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Determinant Factors Related to the Event of Dengue Hemorrhagic Fever (DHF) in the Work Area of Payung Sekaki Health Center, Pekanbaru Regency.

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A R T I C L E I N F O

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Determinant Factors,
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,

ABSTRACT

Dengue hemorrhagic fever (DHF) or dengue hemorrhagic fever (DHF) is currently one of the public health problems in Pekanbaru, Riau. The research design is an Unmatched Case Control Study. The case population is all DHF sufferers from 2019-2021, totaling 194 people and the control population is all non-DHF cases in the same period when DHF occurred in 2019-2-2021, totaling 7,624 people. The number of samples is 180 cases and 180 controls. Data were analyzed by univariate, bivariate and multivariate. The results of multivariate analysis, the most influential variables were the habit of hanging clothes (95% CI = 2,970-8,557), the use of repellents during the day (95% CI = 2,272-6,307), knowledge about dengue transmission (95% CI = 2,108-5,892), presence of larvae (CI 95% = 1.716-4.760), sleep during the day (95% CI = 1.699-4.699). The determinant factors related to the incidence of Dengue Hemorrhagic Fever (DHF) in the Working Area of the Payung Sekaki Health Center are the presence of larvae, daytime sleep habits, hanging clothes habits, daytime use of repellants and knowledge of dengue transmission. While mosquito repellent plants, education, age and gender. It is recommended that the Health Center conduct health education so that people do not hang clothes that have been used, use repellents during the day, do 3M (closing water reservoirs, draining bathtubs, burying), not sleeping during the day and if sleeping during the day need to use tools or mosquito repellent.

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1. Introduction

DHF is still a serious health problem and threat in a number of regions in Indonesia [1],[2]. The reason is that this disease does not only affect the health sector, but also the social and economic sectors of the community [3]. In Indonesia, the number of dengue cases tends to increase from year to year. The increasing number of dengue fever in various cities in Indonesia is caused by the difficulty of controlling diseases transmitted by Ae. Aegypti [4],[5],[6]. The increase in dengue cases continues to occur, especially during the rainy season. The Ministry of Health noted that in 2022, the cumulative number of dengue cases in Indonesia until the 22nd week was reported to be 45,387 cases. Meanwhile, the number of deaths from dengue fever reached 432 cases. Dengue cases have been reported in 449 districts/cities spread across 34 provinces with deaths spread to 162 districts/cities in 31 provinces[7]. Dengue Hemorrhagic Fever (DHF) is an infectious disease caused by the dengue virus with the main vector being Aedes aegypti. Dengue Hemorrhagic Fever (DHF) is still a public health problem in Indonesia with high morbidity and mortality rates and has the potential to cause extraordinary events (KLB). The high incidence of DHF results in high costs of illness that must be borne by DHF patients [8]. In 2016, recorded cases of DHF that occurred in Indonesia caused economic losses to the community around 986 billion. These losses include medical expenses, loss of productive time for patients and their families [10]. Until now, the

implementation of adaptation strategies for dealing with the incidence of DHF is still not optimal. The lack of data on economic assessments and community acceptance of the impact of DHF events, causes doubt and uncertainty to adopt appropriate adaptation strategies for dealing with DHF events [11] ,[12]. All regions in Indonesia are at risk for contracting dengue disease. This is because both the virus that causes it and the mosquitoes that transmit it have spread widely in residential areas and in public places throughout Indonesia. Almost every year extraordinary events (KLB) occur in several areas during the rainy season[13],[14],[15]. This disease is still a public health problem and is endemic in some districts/cities in Indonesia [16] ,[17]. Riau Province consists of 12 regencies/ cities where each region has a number of patients with DHF (Dengue Hemorrhagic Fever) . Distribution of DHF in Pekanbaru City by District. The sub-district that experienced an increase in DHF until 2019 was the Payung Sekaki District. Data from the Pekanbaru City Health Office recorded that 442 cases of DHF and 4 cases of death (IR38.7 per 100,000 population and CFR = 0.9%) occurred in 2019 and increased by 501 cases with 3 deaths occurring in 2020. Pekanbaru City Health Office data in 2019, Payung Sekaki Health Center is the area with the highest dengue cases, reaching 79 cases with a death toll of 1 person (IR = 38.7 per 100,000 population, CFR = 1.3%) and has increased in 2020 as many as 138 cases (Profile of Pekanbaru City Health Office 2019). Of the 21 Puskesmas in Pekanbaru City, Payung Sekaki Health Center is the number 1 health center with the highest number of cases of Dengue Hemorrhagic Fever (DHF) from 2019 to 2020, it is important to conduct research with the aim of analyzing the factors associated with the incidence of Dengue Hemorrhagic Fever. (DHF) at the Payung Sekaki Health Center.

2. Methods

This study is an observational quantitative analytical study with an Unmatched Case Control Study design type, where the case is a person suffering from DHF in the work area of the Payung Sekaki Health Center from 2019 to 2021 which was obtained from the S0 report at the puskesmas. S0 is an immediate report (sent at the latest within 24 hours after establishing the diagnosis) regarding the presence of patients (DD , DHF and SSD) including suspected DHF who were discharged from the hospital in the working area of the health center and submitted to the public health center so that action can be taken immediately. While the controls were non-DHF cases in the same month that DHF occurred in 2020. The research location was in the work area of the Payung Sekaki Health Center. The case population is all DHF sufferers from 2019-2021, totaling 194 people and the control population is all non-DHF cases in the same period when DHF occurred in 2019-2-2021, totaling 7,624 people. The number of samples is 180 cases and 180 controls. Data were analyzed by univariate, bivariate and multivariate.

3. Results

3.1 Bivariate analysis

Bivariate analysis is data analysis conducted to find correlation or influence between 2 or more variables studied. In this study the correlation of variables was carried out on aspects of knowledge, sleeping during the day , the habit of hanging clothes, the habit of using repellents during the day, the presence of mosquito repellent plants. The following is a bivariate sales table 1.

Table 1
DHF incident

No.	Independent Variable	Case		Control		Total		Or	*P Value*
		n 180	%	n 180	%	N	%		
1	Flickr Presence								
	- Yes	106	58.9	66	36.7	172	47.8	2,474	0.000
	- Not	74	41.1	114	63.3	188	52.8	(1.61-3.78)	
2	The Presence of Mosquito								
	Repellent Plants	108	60.0	82	45.6	190	52.8	1,793	0.008
	- Not	72	40.0	98	54.4	170	47.2	(1.18-2.72)	
	- Yaq								
3	Sleeping during the Day								
	- Yes	122	67.8	78	43.3	200	55.6	2,751	0.000
	- Not	58	32.2	102	56.7	160	44.4	(1.79-4.22)	

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4	Habit of Hanging Clothes								
	- Yes	124	68.9	70	38.9	194	53.9	3,480	0.000
	- Not	56	31.1	110	61.1	166	46.1	(2.25-5.37)	
5	Habits of Using Repellents								
	during the Day	119	66.1	68	37.8	187	51.9	3,213	0.000
	- Not	61	33.9	112	62.2	173	48.1	(2.08-4.94)	
	- Yes								
6	Knowledge of Dengue								
	Transmission	114	63.3	68	37.8	182	50.6	2,845	0.000
	- Low Knowledge	66	36.7	112	62.2	178	49.4	(1.85-4.36)	
	- High Knowledge								
7	Education								
	- Low education	87	48.3	69	38.3	156	43.3	1,505	0.071
	- higher education	93	51.7	111	61.7	204	56.7	(0.99-2.28)	
8	Age								
	- < 12 years old	32	17.8	25	13.9	57	15.8	1.341	0.312
	- 12 years	148	82.2	155	86.1	303	84.2	(0.75-2.36)	
9	Gender								
	- Woman	100	55.6	83	46.1	183	50.8	1,461	0.092
	- Man	80	44.4	97	53.9	177	49.2	(0.96-2.21)	

Based on the table above, it is known that the presence of larvae has a relationship with the incidence of dengue fever is the presence of larvae as evidenced by the P Value 0.000 with OR = 2.474 (95% CI: 1.61 -3.78). The habit of sleeping during the day has a relationship with the incidence of dengue fever is the presence of larvae as evidenced by the P Value 0.000. Habit of Hanging Clothes having a relationship with the incidence of dengue fever is the presence of larvae as evidenced by the P Value 0.000. Knowledge of Dengue Transmission. having a relationship with the incidence of dengue fever is the presence of larvae as evidenced by the P Value 0.000. the presence of mosquito repellent plants has no relationship with the incidence of dengue fever is evidenced by the P Value 0.008. Education has no relationship with the incidence of dengue fever is evidenced by the P Value 0.071. age does not have a relationship with the incidence of dengue fever is evidenced by the value of P Value 0.312. gender does not have a relationship with the incidence of dengue fever is evidenced by the value of P Value 0.092

3.2 Multivariate analysis

Multivariate analysis was carried out in order to facilitate the measurement of samples with multiple variables simultaneously. The multivariate test variables in this study include the use of daytime repellantsKnowledge, Daytime Sleep , Habit of hanging clothes, The existence of larvae

Table 2
Multivariate Modeling

No	Variable	*P Value*	*Exp (B)*	*95% CI For EXP (B)*	
				Lower	*Upper*
1	Flickr Presence	,000	2.858	1,716	4.760
2	Daytime Sleep	,0000	2.825	1,699	4.699
3	Habit of hanging clothes	,000	5.041	2,970	8,557
4	Daytime Repellent Use	,000	3.786	2.272	6.307
5	Knowledge of Dengue Transmission	,000	3.525	2.108	5.892
Omnibus test of model coefficient = 0.000		*Nagelkerke R Square* = 0.297			

The results of the analysis showed that the habit of hanging clothes that had been used had an effect of 5 times on suffering from DHF when compared to those who did not have the habit of hanging clothes (95% CI = 2,970-8,557. Not using repellents during the day had an effect of 3.7 times on suffering from DHF when compared to using repellents during the day). repellent during the day (95% CI = 2,272-6,307) Knowledge of dengue transmission: low knowledge of dengue prevention has an effect of 3.5 times on suffering from DHF when compared to high knowledge (95% CI = 2,108-5,892). Aedes Aegypty in and around the house has 2.8 times the effect of suffering from DHF when compared to houses where Aedes Aegypty larvae are not found in and around the house (95% CI = 1.716-4.760). Sleeping during the day has an effect of 2.8 times. suffer from DHF when compared with those who do not sleep during the day (95% CI = 1.699-4.699).

3.3 Discussion

Dengue virus infection can cause disease in humans, with mosquitoes as an intermediary vector of transmission. Dengue Hemorrhagic Fever infection is also one of the infectious diseases whose case numbers continue to increase during the current Covid-19 pandemic. In the Special Region of Riau Province, dengue infection is still one of the main health problems. Dengue Hemorrhagic Fever (DHF) is an acute disease, is endemic but periodically can bring extraordinary events. The results of this study found that the factors of Knowledge about DHF Transmission, Daytime Sleep, Habits of Hanging Clothes, Daytime Use of Repellents, and the Presence of Larvae were associated with the incidence of Dengue Hemorrhagic Fever (DHF) in the Working Area of the Payung Sekak Health Center. Knowledge about the transmission of dengue fever is related to the incidence of dengue hemorrhagic fever (DHF) in the work area of the Payung Sekak Health Center.

The knowledge of the surrounding community regarding efforts to prevent dengue is still lacking. Findings in the field that some respondents never use mosquito repellent during the day, but instead use mosquito repellent such as spraying or using mosquito nets only at night, their assumption is that during the day they are more active so that protection against mosquito bites does not need to be done. The existence of live mosquito larvae is very possible for the occurrence of dengue hemorrhagic fever. Mosquito larvae that live in various places such as water tanks, or perched in tree holes, stone holes, leaf midribs, coconut shells, banana midribs, bamboo pieces [18] . The percentage of houses with larvae had a 3.2 times higher risk factor for DHF compared to the control group without larvae in their homes [19] . the respondent's house where Aedes sp. 2.67 times greater risk of developing DHF compared to respondents who do not have larvae in their homes. The habit of hanging clothes affects the incidence of Dengue Hemorrhagic Fever (DHF) in the Working Area of the Payung Sekak Health Center. This is also supported by research [20] which also has similar results where respondents who have the habit of hanging clothes have a 5 times greater risk of developing dengue than respondents who do not have the habit of hanging clothes. Hanging used clothes will become a dark, damp and slightly windy space which is a favorite place for dengue vectors [21].

The number of environments that support the development of larvae will increase the number of mosquitoes and facilitate contact between humans and Aedes mosquitoes so that they have a high risk of dengue infection [22]. There is a significant relationship between daytime sleep and the incidence of DHF. During the day is the peak of mosquitoes biting humans because at that time the activity of biting Aedes Agypti mosquitoes becomes more active due to environmental conditions, humidity levels, and lighting in the house that mosquitoes like. The research is in line with previous research which states that the influence of an unfavorable environment has an effect of 2.9 times with the incidence of DHF[23] the incidence of Dengue Hemorrhagic Fever (DHF) Directly or indirectly, the environment has an influence on the chain of transmission and distribution of cases of Dengue Dengue. One of the environmental factors that can affect the pattern of outbreaks of dengue virus infection is the weather element. Climatic factors have a close relationship with the number of dengue cases, especially in the Southeast Asian region. The peak of dengue transmission occurs in months with high rainfall and temperature.

4. Conclusion

The determinant factors related to the incidence of Dengue Hemorrhagic Fever (DHF) in the Working Area of the Payung Sekaki Health Center are the presence of larvae, daytime sleep habits, hanging clothes habits, daytime use of repellants, and knowledge of dengue transmission. While mosquito repellent plants, education, age, and gender do not factor in the incidence of Dengue Hemorrhagic Fever (DHF) in the Working Area of the Payung Sekaki Health Center.

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