was maintained throughout the questionnaire process.

RESEARCH RESULTS AND DISCUSSION

The following table presents the distribution of respondent characteristics in Palangka Raya City, expressed in percentages

Table 1. Percentage of Respondent Characteristics in Palangka Raya City

Karakteristik	Answer Choices	Respondents	
		Number	%
Gender	Male	46	40,7
	Female	67	59,3
Age	<17 Years Old	77	68,1
	18-30 Years Old	31	27,4

	31-50 Years Old hun	5	4,5
	>51 Years Old	0	0
Last Education	No Response	2	1,8
	Junior High School	12	10,8
	Senior High School	70	63
	Associate Degree	3	2,7
	Bachelor's Degree	23	20,7
	SPN	1	1
Occupation	Student	70	63
	Teacher/Educator	11	10
	Private Sector Employee	7	6,3
	Police Officer	6	5,4
	Homemaker	2	1,8
	Receptionist/Admin Staff	1	0,9
	Freelancer	2	1,8
	Content Creator	1	0,9
	Pharmacist	1	0,9
	Midwife	2	1,8
	No Response	7	6,3

The age range of the respondents was predominantly under 17 years, accounting for 77 individuals (68.1%). Most respondents had completed or were currently enrolled in senior high school education, totaling 70 individuals (63%). In terms of occupation, the majority of respondents were students or university students, comprising 70 individuals (63%). Based on Table 1, the characteristics of the respondents align with the objectives of the survey on knowledge of Dengue Hemorrhagic Fever (DHF). These findings are also consistent with those reported by Yuziani and Nguyen^[3,22].

The selection of senior high school students as respondents is considered appropriate, as this educational level requires the acquisition of substantial knowledge. This also corresponds with the "Merdeka Curriculum," particularly the topic of viruses taught in grade X of senior high school. A higher level of education generally facilitates individuals in acquiring and understanding information ^[23].

In general, the higher an individual's level of education, the better their level of knowledge ^[18]. This study demonstrates that a higher level of education corresponds to a higher level of knowledge, as evidenced in Table 1, where the majority of respondents were senior high school students, with some holding a bachelor's degree (S1). Knowledge is generally acquired through personal experiences and information received from parents, teachers, peers, and literature (printed and digital media) ^[24].

Table 2. Respondents' Knowledge of Dengue Hemorrhagic Fever (DHF)

Questions	Answers	Respondents (%)
Do you have any knowledge about Dengue Hemorrhagic Fever (DHF)?	Yes, I am very knowledgeable about it.	78,8
	Do not know	0
	I have only heard of it	21,2
What is the cause of Dengue Hemorrhagic Fever (DHF)?	A virus transmitted through the bite of the Aedes aegypti mosquito.	88,5
	A virus transmitted by flies	0

Bacteria transmitted through the bite of <i>Aedes aegypti</i> mosquitoes.	11.5
Bacteria transmitted by flies.	0

Public knowledge regarding Dengue Hemorrhagic Fever (DHF) generally shows positive results. Based on the basic question regarding how much people know about DHF, out of 113 respondents who completed the questionnaire, 89 individuals (78.8%) answered "highly knowledgeable" and 24 individuals (21.2%) answered "have only heard of it." Additional questions regarding knowledge of DHF were also asked, such as the cause of DHF. A total of 100 individuals (88.5%) correctly answered that DHF is caused by a virus transmitted through the bite of the *Aedes aegypti* mosquito. Public knowledge about DHF is presented in Table 2.

The researchers also provided respondents with an optional question to collect additional data regarding water storage types used in their bathrooms or toilets. The questionnaire included the following options: buckets, bathtubs, and no storage container (use of a shower), and respondents were allowed to choose more than one option. The survey results from 113 respondents showed that buckets were the most frequently selected option, with 58 responses (51.3%), followed by bathtubs with 43 responses (38.1%), and the option of not using a container (using a shower) with 23 responses (20.4%).

Another question was posed regarding possible mosquito breeding sites. The answer choices included: bathtubs, flower vases, buckets, water dispensers, and clay jars/earthenware pots (kendi/tempayan). Respondents were allowed to select multiple answers freely and to add other locations based on their knowledge of potential *Aedes aegypti* breeding habitats. Mosquito habitats are typically found in man-made containers located close to human dwellings [25,26].

Survey results showed that 65 respondents (57.5%) selected buckets, 57 respondents (50.4%) selected bathtubs, and 48 respondents (42.5%) selected clay jars/earthenware pots as potential breeding sites for mosquitoes. Other potential breeding sites included flower vases, selected by 28 respondents (24.8%) out of the total sample.

Table 3. Community Experience in Observing Mosquito Larvae

Question	Answer	(%)
How often do you see mosquito larvae	Yes, frequently	22,1
	Rarely	69,9
	No, I do not	8

Community experience in observing mosquito larvae, based on respondents' answers, shows that the majority rarely see mosquito larvae in their daily lives, with a percentage of 69.9% (79 individuals), while only 22.1% (25 individuals) reported frequently seeing mosquito larvae.

Another question was asked regarding the places where they most often observe mosquito larvae. The survey results indicate that respondents mostly chose buckets with 49 responses (43.3%), clay jars/earthenware pots (kendi/tempayan) with 32 responses (28.3%), and bathtubs with 29 responses (25.7%). These findings are consistent with the research conducted by Ratnasari [26].

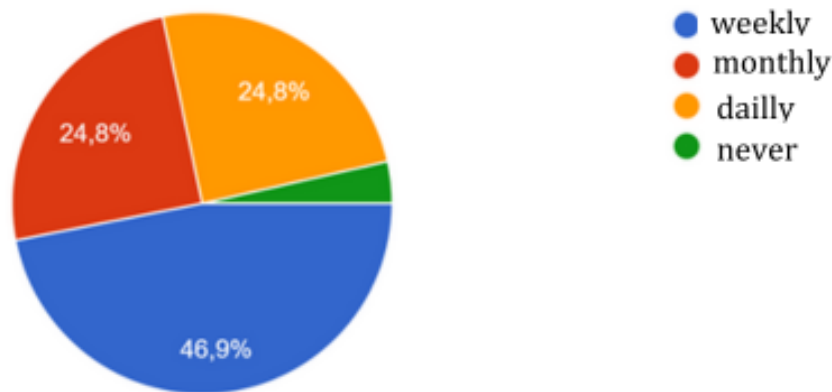


Figure 1. Frequency of Community Water Storage Cleaning

Based on Diagram 1, the survey results show that the frequency of community water storage cleaning is quite good, with 46.9% of respondents selecting "weekly" as their cleaning frequency. The survey responses for "daily" and "monthly" cleaning frequencies each accounted for 24.8%. Community experience in observing mosquito larvae must align with their behavior and awareness of larvae presence; when proper management and efforts are applied, it can reduce the spread of diseases and the incidence of Dengue Hemorrhagic Fever (DHF) cases. [27,28]

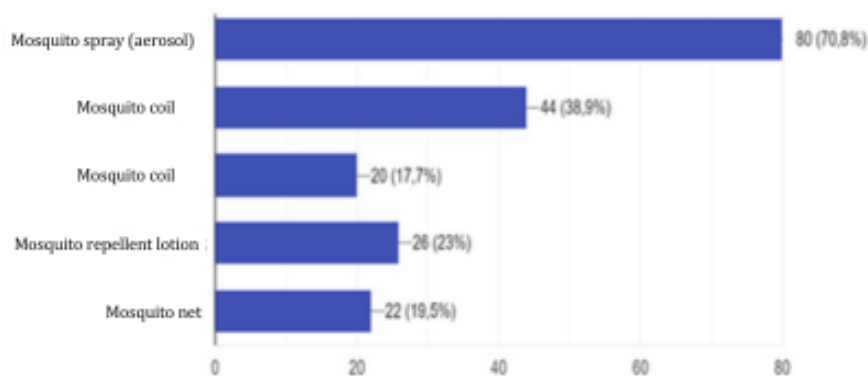


Figure 2. Community Efforts in Mosquito Control

Based on Graph 1, the survey results show that 80 respondents (70.8%) chose to use mosquito spray (aerosol) as their method of mosquito control in daily life. Mosquito coils were also frequently selected, with 44 respondents (38.9%) choosing this option. For most people, the use of mosquito spray is not limited to killing mosquitoes only. This survey also revealed that out of a total of 113 respondents, 89 individuals (77%) use mosquito spray (aerosol) to eliminate insects other than mosquitoes.

The use of mosquito control products by the community in daily life to eliminate other insects includes examples such as ants and cockroaches. Mosquito spray is widely preferred due to

its practicality and ease of use indoors for controlling mosquitoes and other insects. Moreover, the community feels safe and comfortable while using mosquito spray [19].

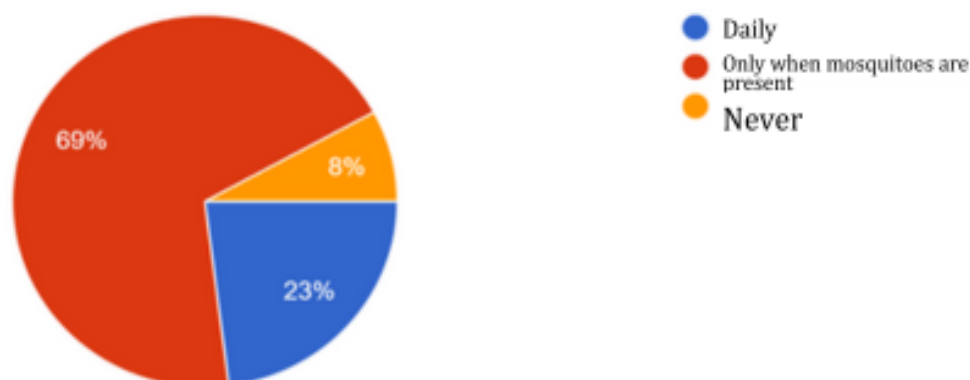


Figure 3. Frequency of Community Use of Mosquito Spray

Questions regarding the frequency of mosquito repellent use were also conducted to determine how often the community uses mosquito repellents daily. The survey data showed positive results, where 78 respondents (69%) reported using mosquito repellents only when mosquitoes were present around them. Similar research on the frequency of mosquito repellent use was previously conducted by [29] in Purworejo Regency. According to Riyadi and Satoto [29], if the community's behavior in using mosquito repellents involves high doses, improper application, and continuous use over a long period, it can lead to resistance and reduce the effectiveness of an insecticide [31,32]

Vector control efforts for Dengue Hemorrhagic Fever (DHF) are also carried out by the government through established policies, including the fogging program. This study also assessed community knowledge regarding the effectiveness of fogging in killing mosquitoes. Out of 113 respondents, 46 individuals (40.7%) believed that mosquitoes die after fogging, 33 individuals (29.2%) stated that mosquitoes are still found after fogging, and 34 individuals (30.1%) did not know. These results indicate that the use of fogging in the Palangka Raya community, Central Kalimantan, remains effective for mosquito control.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this study indicate positive results regarding the knowledge and behavior of the community in controlling the vector of Dengue Hemorrhagic Fever (DHF), which is transmitted by the *Aedes aegypti* mosquito. Concerning knowledge about DHF, 78.8% of respondents reported being highly knowledgeable about the disease, and 88.5% correctly identified that the cause of DHF is a virus transmitted through the bite of the *Aedes aegypti* mosquito. The well-informed community shows positive awareness in maintaining family health and keeping water storage areas clean, which are potential breeding grounds for *Aedes aegypti* mosquitoes as vectors of DHF.

Mosquito spray (aerosol) is widely chosen by the community (70.8%) as an effort to eliminate mosquitoes indoors. Additionally, mosquito spray is also used to eliminate other insects such as ants and cockroaches. The preference for mosquito spray is due to its practicality. The frequency of mosquito spray use in daily life is appropriate, as people tend to use it only when mosquitoes are present; continuous use may lead to insecticide resistance.

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