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KNOWLEDGE OF DENGUE HEMORRHAGIC FEVER AND ITS INFLUENCE ON 5M-PLUS PRACTICES AMONG HOUSEWIVES

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Abstract

Dengue hemorrhagic fever (DHF) is caused by the dengue virus transmitted by the Aedes aegypti mosquito. In 2022, Indonesia reported 45,387 dengue cases, resulting in 432 deaths. The knowledge of housewives influences the prevalence of DHF; those with better knowledge tend to exhibit more effective prevention behaviors. This study assessed the relationship between DHF knowledge and 5M-Plus behavior among housewives in the Pakisaji Health Center area, Malang Regency. This study employed a cross-sectional analytic observational design and included 270 respondents, with a sample size of 124 obtained through convenience sampling. The research utilized a questionnaire and analyzed data using Spearman's test. Results indicated that 80.6% of respondents had good knowledge of dengue, while 33.9% demonstrated sufficient 5M-Plus behavior. Spearman's test revealed a significant relationship between dengue knowledge and 5M-Plus behavior among housewives ($r = 0.188$, $p = 0.037$). Those with strong knowledge more readily understand and implement 5M-Plus practices. Future research should explore the link between dengue knowledge and the motivation of housewives to eliminate dengue mosquito nests

***Keywords*:** DHF, Housewives, 5M-Plus Implementation, Knowledge Level on DHF, Malang

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1. Introduction

Dengue fever (DHF) is an infectious disease caused by the dengue virus and transmitted by the *Aedes aegypti* mosquito [1]. This mosquito is characterized by its black color and distinctive white spots on its body and wings. *Aedes aegypti* mosquitoes can adapt to environmental changes, thrive in non-natural habitats, and survive in detergent water [2]. Dengue hemorrhagic fever primarily affects children and can be fatal if not treated properly. The signs and symptoms of DHF typically begin with a high fever lasting 2 to 7 days, along with cough, cold-like symptoms, nausea, vomiting, weakness, and the appearance of red spots on the skin caused by ruptured capillaries [3].

According to health data from East Java Province, the incidence rate of dengue fever is 17 cases per 100,000 population. In 2020, the morbidity rate reached 34.7 cases per 100,000 population, meaning that 34 to 35

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individuals out of every 100,000 in Malang City reported being infected with DHF [4].

Research indicates that a higher level of knowledge significantly correlates with improved behavior in preventing DHF. For instance, a study found that mothers with adequate knowledge exhibited a 35% greater likelihood of engaging in preventive behaviors than those with limited knowledge [5]. Another study highlighted that 51.4% of housewives needed to improve their knowledge regarding DHF prevention [6]. Knowledge of DHF encompasses understanding its causes, transmission, and prevention strategies. It can be defined as the information an individual acquires through sensory experience, reasoning, and belief-collectively contributing to a person's mental wealth and overall well-being [7]. Moreover, factors influencing housewives' knowledge about DHF include access to information sources, educational background, and environmental conditions. Findings suggest that 41% of housewives lack knowledge about DHF, underscoring their critical role in prevention efforts [8].

Research indicates that environmental factors, effective waste management, and the involvement of 'jumantik' cadres contribute to the risk factors associated with DHF. When public awareness of the 5M-Plus behavior—an initiative aimed at preventing DHF—increases, the incidence of DHF cases tends to decrease [9]. Additionally, a study revealed that 64.7% of housewives reported needing a better attitude toward implementing the 3M-Plus actions, which are vital for preventing DHF [8].

Moreover, DHF cases are also affected by seasonal changes, particularly during the rainy season [10] Several elements contribute to the risk of DHF, including climate, temperature, humidity, and rainfall. Research has shown a significant relationship between rainfall and the incidence of DHF, demonstrated by a Spearman correlation test revealed a p-value of 0.006 and a correlation coefficient (r) of 0.35. This suggests a moderate relationship where increased rainfall correlates with a rise in DHF cases, as analyzed through environmental epidemiology [11].

A preliminary study conducted at the Pakisaji Health Center observed the incidence of DHF between 2020 and 2021, reporting a morbidity rate of 18 cases. In 2022, dengue cases rose dramatically, with a morbidity rate of 82 cases. The Kebonagung village registered the highest incidence, with 22 patients. This increase was attributed to a lack of environmental hygiene exacerbated by the rainy season.

2. Method

This study is a cross-sectional analytical observational research project conducted at a single point in time using convenience sampling. Data processing included editing, coding, scoring, tabulating, cleaning, and analysis. The Spearman rank correlation was used for statistical analysis.

The research was conducted in Kebonagung Village, Pakisaji Subdistrict, Malang Regency, from April 9 to May 31, 2023. A questionnaire measuring knowledge of Dengue Hemorrhagic Fever (DHF) was distributed, consisting of 21 questions scored as 1 for "correct" answers and 0 for "incorrect" answers. A 5M-Plus behavior questionnaire with 15 items was employed, scoring "yes" as 1 and "no" as 0. According to Arikunto (2010), DHF knowledge and 5M-Plus behavior are categorized as follows: scores of 76-100% indicate "good," 56-75% indicate "sufficient," and below 56% indicate "poor".

The study included 270 housewives with family members affected by DHF, with a sample size of 124 respondents. Inclusion criteria required participants to consent, be housewives with affected family members, and have resided in Kebonagung for at least three years.

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Exclusion criteria included housewives who were unavailable or unwilling to participate or did not have family members affected by DHF.

Ethical considerations involved obtaining participation requests and informed consent from respondents, who had the right to decline or agree to participate voluntarily. All research data is kept confidential, ensuring that respondents' identities and information remain secure.

3. Results and Discussion

This study employs univariate analysis to highlight the two variables' characteristics.

Table 1. Characteristics of Respondents

Characteristics	f	(%)
Age (years old)		
25-35	25	20.2
36-45	72	58.1
46-55	27	21.8
Education		
Elementary School	6	4.8
Junior High School	23	18.5
High School/ Vocational School	81	65.3
Diploma/Sarjana	14	11.3
Number of Family Members		
3	54	43.5
4	52	41.9
5	17	13.7
6	1	8
Housing Arrangements		
Rental Housing	2	21.3
Homeownership	122	78.7
Received Information about DHF		
Have	124	100
Not Yet	0	
Information Sources		
TV	1	8
Extension	122	98.4
Media	1	8
Others	0	0
Total	124	100,0

From the frequency distribution of respondents' general data, it was determined that the majority (58.1%) were aged 36-45, most (65.3%) had completed SMA/SMK education, nearly half (43.5%) had three family members, and almost all (78.7%) lived in their own homes. These demographics provide a valuable context for understanding the awareness and health behaviors of the respondents. Notably, all participants reported receiving information about dengue hemorrhagic fever (DHF) through various channels, including television, health worker socialization, and other media.

Table 2. Frequency Distribution of Housewives' Knowledge about DHF and their 5M-Plus Behavior

Variable	f	(%)
Knowledge		
Good	102	82.3
Sufficient	19	15.3
Poor	3	24
5M-Plus Implementation		
Good	49	39.5
Sufficient	54	43.5
Poor	21	16.9
Total	**124**	**100**

As indicated in Table 2, this access to information seems to correlate with the participants' understanding of the disease; 82.3% of respondents possess good dengue knowledge. However, it is important to note that despite this high level of knowledge, nearly half (43.5%) exhibit only sufficient 5M-Plus behavior.

Table 3 reveals that 80.6% of respondents have good knowledge, with nearly a third (33.9%) demonstrating sufficient 5M-Plus behavior. The study found that respondents with strong knowledge adequately practiced 5M-Plus, while those with poor knowledge needed improvement. The Spearman's test yielded a p-value of 0.037, indicating a significant relationship between knowledge of DHF and 5M-Plus behavior ($p < 0.05$). The positive correlation coefficient ($r = 0.188$) suggests that increased DHF knowledge is associated with enhanced 5M-Plus behavior.

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Knowledge about DHF

The analysis of knowledge distribution regarding dengue fever reveals that the majority of respondents demonstrated a proficient understanding of key topics. Specifically, they were able to accurately identify that dengue fever is transmitted by the Aedes aegypti mosquito, recognize the characteristics of this vector, comprehend that the eradication of mosquito breeding sites is essential for breaking the chain of dengue transmission, and adhere to the guidelines for the application of Abate powder (10 grams per 100 liters of water). Furthermore, respondents exhibited awareness of the signs and symptoms of dengue fever, as well as an understanding of various mosquito nest eradication activities. These findings are consistent with previous research[12] which indicated that a significant proportion of respondents possessed knowledge categorized as 'good.' Similarly, from other research[13] indicated that the average knowledge score among respondents was 73.52, reflecting adequate dengue knowledge. Moreover, a study conducted in 2022 in Tanjung Rancing village[8] highlighted a positive correlation between knowledge and attitudes regarding the 3M Plus measures among housewives, suggesting that those with good knowledge were influenced by various factors, including reliable sources of information, educational background, and environmental influences.

Table 3. Cross-Tabulation Analysis of the Association Between Dengue Knowledge and 5M Plus Behavioral Practices Among Housewives in the Pakisaji Health Center Region, Malang Regency

Correlation Between Variables		5M-Plus Behavior						Total		*Spearman's*	
		Good		Sufficient		Poor					
		f	%	f	%	f	%	f	%	*R*	*p-value*
Knowledge	Good	41	33.1	42	33.9	17	13.7	100	80.6	0.188	0.037
	Sufficient	5	4.0	11	8.9	3	2.4	19	15.3		
	Poor	2	1.6	1	0.8	2	1.6	5	4.0		
Total		48	38.7	54	43.5	22	17.7	124	100,0		

The exemplary knowledge of dengue hemorrhagic fever (DHF) among housewives in the Pakisaji Community Health Center jurisdiction is particularly attributed to educational attainment. This study identified that a significant number of respondents had completed high school or vocational education, aligning with findings from prior research [8] which reported that 41 housewives possessed a high school educational background.

Additionally, this research found that the majority of respondents fell within the age range of 36 to 45 years, categorizing them as late adults. This demographic information suggests that housewives are still capable of acquiring and assimilating information or participating in socialization efforts regarding DHF, which contributes to their elevated level of knowledge. Supporting this notion, research [14] indicated that most respondents were around 35 years of age and demonstrated a willingness to seek health information, particularly concerning family well-being. As individuals age, they are often better equipped to absorb knowledge and engage in more sophisticated cognitive processing.

5M Behavior

This study found that nearly half of the respondents exhibited a sufficient level of 5M-Plus behavior. This indicates that while the respondents have implemented some dengue prevention

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measures, their efforts are not maximized. The result revealed several gaps in household practices: a significant number of respondents did not secure water storage containers, did not dispose of used items that could accumulate rainwater, failed to apply Abate powder as recommended, neglected to install wire mesh on ventilation openings, and did not utilize mosquito nets while sleeping. These findings align with prior research [13] which indicated that DHF prevention behaviors remain inadequately practiced. Specifically, participants did not bury used items capable of collecting rainwater or cultivating mosquito-repelling plants, resulting in behaviors categorized within a moderate range. The availability of informational resources significantly influences the moderate 5M-Plus behaviors observed among housewives.

This study found that all respondents had received information regarding dengue fever through various channels, including television, local health workers, and other media outlets. Research conducted in Antiga village, within the Manggis Public Health Center jurisdiction [16] corroborated these findings; respondents reported acquiring information from newspapers, television, and personal networks. The moderate level of 5M-Plus behavior may also be affected by age demographics. The results indicated that the majority of respondents fell within the 36 to 45-year age bracket. This moderate behavior may stem from a lack of awareness regarding the importance of environmental cleanliness, compounded by the time constraints of housewives, as individuals within this age group often engage in numerous productive activities. According to research [17] as housewives age, their cognitive maturity enhances their capabilities in activity management.

Relationship Between Dengue Hemorrhagic Fever Knowledge and 5M-Plus Behavior

The findings of this study indicate a notable relationship between knowledge of dengue hemorrhagic fever (DHF) and the implementation of 5M-Plus behavior among housewives within the working area of the Pakisaji Health Center, Malang Regency. This is consistent with research [15] which identified a significant correlation between maternal knowledge and DHF prevention behaviors in school-age children in Tegallinggah Village, Karangasem Regency. A sound understanding of DHF is crucial for housewives, as it serves as the foundation necessary for preventing or breaking the transmission cycle of Aedes aegypti mosquitoes. Individuals with comprehensive knowledge are more likely to comprehend and apply dengue prevention methods by adopting 5M-Plus behaviors.

The correlation coefficient obtained in this study was positive, indicating that improved knowledge of DHF among housewives correlates with enhanced 5M-Plus behaviors. However, despite this positive relationship, the overall performance of these prevention behaviors was identified as relatively low. This finding suggests that the level of awareness among housewives regarding the importance of maintaining a clean and healthy living environment remains insufficient, thereby hampering practical dengue prevention efforts. This aligns with earlier research [15] which similarly illustrated that enhanced knowledge among housewives corresponded with improved preventive behaviors against DHF.

Notably, the study also identified two respondents who exhibited limited knowledge regarding DHF yet engaged in good 5M-Plus behavior. This observation is corroborated by research [18] which established a relationship between knowledge of DHF and behaviors aimed at its prevention.

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Additionally, findings from another study [19] confirmed the association between knowledge levels and maternal behaviors in preventing DHF. Conversely, the results reported by research [20] indicated a lack of a significant relationship between knowledge and DHF prevention behaviors, as evidenced by a p-value of 0.461, which is more significant than the standard significance level of 0.05.

The results of this study highlight the essential role of health workers in facilitating initiatives to disrupt the life cycle of Aedes aegypti mosquitoes. It is recommended that health workers engage in counseling sessions focused on dengue prevention strategies that are both engaging and easily comprehensible to the community. Additionally, they should consider implementing larval monitoring training and community empowerment activities, such as the G1R1J initiative (*Gerakan 1 Rumah 1 Jumantik*), which promotes the concept of "one house, one larva monitor".

4. Conclusion

The findings of this study indicate that all respondents within the working area of the Pakisaji Health Center, particularly in Kebonagung Village, possessed knowledge of dengue hemorrhagic fever (DHF), which falls within the 'good' category. However, the results also revealed that nearly half of the respondents exhibited 5M-Plus behavior classified within a 'moderate' category. Importantly, this study established a statistically significant relationship between DHF knowledge and 5M-Plus behavior among housewives in Kebonagung Village, as evidenced by a p-value of 0.037, less than the conventional threshold of 0.05 for statistical significance. These results suggest that enhancing DHF knowledge among housewives may be crucial in improving their preventive behaviors against dengue transmission.

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