Risk Factors of Dengue Hemorrhagic Fever in the Oesapa Public Health Center Working Area

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ABSTRACT

Introduction: Dengue Hemorrhagic Fever (DHF) which is transmitted through the bite of mosquitoes from the genus Aedes, especially Aedes aegypti or Aedes albopictus, can occur throughout the year and can affect all age groups. This disease is related to environmental conditions, climate, high mobilization, population density, expansion of housing and community behavior. This study aimed to analyze the factors that can cause the incidence of dengue hemorrhagic fever in the working area of the Oesapa Public Health Center.

Material and methods: This type of research is an analytic observational study using a case control research design. The population in this study was the number of dengue hemorrhagic fever cases in the Oesapa Health Center working area, namely as many as 145 samples consisting of 55 case samples and 55 control samples. The data collection technique used a questionnaire and the research time was June-July 2020. The data analysis included univariate and bivariate with chi square test and multivariate with logistic regression test.

Results: The results of the research on the chi square test for age with p value = 0.237 (p> 0.05), knowledge p value = 0.123 (p> 0.05), the habit of using mosquito nets p value = 0.000 (p <0.05) and occupancy density p value = 0.000 (p <0.05) on the incidence of dengue hemorrhagic fever.Logistic regression test on the habit of using a mosquito net has a chance of 14,256 times the occurrence of dengue fever.

Conclusion: It can be concluded that there is no significant relationship between age and the incidence of dengue hemorrhagic fever, there is no significant relationship between knowledge and the incidence of dengue hemorrhagic fever, there is a significant relationship between the habit of using a mosquito net and the incidence of dengue hemorrhagic fever, and there is a significant relationship between occupancy density and the incidence of dengue hemorrhagic fever.

Keywords: Incidence of Dengue Hemorrhagic Fever, Age, Knowledge, Habit of using a Mosquito Net, Occupancy Density.

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infection caused by the dengue virus. Dengue virus is a disease virus caused by Aedes Spp. For Indonesia with a tropical climate, it is very suitable as a breeding ground for vector-borne diseases.[1] Fever cases increased between ages during the observation period to 1998 with the highest incidence aged 5-14 years. From 1999 onwards, the trend of dengue fever incidence increased among those aged 15 years and over. This study shows the incidence of dengue fever has increased rapidly over the past 45 years in Indonesia with the peak incidence shifting from children to older age groups.[2]

The incidence of dengue hemorrhagic fever cases in Indonesia from year to year tends to fluctuate. The dengue hemorrhagic fever morbidity rate in 2018 decreased compared to 2017, from 26.10 to 24.75 per 100,000 population. The decline in the case fatality rate (CFR) from the previous year was not too high, which was 0.72% in 2017 to 0.71% in 2018.[3]

Kupang is a dengue hemorrhagic fever endemic area because every year there are always dengue cases found. In 2017 there were 132 cases with a case fatality rate of 2.3 and increased again in 2018 to 228 with a case fatality rate of 1.8%. In 2018 there was an increase in cases of 238 dengue cases, dominated by women, namely 124 cases and men with 114 cases and case fatality rate = 1.7%.In 2019, the number of cases reached 681 with 331 women and 350 cases for men.[4]

The Oesapa Public Health Center is one of the Health Center in the working area of the Kupang Health Office which still has a high number of dengue hemorrhagic fever cases.Based on data from the recapitulation of dengue hemorrhagic fever patients, there were 145 cases in the OesapaPublic Health Center working area. Based on the data obtained, researcher is interested in conducting research on the Risk Factors of Dengue Hemorrhagic Fever in the Oesapa Public Health Center Working Area.

Methods

This type of research was an analytic observational study using a case control research design. In this study, the incidence of DHF was determined by comparing the risk factors or determinants in the case group and the control group. The variables studied in this study were independent variables, namely age, knowledge, habit of using mosquito nets, and occupancy density. The dependent variable used was the incidence of dengue hemorrhagic fever (DHF). The population in this study was the number of dengue hemorrhagic fevercases in the Oesapa Public Health Center working area, as many as 145 samples and 110 samples consisting of 55 case samples and 55 control samples. The inclusion criteria for this study were respondents aged> 15

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years and respondents who lived in the work area of the Oesapa Health Center. The data collection technique used a questionnaire and the research time was from June-July 2020. Data analysis included univariate and bivariate with chi square test and multivariate with logistic regression test. The sampling technique in this research is the sampling technique using simple random sampling. Presentation of data in this study in tabular form.

RESULTS

Based on table 1, the results of statistical tests between the variable age and the incidence of dengue fever obtained a probability value (p) = 0.237. This means that there was no significant relationship between age and the incidence of dengue hemorrhagic fever.

In the knowledge variable, the statistical test results obtained a probability value (p) = 0.123, meaning that there was no significant relationship between knowledge and the incidence of dengue hemorrhagic fever.

In the habit of using mosquito nets, the statistical test results obtained a probability value (p) = 0.000 with an Odds Ratio (OR) value of 13,222 (95% CI; 4,829-36,203) this means that respondents who did not use bed nets have a risk of

13,222 times greater than with those who used bed nets on the incidence of dengue fever.

And for the occupancy density variable, the statistical test results obtained a probability value (p) = 0.000 with an Odds Ratio (OR) value of 7,648 (95% CI; 2,948-19,844), this means that dense residential density had a risk of 7,648 times greater than which was not overcrowded towards the incidence of dengue fever

The multivariate analysis uses the logistic regression method to see the relationship between several independent variables and one dependent variable (the incidence of dengue hemorrhagic fever) which being tested at the same time. The variable that was continued using multivariate was the Oesapa Public Health Center. This analysis was carried out by taking the independent variable which had a pvalue <0.25 in the bivariate analysis. Table 1 showed that the age variable p value> 0.25 means that this variable could not be continued in the multivariate analysis.

Furthermore, the final modeling of the multivariate analysis showed that the variable had a p value> 0.05. Table 2 showed that education and knowledge had a p value> 0.05, so that they could not be included in the final modeling of the next multivariate analysis.

Variable	Case		Control		Total		P value	OR	95% CI for EXP (B)	
	n	%	n	%	N	%			Lower	Upper
Age										
>56	4	7,3	9	16,4	13	11,8	0,237	0,401	0,116	1,390
15-56	51	92,7	46	83,6	97	88,2				
Total	55	100	55	100	110	100				
Knowledge										
Lack of knowledge	28	50,9	19	34,5	47	42,7	0,123	1,965	0,912	4,231
Have good knowledge	27	49,1	36	65,5	63	57,3				
Total	55	100	55	100	110	100				
Habit of Using A Mosquito Net										
Not using a mosquito net	49	89,1	21	38,2	70	63,6	0,000	13,222	4,829	36,203
Using mosquito net	6	10,9	34	61,8	40	36,4				
Total	55	100	55	100	110	100				
Occupancy Density										
Crowded	48	87,3	26	47,3	74	67,3	0,000	7,648	2,948	19,844
Not crowded	7	12,7	29	52,7	36	32,7				
Total	71	100	71	100	142	100				
Table-1: Effect of risk factors for dengue hemorrhagic fever										

	B	S.E	Wald	df	Sig.	Exp.(B)	95% CI for EXP (B)	
							Lower	Upper
Age	-.001	0,786	0,000	1	0,999	0,999	0,214	4,666
Knowledge	0,629	0,505	1,551	1	0,213	1,875	0,697	5,044
Habit of Using A Mosquito Net	2,634	0,575	21,007	1	0,000	13,934	4,517	42,985
Occupancy Density	2.148	0,570	14,219	1	0,000	8,564	2,805	26,148
Table-2: Multivariate logistic regression								

	B	P value	OR	95% CI for EXP (B
Habit of Using A Mosquito Net	2,657	0,000	14,256	4,764-42,656
Occupancy Density	2,129	0,000	8,404	2,821-25,035
Table-3: Final Modeling of Multivariate Analysis				

The final results of the multivariate analysis modeling showed that there was still a significant relationship when the analysis was carried out together, which was the habit of using a mosquito net and occupancy density, with the order of the strength of the relationship from the largest to the smallest was the habit of using a mosquito net (OR = 14.256) then the occupancy density (OR = 8,404). Of the two determinants, the most dominant factor that directly affects the incidence of dengue fever was the habit of using mosquito nets and this factor had the largest odds ratio (OR) which was 14.256 (table-3).

DISCUSSION

Analysis of Age Factors in the Incidence of Dengue Fever
Age is also the time we have lived or existed (since birth).[5] Dengue hemorrhagic fever can infect all age groups, including those that are only a few days old.[6] Based on age distribution data in dengue hemorrhagic fever cases in Indonesia in 1993 - 2009, there was a shift in the age group of dengue hemorrhagic fever sufferers, where in 1993 - 1998 the largest age group was <15 years old, but from 1999 to 2009 there was the most cases at age ≥15 years.[7]

The results showed that the age variable indengue hemorrhagic fever patients, most of the respondents were at the age of 15-56 years, which was 88.2%. Based on the results of the Chi Square test, the probability value (p value) was obtained 0.237 where p> 0.05, meaning that there was no significant relationship between age and the incidence of dengue.

This research is in contrast to research[8] which stated that there was a relationship between age and the incidence of dengue hemorrhagic fever. The bivariate test results obtained p value = 0.000 with OR = 25.020, which means that respondents who aged 25-70 years old were at risk of developing dengue hemorrhagic fever disease 25.020 times compared to someone aged 0-25 years. Another study which contradicts this research is research by[9] which stated that there was a relationship between age and the incidence of dengue hemorrhagic fever. This can be seen from the p-value = 0.002 (p value <0.05). This shows that the age of the respondent has an influence on the incidence of dengue hemorrhagic fever. When the respondent has an age that is in the young category, the risk of getting dengue disease will be greater than the respondents who have the old category.

According to researcher, age is not related to the incidence ofdengue hemorrhagic fever because dengue hemorrhagic fever can attack all age groups, both children and adults. All age groups are at risk for dengue hemorrhagic fever if the prevention of dengue hemorrhagic fever is not taken maximally, both individually and in families.

Analysis of Knowledge Factors on the Incidence of Dengue Fever
Knowledge is the result of knowing and this occurs after people sensing a certain object. Sensing occurs through the five human senses, namely: the senses of sight, hearing, smell and taste. Most of human knowledge is obtained through the eyes and ears.[10] The knowledge in this study is the knowledge possessed by respondents about the symptoms, causes, and ways of preventing the transmission of dengue disease.

The results showed that the knowledge variable in dengue hemorrhagic fever patients,most of the respondentshad good knowledge, namely 57.3%.Based on the results of the Chi Square test, the probability value (p value) was obtained 0.123 (> 0.05), which means that there was no significant relationship between knowledge and the incidence of dengue hemorrhagic fever.

This research is in line with research conducted by[11] which stated that there was no relationship between knowledge and the incidence of dengue with p = 0.643.However, another research that is not in line with this research is research conducted by[12] which stated that there was a relationship between knowledge and the incidence of dengue hemorrhagic fever.This can be seen from the p-value = 0.000 (p value <0.05) and the OR value = 10.7, which means that people with lack of knowledge were 10.7 times more likely to have dengue hemorrhagic fever than people with good knowledge. According to researcher, there is no relationship between knowledge and the incidence of dengue hemorrhagic fever because even though the respondent has good knowledge about dengue hemorrhagic fever, if this knowledge is not used or the respondent is indifferent to dengue hemorrhagic fever prevention, the respondent is still at risk of getting dengue disease, plus if they live in an environment that is support the reproduction of dengue vectors.

Analysis of the Habitual Factor of Using Mosquito Net on the Incidence of Dengue Fever
One of the controls that can be done is by using a mosquito net while sleeping to prevent dengue hemorrhagic fevervector mosquito bites.

The results showed that in the habit variable of using a mosquito net fordengue hemorrhagic fever patients, most of the respondents did not use a mosquito net, namely 63.6% at OesapaPublic Health Center. Based on the results of the Chi Square test, it showed the probability value (p value) is 0.000 (<0.05), which means that there was a significant relationship between the habit of using bed nets and the incidence of dengue hemorrhagic fever. The OR value of the habit variable using mosquito nets on the incidence of dengue hemorrhagic fever in OesapaPublivHealth Center was 13,222, which means that people who did not use mosquito nets have a risk of 13,222 times compared to respondents who used a mosquito net.

This research is not in line with research conducted by[13] which stated that there was no relationship between the habit of using a mosquito net and the incidence of dengue fever with a value of p = 1,000.Another study that is not in line with this research is research conducted by[14] which stated that there was no relationship between the habit of using a mosquito net and the incidence of dengue hemorrhagic feverfever. This can be seen from the p-value = 0.164 (p value> 0.05).

From the results of the study, it is known that the habit of using a mosquito net is related to the incidence of dengue hemorrhagic fever, this means that respondents need to use

a mosquito net while sleeping because the mosquito net is an effective way to prevent mosquito bites while sleeping. According to researcher, the use of mosquito nets is no longer considered a practical alternative to preventing dengue hemorrhagic fever, so that people prefer other alternatives that they consider practical, such as: using a mosquito racket, attaching gauze, or using mosquito repellent lotion.

Analysis of the Occupancy Density Factor in the Incidence of Dengue Fever

The large number of individuals in a certain area will facilitate the spread of dengue hemorrhagic fever, because it will simplify and accelerate the transmission of dengue virus from vectors. And the denser the population, the denser the occupancy.

The results showed that the variable occupancy density in some dense settlements was 67.3%. Based on the results of the Chi Square test, it showed that the probability value (p value) is 0.000 (<0.05), which means that there was a significant relationship between occupancy density and the incidence of dengue hemorrhagic fever. The OR value of the occupancy density variable on the incidence of dengue hemorrhagic feverwas 7,648, which means that respondents with dense occupancy had a risk of 7,648 times compared to respondents who were not densely occupied.

This research is in line with research conducted by[15] which stated that there was a relationship between occupancy density and the incidence of dengue fever with a value of $p = 0.020$ and a value of OR = 3.02. This means that dense occupancy is 3.02 times more at risk ofdengue hemorrhagic fever incidence compared to less dense occupancy.Another study that is not in line with this research is research conducted by[16] which stated there was no relationship between occupancy density and the incidence of dengue hemorrhagic fever. This can be seen from the p-value = 0.605 (p value> 0.05).

According to researcher, the occupancy density factor is not related to the incidence of dengue hemorrhagic fever because the respondents who live in the house do a lot of activities inside the house even though the house is densely occupied. Besides, the occupants of the house do not always sleep in the same room continuously in the morning, meaning that the occupants of the house often travel and do activities outside the home such as work and school, this shows that the respondent only occupies the bedroom at night.The level of population density that continues to increase will be more at risk of dengue hemorrhagic fever transmission if not accompanied by prevention of the development of the Ae. Aegypti mosquito.

CONCLUSION

Based on the results of the study, it can be concluded that there is no significant relationship between age and the incidence ofdengue hemorrhagic fever, there is no significant relationship between knowledge and the incidence of dengue hemorrhagic fever, there is a significant relationship between the habit of using a mosquito net and the incidence of dengue hemorrhagic feverand there is a significant relationship

between occupancy density and the incidence of dengue hemorrhagic fever.

Suggestions for further researchers are that there is a need for further research related to the differences in risk factors for the incidence of dengue hemorrhagic fever that are studied (host, agent and environment), and to study more deeply or specifically so as to broaden the horizons of researchers and readers and to improve health services to reduce the incidence of dengue hemorrhagic fever factors. It is hoped that the health office can provide services that are in accordance with the risk factors for the incidence of dengue and mosquito nets eradication activities so as to reduce the incidence of dengue hemorrhagic fever.

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