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ANALYSIS OF FACTORS ASSOCIATED WITH THE INCIDENCE OF DENGUE HEMORRHAGIC FEVER (DBD)

Astuti, Irfansyah Baharuddin Pakki*, Iwan Muhamad Ramdan
Faculty of Public Health, Universitas Mulawarman, Jl. Kuaro, Gn. Kelua, Samarinda Ulu, Samarinda, Kalimantan Timur 75119, Indonesia
*irfanchango@gmail.com

ABSTRACT
Dengue fever is still a public health problem worldwide, especially in tropical and subtropical regions. Data from around the world shows that Asia ranks first in the number of Dengue Fever sufferers each year. The purpose of this study was to determine the factors that affect the incidence of Dengue Fever (DHF) in the work area of BLUD Puskesmas Sangatta Utara, Kecamatan Sangatta Utara, Kabupaten Kutai Timur. This study used a case-control design, with 115 positive cases of DHF and 115 control cases in the work area of BLUD Puskesmas Sangatta Utara, East Kutai Regency, making a total of 230 samples. The data collection techniques included a preparation stage (obtaining research permits and conducting a preliminary study), followed by an implementation stage (collecting respondent data, sorting samples according to criteria into two groups, filling out questionnaires, and collecting research instruments). This study found a significant association with the incidence of DHF in the following variables: knowledge ($p < 0.001$) OR 0.061, daytime activity ($p < 0.001$) OR 2.878, mosquito nest eradication efforts ($p < 0.001$) OR 0.118, and the habit of hanging used clothes in the house ($p < 0.001$) OR 8.576. It can be concluded that the habit of hanging used clothes in the house is the most dominant variable associated with the incidence of DHF in the work area of BLUD Puskesmas Sangatta Utara (Odds Ratio Exp(β) = 89.297).

Keywords: clothes hanging habits; dengue fever; knowledge

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INTRODUCTION

Chronic renal failure disease is a pathophysiological process with various causes that can cause progressive decline in kidney function and a decrease in glomerular filtration rate (GFR) of less than 60 which is characterized by a slow decline in glomerular filtration rate over a long period of time. Failure of kidney function leads to disruption of meta-bolism and fluid balance resulting in accumulation of metabolic products. Derngurer's Hemorrhagic Fever (DHF) is an acute virulence-infected disease caused by derngurer's virulence characterized by a 2-7 day fever accompanied by bleeding manifestations, platelet depletion (thrombocytopenia), hermoconcentration characterized by plasma leakage (increased hermatocrit, ascites, plerurra effusion, hypoalbuminemia). Can be accompanied by atypical symptoms such as headache, muscle & turlang pain, blurred vision or pain behind the eyeball (Kermernkers RI, 2020).

Dengue fever is still a major public health problem in tropical and surbtropical regions. Data from the World Health Organization shows that Asia ranks first in the number of people suffering from dengue fever every year. In 2023, Indonesia was recorded as the 3rd ranked country with the highest Incidernt Rater (IR) followed by Cambodia and Thailand and the 2nd ranked country with the highest Caser Fatality Rater (CFR) followed by Cambodia.

Data from the Health Office of East Kalimantan (Division of Disease Prevention and Control) during the last 5-year period obtained data as follows: in 2019 the number of dengue cases

was 6,723 (IR = 178.6 per 100,000 people) with a death rate of 45 cases (CFR = 0.67%), in 2020 the number of dengue cases was 2. 412 (IR=64.1 per 100,000 people) with a death toll of 21 cases (CFR=0.67%), in 2021 the number of dengue cases is 2,412 (IR=73.0 per 100,000 people) with a death toll of 22 cases (CFR=0.80%), in 2022 the number of dengue cases is 5. 887 (IR=158.2 per 100,000 people) with a death toll of 39 cases (CFR=0.66%), and in 2023 the number of dengue cases was 5,524 (IR=145.8 per 100,000 people) with a death toll of 25 cases (CFR=0.45%).

A preliminary study conducted through observation and data from the BLUD Sangatta Utara Community Health Center indicates that the incidence of Dengue Hemorrhagic Fever (DHF) remains high in its working area. This situation may be influenced by both internal and external factors, such as the community's knowledge, attitudes, and behaviors in understanding and implementing household environmental sanitation activities to prevent recurring DHF cases. The Kutai Timur Regency Government has issued Regent Regulation No. 30 of 2019 concerning the Control of Dengue Hemorrhagic Fever. However, its implementation has not been effective, resulting in a continued increase in DHF cases during certain periods, particularly in the working area of the BLUD Sangatta Utara Community Health Center. The purpose of this study was to determine the factors that affect the incidence of Dengue Fever (DHF) in the work area of BLUD Puskesmas Sangatta Utara, Kecamatan Sangatta Utara, Kabupaten Kutai Timur.

METHOD

The type of research used is an observational analytic study employing a case-control design, selecting cases of individuals who contracted Dengue Hemorrhagic Fever (DHF) and controls who did not. This study was conducted in the working area of the BLUD Sangatta Utara Community Health Center, East Kutai Regency. The research period was from January to May 2024.The case population in this study consisted of all DHF patients in 2023 within the working area of BLUD Sangatta Utara Community Health Center, totaling 171 cases. The control population included all individuals who did not have DHF during the same year but resided in the same working area. The sample size was calculated based on the number of DHF cases reported between July and December 2023, totaling 115 individuals. The control group also consisted of 115 individuals, using a 1:1 matching ratio based on gender and area of residence, resulting in a total sample size of 230 participants. The data collection techniques included a preparation stage (obtaining research permits and conducting a preliminary study), followed by an implementation stage (collecting respondent data, sorting samples according to criteria into two groups, filling out questionnaires, and collecting research instruments).

RESULT

Table 1.
Distribution and Frequency of Research Variables

Variable	Amount (n=230)	
	f	%
Knowledge		
Less good	123	53.5
Good	107	46.5
Daytime Activity		
No	66	28.7
Yes	164	71.3
Mosquito Nest Eradication Effort		
Less good	139	60.4
Good	91	39.6
Habitual Hanging of Used Clothes		
No	106	46.1
Yes	124	53.9

Based on the table, the frequency distribution of each research variable is presented as follows. A total of 123 respondents (53.5%) had poor knowledge regarding Dengue Hemorrhagic Fever (DHF). Furthermore, 164 respondents (71.3%) were engaged in daytime activities that may increase the risk of contracting DHF. Regarding mosquito breeding site eradication efforts, the majority of respondents (60.4%) showed inadequate practices. In addition, 124 respondents (53.9%) had the habit of hanging used clothes. Concerning the use of mosquito nets/screens, the majority of respondents (68.3%) did not use them.

Table 2.
Relationship between Knowledge and the Incidence of DHF

Knowledge	DHF				*P Value*	*OR*
	DHF		Not DHF			
	f	%	f	%		
Less Good	96	83.5	27	23.5	< 0,001	0,061
Good	19	16.5	88	76.5		

Based on the table, it was found that among respondents with poor knowledge, the highest proportion was observed in those who experienced DHF (83.5%). Conversely, among respondents with good knowledge, the highest proportion was found in those who did not experience DHF (76.5%). The chi-square analysis showed a p-value of <0.001 ($p < 0.05$), indicating a significant association between knowledge and the incidence of DHF. The Odds Ratio was 0.061, which means that respondents with poor knowledge had a 0.061 times higher risk of developing DHF compared to those with good knowledge.

Table 3.
The Relationship between Daytime Activities and the Incidence of DHF

Daytime Activities	DHF				*P Value*	*OR*
	Not DHF		DHF			
	f	%	f	%		
Tidak	45	39,1	21	28,7	0,001	2,878
Ya	70	60,9	94	81,7		

Based on the table, it was found that among respondents who engaged in daytime activities, the highest proportion was observed in those who experienced DHF (81.7%). Conversely, among respondents who did not engage in daytime activities, the highest proportion was found in those who did not experience DHF (39.1%). The chi-square analysis showed a p-value of 0.001 ($p < 0.05$), indicating a significant association between daytime activity and the incidence of DHF. The Odds Ratio was 2.878, meaning that respondents who engaged in daytime activities had a 2.878 times higher risk of contracting DHF compared to those who did not engage in such activities.

Table 4.
Relationship between Mosquito Nest Eradication and the Incidence of DHF

Eradication Efforts	DHF				*P Value*	*OR*
	Not DHF		DHF			
	f	%	f	%		
Good	43	37,4	96	83,5	<0,001	0,118
Less Good	72	62,6	19	16,5		

Based on the table, it was found that among respondents who had poor mosquito nest eradication practices and experienced DHF, the proportion was 16.5%, while among those with good practices who did not experience DHF, the proportion was 37.4%. The chi-square analysis showed a p-value of <0.001 ($p < 0.05$), indicating a significant association between mosquito nest eradication efforts and the incidence of DHF. The Odds Ratio was 0.118, meaning that respondents with poor mosquito eradication practices were 0.118 times more

likely to experience DHF compared to those who carried out mosquito nest eradication effectively.

Table 5.
The Relationship between the Habit of Hanging Used Clothes with the Incidence of DHF

Hanging Clothes	DHF				*P Value*	*OR*
	Not DHF		DHF			
	f	%	f	%		
No	81	70,4	25	21,7	<0,001	8,576
Yes	34	29,6	90	78,3		

Based on the table, it is known that among respondents who had the habit of hanging clothes, 78.3% experienced Dengue Hemorrhagic Fever (DHF). Meanwhile, among respondents who did not have the habit of hanging clothes, 70.4% did not experience DHF. The chi-square analysis showed a p-value of <0.001 ($p < 0.05$), indicating a significant association between the habit of hanging clothes and the incidence of DHF. The Odds Ratio was 8.576, meaning that respondents who had the habit of hanging clothes were 8.576 times more likely to experience DHF compared to those who did not have this habit.

DISCUSSION

The factors of DHF incidence are inseparable from humans themselves, namely knowledge and human behavior. Individuals with good or high knowledge of the disease will have the right attitude or action. Knowledge is also enough to influence a person's initial motivation to behave. There are two factors that influence knowledge about DHF: internal and external factors. Internal factors include education, age and occupation. Then, external factors consist of environmental and socio-cultural factors.Various studies have examined the relationship between certain risk factors and the incidence of DHF. The results of this study are in line with research (Erspiana, Lestari, and Ningsih, 2022) which found a significant relationship between knowledge and family behavior about PSN DHF. Bivariate analysis of the relationship between respondents' knowledge and family behavior about PSN DHF in Korong Sarang Gagak, Puskesmas Enam Lingkung Working Area, Padang Pariaman Regency showed that respondents who had poor behavior about PSN DHF were found more in respondents who had a low level of knowledge, namely 31 people (86.1%) compared to respondents who had high knowledge, namely 11 people (43.4%). Statistical tests using the Chi-square test obtained a p-value = 0.000 <0.05.

According to research by Dardjito et al. (2008) conducted in East Purwokerto Subdistrict, p = 0.444 was obtained, indicating that there was no relationship between the habit of napping and the incidence of DHF. Research conducted by Pramudyo et al. (2015) obtained p = 1.00, meaning there was no association between the habit of napping and the incidence of DHF. However, the habit of sleeping in the morning / afternoon which is usually done by children is very detrimental to health. The habit of the Aedes aegypti mosquito bites in the morning and evening when the occupants of the house take a nap, especially if they do not use mosquito nets or mosquito bite prevention lotions. Usually, female mosquitoes look for prey during the day. Biting activity usually starts from morning until evening, with two peaks of activity between 09.00-10.00 and 16.00-17.00 (Depkes RI, 2017).This study is in line with the research of Arsin A. et al. (2010) which showed an association between the habit of napping and the incidence of DHF with a p value = 0.010. The researcher's assumption is that this is due to the habit of Aedes aegypti mosquitoes biting in the morning and evening when the occupants of the house take a nap. So, family members who often take a nap, especially without using mosquito nets or anti-mosquito lotions, are at risk of being bitten by Aedes aegypti mosquitoes. Another study by Herlina et al. (2014) also showed a significant relationship between napping habits and DHF incidence in Pekanbaru.

Mosquito nest eradication behavior is an action or activity carried out by a person or community in an effort to eradicate mosquito nests that cause dengue disease by physical, chemical, and biological means. A comprehensive eradication effort of the disease. The government has issued the PSN-3M Plus policy to tackle DHF. This is the main way that is considered effective, efficient, and economical to eradicate the vector that transmits DHF considering that drugs and vaccines that kill the DHF virus have not yet been found (Depkes RI, 2017).Various studies have examined the relationship between certain risk factors and the incidence of DHF. Research by Jumiati et al (2018) stated that Mosquito Nest Eradication (PSN) efforts are a risk factor for dengue fever in Wantulasi Village, North Wakorumba District, North Buton Regency in 2015, with an OR of 3.25 and p-value = 0.049 <0.05. Thus, respondents who did not make good PSN efforts had a 3.25 times greater risk of experiencing DHF compared to respondents who did PSN well.

The habit of hanging clothes has been around for a long time, both in urban and rural communities. This bad habit has been going on for a long time. Clothes hanging behind cabinets or doors should be folded and stored in cupboards, and clothes that have been worn should be washed immediately, not put in a tub, because the Aedes aegypti mosquito likes to stay and rest in dark places and hanging fabrics (Wati, 2009).Various studies have examined the relationship between certain risk factors and the incidence of DHF. This study is in line with the research theory of Sursilowati & Cahyati (2021), that the habit of hanging used clothes provides an understanding of why PSN activities are not enough with 3M alone, but must be with 3M Plus. 3M activities will only reduce the mosquito population by reducing the possibility of eggs and larvae, while 3M Plus, namely by increasing the habit of using anti-mosquito, using mosquito nets, and reducing the habit of hanging clothes in the house, will avoid the possibility of contact with adult mosquitoes. According to Sursilowati's research (2021), the habit of hanging clothes is also associated with the incidence of DHF with a p-value of 0.000. In this study, respondents who had the habit of hanging clothes had a 12 times greater risk of suffering from DHF compared to respondents who did not have this habit.

CONCLUSION

This study shows that there is a significant relationship between the variables of knowledge, daytime activities, mosquito nest eradication efforts, and the habit of hanging clothes with the incidence of Dengue Hemorrhagic Fever (DHF) in the working area of BLUD Puskesmas Sangatta Utara, East Kutai Regency. The results of this study emphasize the importance of increasing community knowledge about DHF, reducing activities that increase the risk of daytime mosquito bites, as well as increasing efforts to eradicate mosquito nests and changing the habit of hanging clothes that can become a breeding ground for Aedes mosquitoes. Thus, it is expected that the results of this study can serve as a basis for the development of dengue prevention and control programs in the area.

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