Factors Influencing Efforts to Prevent DHF in the Community Health Center

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Abstract

Dengue hemorrhagic fever (DHF) is an illness spread by the Aedes aegypti mosquito, which is infected with the dengue virus from the genus Flavivirus, family Flaviviridae. The research set out to identify what elements in the Working Area of the Sungai Guntung Public Health Center in the Kateman District of the Indragiri Hilir Regency of Riau were most influential in dengue prevention efforts. An analytical survey using a Cross Sectional Study design is used to conduct the quantitative study. All 19,271 adults living in the nine-village Sungai Guntung Health Center Working Area were included in the analysis. Up to 99 family heads were included in the Stratified Random Sample. Univariate, bivariate, and multivariate analyses were employed to examine the data. Education, knowledge, attitudes, the role of health workers, water storage, and the presence of garbage were all found to be related to efforts to prevent DDB in the Working Area of the Sungai Guntung Health Center in the Kateman District of the Indragiri Hilir Regency of Riau. P = 0.000 0.025, 95% CI = 5.389-316.539, OR = 41.154; the most important factor is level of education. In order to avoid DDB in the Working Area of the Sungai Guntung Health Center in the Kateman District of the Indragiri Hilir Regency of Riau, the study's authors recommend focusing on education, knowledge, attitudes, the role of health professionals, water reservoirs, and the presence of rubbish.

Introduction

Dengue Hemorrhagic Fever (DHF) is a compelling infectious ailment that arises from the dengue virus, belonging to the esteemed genus Flavivirus and the esteemed family Flaviviridae. This pernicious virus is primarily disseminated to humans through the nefarious bite of an Aedesaegypti mosquito, which has been tainted with the dengue virus. The dengue virus exhibits a fascinating diversity with its classification into four distinct serotypes, aptly named Den-1, Den-2, Den-3, and Den-4. Dengue fever, a formidable affliction, has the potential to assail individuals indiscriminately, culminating in fatal outcomes (KKRI, 2020).

The dengue virus is a formidable ailment that thrives within the environment, posing a significant public health concern. This infectious disease is primarily instigated by the dengue virus, which is efficiently transmitted through the bite of the Aedes aegypti mosquito. The consequences of contracting this virus can be dire, as it has the potential to induce rapid fatality through hemorrhaging and various physiological disturbances. Dengue Hemorrhagic Fever (DHF) is a malady that arises as a consequence of inadequate environmental sanitation conditions, which fail to meet the requisite health standards (Hidayani, 2022; Nurhayati et al., 2021). Dengue Hemorrhagic Fever (DHF) is a contagious ailment that arises from the pathogenic activity of four distinct dengue viruses. The primary mode of transmission occurs through the bites of mosquitoes, particularly the species Aedes aegypti and Aedes albopictus.

These vectors are predominantly prevalent in regions characterized by tropical and subtropical climates, encompassing the geographical expanse from the Indonesian archipelago to the northern reaches of Australia (Achmadi, 2015).

In recent decades, there has been a significant surge in the incidence of dengue cases worldwide, as reported by the World Health Organization (WHO, 2020). The global populace faces a substantial threat of dengue fever infection, with an estimated 3.9 billion individuals, surpassing 40% of the world's population, falling within the vulnerable category. At present, dengue fever has established itself as an endemic ailment in over 100 nations across the globe. The majority of instances exhibit an absence of symptoms and can be effectively managed without external intervention. Henceforth, it can be posited that the veritable magnitude of dengue cases remains inadequately documented. Numerous instances are erroneously diagnosed, erroneously classified as alternative febrile ailments. The World Health Organization (WHO) has witnessed a remarkable surge in the incidence of dengue cases, with an exponential growth of over eight times within the span of the past twenty years. This escalation is evident in the statistical data, as the number of reported cases escalated from a modest 505,430 in the year 2000 to a staggering 2.4 million in 2010. Furthermore, the year 2020 witnessed an even more substantial surge, with the reported cases reaching a staggering 4.2 million.

According to the Indonesian Health Profile of the year 2020, a notable number of 138,127 cases of dengue fever were documented and reported. There has been a notable surge in the numerical magnitude, with an increase of 65,602 cases when juxtaposed with the corresponding figures from the preceding year of 2018. The mortality rate attributed to dengue fever in the year 2019 witnessed a notable surge when juxtaposed with the preceding year of 2018, with a lamentable escalation from 467 to 919 fatalities. The measurement of illness and mortality can be effectively captured through the utilization of two key indicators: the Indicator Incidence Rate (IR) per 100,000 individuals and the Case Fatality Rate (CFR) expressed as a percentage (Kemnakes, 2020).

In the year 2020, Riau Province encountered a notable occurrence of dengue fever, with a total of 4,135 reported cases and a regrettable loss of 30 lives. This translates to an incidence rate (IR) or morbidity rate of 59.9 per 100,000 individuals within the population. Furthermore, the case fatality rate (CFR) or mortality rate stood at a solemn 0.7%. In contrast to the data from the preceding year, a noteworthy surge in instances was observed, wherein the incidence rate or morbidity rate reached a value of 12.44 per 100,000 individuals within the population. In 2015, a notable surge in the Case Fatality Rate (CFR) pertaining to Dengue Fever was observed, with a marked increase to 0.6%. However, it is worth noting that no significant outbreaks were reported during this period. Subsequently, from 2016 to 2019, a discernible downward trend in the CFR associated with Dengue Fever has been observed, indicating a decline in the mortality rate. Based on empirical evidence, it has been observed that the incidence of dengue fever exhibits a notable surge at regular intervals of approximately five years. In the realm of dengue fever, fatalities are deemed significant when the Case Fatality Rate (CFR) exceeds 1%. Consequently, in the year 2020, a solitary administrative division stands out with an elevated CFR. Rohul Regency, boasting a CFR of 2.2%, emerges as the epicenter of concern, closely followed by Inhil Regency with a CFR of 1%.

New cases of Dengue Fever (incidence rate) in Riau Province in 2019-2020 increased from 12 per 100,000 to 59.9 per 100,000 population, where the target that has been determined is <49 per 100,000 population. Likewise, almost all districts/cities have experienced an increase. The district that experienced a high increase in dengue fever cases was Bengkalis district, where in 2019 12 dengue fever cases were found per 100,000 population, increasing in 2020 to 194 per 100,000 population. Meanwhile, Indra Hilir Regency found 12 dengue fever cases per 100,000 population (8) DKPR (2020).

The incidence of dengue fever is influenced by many factors, one of which is clean and healthy living behavior in the community (Ismainar etal., 2021; Rakhmani et al., 2018). Several factors are needed, such as predisposing factors, such as public knowledge about how to prevent dengue fever, as well as community attitudes towards housewives' efforts to prevent dengue fever, as well as maternal education. Then also other supporting factors are enabling factors such as the provision of facilities and infrastructure or facilities for health behavior to occur. As well as reinforcing factors including the attitudes and roles of officers who support dengue prevention efforts.

Environmental conditions that allow the Aedes aegypti mosquito to live are factors that encourage the occurrence of dengue fever. Breaking the chain of dengue transmission is the right way to prevent the occurrence of this disease. Eradicating mosquito larvae/larvans is the right way to prevent dengue fever (Depkes, 2014). Community behavior should reflect what is being done in order to increase the highest level of health, knowledge, attitudes and actions regarding efforts to prevent dengue fever, which is an infectious disease that is influenced by environmental conditions, education and community behavior. The process of knowledge is a fundamental problem in efforts to prevent dengue fever (Notoadmojo, 2010)

Methods

The research design uses quantitative methods using an analytical survey using a Cross Sectional Study approach, which is a research design where the independent variable and dependent variable are measured and collected at the same time. The population in this study was the entire community in the Sungai Guntung Community Health Center Working Area, Kateman District, Indragiri Hilir Regency, Riau, consisting of 9 villages, namely 19,271 heads of families, while the sample was determined using the Slovin Formula as many as 99 heads of families.

Results and Discussion

Univariate Analysis

Table 1. Distribution of Respondents' Education in the Working Area of Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

Education	f	%
Low (elementary, junior, high school)	81	81,8
High (Diploma, Bachelor, Master)	18	18,2
Total	99	100,0

According to the findings shown in Table 1, it was observed that out of the total 99 participants included in the study, a majority of 81 individuals (81.8%) had a lower level of education, namely elementary, junior high, or high school. Conversely, a smaller proportion of 18 individuals (18.2%) had attained a higher level of education, namely D3, S1, or S2.

Table 2. Distribution of Respondents' Knowledge in the Working Area of the Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

Knowledge	f	%
Not Good	74	74,7
Good	25	25,3
Total	99	100,0

According to the data shown in Table 2. The data indicates that out of the 99 participants examined, 74 individuals (74.7%) exhibited a lack of understanding, whereas 25 individuals (25.3%) shown a satisfactory level of knowledge.

Table 3 Distribution of Respondents' Attitudes in the Working Area of the Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

Attitude	f	%
Negative	56	56,6
Positive	43	43,4
Total	99	100,0

Table 3 reveals that of the 99 respondents surveyed, 56 (or 56.6%) had unfavorable views, while 43 (or 43.4%) held good views.

Table 4. Distribution of the Role of Health Workers in the Working Area of the Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

The Role of Health Workers	f	%
Not Good	76	76,8
Good	23	23,2
Total	99	100,0

Table 4 demonstrates that 76 (or 76.8%) of the 99 respondents had subpar officer responsibilities, whereas 23 (or 23.2%) had excellent responsibilities.

Table 5. Distribution of Water Reservoirs in the Working Area of the Guntung River Health Center, Kateman District, Indragiri Hilir Regency, Riau

Water Reservoirs	f	%
Exist	64	64,6
None	35	35,4
Total	99	100,0

As seen in table 5. It reveals that as many as 64 (64.6%!) of the 99 respondents analyzed had water reservoirs, while as many as 35 (35.4%!) do not.

Table 6. Distribution of Waste in the Working Area of the Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

The Existence of Garbage	f	%
Exist	62	62,6
None	37	37,4
Total	99	100,0

Table 6 shows that 62 (or 62.6%) of the 99 respondents tested reported seeing rubbish, whereas 37 (or 37.4%) reported seeing no waste.

Table 7. Distribution of DHF Prevention Efforts in the Working Area of the Sungai Guntung Health Center, Kateman District, Indragiri Hilir Regency, Riau

DHF Prevention Efforts	f	%
Not Good	66	66,7
Good	33	33,3
Total	99	100,0

Table 7 reveals that, out of the total of 99 respondents, 66 (66.7%) say they are not making enough of an effort to avoid dengue sickness, while 33 (33.3%) say they are making enough of an effort.

Bivariate Analysis

Following univariate analysis, researchers performed bivariate analysis using the Chi-Square test to examine the significance of the correlation between the independent and dependent variables at the significance level of the statistical computation (p0.05).

The Relationship of Education to Dengue Disease Prevention Efforts

Table 8. The Relationship of Education to Dengue Disease Prevention Efforts

Education	DHF Prevention Efforts				Total		P value
	Not Good		Good				
	f	%	f	%	f	%	
Low (elementary, junior high, high school)	64	64,6	17	17,2	81	81,8	
High (D3, S1, S2)	2	2,1	16	16,1	18	18,2	0,000
Total	66	66,7	33	33,3	99	100,0	

The findings of the Chi-Square test indicate that there is no statistically significant association between education and attempts to avoid dengue illness, at least not at the level of significance set by the research (p = 0.000). Education has a substantial association with attempts to avoid dengue fever, as shown by this study, which meets the criteria of the relationship hypothesis requirements.

Knowledge Relationship to Dengue Disease Prevention Efforts

Table 9. Knowledge Relationship to Dengue Disease Prevention Efforts

Knowledge	DHF Prevention Efforts				Total		P value
	Not Good		Good				
	f	%	f	%	f	%	
Not Good	57	57,6	17	17,2	74	74,7	
Good	9	9,1	16	16,1	25	25,3	0,000
Total	66	66,7	33	33,3	99	100,0	

The findings of the Chi-Square analysis test indicate that the p-value is 0.000 from the value of 0.05, indicating that there is no significant association between knowledge and attempts to avoid dengue sickness. Knowledge has a substantial association with attempts to avoid dengue sickness, as shown by the findings of this investigation, which fit the criteria of the prerequisites of the relationship hypothesis.

The Relationship of Attitudes Towards Dengue Disease Prevention Efforts

Table 10. The Relationship of Attitudes Towards Dengue Disease Prevention Efforts

Sikap	DHF Prevention Efforts				Total		P value
	Not Good		Good				
	f	%	f	%	f	%	
Negative	48	48,5	8	8,1	56	56,6	0,000
Positive	18	18,2	25	25,2	43	43,4	
Total	66	66,7	33	33,3	99	100,0	

The findings of the Chi-Square test indicate that there is no significant link between attitudes and DHF preventive efforts at the 0.05 level of significance (the level of significance used in this research). It can be determined from this study that attitudes have a strong link with attempts to avoid dengue illness, as they match the criteria of the prerequisites of the relationship hypothesis.

The Relationship of the Role of Health Workers to Dengue Disease Prevention Efforts

Table 11. The Relationship of the Role of Health Workers to Dengue Disease Prevention Efforts

The Role of Health Workers	DHF Prevention Efforts				Total		P value
	Not Good		Good				
	f	%	f	%	f	%	
Not Good	63	63,6	13	13,1	76	76,8	0,000
Good	3	3,1	20	20,2	23	23,2	
Total	66	66,7	33	33,3	99	100,0	

It is known that the p-value is 0.000 from the value of 0.05 based on the findings of the Chi-Square analysis test, which examines the correlation between health professionals' participation in disease prevention and the prevalence of dengue fever. This study' findings are consistent with the requirements of the connection hypothesis, thus it can be inferred that health personnel' roles have a substantial association with the prevention of DHF illness.

The Relationship of Water Reservoirs to Dengue Disease Prevention Efforts

Table 12. The Relationship of Water Reservoirs to Dengue Disease Prevention Efforts

Water Reservoirs	**DHF Prevention Efforts**				**Total**		**P value**
	Not Good		**Good**				
	f	%	f	%	f	%	
Exist	53	53,6	11	11,1	64	64,6	
None	13	13,1	22	22,2	35	35,4	0,000
Total	66	66,7	33	33,3	99	100,0	

The research found that a Chi-Square analysis of the association between water reservoirs and dengue illness prevention efforts yielded a p-value of 0.0000005, which is statistically significant at the 5% level of confidence. It may be determined from this research that water reservoirs have a substantial effect on attempts to avoid dengue illness since the findings are consistent with the requirements of the relationship hypothesis.

The Relationship of the Existence of Waste to Dengue Disease Prevention Efforts

Table 13. The Relationship of the Existence of Waste to Dengue Disease Prevention Efforts

The Existence of Garbage	DHF Prevention Efforts				Total		P value
	Not Good		Good				
	f	%	f	%	f	%	
Exist	49	49,5	13	13,1	62	62,6	0,000
None	17	17,2	20	20,2	37	37,4	
Total	66	66,7	33	33,3	99	100,0	

The p-value for the association between waste and attempts to avoid dengue illness, calculated using a Chi-Square analysis test and assuming a probability value of = 0.05, is known to be 0.001 from the value of 0.05. Because this study's findings are consistent with the requirements of the connection hypothesis, it may be inferred that trash disposal sites play an important role in dengue prevention.

Multivariate Analysis

Stage 1 (*Enter Method* **)**

Table 14. Results of Logistic Regression Test Analysis Factors Affecting Dengue Disease Prevention Efforts

Variable	B	H.E.	Forest	df	Sing	Exp(B)	95%CI
Education	3.689	1.187	9.666	1	.002	40.018	3.910-409.592
Knowledge	3.195	1.210	6.971	1	.008	24.420	2.278-261.781
Behaviour	2.738	.921	8.836	1	.003	15.448	2.541-93.926
The Role of Health Workers	1.450	1.119	1.679	1	.195	4.265	.475-38.269
Water Reservoirs	.649	.998	.422	1	.516	1.913	.270-13.537
The Existence of Garbage	3.102	1.137	7.445	1	.006	22.239	2.396-206.441

Stage 2 (Metode *Backward Stepwise (Conditional)*)

The second stage of the logistic regression test (Backward Stepwise Method (Conditional)) has a p value of 0.025, indicating that education, knowledge, attitudes, the role of health workers, water reservoirs, and the presence of waste all have a significant impact on the dependent variable.

Table 15. Results of Logistic Regression Test Analysis Factors Affecting Dengue Disease Prevention Efforts

Variable	B	H.E.	Forest	df	Sing	Exp(B)	95%CI
Education	3.721	1.039	12.824	1	.000	41.303	5.389-316.539
Knowledge	3.717	1.140	10.636	1	.001	41.154	4.407-384.275

Table 15 shows the outcomes. Based on the data presented above, it can be concluded that education plays a significant role in determining the success of programs designed to reduce the spread of dengue fever in the Sungai Guntung Community Health Center Working Area, Kateman District, Indragiri Hilir Regency, Riau (p = 0.000 0.025, 95% CI = 5,389-316,539).

Education is the process by which one person helps another grow in accordance with principles that shape how people behave and what they do with their life so that they may live in peace and fulfillment. The quality of one's life may be enhanced by acquiring knowledge, such as about health-related resources. Lifestyle choices, as well as attitudes and motivations for contributing to growth, may be influenced by a person's level of education. The more educated a person is, the more likely they are to be receptive to new ideas and information. The dissemination of knowledge is also crucial in the fight against the Aedes aegypti mosquito. Evidenced by the majority of respondents having only completed elementary or middle school, insufficient public education about Aedes aegypti mosquito control has resulted in the persistence of disease vectors like mosquitoes in and around the homes of survey respondents.

The researcher thought that the Aedes aegypti mosquito might be managed with more information. The study shows that most responders had little understanding. Respondents' lack of Aedes aegypti management knowledge has a significant impact on their behavior. To eliminate dengue hemorrhagic fever, substantial effort is required from all quarters to raise awareness and educate the public. Dengue hemorrhagic fever cases and deaths may be reduced in part by increasing awareness of the necessity of eliminating the Aedes aegypti mosquito via regular outreach held by the local health center.

The evaluation of an attitude object yields an attitude, which may then be employed in cognitive, affective (emotional), and behavioral contexts. According to this definition, attitudes

are made up of three main parts: one's thoughts (a term often connected with conversation and education), one's actions (which have the power to affect proper and incorrect reactions), and one's feelings (which lead to consistent replies). (2019) Haryanti.

Because of their familiarity with the area, health care professionals provide valuable contributions to health care teams. A health care provider may either strengthen or diminish an individual's resolve to alter their behavior (Pibrianti, 2022). During outreach, health personnel should act as a guide and provide facts to residents about how to get rid of mosquito breeding grounds. The role of health workers in the control of the Aedes aegypti mosquito extends beyond that of mere facilitators; they also serve as mobilizers and supervisors, providing the community with resources such as home visits to ensure families and communities are aware of and willing to participate in efforts to eliminate mosquito breeding grounds. The growth of larvae in water reservoirs may be reduced by emptying the reservoirs at the appropriate frequency (about once per week). This is due to the fact that the life cycle of an Aedes aegypti mosquito may take up to 8 days. The Aedes aegypti mosquito is not likely to establish a breeding population in this water storage facility.

Conclusion

Aedes aegypti mosquito prevalence is significantly affected by the household head's lack of awareness on mosquito management. To prevent the Aedes aegypti mosquito from multiplying, empty the water reservoir at least once a week, brush the walls, and refill it with clean water to break the mosquito life cycle. In addition, it's important to keep your immediate neighborhood free of debris like old furniture and other items that might serve as breeding grounds for dengue mosquitoes.

Suggestion

The general public in the working area of the Sungai Guntung Community Health Center is expected to better protect the environment around where they live by providing education on disposing of used items that can hold water, closing water reservoirs, draining water reservoirs and using mosquito repellent.

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