

Factors Associated with the Incidence of Dengue Hemorrhagic Fever in the Working Area of Paal Lima Health Center, Jambi City 2024

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ABSTRACT

Dengue fever is an infectious disease that continues to be a global issue. In 2021, the CFR in Jambi Province was 1.4%. Puskesmas Paal V Jambi City from the data there were 36 DHF patients in 2022 making the puskesmas with the highest number of DHF cases. The aim of this research was to determine what factors are associated with the incidence of DHF in the Paal V Health Center Working Area of Jambi City. The research approach used is quantitative using a case-control research design. This study's sample approach utilized a total sample size of 72 people with a ratio of 1: 1, namely 36 cases and 36 controls. This study's statistical test was the Chi Square test. The findings revealed a correlation between the frequency of depleting water reservoirs ($P=0.004$), health worker support ($P=0.006$), knowledge ($P=0.000$), attitude ($P=0.003$) with the incidence of DHF. There was no association between water storage cover ($P=0.777$), experience of counseling with DHF incidence ($P=0.057$). The frequency of draining water reservoirs, support from health workers, knowledge and attitudes can increase the risk of DHF cases, so it is necessary to increase education for the entire community.

INTRODUCTION

Dengue hemorrhagic fever (DHF) is an illness caused by the Dengue virus that is transmitted from person to person by the bite of the *Aedes Aegypti* mosquito which is the main vector (Hidayani, 2020). Dengue fever is a disease that is often found in tropical regions including Indonesia. This disease is frightening because of its rapid transmission (Suryowati et al., 2018).

Until now, DHF is still a health problem for all levels of society, which will have a social or economic impact. The social costs of DHF include anxiety and panic in the family, death of family members, and decreased life expectancy in the family or community. Apart from the social, the economic sector also feels the direct impact of DHF such as the high cost of DHF treatment. While the indirect impact is work time, other costs incurred to support treatment such as transportation costs during treatment (Yuningsih, 2019).

In June and August of 2022, the number of dengue fever cases reported by the European Center for Disease Prevention and Control (ECDC) on August 24, 2022, there were 2,597,067 cases from Brazil 1,910,657 cases, Vietnam 145,536 cases, the Philippines 82,597 cases, Indonesia 68,903 cases, and Peru 57,469 dengue cases (Sah et al., 2022). In 2021 there were 73,518 cases of Dengue Fever with 705 deaths. The Case Fatality Rate (CFR) or the number of deaths of Dengue fever cases in Indonesia has decreased in the period 2012 - 2020, from 0.9% to 0.69%. However, in 2021 it increased to 0.96%. From 2011 to 2021 the number of districts/cities infected with Dengue hemorrhagic fever has increased.

In Jambi Province in 2021 there were 357 DHF cases, this has decreased from the previous year where in 2020 there were 2,056. The CFR (Case Fatality Rate) in 2021 is 1.4% which has increased from the previous year which was 0.68%. This figure is higher than the national target and the Regional Medium-Term Development Plan (RPJMD (<1%)).(keuangan, 2022). Data obtained from the Jambi City Health Office in 2022, 3 health centers with the highest number of cases, namely PAAL V Health Center with 36 cases, Payo Selincah Health Center with 25 cases, Kenali Besar Health Center with 24 cases. Over the past 2 years, the number of DHF cases at the PAAL V Health Center has continued to increase, starting from 12 cases in 2021 to 36 cases in 2022. Based on the background description described above, the research problem can be formulated, namely what factors are associated with dengue hemorrhagic fever at the PAAL V Health Center.

LITERATURE REVIEW

Environmental health, which is a factor, also has a role in causing disease, such as being a predisposing factor, causing disease, apart from that the environment can also be a medium for transmission or transmission of disease and support or influence the course of a disease (Agnesia et al., 2023). This theory can be seen in Achamdi's knot theory (Islam, 2021).

Based on the studies conducted by Hendrik, It is clear that there is a connection between the eradication of mosquito nests (PSN) and the incidence of DHF and there is a relationship between the presence of larvae in water reservoirs (Sasongko et al., 2020).Research at the Parsikkaman Health Center

found that factors related to the incidence of DHF, namely knowledge, attitudes and actions taken by families have a relationship with the incidence of DHF (Widiyono et al., 2021). from research conducted by Ubaidilla and Deden in a study entitled Risk Factors Affecting the Occurrence of Dengue Hemorrhagic Fever (DHF) at the Sewon II Bantul Health Center that there is a significant relationship between cleaning water reservoirs and the incidence of DHF with a P-value = 0.002 with a sig value $< \alpha$ value ($p < 0.05$) which means there is a significant effect and on the variable of sprinkling abate powder, the P-value = 0.013 with sig $< \alpha$ value which means there is a significant effect of sowing abate with the incidence of DHF (Ubaidillah & Kurniawan, 2020).

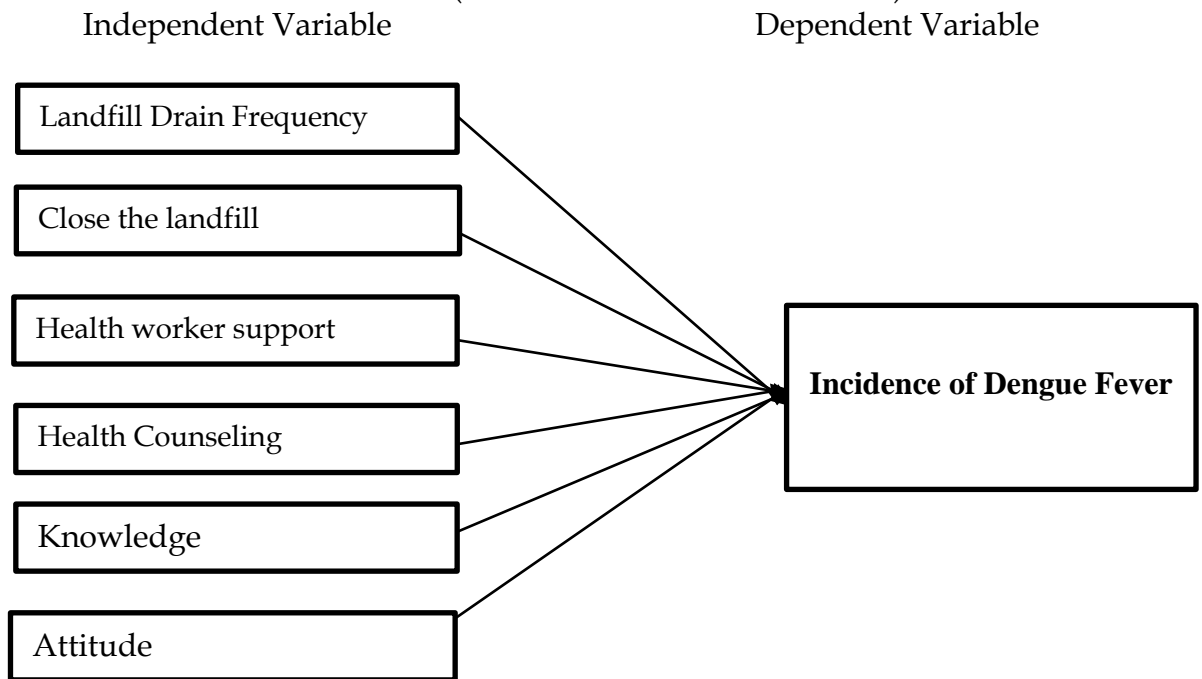


Figure 1. Conceptual Framework

METHODOLOGY

This study uses quantitative research, namely observations made on research samples to determine the variables studied, namely behavior, environment and health services on the incidence of Dengue Fever at the PAAL V Health Center in Jambi City. This study also uses a design, namely case control, which is where the research conducted is related to risk factors using a retrospective approach or looking back. This is done to determine whether or not there are risk factors.

RESEARCH RESULT

Table 1 Analysis of the relationship between the frequency of landfill draining and the incidence of DHF in the Paal V Health Center Working Area, Jambi City

Landfill Drain Frequency	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
>1 Week	22	61.1	9	25.0	4,714	0.004
< 1 Week	14	38.9	27	75.0	(1,719-	
Total	36	100.0	36	100.0	12,931)	

Table 1 shows that as many as 61.1% of respondents with the frequency of draining water reservoirs > once a week and as many as 25% in the control group. A total of 38.9% of the case group drained water reservoirs <1 week and 75% of the control group. This shows that draining water reservoirs > once a week was more prevalent in the case group. Respondents who drain > once a week are more at risk of DHF.

The analysis also showed a P-value of 0.004 <0.05, indicating that there is a relationship between the frequency of draining and the incidence of DHF. The Odd Ratio obtained was 4.714, meaning that respondents with a frequency of draining > once a week were 4.714 times more at risk of DHF than respondents who drained once a week.

Table 2. Analysis of the relationship between landfill cover and DHF incidence in the Paal V Health Center Working Area, Jambi City 2024

Close the landfill	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
Open	27	75.0	29	80.6	0.724	0.777
Closed	9	25.0	7	19.4	(0.237-	
Total	36	100.0	36	100.0	2.215)	

Table 2 shows that 75% of respondents from the case group had open water reservoirs and 80.6% from the control group. As many as 25% of the case group had closed water reservoirs and 19.4% of the control group. This shows that the condition of open water reservoirs is more in the control group.

From the analysis, the P-value was 0.777 > 0.05, so it was concluded that there was no relationship between the condition of closed water reservoirs and the incidence of DHF. An OR value of 0.724 was obtained, which means it is a preventive value because the OR value is < 1. This means that respondents with closed water reservoirs are 1.4 times less likely to get DHF disease when compared to respondents with open conditions.

Table 3. Analysis of the relationship between health worker support and the incidence of DHF in the Paal V Health Center Working Area, Jambi City 2024

health worker support	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
Less Supportive	22	61.1	33	91.7	0,143	0.006
Supportive	14	38.9	3	8.3	(0,037-	
Total	36	100.0	36	100.0	0,556)	

Table 3 shows that 61.1% of respondents from the case group lacked officer support and 91.7% from the control group. A total of 39.9% of the case group received officer support and 8.3% of the control group had received officer support. This shows that respondents who received support were more in the case group.

From the analysis, the P-value was $0.006 < 0.05$, Therefore, it can be argued that there is a relationship between officer support and DHF incidence. An OR value of 0.143 was also obtained, which indicates that it is a preventative factor because the OR value is < 1 . This means that respondents who receive assistance from health workers 10 times less likely to get DHF when compared to respondents who lack support.

Table 4. Analysis of the relationship between the experience of receiving counseling with the incidence of DHF in the Paal V Health Center Working Area, Jambi City 2024

Receiving counseling	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
Never	20	55.6	11	30.6	2.841	0.057
Once	16	44.4	25	69.4	(1.080-	
Total	36	100.0	36	100.0	7.472)	

Table 4 shows that 55.6% of respondents from the case group never received counseling and 30.6% from the control group. As many as 44.4% of the case group had received counseling and as many as 69.4% of the control group. This shows that respondents who had received counseling were more numerous in the control group.

From the analysis, a P-value of $0.057 > 0.05$ was obtained, meaning that there was no relationship between the experience of receiving counseling and the occurrence of DHF. The OR obtained was 2.841, meaning that respondents who never received counseling were 2.841 more at risk of DHF compared to respondents who had received counseling.

Table 5. Analysis of the relationship between knowledge and the incidence of DHF in the Paal V Health Center Working Area, Jambi City 2024

Knowledge	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
Not Good	25	69.4	5	13.9	14.091	0.000
Good	11	30.6	31	86.1	(4.325-	
Total	36	100.0	36	100.0	45.909)	

Table 5 shows that 69.4% of respondents from the case group had poor knowledge and 13.9% from the control group. As many as 30.6% of the case group had good knowledge and as many as 86.1% of the control group. As may be observed, the respondents with good category knowledge are more in the control group.

From the analysis, the P-value was $0.000 < 0.05$, so it can be concluded that there is a relationship between knowledge and the incidence of DHF. An OR value of 14.091 was also obtained, This means that respondents with low knowledge were 14.091 times more at risk of DHF than respondents with good knowledge.

Table 6. Analysis of the relationship between attitudes and the incidence of

Attitudes	Dengue Incident				OR	P- Value
	Case		Control			
	n	%	n	%		
Negatif	20	55.6	7	19.4	5.179	0.003
Positif	16	44.4	29	80.6	(1.803-	
Total	36	100.0	36	100.0	14.875)	

DHF in the Paal V Health Center Working Area, Jambi City 2024

Table 6 shows that 55.6% of respondents from the case group had a negative attitude and 19.4% from the control group. As many as 44.4% of respondents from the case group had a positive attitude and as many as 80.6% from the control group. It can be seen that respondents with a positive attitude were more in the control group of respondents.

From the analysis, the P-value was $0.003 < 0.05$, so it can be concluded that there is a relationship between attitude and DHF incidence. An OR value of 5.179 was also obtained. This means that respondents with a negative attitude are 5,179 times more at risk than respondents with a positive attitude.

DISCUSSION

Relationship between frequency of landfill draining and DHF incidence

Based on the analysis that has been done, the P-value = $0.004 < 0.05$, meaning that there is a relationship between the frequency of landfill draining and the incidence of DHF. The OR = 4.714 means the risk of DHF in respondents with a frequency of draining > once a week. It can be seen that the

respondents of the case group (61.1%) drained the water reservoir more than once a week, this is much greater when compared to the control group (25%).

The results of this study are also in line with Ubaidillah's research where the variable of cleaning water reservoirs received a value of $P = 0.002 < 0.05$ so that the variable of cleaning water reservoirs is said to have a significant influence on the incidence of DHF (Ubaidillah & Kurniawan, 2020). This shows that if you do not drain the landfill, the number of respondents affected by DHF will be greater than the number of respondents who are not affected by DHF. It can be seen that draining water reservoirs affects the incidence of DHF by not routinely draining water reservoirs will become a place for mosquitoes to lay eggs or there will be mosquito larvae that arise. This will increase the risk of dengue hemorrhagic fever.

Draining or cleaning water reservoirs should be done regularly, at least once a week, so that there are no mosquito larvae. This is because mosquitoes themselves take about 9-10 days to develop. By draining once a week, it will prevent the development of mosquitoes as well as eradicate mosquito larvae.

Relationship between landfill cover and dengue incidence

The results of the analysis that has been done, known $P\text{-value} = 0.777 > 0.05$ so it can be concluded that there is no relationship between the lid of the tpa with the incidence of DHF. From the observations made, it was found that many of the control group (80.6%) had open water reservoirs while the case group (75%) had fewer.

This study is in line with the results of Purnajaya's research in 2012, related to the relationship between landfill cover and DHF incidence where the $P\text{value} = 0.055 > 0.05$, indicating that there is no relationship between landfill cover and DHF incidence (Ketut et al., 2014). The mosquito breeding ground for DHF, the community assumes that the mosquito breeding ground for DHF is anywhere, including in ponds, rivers, ditches with dirty water, because respondents do not know the breeding ground for the *Aedes Aegypti* mosquito. Public ignorance of the correct mosquito breeding sites risks the existence of breeding places (Rojali & Amalia, 2020).

Relationship between Health Worker Support and DHF Incidence

Based on the results of the analysis, there was a relationship between health worker support and the incidence of DHF, with a $P\text{-value}$ of $0.006 < 0.05$. Respondents in the case group (38.9%) received much less health support than the control group (8.3%). This shows that the support of officers to the community affects the incidence of DHF.

These results are also in line with research conducted by Khairatunnisa and Friska at Sri Padang Health Center in 2021 with a $P\text{-value} = 0.000$, meaning that there is a relationship with health workers with the actions of the head of the family with dengue prevention (Dengue et al., 2021). Based on Green's theory, L. states that the support of health workers is included in the enabling or reinforcing factors of one's behavior. In addition, social support is useful for reducing anxiety, depression, and stress. People who receive high social

support experience positive things, have high self-esteem and a better self-view and tend to be less anxious.

Relationship between counseling experience and DHF incidence

Based on the analysis that has been done, it is known that the value of $P = 0.057 > 0.05$, meaning that there is no relationship between counseling and the incidence of DHF. In the case group who had received counseling (44.4%) and while the control group who received counseling as much (69.4%). The results of this study are in line with research conducted by Al Rajab at the Baubau City Health Center 2019 with a P value of $= 1.00 > 0.05$ (Nuzulia, 1967).

The small number of respondents who have received counseling can lead to a lack of information that respondents have about dengue symptoms. The symptoms of DHF that seemed common to respondents caused respondents to not realize that these symptoms included DHF symptoms. Counseling provided by health workers to the community will affect good knowledge and positive attitudes which will eventually lead to PSN-DBD behavior. Extension is an activity in relation to increasing knowledge, skills, attitudes and behavior. Counseling is an activity in relation to increasing knowledge, skills, attitudes and behavior. Health promotion activities aimed at reinforcing factors are in the form of trainings for community leaders, both formal and informal (Heryanto & Meliyanti, 2021).

Relationship between knowledge and dengue incidence

Based on the results of the analysis that has been done, $P\text{-value} = 0.000 < 0.05$, so it can be concluded that there is a relationship between respondents' knowledge and the incidence of DHF. The OR value = 14.091 was also obtained, meaning that respondents who have poor knowledge are 14 times more at risk when compared to respondents with good knowledge. The results of this study are in accordance with the research of Lia et al where the P value = $0.009 < 0.05$, meaning that there is a relationship between knowledge and the incidence of dengue fever in the Pagaran Tapah Darussalam Health Center Working Area, Rokan Hulu Regency (Fentia Lia, Juwita Ratna, 2021).

This good and poor knowledge can be caused by several factors such as information from family, from neighbors and from health workers through the provision of flyers and counseling. Information from health workers or from health center cadres can be a means for sufferers and the community to increase knowledge related to DHF so that it can reduce the risk of DHF (Rojali & Amalia, 2020).

Someone who has good knowledge will practice PSN DHF well when compared to someone who has less knowledge. In general, a person with good knowledge feels afraid of the transmission of DHF, so that people with good knowledge will be more responsive and diligent in carrying out DHF PSN activities.

Relationship between attitude and dengue incidence

The results of the study on the attitude variable with DHF incidence showed that based on the chi-square test, the value of $P = 0.003$ was obtained,

meaning that there was a significant relationship between attitude and DHF incidence. In the case group, respondents with positive attitudes (44.4%) were much less when compared to control group respondents (80.6%).

The results of this study are in line with research conducted by Tisnawati et al (2022) obtained a value of $P = 0.011 < 0.05$, meaning that there is a relationship between attitude and the incidence of DHF in Puskesmas Andalas Padang City (Tisnawati et al., 2023). Attitude is a person's feelings or views accompanied by a tendency to act on an object or stimulus. People have a positive or negative attitude towards an attitude object formed through observation of their own behavior. Some of the factors that influence attitude formation include personal experience, other people who are considered important, and cultural influences. If the individual is completely free from all pressures or obstacles that can interfere with the expression of his attitude, it can be expected that the form of behavior that appears as a form of actual expression. The emergence of willingness or will is an advanced form of awareness and understanding of the object, in this case the practice of DHF PSN.

CONCLUSIONS AND RECOMMENDATIONS

The frequency of draining < 1 week of water reservoirs in the case group was 38.9% and the control group was 75%. The condition of the water reservoir was closed in the case group 25% and the control group 19.4%. respondents who received support from health workers in the case group 38.9% and the control group 8.3%. had received counseling in the case group 44.4% and the control group 69.4%. good knowledge in the case group 30.6% and control by 86.1%. positive attitudes in the case group 44.4% and the control group by 80.6%.

There is a relationship between the frequency of draining, officer support, knowledge and attitudes towards the incidence of DHF at the Paal V Health Center, Jambi City 2024. There was no relationship between landfill cover and counseling experience with the incidence of DHF at the Paal V Health Center, Jambi City 2024.

Health institutions are advised to strengthen the PSN movement by actively monitoring larvae evenly in every house in the working area of the health center. Controlling and preventing Dengue Fever through socialization and promotion and collaborating with universities or other agencies in controlling DHF. As well as the community to increase their active role in the dengue eradication program through changes in attitude and participate in prevention, namely doing PSN to prevent mosquito breeding and closing water reservoirs tightly. Increase basic knowledge of DHF such as DHF symptoms so that they can make efforts to prevent DHF continuously.

ADVANCED RESEARCH

This study can cause recall bias, this happens because this study relies on the memory of respondents and uses a case control design that examines a

disease after the occurrence of illness, then investigates what the cause or risk is, it is not known which comes first between exposure and effect.

For future researchers to continue research related to DHF by adding different variables such as weather, use of ventilation gauze, lighting and reaching the multivariate stage to find out the dominant factors of the cause of DHF.

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