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FACTORS RELATED TO THE PRESENCE OF AEDES SP. MOSQUITO LARVAE IN THE IMPLEMENTATION OF MOSQUITO NEST ERADICATION IN THE WORKING AREA OF THE KENALI BESAR COMMUNITY HEALTH CENTER IN JAMBI CITY IN 2026

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Abstract
Dengue Hemorrhagic Fever remains a public health problem influenced by preventive behavior and home environmental conditions. This study aims to analyze factors related to the presence of Aedes sp. larvae in the implementation of PSN in the Kenali Besar Community Health Center, Jambi City, in 2026. This study is an observational analytic study with a cross-sectional design. The study population was all heads of families in the Kenali Besar Community Health Center, with a sample of 110 houses selected through simple random sampling. The research instruments were questionnaires, observation sheets, and hygrothermometers, while the data were analyzed using the chi-square test. The results showed a significant relationship between knowledge, attitudes, PSN actions, the role of health workers, and humidity with the presence of Aedes sp. larvae, while temperature was not significantly related. In conclusion, larva control is more related to behavioral factors and home microenvironment, so health education, strengthening jumantik cadres, and consistency of PSN need to be continuously strengthened.

Keywords: Aedes Aegypti, Dengue, Larvae, Larval Density, Public Health

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) remains one of the most important public health threats in tropical regions because its transmission is strongly influenced by the interaction between human behavior, the presence of Aedes sp. vectors, and environmental conditions. In the past two to three years, the dengue burden has continued to show a high trend in many endemic countries, including Indonesia, so community-based control remains a relevant and urgent strategy (Ministry of Health of the Republic of Indonesia, 2024; World Health Organization [WHO], 2021). In Indonesia, the national dengue control strategy for 2021–2025 emphasizes that the target of reducing incidence can only be achieved through strengthening vector management, surveillance, and active community participation in eradicating mosquito breeding grounds (WHO Indonesia, 2021; Ministry of Health of the Republic of Indonesia, 2024). Scientifically, this context demonstrates that dengue is not merely a clinical problem, but also an ecological health issue influenced by household preventive behavior and the effectiveness of community interventions (Rahman et al., 2023; Sari & Wulandari, 2024).

In the local context, Jambi City exhibits fluctuating dengue fever (DHF) case dynamics that have tended to increase in recent years, while the Kenali Besar Community Health Center (Puskesmas) area is one of the areas with a significant caseload. Program data shows that the mosquito-free rate has indeed increased, but cases persist, indicating that the increase in mosquito-free dengue fever (ABJ) does not always translate directly to a reduction in the risk of transmission at the household level. This phenomenon reinforces the suspicion that behavioral and environmental factors remain uncontrolled, particularly in the context of homes with open water containers, inconsistent 3M Plus (National Population and

Immunization) practices, and uneven supervision by mosquito larvae (Jumantik) cadres (Jambi City Health Office, 2025; Putri et al., 2022). Similar findings have been reported in other endemic areas in Indonesia, where mosquito-free mosquito populations often persist despite ongoing control programs, highlighting the need for a more specific approach at the household and community levels (Wahyuni et al., 2021; Rasjid et al., 2023).

In general, recent literature indicates that the presence of Aedes sp. larvae is closely related to community knowledge, attitudes, and practices in implementing the 3M Plus PSN, accompanied by support from mosquito larvae monitoring cadres and the physical condition of the environment. Studies in Indonesia report that good knowledge about dengue and consistent preventive behaviors tend to increase the practice of larval inspection, draining water reservoirs, and routine reporting to health workers (Putri et al., 2022; Munawwaroh et al., 2024). Furthermore, recent research also confirms that open water reservoirs, poor home ventilation, and certain microclimate conditions can increase the risk of larvae presence and dengue incidence (Rasjid et al., 2023; Larasati et al., 2024). Thus, these results provide a strong theoretical basis that dengue control needs to examine the relationship between behavioral and environmental factors simultaneously, rather than partially.

However, previous studies have yielded inconsistent results. Some studies place 3M Plus behavior as the primary determinant of larval presence, while others emphasize the role of mosquito larvae monitoring or the characteristics of the home environment as more dominant factors (Wahyuni et al., 2021; Putri et al., 2022). Furthermore, evidence related to climatic factors such as temperature and humidity is also inconsistent; some studies find a clear effect on larva-free rates, while others show weak or statistically insignificant associations (Rasjid et al., 2023; Larasati et al., 2024). A common limitation of previous research lies in their often fragmented focus, for example, assessing only community behavior without including health worker monitoring, or assessing only environmental factors without linking them to the implementation of the National Population and Family Planning (PSN) at the household level. This situation highlights the need to test more integrative models in specific endemic areas.

Based on this gap, this study explicitly aims to analyze factors related to the presence of Aedes sp. mosquito larvae in the implementation of Mosquito Nest Eradication (PSN) in the working area of the Kenali Besar Community Health Center in Jambi City in 2025. The urgency of this study lies in the high burden of dengue fever in Indonesia, the continued discovery of cases and larvae at the household level, and the need to strengthen community-based strategies in accordance with national dengue control policies (WHO Indonesia, 2021; Ministry of Health of the Republic of Indonesia, 2024). The novelty of this study lies in the integration of several determinants at once—knowledge, attitudes, PSN practices, supervision of the role of health workers, air temperature, and air humidity—in a specific primary care context. Theoretically, this study enriches the understanding of behavioral-environmental interactions in the presence of Aedes sp. larvae, while practically, the results are expected to provide a sharper basis for community health centers and local governments in designing more targeted, sustainable, and evidence-based dengue control interventions.

METHOD

This study used a quantitative approach with an analytical observational study type and a cross-sectional design. This design was chosen because it allows researchers to observe the relationship between independent and dependent variables at a single measurement point without providing any intervention to respondents. Therefore, it is suitable for assessing the relationship between knowledge, attitudes, and

actions of the 3M Plus National Health Monitoring Program (PSN 3M Plus), the role of health workers, air temperature, and humidity on the presence of Aedes sp. larvae in households. Methodologically, cross-sectional designs are widely used in public health research because they are efficient, practical, and able to describe patterns of relationships between variables in a population over a specific period (Sugiyono, 2022; Creswell & Creswell, 2023;). This approach is also in line with the characteristics of observational research, which emphasizes field observations without variable manipulation, as is commonly used in epidemiological studies of risk factors and health behaviors (Emzir, 2021; Sudaryono, 2022).

The study was conducted in the Kenali Besar Community Health Center (Puskesmas) working area in Alam Barajo District, Jambi City, which epidemiologically includes an area with a history of dengue fever cases and the presence of mosquito larvae that still needs to be controlled. This location was selected based on the need to analyze factors related to the presence of mosquito larvae more specifically in the context of an urban community, considering that the area consists of several sub-districts with different population densities and household environments. The research period included the preparation of the proposal in July 2025, while field data collection was conducted from December 2025 to February 2026. This timeframe provided space for researchers to prepare instruments, conduct questionnaire trials, and ensure the data collection process took place during the same period for all respondents, thus maintaining consistency of observation (Creswell & Creswell, 2023; Sugiyono, 2022).

The population in this study were all heads of families domiciled in the working area of the Kenali Besar Community Health Center in Jambi City, with a population of 64,115 people spread across four sub-districts, namely Simpang Rimbo, Kenali Besar, Bagan Pete, and Pinang Merah. The research sample was determined using the Lemeshow formula because the population was quite large and the researcher focused on estimating the proportion of incidents in the field survey. Based on this calculation, a minimum sample of 100 respondents was obtained, then an additional 10 percent to anticipate dropouts or incomplete data so that the total sample was 110 respondents or homes. The sampling technique was carried out using simple random sampling with proportional distribution based on the population of each sub-district, so that each household had an equal chance of being selected and the sample distribution remained representative of the population structure in the field. Inclusion criteria included heads of families who domiciled in the research area, had a water reservoir, and were willing to be respondents, while exclusion criteria included respondents who had difficulty communicating and homes that refused to undergo mosquito larvae examination. This approach is consistent with the principles of quantitative sampling which emphasize the representativeness and measurability of data (Sudaryono, 2022; Emzir, 2021;).

The research instruments consisted of a questionnaire, an observation sheet, and a hygrothermometer. The questionnaire was used to measure knowledge, attitudes, and practices of the 3M Plus National Health Program (PSN 3M Plus), and the role of health workers through structured questions completed by respondents according to the researcher's guidelines. The observation sheet was used to directly check for the presence of larvae in water reservoirs, while the hygrothermometer was used to measure the temperature and humidity around the respondents' homes. Before being used in the main study, the questionnaire was tested for validity and reliability on 30 respondents in Aur Kenali Village, Telanai Pura District. The test results showed that items that met the validity and reliability criteria could be used as data collection instruments, while invalid items were eliminated to maintain measurement quality. Methodologically, this procedure is important because a good instrument must be able to measure the research constructs consistently, accurately, and in accordance with the analysis objectives (Sugiyono, 2022; Creswell & Creswell, 2023;).

Data collection was conducted through two sources: primary and secondary data. Primary data were obtained through interviews using questionnaires and field observations of house conditions and water reservoirs. Secondary data were obtained from official documents from the Jambi City Health Office and the Kenali Besar Community Health Center, specifically regarding dengue fever incidence data from 2021 to 2025. All collected data then underwent a data processing stage, including editing, coding, data entry, and cleaning to ensure there were no input errors or categorization errors. Subsequently, the data were analyzed univariately to describe the distribution of each variable, and bivariately using the chi-square test with a significance level of 0.05 to determine the relationship between the independent and dependent variables. This analysis is appropriate for cross-sectional studies that aim to examine associations between categorical variables within a single observation period (Emzir, 2021; Sudaryono, 2022;).

The research procedure was carried out through preparation, implementation, and data processing stages. In the preparation stage, the researcher proposed a title, conducted an initial survey, compiled a proposal, attended a proposal seminar, and processed research permits from relevant agencies. In the implementation stage, the researcher collected data from selected respondents, checked the completeness of the instruments, and systematically recorded the results of field observations. In the final stage, the researcher analyzed the data using statistical software and compiled an interpretation of the results based on the research objectives. The entire process was carried out in accordance with ethical research principles, including providing informed consent, ensuring confidentiality of respondents' identities, and ensuring the participant's right to refuse or discontinue participation at any time. With this process, the research is expected to produce valid, scientifically accountable, and relevant findings to support community-based dengue control in the Kenali Besar Community Health Center (Puskesmas Kenali Besar) work area.

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1 Frequency Distribution of Respondents by Gender, Age, Education and Occupation in the Kenali Besar Community Health Center Working Area in 2026

Respondent Characteristics		Frequency (f)	Percentage (%)
Gender			
	Man	19	17.3
	Woman	91	82.7
Age			
	21-30 Years	21	14.3
	31-40 Years	20	13.6
	41-50 Years	38	25.9
	51-60 Years	45	30.6
	61-70 Years	20	13.6
Education			
	Elementary School	7	6.4

	Junior High School/School	17	15.5
	High School/Senior High School	46	41.8
	Diploma/Bachelor's Degree	32	29.1
Work			
	Private employees	18	12.2
	Trader/Entrepreneur	25	17.0
	Civil Servants/Police/TNI	14	9.5
	IRT (Housewife)	73	49.7
	Laborer	11	7.5
	Retired	6	4.1
Total		**110**	**100**

Based on Table 1, respondents were predominantly female, aged 51–60 years, with a high school education, and most of them worked as housewives.

Univariate Analysis

Table 2 Frequency Distribution of Houses with the Presence of Aedes Sp Mosquito Larvae in the Kenali Besar Community Health Center Work Area

No	The presence of larvae	Frequency (f)	Percentage (%)
1	There is	32	29.1
2	There isn't any	78	70.9
	Total	110	100

The results of the study showed that of the total of 110 houses inspected, 78 houses were not found to have mosquito larvae, or 70.9%, while 32 houses or 29.1% were found to have mosquito larvae.

Table 3 Percentage of Respondents Based on Knowledge in the Work Area of Kenali Besar Community Health Center

No	Knowledge	Frequency (f)	Percentage (%)
1	Not enough	62	56.4
2	Good	48	43.6
	Total	110	100

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It can be seen that the majority of respondents have a low level of knowledge, namely 62 respondents (56.4%), while respondents with good knowledge are 48 respondents (43.6%).

Table 4 Percentage of Respondents Based on Attitudes in the Kenali Besar Community Health Center Work Area

No	Attitude	Frequency (f)	Percentage (%)
1	Negative	44	40.0
2	Positive	66	60.0
	Total	110	100

The results of the study showed that 66 respondents had a positive attitude with a percentage of 60.0%, while 44 respondents or 40.0% had a negative attitude.

Table 5 Percentage of Respondents Based on Actions in the Kenali Besar Community Health Center Work Area

No	Action	Frequency (f)	Percentage (%)
1	Not enough	52	47.3
2	Good	58	52.7
	Total	110	100

The results of the study showed that 58 respondents (52.7%) had good actions, while 52 respondents (47.3%) had poor actions.

Table 5 Percentage of Respondents Based on the Role of Health Workers in the Work Area of the Kenali Besar Community Health Center

No	The Role of Health Workers	Frequency (f)	Percentage (%)
1	Not enough	52	47.3
2	Good	58	52.7
	Total	110	100

The results of the study showed that 58 respondents (52.7%) rated the role of health workers as good, while 52 respondents (47.3%) rated it as poor.

Table 6 Percentage of Respondents Based on Temperature in the Kenali Besar Community Health Center Work Area

No	Air temperature	Frequency (f)	Percentage (%)
1	Eligible (No risk)	70	63.3
2	Not eligible (at risk)	40	36.4
	Total	110	100

The results of the study showed that as many as 70 respondents with a percentage of 63.3% had a non-risky air temperature and 40 respondents with a percentage of 36.4% had a risky air temperature.

Table 7 Percentage of Respondents Based on Humidity in the Kenali Besar Community Health Center Work Area

No	Air temperature	Frequency (f)	Percentage (%)
1	Eligible (No risk)	71	64.5
2	Not eligible (at risk)	39	35.5
	Total	110	100

The results of the study showed that as many as 71 respondents with a percentage of 64.5% had non-risky humidity and 39 respondents with a percentage of 35.5% had risky humidity.

Bivariate Analysis

Table 8 The relationship between knowledge and the presence of Aedes sp mosquito larvae

Knowledge	The presence of Aedes Sp mosquito larvae						OR (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
Not enough	24	38.7	38	61.3	62	100.0	3,158	
Good	8	16.7	40	83.3	48	100.0	1,265-	0.012
Total	32	29.1	78	70.9	110	100.0	7,885	

Based on Table 9, respondents' knowledge is significantly related to the presence of Aedes sp. larvae. Respondents with good knowledge mostly did not find larvae, while in the less knowledgeable group, the proportion of larvae found was greater. The Chi-Square test results showed a p value = 0.012, and an OR value of 3.158 indicating that respondents with less knowledge had a 3.158 times greater risk of finding larvae compared to respondents with good knowledge.

Table 9 The Relationship between Attitude and the Presence of Aedes Sp Mosquito Larvae

Attitude	The presence of Aedes Sp mosquito larvae						0R (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
Negative	19	43.2	25	56.8	44	100.0	3,098	
Positive	13	19.7	53	80.3	66	100.0	1,323-7,255	0.008
Total	32	29.1	78	70.9	110	100.0		

Based on Table 10, respondents' attitudes were significantly related to the presence of Aedes sp. larvae. Respondents with positive attitudes were less likely to find larvae, while respondents with negative attitudes were more likely to find larvae, with a p value of 0.008 and an OR of 3.098, indicating a risk approximately 3 times greater in the negative attitude group.

Table 10 The Relationship between Actions and the Presence of Aedes Sp Mosquito Larvae

Action	The presence of Aedes Sp mosquito larvae						0R (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
Not enough	22	42.3	30	57.7	52	100.0	3,520 1,466-8,450	0.004
Good	10	17.2	48	82.8	58	100.0		
Total	32	29.1	78	70.9	110	100.0		

Based on Table 11, respondents' actions were significantly related to the presence of Aedes sp. larvae. Respondents with good actions were more likely to not find larvae, while in the less action group, the proportion of larvae found was higher, with a p value of 0.004 and an OR of 3.520, indicating a risk approximately 3 times greater in respondents with less action.

Table 11 The Relationship between the Role of Health Workers and the Presence of Aedes Sp Mosquito Larvae

The Role of Health Workers	The presence of Aedes Sp mosquito larvae						0R (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
Not enough	9	17.3	43	82.7	52	100.0		
Good	23	39.7	35	60.3	58	100.0	0.319	0.010
Total	32	29.1	78	70.9	110	100.0	0.131-0.776	

Based on Table 12, the role of health workers is significantly related to the presence of Aedes sp. larvae. Respondents who assessed the role of health workers as good tended to find more larvae, while in the group with poor assessments, the proportion of no larvae found was greater, with a p value of 0.010 and an OR of 0.319.

Table 12 The Relationship between Temperature and the Presence of Aedes Sp Mosquito Larvae

Air temperature	The presence of Aedes Sp mosquito larvae						0R (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
No Risk	16	50.0	16	50.0	32	100.0	0.444 0.191-1.033	0.057
At risk	54	69.2	24	30.8	78	100.0		
Total	70	63.6	40	36.4	110	100.0		

Based on Table 13, house temperature is not significantly related to the presence of Aedes sp. larvae. Although more larvae were found in houses with risky temperatures, the Chi-Square test results showed a p-value of 0.057, so the relationship was not statistically significant, with an OR of 0.444 indicating that houses with non-risky temperatures had a lower chance of finding larvae.

Table 13 The Relationship between Humidity and the Presence of Aedes Sp Mosquito Larvae

Humidity	The presence of Aedes Sp mosquito larvae						0R (95% CI)	P-Value
	There is		There isn't any		total			
	n	%	n	%	n	%		
No Risk	58	81.7	13	18.3	71	100.0	10,038 4,050-24,884	0,000
At risk	12	30.8	27	69.2	38	100.0		
Total	70	63.6	40	36.4	110	100.0		

Based on Table 14, humidity is significantly related to the presence of Aedes sp. larvae. Houses with low humidity levels actually have more larvae found, and the Chi-Square test results show a p-value of 0.000 with an OR of 10.038, which means the chance of finding larvae is approximately 10 times greater in houses with low humidity levels.

Discussion

1. The Relationship Between Knowledge and the Presence of Aedes Sp Mosquito Larvae

   Public knowledge about dengue fever and PSN is a basic factor that shapes preventive attitudes and behavior, thus greatly determining the success of controlling Aedes sp. larvae at the household level (Notoatmodjo, 2012;). The results of your study show that respondents with good knowledge tend not to find larvae, while in the group with less knowledge the proportion of larvae found is higher, and the relationship is statistically significant with a p value of 0.012. This finding is in line with studies showing that better knowledge is associated with better PSN behavior and a reduced risk of the presence of larvae in the community (Mardiah et al., 2023; Rahmawati et al., 2022;).

   Theoretically, education and exposure to health information influence an individual's ability to understand risks and consistently implement preventive measures. In your study, the predominance of

respondents with a high school education indicates that health literacy levels have the potential to influence acceptance of information about dengue fever, especially if supported by routine counseling from community health centers. Other evidence also suggests that environmental health counseling and interactive education can increase public awareness of maintaining a mosquito-free environment and encourage more active use of available health services (). Therefore, strengthening risk communication through easily understood media, such as posters, group counseling, and mentoring of cadres, remains relevant as a practical strategy to improve dengue fever prevention behavior ().

Based on these findings, the results of this study confirm that knowledge is not merely a cognitive variable, but rather the foundation of preventive behavior directly related to the presence of Aedes sp. larvae in the home environment. Consequently, health agencies need to maintain and expand PSN education on an ongoing basis, with a more participatory approach to not only increase knowledge but also encourage concrete changes in community action. Therefore, outreach-based interventions, cadre supervision, and strengthening the role of community health centers are crucial to reduce the risk of larvae presence and support more effective dengue control.

2. The Relationship Between Attitude and the Presence of Aedes Sp Mosquito Larvae

Attitude is a person's tendency to respond to an object or condition before it occurs in actual action, thus playing a crucial role in shaping dengue prevention behavior at the household level. In this study, respondents with positive attitudes were more likely to have no Aedes sp. larvae, while those with negative attitudes were more likely to have larvae found, and the relationship was significant with a p-value of 0.008. This finding aligns with various studies showing that attitudes supportive of PSN are closely associated with better prevention practices and a reduced risk of larvae presence in the home environment (Wahyuni et al., 2022; Pratiwi et al., 2023;).

Conceptually, attitudes are influenced by experience, habits, and exposure to health information, so education from community health centers is crucial for shaping more positive behavioral orientations. In the study area, most respondents had received information about dengue fever through counseling, potentially explaining why the positive attitude group was more dominant in mosquito-free homes. Counseling-based interventions and cadre training, including a training-of-trainers model for health cadres, have also been reported to strengthen community understanding and awareness of dengue fever control ().

Thus, the results of this study confirm that attitudes are not merely views, but psychosocial factors that directly contribute to the success of the National Population and Disaster Mitigation Program (PSN). The negative attitudes still found among some respondents indicate that health education needs to be carried out more comprehensively, routinely, and participatory in all sub-districts within the Kenali Besar Community Health Center's coverage area. Strengthening the role of health workers and local cadres is a logical strategy to shape community attitudes that are more supportive of Aedes sp. larvae prevention efforts.

3. Relationship between Actions and the Presence of Aedes Sp Mosquito Larvae

Mosquito Nest Eradication (PSN) is a concrete form of behavior that is very important in determining the success of controlling Aedes sp. larvae at the household level, because this action directly cuts off the mosquito breeding ground before it becomes an adult vector. In this study, respondents with good actions were more likely to not find larvae, while in the less action group the proportion of larvae found was higher, and the relationship was statistically significant with a p value of 0.004. This finding is in line with the literature which confirms that PSN 3M Plus, namely draining, covering, and recycling used goods, plus actions such as larviciding and maintaining the home environment, is the most effective strategy to reduce the density of larvae ().

Empirically, your research results indicate that consistent prevention practices are associated with cleaner home environments and fewer mosquito larvae. Conversely, the continued presence of open water containers, the habit of not regularly emptying water reservoirs, and the presence of used items that collect rainwater indicate that preventive measures have not been optimally implemented by some respondents. Field evidence and vector control reports also emphasize that household-based control will only be effective if communities implement PSN routinely, not only when dengue cases occur ().

These results support previous findings that community action is closely related to the presence of mosquito larvae and is a key factor in dengue control. Theoretically, action is the concrete implementation of knowledge and attitudes, so educational interventions need to be followed by regular mentoring and monitoring to ensure preventive behaviors are truly implemented at home. Therefore, strengthening the role of health workers and mosquito larvae control cadres is crucial to ensure the sustainable implementation of the National Population and Disaster Mitigation Program (PSN), while ensuring that the community not only understands but also consistently implements preventive measures in their homes.

4. The Relationship between the Supervision of the Role of Health Workers and the Presence of Aedes Sp Mosquito Larvae

   The role of health workers has been shown to be associated with the presence of Aedes sp. larvae. Respondents who assessed the role of health workers as good tended not to find larvae, while those who assessed the role of health workers as poor still found larvae. Therefore, education and counseling from health workers are important factors in dengue fever prevention.

   These findings indicate that health workers play a role not only as information providers but also as drivers of behavioral change in the community through outreach, larva monitoring, and assistance with the National Mosquito Control Program (PSN). However, observations also show that this role is not always optimal, as larvae are still found in some health cadres' homes, indicating a gap between knowledge and practice. Therefore, the role of health workers needs to be strengthened through ongoing education, routine monitoring, and evaluation of the implementation of PSN to ensure more effective mosquito larvae control in the community.

5. The Relationship Between Temperature and the Presence of Aedes Sp Mosquito Larvae

   Temperature did not show a significant relationship with the presence of Aedes sp. larvae in this study, with a p-value of 0.057. Although more larvae were found in homes with risky temperatures, the temperature differences between homes were not significant, so the effect was not statistically significant.

   In contrast, humidity showed a significant relationship with the presence of Aedes sp. larvae, with a p-value of 0.000. Houses with high humidity are more likely to have larvae, especially in houses with poor ventilation and poor air circulation.

CONCLUSION

Based on the research results, factors significantly related to the presence of Aedes sp. larvae are knowledge, attitudes, PSN actions, the role of health workers, and humidity, while air temperature did not show a statistically significant relationship. This finding confirms that larva control in the Kenali Besar Community Health Center work area is more strongly influenced by behavioral aspects and home microenvironmental conditions than temperature alone, so that prevention efforts need to be focused on increasing knowledge, forming positive attitudes, and consistent implementation of the 3M Plus PSN.

However, the results of this study have limitations because the cross-sectional design only describes relationships at a single point in time and therefore cannot confirm cause and effect. Variable measurement

relies on questionnaires and household observations, and the results only reflect the conditions of respondents in the study area. Future research is recommended to use a more robust longitudinal or analytical design, add variables such as home sanitation conditions, larvicide use behavior, and neighborhood density, and involve a broader sample to make the results more general and sharper for policymaking. Practically, community health centers and local governments need to strengthen education, jumantik visits, and routine household-based PSN monitoring to more effectively suppress the presence of larvae.

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