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Individual Characteristics, Environmental Factors, and Behavior With the Event of Dengue Hemorrhagic Fever

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ABSTRACT

Dengue hemorrhagic fever is still a serious public health problem in Indonesia. The number of dengue cases in Tebing Tinggi City is getting higher every year. This study aims to determine the relationship between individual characteristics, environmental factors and behavior with the incidence of DHF in the Tanjung Marulak Public Health Center, Tebing Tinggi City. The method used in this study is an analytical study method using a case-control study design. Analysis of research data with chi-square test. This research was conducted in the Tanjung Marulak Public Health Center, Tebing Tinggi City. From January to August 2021. The population of this study consisted of 1,457 households. The sample of this study amounted to 177 respondents. The sampling technique in the case used total sampling and the control sampling technique used gender matching. Data analysis, and discussion in the previous chapter, it can be concluded that the incidence of DHF was 59 respondents (33.3%) while those who had never contracted DHF were 118 respondents (66.7%) in the Tanjung Marulak Health Center Work Area. Cliff City. The incidence of DHF is more dominant in people aged >24 years as much as 73.4%. The majority of respondents suffering from DHF with female sex were 103 respondents (58.2%), the incidence of DHF was more dominant in respondents with low education as many as 140 respondents (79.1%) and the incidence of DHF was more dominant in respondents who worked as many as 116 respondents (65.5%). It is hoped that it can improve performance in the implementation of dengue control efforts and help establish policies and operational strategies that are efficient and effective in the implementation of dengue control in the community.

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1. INTRODUCTION

Health problems have become a special concern in the last decade. Health problems such as dengue hemorrhagic fever (DHF) is a health problem that still persists and has become a health problem for the last few decades and many people in the world have been infected with dengue fever because of its increasing spread. The actual number of dengue cases has not been reported, in most cases the symptoms are not severe or mild and can be self-treated(WHO, 2020). Dengue virus is the cause of this infectious disease. Dengue is a viral disease transmitted by the Aedes spp mosquito, the fastest growing mosquito in the world and has infected nearly 390 million people every year (Kemenkes RI, 2017).

In Indonesia, the number of dengue hemorrhagic fever sufferers in 2014 was 100,347 people, then in 2015 it was 129,650, then in 2016 it was 204,171. Then in 2017 it was 68,407 people, in 2018 it was 53,075 people and in January 2019 it was 13,683 people. Dengue hemorrhagic fever in 2015 was 1,071 people with a total of 129,650 patients reported in Indonesia and the majority of cases occurred in Indonesia, namely East Java province. The incidence rate (IR) in Indonesia in 2015 was 50.75 and the mortality rate per case (CFR) was 0.83% (Kemenkes RI, 2016).

North Sumatra is one of the provinces in Indonesia with a relatively high number of dengue fever cases, namely 5,786 cases in 2018, with 26 deaths. This number decreased from the previous year, 2017 as many as 5,454 cases while the number who died from DHF was 28 people. The number of dengue fever cases in 2016 was 8,715 cases, up from 2017. And in 2015 there were 5,695 cases. However, the decrease in the death rate (CFR) from the previous year was not too high, the 2015 case fatality rate (CFR) was 45 cases, in 2016 there were 60 cases, in 2017 there were 28 cases and in 2018 there were 26 cases (Dinkes Provinsi Sumut, 2018).

Dengue hemorrhagic fever (DHF) which is transmitted through the bite of mosquitoes of the Aedes genus, especially Aedes aegypti or Aedes albopictus, can occur throughout the year and affects all age groups. This disease is related to area conditions, weather, large movements, community density, division of units, and people's attitudes (Kemenkes RI, 2019).

In 2017, data on dengue cases contained 5 sub-districts in the city of Tebing Tinggi. Dengue cases/incidents occur every month and almost in every Kelurahan with the following data, Padang Hulu Subdistrict 24 people, Padang Hilir Subdistrict 16 people, Tebing Tinggi Kota Subdistrict 20 people, Rambutan Subdistrict 33 people and Batipe Subdistrict 40 people. The total number of DHF sufferers in 2017 was 133 people (Nainggolan, 2018). In 2018 data on dengue cases in Tebing Tinggi City, there are in every sub-district where Tebing Tinggi City has 5 sub-districts with cases/incidences of DHF every month and almost in every sub-district with the following data, Padang Hulu District 58 people, Padang Hilir District 43 people , District Tebing Tinggi Kota 31 people, Rambutan District 83 people and Batipe District 84 people. The total number of DHF sufferers in 2018 was 298 people (Dinkes Kota Tebing Tinggi, 2019). In 2019 there was an increase in dengue cases in every sub-district in the city of Tebing Tinggi with the following data, Padang Hulu District 96 people, Padang Hilir District 122 people, Tebing Tinggi City District 47 people, Rambutan District 109 people and Batipe District 141 people. The total number of DHF sufferers in 2019 was 515 people (Dinkes Kota Tebing Tinggi, 2020). Data on cases of dengue fever in Tebing Tinggi City in Rambutan District for the last three years

has increased significantly every year. Which of the health centers in the Rambutan sub-district, the working area of the Tanjung Marulak Health Center has the highest DHF rate every year.

Several factors influence the incidence of DHF in Karya Jaya and Tanjung Marulak sub-districts, Rambutan sub-district, Tebing Tinggi city which includes respondent characteristics (age, gender, education and occupation), environmental factors (presence of used goods, presence of water reservoirs, presence of larvae). Aedes aegypti mosquitoes and occupancy density) and behavioral factors such as 3M practices (draining, closing and burying).

2. RESEARCH METHODE

This research uses quantitative analysis research or analytical observational. By using a survey method using research questionnaires and face-to-face interviews with informants in the case control method. The sampling technique in the case used was total sampling, namely all dengue hemorrhagic fever patients registered in the Tanjung Marulak Health Center medical record. Meanwhile, control sampling was carried out with certain considerations such as population characteristics and previously known characteristics through sex comparisons.

This research was conducted in the working area of Tanjung Marulak Health Center, Tebing Tinggi City. In this study, the comparison used in case-control is 1:2 with 59 case samples and 118 control samples. The sample size includes 177 people in the working area of Tanjung Marulak Health Center, Tebing Tinggi City.

The data collection technique used in this study is data collection using secondary data sources obtained from the Tanjung Marulak Health Center, namely data on dengue cases and primary data obtained from observations at the research location. And using questionnaires and observation sheets as research instruments.

The data collection method used in this study was two tests. First, the validity test is carried out by taking samples from outside the research sample from the same population. Validity analysis was conducted to determine the validity of the questionnaire. Second, the reliability test was conducted to determine whether the single-variable questionnaire could measure what it was trying to measure in this study, first evaluating the validity and reliability of various research locations.

This study uses univariate data analysis which aims to confirm the frequency distribution of each variable and bivariate analysis is used to determine the relationship between each independent variable and the dependent variable. By using the chi-square test to confirm the relationship between the dependent variable and the independent variable.

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3. RESULT AND ANALYSIS

Table1 Frequency Distribution of Characteristics, Environmental Factors and 3M Practices with the Incidence of Dengue Hemorrhagic Fever

Variable	Frequency	Percentage
Aged		
<24 y.o	47	26,6
>24 y.o	130	73,3
Sex		
Male	74	41,8
Female	103	58,2
Eduction		
Medium	140	79,1
High	37	20,9
Work		
Work	116	65,5
Not Work	61	34,5
Density of Occupancy		
Dense people	56	31,6
Quite people	121	68,4
Water shelter for daily use Bathtub		
Yes	149	84,2
Not	28	15,8
Water shelter (TPA) for Ember's Daily Needs		
Have	175	98,9
Have Not	2	1,1
Water shelter (TPA) for the daily needs of Talang Air		
Have	73	41,2
Have Not	104	58,8
Water Shelter (TPA) at the Bird Drinking Place		
Have	34	19,2
Have Not	143	80,8
Water Shelter (TPA) in the Refrigerator		
Have	159	89,8
Have Not	18	10,2
Water shelter (TPA) in used Bottles/Cans		
Have	87	49,2
Have Not	90	50,8
Water Shelters (TPA) in Used Tires		
Have	40	22,6
Have Not	137	77,4
Water shelter (TPA) in Dispenser		
Have	114	64,4
Have Not	63	35,6
Mosquito Flick [Bathtub]		
Have	25	14,1
Have Not	152	85,9

Mosquito Flick [Ember]		
Have	14	7,9
Have Not	163	92,1
Mosquito Flick [Dispenser]		
Have	34	19,2
Have Not	143	80,8
Mosquito Flick [Refrigerator]		
Have	50	28,2
Have Not	127	71,8
Mosquito Flick [Bird Drinking Place]		
Have	7	4,0
Have Not	170	96,0
The Practice of Draining the Bathtub		
Not Draining	65	36,7
Draining	112	63,3
Practice on Second-Hand Goods		
Buried	10	5,6
Given to the garbage man	109	61,6
Crafted	11	6,2
Burned	27	15,3
Other	20	11,3
DBD		
Yes	59	33
Not	118	67
Total	177	100

Based on the results of the study, it was found that the majority of respondents aged >24 years were 130 respondents (73.4%), while respondents aged <24 years were 47 respondents (26.6%). Based on the results of the study, it was found that the majority of respondents were female as many as 103 respondents (58.2%), while male respondents were 74 respondents (41.8%). Based on the results of the study, it was found that the majority of respondents with low education were 140 respondents (79.1%) with low education who did not go to school/did not finish elementary school, elementary school, junior high school/equivalent and senior high school/equivalent education. While respondents who have higher education are 37 respondents (20.9%) with higher education in the education category of diploma and education graduated from academic/university. Based on the results of the study, it is known that the majority of respondents who work are 116 respondents (65.5%), while respondents with the category of not working there are 61 respondents (34.5%).

Based on the results of the study, it was found that the majority of houses in the non-occupancy category were 121 respondents (68.4%), while the houses in the densely occupied category were 56 respondents (31.6%). Based on the results of the study, it was found that the majority of respondents had a water reservoir (TPA) for daily needs. which do not have gutters 73 (41.2%). Based on the results of the study, it showed that the majority of respondents did not have a water reservoir (TPA) not for daily necessities such as a bird drinking place as many as 143 respondents (80.8%), the majority of respondents who had a water reservoir (TPA) such as a refrigerator as many as 159 respondents (89 ,8%), the majority of respondents who do not have a water reservoir (TPA) such as used bottles/cans are 90 respondents (50.8%), the majority of respondents do not have a water reservoir (TPA) such as used tires as many as 137 respondents (77, 4%), and the majority of respondents who have water reservoirs (TPA) such as dispensers are 114 respondents (64.4%).

Based on the results of the study showed that the majority of respondents did not find the presence of mosquito larvae in the bath as many as 152 respondents (85.9%) and as

many as 25 respondents (14.1%) found the presence of Aedes aegypti mosquito larvae, the majority of respondents did not find the presence of mosquito larvae in buckets as many as 163 respondents (92.1%) and as many as 14 respondents (7.9%) found Aedes aegypti mosquito larvae, the majority of respondents who did not find the presence of mosquito larvae in the dispenser were known as many as 143 respondents (80.8%) and as many as 34 respondents (19.2%) found Aedes aegypti mosquito larvae, the majority of respondents did not find mosquito larvae in the refrigerator as many as 127 respondents (71.8%) and as many as 50 respondents (28.2%) found Aedes aegypti mosquito larvae, the majority of respondents did not find the presence of mosquito larvae in the bird's drinking place, it was known as many as 170 respondents (96.0%) and as many as 7 respondents (4.0%) respondents found Aedes aegypti mosquito larvae.

Based on the results of the study, it was found that the majority of respondents who drained the bathtub were 112 respondents (63.3%), while those who did not drain the bath were 65 respondents (36.7%). Based on the results of the study, it was found that the majority of respondents gave used goods to garbage/flea collectors as many as 109 respondents (61.6%), 27 respondents who processed waste by burning (15.3%), respondents who processed waste by burying it as many as 10 respondents (5.6%) and others such as throwing away used goods were carried out by 20 respondents (11.3%). Based on the results of the study, it was found that the majority of respondents did not have a TPA cover at home as many as 132 respondents (74.6%) and as many as 45 respondents (25.4%) had a TPA lid at home. And in the practice of closing the TPA meeting, it was found that the majority of respondents did not close the TPA tightly as many as 157 (88.7%) respondents, while the respondents who closed the TPA were 20 respondents (11.3%).

Based on the results of research on the incidence of DHF obtained from medical records and interviews with informants, the data on the incidence of DHF that attacked the community were 59 respondents (33.3%) while those who had never experienced dengue fever were 118 respondents (66.7%).

4. DISCUSS

The majority of respondents in the case group were male, i.e. more than 30 respondents (16.9%), while the majority of respondents in the control group were female, including 77 respondents (1.8%). The education level of the informants showed that the education level of respondents in the case group was higher, namely 30 respondents (16.9%), but the education level of most of the control group was also higher up to 90 respondents (67.8%). Most of the respondents in the case group as many as 34 respondents (19.2%) did not work, while most of the 91 respondents (65.5%) in the control group also worked regularly and regularly.

Age is the life span of a person from birth to his birthday. Age is one aspect that influences people's perspective. with age, the level of development will further develop based on the knowledge gained and personal experience (Eka Cania 2017). Age also affects a person's life, because when they are old enough, their ability and maturity to think and receive information will increase. Similarly, the maturity of one's mind affects one's behavior better in one's environment. DHF is still a health problem in Indonesia; the incidence of DHF is still high in North Sumatra Province, and the incidence of DHF is still a problem in Pematangsiantar city. The goal of this research was to see if there was a link between environmental sanitation, 3M behavior, and the House Index and the occurrence of DHF at the Bah Kapul Health Center's Work Area in Pematang Siantar City (Lubis 2021).

Ages less than 24 years who are classified as young are indeed faster in absorbing information because they are more active in the use of information technology and social media where information about dengue prevention is widely found, but sometimes at that age they are still lacking in application, sensitivity or concern for the environment. The results of this study are in line with research Monintja (2015) shows that there is a significant relationship between age and PSN behavior. These results provide a significance value (p) of 0.011. The significant value of the results of the analysis of the relationship between age and PSN measures if the results of the analysis of the relationship between age and PSN measures are 0.05, the odds ratio (OR) value of 2.663 is the elderly (<46 years) compared to the young age (<46 years) 46 years).

The results of this study are in line with Marbun (2021) study that there is a significant relationship between the age of the patient and the incidence of dengue hemorrhagic fever. These results indicate that due to the increased risk of DHF in children under 15 years of age, children under 15 years of age are more at risk of developing DHF than persons aged 15 years and over. The immune system is still very low, the habit of napping and being aware of mosquito bites is still very low. Children usually spend time outdoors with activities such as going to school and playing. The places where people gather and visit are public places, where dengue fever can spread after being bitten by mosquitoes.

The results of this study indicate that there is no relationship between gender and the frequency of DHF, because women and men have the same chance of getting DHF, regardless of where the respondents are or where they work. The results showed that men were more at risk of developing DHF than women. Aedes aegypti is not a vector that prefers to chew on males and females, but has an equal tendency to bite males and females.

Gender is often associated with the way people behave and roles. The female gender tends to be more educated to be more expressive, cooperative, sympathetic, and independent. This phenomenon produces women who are more concerned about the environment and their health. While men have activities and activities that are more active outside the home than inside the house, as well as men who tend to be unsympathetic to the surrounding environment, making the risk of DHF for the male sex more at risk.

Work is an activity carried out by someone with a specific purpose. Work is an activity or activity that is carried out by someone as a profession and is carried out to earn income (Handayani, 2019). Knowledge that is not related to work has no impact on a person's life. The work environment allows people to directly or indirectly gain experience and knowledge(Notoatmodjo 2017;Saragih 2020; Siregar 2020).

Based on the results of the work research, the majority of respondents did not work as many as 34 respondents (19.2%) while in the control respondents who worked as many as 91 respondents (51.4%). It can be concluded that there is a relationship between work and the incidence of DHF. The results of this study are in line with the results of research conducted by (Utami, 2018). Occupation is one of the risk factors associated with the incidence of dengue fever. Based on the results of the study, respondents who do not work have a relationship with the incidence of DHF and are more at risk than respondents who work. In this study, many sufferers are not working, and many of them are children, students, and housewives.

From the existing problems, the researcher tries to find out what problems arise. and after interviewing several respondents, it turns out that most respondents do not work, spend a lot of time sleeping and chatting with neighbors so they don't have predictable daily routines. And some respondents also spend their time every day for school and studying. Meanwhile, respondents who work, even though they are busy with their work, still have a clear work agenda.

Vector Dengue fever is more commonly transmitted among students than the general population. This is because many media are nested under student benches, student chair poles, parks and yards where students play. In addition, school activities such as learning and playing occur concurrently with the cycle of infectious vectors, which causes vectors to be bitten more frequently. It is clear from the description that the incidence of dengue fever is very high at the student level (Santjaka, 2015).

The incidence of DHF is higher in respondents who live in the Tanjung Marulak Health Center work area, where most of the respondents do not work. Most of the respondents worked in the community control group, which made up the majority of respondents in this survey. Transmission of DHF spreads in an environment evenly, so those who do not work are more susceptible to contracting it. The number of people living in one house can affect the density of occupancy indirectly because more and more family members living in one house can lead to more activities that can become a breeding ground for Aedes aegypti mosquito larvae (Wahyuningsih et al., 2017; Engka 2017).

The results showed that as many as 40 (29.6%) respondents in the densely populated case group and the control group also experienced a population density of up to 81 respondents (20.9%). This shows that fluctuations in residential density are often a risk factor for dengue fever. The results of this study are in line with research Wahyuningsih (2017) namely the variable density of placement is a risk factor for DHF. The survey results show that most of the respondents are not congested. The result is calculated by knowing the area of the house and the number of occupants of the house. According to Law Number 1 of 2011 concerning Residential Areas and Residential Areas, namely if the density of dwellings exceeds < 8 m2/person, then the dwellings are designated as dense dwellings. Therefore, housing density is not a factor associated with the occurrence of DHF. Persons who live in houses with standing water are 5.1 times more likely to get malaria than people who do not live in houses with standing water (Harya 2021).

This study is in line with the research of Handoyono et al. (2015) that respondents who have dense dwellings are less affected by DHF, namely 16 (21.1%) compared to respondents who have non-dense dwellings as much as 18 (29%). In this case it is not a causative factor for dengue fever, but only a risk factor that can cause dengue fever as a whole, along with other risk factors such as migration, environmental hygiene, mosquito breeding grounds, and vector density.

Based on the results of research in the field by comparing the area of the house and the number of people living in the house, the population experiences residential density. There are some houses that only have one room and must be occupied by 4 occupants of the house. Where the density of the dwelling can cause the house to experience humidity, the air and room temperature become unstable and the cleanliness of the house is also not maintained. The frequency of mosquito bites can affect human activities, people who have less activity have a greater risk of contracting the dengue virus because they will be bitten by Aedes aegypti mosquitoes three times more often than people who are more active. Since the frequency of mosquito bites is also influenced by the presence and density of the population, it is estimated that Aedes aegypti is at high risk of contracting dengue fever in densely populated houses.

The results showed that 95 respondents who had Aedes aegypti mosquito larvae, of which 34 (19.2%) were infected with DHF, and 61 (34.5%) were not infected with DHF. Meanwhile, there were 82 respondents who did not have Aedes aegypti mosquito larvae, of which 25 (14.1%) had DHF and 57 (32.2%) did not. It can be said that a house where the presence of mosquito larvae is found is more risky than not finding mosquito larvae in the

house. The results of this study are also in line with the research of Hakim et al., (2015) that the number of positive containers for Aedes spp mosquito larvae is not related to the presence of dengue hemorrhagic patients.

Based on the results of research that has been carried out in the working area of the Tanjung Marulak Health Center, the two types of water reservoirs studied are daily water reservoirs and non-daily water reservoirs. At the daily TPA there are mosquito larvae in the bathtub and buckets outside the house. And at the non-daily TPA, there are mosquito larvae in the refrigerator, dispenser and bird drinker. The respondent's house is not infested with larvae because it collects water using a bucket that drains automatically every day. However, the presence of mosquito larvae is often found in other places from the respondent's TPA such as in refrigerators and dispensers. The community in the Tanjung Marulak Health Center Work Area, most of the people collect water by using a bath instead of a bucket. And most of the people use refrigerators and dispensers where the presence of mosquito larvae is also found in the two TPAs.

Water reservoirs for daily necessities such as drums, bathtubs, buckets, and water reservoirs made from old/unused things such as cans, used tires, bottles, and flower vases are among the areas where Aedes Aegypti mosquitoes prefer to reproduce (Zen and Rahmawati 2015). According to Saragih et al. (2019), unclean water reservoirs become breeding grounds for Aedes Aegypti mosquitoes; cleaning water reservoirs in the house, such as bathtubs, should be done once a week; and the habit of cleaning bathtubs can help reduce the spread of dengue disease.

Based on the results of the study showed that there was no significant relationship between the presence of Aedes aegypti larvae and DHF. However, the presence of larvae has a risk for dengue fever. In this case, the presence of mosquito larvae is a risk because mosquito larvae are part of the mosquito breeding process. The previous adult mosquito was lava (mosquito larvae). And this is at risk of the occurrence of DHF in the Tanjung Marulak Health Center working area.

5. CONCLUSION

Based on the results of research, data analysis, and discussion in the previous chapter, it can be concluded that the incidence of DHF was 59 respondents (33.3%) while those who had never contracted DHF were 118 respondents (66.7%) in the Tanjung Marulak Health Center Work Area. Cliff City. The incidence of DHF is more dominant in people aged >24 years as much as 73.4%. The majority of respondents suffering from DHF with female sex were 103 respondents (58.2%), the incidence of DHF was more dominant in respondents with low education as many as 140 respondents (79.1%) and the incidence of DHF was more dominant in respondents who worked as many as 116 respondents (65.5%).

The incidence of dengue fever is mostly found in the home environment with the category of not being densely populated, as many as 121 respondents (68.4%). The water reservoirs for daily needs which are more dominantly used by respondents are buckets as many as 175 respondents (98.9%) and respondents are more dominant in using water reservoirs instead of daily necessities such as refrigerators as many as 159 respondents (89.8%). And the majority of respondents did not find the presence of mosquito larvae in bird drinking places, it was known as many as 170 respondents (96.0%) and the presence of Aedes aegypti mosquito larvae were found in landfills such as refrigerators, 50 respondents (28.2%).

The behavior of draining the bathtub in respondents was more dominant than respondents who drained the tub < once a week as many as 112 respondents (63.3%). The behavior of processing used goods by respondents is more dominant in the behavior of giving used goods to garbage/flea collectors as many as 109 respondents (61.6%). And the

majority of respondents were found not to close the TPA with a meeting as many as 157 respondents (88.7%).

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