FACTORS THAT AFFECT DENGUE PREVENTION EFFORTS IN THE WORKING AREA OF THE PEUSANGAN KEC HEALTH CENTER. BIREUEN ACEH REGENCY

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Abstract

Dengue Hemorrhagic Fever (DHF) is an infectious disease transmitted through the bite of the Aedes aegypti mosquito and is still a public health problem. Dengue cases in the work area of the Peusangan Health Center continue to increase every year, so it becomes a threat to family health. This study aims to find out the factors that affect dengue prevention efforts in the working area of the Peusangan Health Center, Peusangan District, Bireuen Regency. The study uses a quantitative design with an analytical survey through a cross sectional study approach. The population is the entire community in nine villages with a total of 19,271 families. The sample was determined by stratified random sampling of 99 families. Data analysis was carried out in univariate, bivariate, and multivariate manners. The results of the study show that education, knowledge, attitudes, the role of health workers, water reservoirs, and the existence of waste have an effect on dengue prevention efforts. The most dominant factor was education with a value of p = 0.000 < 0.025; CI 95% = 5,389–316,539; and OR = 41.154. It was concluded that the educational variable has an important role in the prevention of dengue. The Peusangan Health Center is advised to conduct regular larval checks every three months, carry out fogging, and improve health promotion through the application of the 3M Plus principle to reduce the incidence of dengue incidence.

Keywords : Education, Knowledge, Attitude, Role of Health Workers, Water Shelters, Presence of Waste, Dengue Disease Prevention Efforts

Introduction

Dengue Hemorrhagic Fever (DHF) is still one of the main public health problems in the world, especially in tropical and subtropical countries. This disease is caused by dengue virus infection transmitted through the bite of Aedes aegypti and Aedes albopictus mosquitoes (WHO, 2023). According to the WHO (2023), more than 3.9 billion of the world's population or about 40% of the population are at risk of being infected with the dengue virus, with reported cases increasing sharply in the last two decades. The number of cases recorded in 2000 of 505,430 cases jumped to more than 4.2 million cases in 2020, indicating that the disease is still a serious global threat (WHO, 2023).

Indonesia is one of the dengue endemic countries with the number of cases continuing to increase every year. The Indonesian Health Profile in 2022 recorded 138,127 dengue cases with 919 deaths, an increase compared to the previous year (Ministry of Health of the Republic of Indonesia, 2023). Tropical climate conditions, high population density, and community behavior that does not support mosquito nest eradication efforts make Indonesia a very vulnerable region to the spread of this disease, especially in the rainy season (Ministry of Health of the Republic of Indonesia, 2023; WHO, 2023).

Aceh Province is one of the regions that has experienced a significant increase in dengue cases. In 2024, there will be 4,135 cases with 30 deaths, with an incidence rate of 59.9 per 100,000 population

and a case fatality rate of 0.7% (Aceh Health Office, 2024). This figure is still above the national target which sets an IR of < 49 per 100,000 population and a CFR of < 1% (Ministry of Health of the Republic of Indonesia, 2022). One of the areas that has become an endemic area is the Peusangan Health Center of Bireun Regency, where the number of cases continues to increase from year to year. Data shows that in 2020 there were 16 cases, increasing to 33 cases in 2024, even with deaths recorded in 2023.

Control efforts have actually been carried out through various programs such as counseling, mosquito nest eradication (PSN), distribution of abate powder, fogging, and periodic larval monitoring. However, the achievement of the Larvae-Free Rate (ABJ) in this region is still not in line with the national target of 95%, because in 2024 it will only reach 79.53% (Aceh Health Office, 2024). The geographical condition of the Peusangan area, which is located on the banks of rivers and swamps, as well as the low knowledge, attitudes, and behaviors of the community in the prevention of dengue, are factors that worsen the situation. There are still many people who do not routinely drain the bathtub, do not close water reservoirs, and leave used items that have the potential to become mosquito breeding grounds (Notoatmodjo, 2010).

Previous research has shown a significant relationship between environmental factors and the presence of Aedes aegypti larvae. Water containers such as bathtubs and crocks are the most places where larvae are found (Ariantio, 2019), while other studies have shown that water reservoirs have a meaningful relationship with the presence of mosquito larvae (Pratiwi et al., 2017). Behavioral factors also play an important role, where prevention practices by housewives are influenced by knowledge, attitudes, education levels, and support of health workers (Widjanarko et al., 2015; Sari, 2018).

Seeing this phenomenon, it is important to know the factors that affect efforts to prevent dengue disease in the community, especially in the working area of the Peusangan Health Center, Bireun Regency. This research is expected to provide an overview of the actual conditions in the field and be the basis for designing a more effective, sustainable, and targeted dengue prevention and control strategy.

Method

This study uses a quantitative design with an analytical survey and a cross sectional study approach. The research was carried out in the working area of the Peusangan Health Center, Bireuen Regency, Aceh, which consisted of nine villages. The research period lasts from September 2024 to June 2025, starting from the initial survey to the preparation of the report. The research population is all heads of families (19,271 households) in the work area. Samples were calculated using the Slovin formula with a precision level of 10%, 99 households were obtained. The sampling technique is stratified random sampling with a proportional distribution in each village. Primary data were obtained through closed questionnaires, secondary data from Puskesmas documents, and tertiary data from WHO/Ministry of Health journals and reports. The questionnaire instrument was tested for validity using the correlation of Product Moment (all question items are valid) and reliability with Cronbach's Alpha (>0.60) which was declared reliable (Muhammad, 2016).

Research Results
Respondent Characteristics
Based on Table 4.1, the majority of respondents were 25–29 years old (50.5%), male (72.7%), and junior high school educated (49.5%). The main jobs of the respondents were farmers (60.6%), while some others worked as housewives (13.1%), laborers (11.1%), civil servants (8.1%), and self-employed (7.1%).

Table 1. Characteristics of Respondents (n = 91)

Characteristics	Category	f	%
Age (years)	25–29	50	50,5
	30–34	33	33,3
	35–39	14	14,1
	40–44	2	2,0
Gender	Man	72	72,7
	Woman	27	27,3
Education	SD	7	7,1
	SMP	49	49,5
	SMA	24	24,5
	D3–S1	19	16,2
Work	Farmer	60	60,6
	Self employed	7	7,1
	PNS	8	8,1
	IRT	13	13,1
	Laborer	11	11,1
Total		99	100,0

Bivariate Analysis
Bivariate analysis with the Chi-square test showed that all independent variables had a significant relationship with dengue disease prevention efforts ($p < 0.05$). Respondents with higher education, good knowledge, positive attitudes, good judgment on the role of health workers, uncovered water reservoirs, and poor waste management did more efforts to prevent dengue.

Table 2. Relationship of Independent Factors with Dengue Prevention Efforts (n=99)

Variabel	Category	Good Prevention Efforts n (%)	p-value
Education	Tall	16 (88,9)	0,000
Knowledge	Good	16 (64,0)	0,000
Attitude	Positive	25 (58,1)	0,000
The role of health workers	Good	20 (87,0)	0,000
Water reservoirs	Uncovered	22 (62,9)	0,000
The presence of garbage	Bad	20 (54,1)	0,001

Multivariate Analysis

The most dominant variable was education (OR=41,303), followed by knowledge (OR=41,154).

Table 3. Results of Logistic Regression Analysis of Factors Affecting Dengue Prevention Efforts (n=99)

Variabel	OR	95% CI	p-value
Education	41,3	5,4 – 316,5	0,000
Knowledge	41,2	4,4 – 384,3	0,001

Discussion

1. The Influence of Education on Dengue Disease Prevention Efforts

Statistically, education has a significant effect on dengue prevention efforts (p = 0.000). The composition of respondents is dominated by low education (81.8%), in line with prevention practices that are still not good. These results are consistent with Tomia's (2020) research which shows that education is related to dengue vector control in Ternate City (p = 0.000), Bongakaraeng (2019) in South Sulawesi (p = 0.023), and Hasyim (2021) in Jambi (p = 0.010).

According to Notoatmodjo (2012), education influences the learning process that shapes knowledge, attitudes, and behaviors. Highly educated individuals are more likely to receive health information, so they are better prepared to apply the 3M Plus principles. Field findings showing that the majority of respondents are basic educated explain the low understanding of the relationship between the environment and dengue risk.

2. The Influence of Knowledge on Dengue Disease Prevention Efforts

Knowledge had a significant effect (p = 0.000) with 74.7% of respondents still in the "poor" category. These results are in line with Tomia (2020), Mayasari (2022), and Bongakaraeng (2021) who found a significant relationship between knowledge and vector control practices.

Knowledge is the main predisposing factor (Notoatmodjo, 2010). Without a complete understanding, people often misunderstand, for example considering fogging as the main solution. In fact, fogging only kills adult mosquitoes and is ineffective without PSN 3M Plus (Ministry of Health of the Republic of Indonesia, 2023).

3. The Influence of Attitude on Dengue Disease Prevention Efforts

The association attitude was significant (p = 0.000), but 56.6% of respondents still had a negative attitude. These results are consistent with Tomia (2020), Mayasari (2020), and Bongakaraeng (2021). According to Notoatmodjo (2012), attitude is a predisposition to act, so negative attitudes can hinder the implementation of PSN.

4. The Influence of the Role of Health Workers on Dengue Disease Prevention Efforts

The role of health workers was significantly related (p = 0.000). Research by Liestyana (2021) and Azam (2020) also reported similar results. In health promotion theory, health workers act as facilitators, educators, motivators, and supervisors (Notoatmodjo, 2012). The PSN 3M Plus program has proven to be effective when combined with periodic larval monitoring (Ministry of Health of the Republic of Indonesia, 2020).

5. The Effect of Water Reservoirs on Dengue Disease Prevention Efforts

Water reservoirs were significantly associated (p = 0.000). This is in line with the research of Sutomo (2019), Gloria et al. (2021), and Purnianto (2020) which found the relationship between water containers and the presence of Aedes aegypti larvae. WHO research (2023) also confirms that open water containers are the main habitat for dengue mosquitoes in tropical countries.

6. The Effect of the Presence of Waste on Dengue Disease Prevention Efforts

The presence of waste was significantly related (p = 0.001). Research by Sutomo (2019) and Gloria et al. (2021) supports this finding. Used containers such as cans, plastic bottles, and used tires are the main breeding grounds for Aedes aegypti mosquitoes (WHO, 2023).

Conclusion

This study shows that education, knowledge, attitudes, the role of health workers, water reservoirs, and the existence of waste have a significant effect on efforts to prevent Dengue Hemorrhagic Fever (DHF) in the Working Area of the Peusangan Health Center, Bireuen Regency, Aceh. The multivariate analysis confirmed that education and knowledge were the most dominant factors influencing prevention practices, with respondents with higher education and knowledge having about 41 times greater chance of making preventive efforts than respondents with lower education and less knowledge.

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