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Original Research

Factors Influencing the Incidence of Dengue Haemorrhagic Fever

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ABSTRACT

Background: Dengue Hemorrhagic Fever (DHF) is a contagious disease that is still a community problem in Indonesia. The purpose of this study was to analyze the factors related to the incidence of dengue fever in Deket village.

Method: This study was an observational analytical study with a case control design. The data that was collected used interviews and questionnaires. The sample consisted of 39 for the case group and 39 for the control group. The variables used were 3M behavior (covering the water container, draining the water container, burying unused things) and the incidence of DHF. This study used the Chi-square test.

Result: The results showed that there was a relationship between the habitual draining of the water reservoirs with dengue fever, where p=0.000 (p<0.005). There was a relationship between the habit of closing the water reservoirs with dengue fever; p=0.000 (p<0.005). There was a relationship between the habits of thrift burial with dengue hemorrhagic fever; p=0.000 (p<0.005).

Conclusion: Based on these results, it is expected that the health cadres should control the implementation of 3M in the community.

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KEYWORDS

dengue hemorrhagic fever; peripheral draining; water reservoir; thrift burial

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INTRODUCTION

Dengue is a disease related to the environment (Kesetyaningsih, Andarini, Sudarto, & Pramoedyo, 2018; Rasjid, Yudhastuti, & Notobroto, 2016) that spreads rapidly (Kesetyaningsih et al., 2018). Dengue Fever (DF) is considered as one of the diseases that occur in most of the world's tropical regions (Ferreira et al., 2018; Islam, Haque, Hossain, & Rochon, 2019; Kemenkes RI, 2010) and subtropics in the world (Ferreira et al., 2018), one of which is in Indonesia. Dengue Hemorrhagic Fever (DHF) in Indonesia has an increased incidence and declines in mortality (Kemenkes RI, 2010). Increasing and increasing areas of DHF distribution are in line with increasing community mobility and density (Kemenkes RI, 2016; Rasjid et al., 2016).

Based on the review of the articles, the most cases of dengue were in the Southeast Asian region (62 cases), the Western Pacific Region (20 cases) and the United States (31 cases) (Banno et al., 2018). The WHO noted that Indonesia became the country with the highest number of DHF cases in Southeast Asia from 1968 - 2009 (Kemenkes RI, 2010). In 2015, there were 126,675 DHF sufferers in the 34 provinces in Indonesia and 1,229 of them died (Kementrian Kesehatan RI Pusat Data dan Informasi, 2016). In Lamongan city, the incidence of DHF in 2017 was 248 cases.

Dengue Hemorraghic Fever can be caused by climate change and a low awareness of maintaining environmental cleanliness (Kementrian Kesehatan RI Pusat Data dan Informasi, 2016). The knowledge and behavior of the community at reducing the density of the *aedes aegyepti* mosquito larvae has a relationship with the presence of standing water (Kesetyaningsih & Ulfabriana, 2016; Rasjid et al., 2016). Mosquito vector control measures can be carried out at the shelter as a potential place for mosquito breeding (Islam et al., 2019). Vector control can be done by using, removing and recycling the water reservoirs properly (Islam et al., 2019). In Indonesia, the mosquito vector eradication program is run through the 3M Plus program which includes the movement of draining the water reservoirs, closing the water reservoirs and recycling goods that can hold water (Kementrian Kesehatan RI Pusat Data dan Informasi, 2014). Not all regions in Indonesia do this program

well, so the incidence of DHF still cannot be prevented optimally. The purpose of this study was to identify the 3M factors related to the incidence of dengue in the Deket area, Lamongan.

MATERIALS AND METHODS

Design

This study was an observational analytical study with a case control design, conducted by comparing the case groups and control groups based on their exposure status. The subjects diagnosed with the disease were called cases while the subjects who did not suffer from the disease were called the controls. The variables used were the 3M behaviors (covering the water container, draining the water container and burying unused things) as the independent variables and the incidence of DHF as the dependent variable.

Participant

The population in this study was all of the people living in the village of Deket Lamongan who had been diagnosed with DHF. The sample size in each group was 39 samples. The total sample total in this study was 78 people. The sampling method used in this study was simple random sampling.

Data Collection

The data was collected from November 2018 to January 2019 in Deket village using a questionnaire created by Ariyanti (2005) about 3M behavior. The reliability test was Cronbach's alpha and the result was 0.927. The primary data covering the 3M behavior was obtained through a questionnaire on people who had had DHF. The data of the dengue patients in 2018 was confirmed by the Primary Health Care center of each sub-district.

Data Analysis

The relationship between the variable of 3M behavior with the variable of DHF incidence was analyzed using the Chi-square test using SPSS version 22.

RESULT

For the respondents in this study, most were in the age range of 24-34 years in the case group (46%), and 35-45 years in the control group (33%). The most common sex was women at 69% in the case group and 74% in the control group. The highest educational level was the low level (elementary-junior high school), which was 51% in the case group and 59% in the control group. Most of the respondents worked; 62% in the case group and 51% in the control group (Table 1).

The results of the study were the relationship between the behavior of covering the water container and the incidence of DHF (p=0.000; OR=0.021), the behavior of draining the water containers with the incidence of DHF (p=0.000; OR=0.000) and burying unused things with DHF (p=0.000; OR=0.064). The 3M steps in terms of preventing DHF are part of a government program that has been implemented since 1992. In 2002, it was developed into 3M Plus by using larvacide, maintaining the fish and preventing mosquito bites (Table 2).

Table 1. Respondent's Characteristics

Respondent's Characteristics	Case Group		Control Group	
	n	%	n	%
Age				
24 to 34	18	46%	11	28%
35 to 45	12	31%	13	33%
46 to 56	6	15%	10	26%
>56	3	8%	5	13%
Sex				
Male	12	31%	10	26%
Female	27	69%	29	74%
Educational level				
Low (elementary-junior high school)	20	51%	23	59%
Moderate (high school)	15	38%	16	41%
High (College)	4	10%	0	0%
Occupy				
Worker	24	62%	20	51%
Not worker	15	38%	19	49%

Table 2. Relationship between the 3M Behavior with the Incidence of DHF

Variable	Case Group		Control Group		p	OR
	n	%	n	%		
Covering the water container						
Yes	4	10%	33	85%	0,000	0,021
No	35	90%	6	15%		
Draining the water container						
Yes	27	69%	39	100%	0,000	0,000
No	12	31%	0	0%		
Burying unused things						
Yes	17	44%	36	92%	0,000	0,064
No	22	56%	3	8%		

DISCUSSION

Closing the water reservoir is an effort to prevent dengue fever. This is supported by the results of this study which shows that there is a significant relationship between the behavior of the water reservoir covering and the incidence of DHF. The results of this study support the recent research, namely that there is a need to close the landfill poorly. There is an increase in the risk of developing dengue

fever 9 times greater than the respondents who do not practice closing the landfill well (Rahmawati, Nurjazuli, & Dangiran, 2016). The results of observations in several cities in Indonesia shows that water shelters such as drums, bottles, toilets and buckets have the potential to be a breeding ground for mosquitoes (Rasjid et al., 2016). Poor behavior has an impact on the increasing number of containers available for breeding mosquitoes which can increase the incidence of dengue cases (Azlina, Adrial, & Anas, 2016; Widagdo, Husodo, Bhinuri, & Dkk, 2008).

Burying used goods is one of the PSN's efforts. This is supported by the results of this study which showed that there is a significant relationship between the drainage behavior concerning the water reservoirs and the incidence of DHF. The results of this study support the recent research, which is related to the behavior of using or recycling used goods. This is not good, as the risk of dengue fever is 5 times greater than the behavior of recycling used goods properly (Rahmawati et al., 2016). Changes in people's behavior in the form of using, disposing and recycling of containers properly is very important to do in places that are potential mosquito breeding sites (Islam et al., 2019). Increasing the incidence of DHF is influenced by various factors which include the climatic factor (Khairunisa, Wahyuningsih, Suhartono, & Hapsari, 2018). The rainy season causes environmental changes such as puddles in several places. Gutters which still contain puddles and used cans which still contain puddles are accompanied by the community PHBS which, if not maximized, could increase the incidence of DHF (Artana, 2018).

Closing the containers, exposing the landfill and burying the used goods are some of the efforts that can be done in terms of the PSN activities. The good implementation of PSN in areas with a high DHF incidence is very influential in decreasing the DHF rate (Kesetyaningsih & Ulfabriana, 2016). The poor implementation of the 3Ms involves 6 times the risk of getting dengue fever than those who do not have good 3M practices ("Hubungan Faktor Lingkungan dan Praktik Pemberantasan Sarang Nyamuk (PSN) dengan Kejadian Demam Berdarah Dengue (DBD) di Kecamatan Ngawi," 2016). This effort to prevent dengue fever can be improved with the role of "jumatik" (Astuti et al., 2017) or through the larva monitoring health center that has been formed in each village.

CONCLUSION

There was a relationship between the influence of the 3M's of behavior with the incidence of DHF in Deket Lamongan Village. The behavior of covering the water container, draining the water container, and burying unused things had relationship with the DHF incidence. Community participation as an effort to prevent the occurrence of DHF is needed through the health cadres that have been formed by the public health center. Coordination with the health centers and health offices should be related to the government programs for preventing DHF as needed. The community needs to be given health education concerning the signs and symptoms of DHF as the first form of detection and as the first line of treatment that needs to be done.

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