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Relationship between Knowledge and Family Preparedness in Facing Dengue Fever in Lhokseumawe City

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Abstract:
This study aims to describe relationship between knowledge and family preparedness in facing dengue fever in Lhokseumawe City. The study is conducted in 20 villages, in 3 districts namely Muara Dua District, Banda Sakti, Muara Satu Lhokseumawe City. The selection of this location is considered to be a DHF endemic village where every year DHF free larvae cases are found below 95 percent with the number of cases 111 in 2018. The result shows that Family preparedness in the face of dengue fever in Lhokseumawe City is mostly 76 families ready (66.1%). Knowledge has no effect on family preparedness in the face of dengue fever in Lhokseumawe City (p = 0.073).
Keywords:
relationship; knowledge; family; preparedness; dengue fever; Lhokseumawe City

I. Introduction

Lhokseumawe City is one of the dengue endemic areas in Aceh Province. In 2015 the number of Dengue fever sufferers was 115 cases, in 2016 the number of sufferers increased to 280 cases died 4 people, in 2017 the number of sufferers decreased 98 cases died 1 person and in 2018 the number of sufferers was 111 cases with an Incidence rate of 49.3 per 100,000 population, died 1 person. In 2007 Lhokseumawe City was once designated as an Extraordinary Occurrence area of Dengue fever in Aceh Province and then the Lhokseumawe City Health Office worked together with various sectors to make various efforts in reducing the number of Dengue fever events so that the following year a decrease in cases occurred. However, although it decreases every year, there are cases of Dengue fever found with fluctuating numbers (Lhokseumawe City Health Office, 2018).

In several ASEAN countries in efforts to control DHF, community empowerment activities are one of the approaches used as in Malaysia with the implementation of the Evaluation of Communication for Behavioral Impact (COMBI) project. The Malaysian Ministry formed a Task Force consisting of seven ministries with the concept of Integrate Management in carrying out the prevention and control of DHF, the task force was tasked with overcoming any problems regarding DHF. Community empowerment in controlling DHF is also carried out in the State of Brunei Darussalam through collaborative activities between policy makers and the community, public health services follow the principles that underlie Integrated Vector Management in the prevention and control of dengue in which the community and stakeholders play an important role in combating DHF. The State of Indonesia in controlling DHF community / family empowerment activities is one of the approaches implemented, it has been declared in the ASEAN Dengue Day meeting where Indonesia conducted a one-jumantik house program (Sukesi, 2018).

The Lhokseumawe City Health Office collaborates with several sectors to carry out preparedness activities in dealing with dengue incidents, including active hospital surveillance by surveillance officers, providing 24-hour standby ambulances at each puskesmas,

epidemiological investigations by health workers in areas where dengue cases are found, program socialization one house one jumantik, fostering school jumantik, cadre of jumantik in each village, fogging focus in the area found DHF cases, distribution of larvicide larvae powder, counseling to families and community groups, health promotion through various health promotion media and mass mutual cooperation (Dinas Lhokseumawe City Health, 2018).

Based on interviews with 30 families in 10 endemic villages in Lhokseumawe City, it is known that 18 families (60%) conducted PSN by draining water reservoirs at least once a week, 16 families (53%) closed water reservoirs, 14 families (46%) buried / destroy used goods, 20 families (66%) have larvicidal by sowing larvae powder in water reservoirs that are difficult to clean, 17 families (56%) still often hang clothes, 11 families (36%) have determined the number of families, from the results The interview can be concluded that not all families have done the maximum eradication of dengue mosquito nests (PSN) with 3M Plus.

II. Review of Literature

2.1 Dengue Hemorrhagic Fever

Dengue hemorrhagic fever is an acute viral infection caused by dengue virus, dengue fever is transmitted through the bite of Aedes aegypti mosquitoes characterized by fever 2 to 7 days with manifestations of bleeding, decreased platelets (thrombocytopenia), the presence of hemoconcentration which is characterized by plasma leakage (increased hematocrit) ascites, pleural effusion and hypoalbuminemia) (Ministry of Health, 2016).

The dengue virus is transmitted from one person to another through the bite of the Aedes mosquito, it is known that there are several types of Aedes mosquitoes namely Aedes aegypti, Aedes albopictus, Aedes polynesiensis, Aedes scutelaris, and Aedes niveus. The vector that causes dengue fever in female Aedes mosquitoes, the morphological difference between female Aedes mosquitoes and males lies in the morphological differences in the antennas, Aedes aegypti males have thick feathered antennas while female feathered feathers are rather rare / not dense.

Aedes aegypti has a characteristic that is easily recognizable, namely black and white stripes on the body and white patches on the wings and legs, dengue virus transmitting mosquitoes are found in almost all regions in Indonesia, these mosquitoes can live and breed in areas with a height ± 1000 M above sea level and areas above ± 1000 M above sea level do not allow mosquitoes to breed because the air temperature is too low. This mosquito can fly up to a distance of 100 meters and bite in the afternoon and evening.

Aedes aegypti as well as other types of mosquitoes undergo a perfect metamorphosis, namely from the larvae-larvae, where the stage of the egg, larvae and pupae undergo a life cycle in water. The eggs will hatch into larvae / larvae within ± 2 days after the eggs are submerged in water, larvae / larvae stage usually lasts 6-8 days, and the cocoon stage (pupae) lasts between 2-4 days. Growth from eggs to adult mosquitoes for 9-10 days, female mosquitoes age 2-3 months.

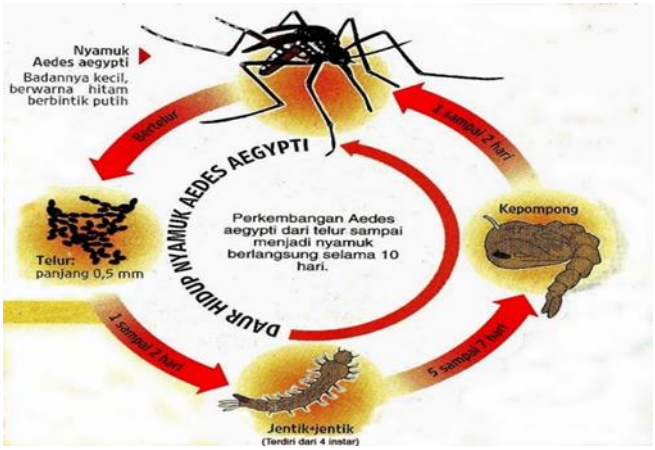

Figure 1. *Life cycle of Aedes aegy mosquitoes*

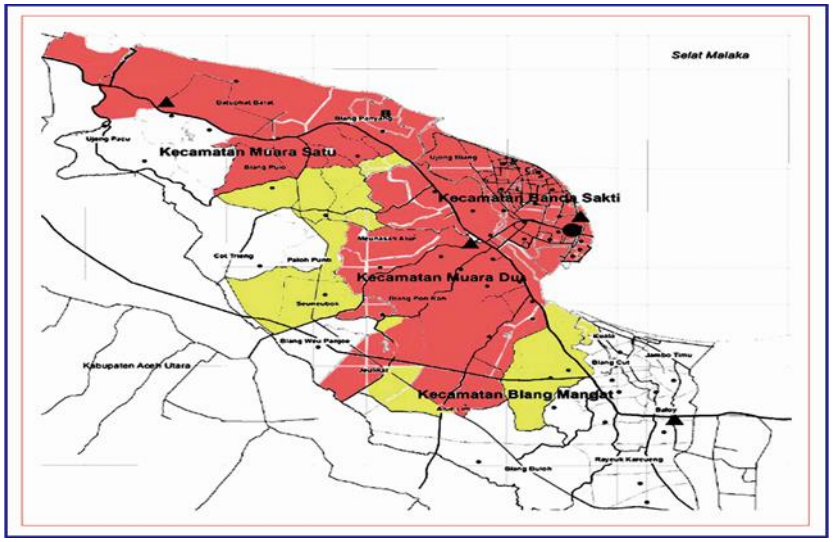

Figure 2*. Map of Dengue Hemorrhagic Fever Areas in Lhokseumawe City*

Information:
= Endemic area of Dengue Hemorrhagic Fever
= Sporadic area of Dengue Hemorrhagic Fever
= Dengue Hemorrhagic Fever free area

Lhokseumawe City consists of four subdistricts: Banda Sakti District, Muara Dua District, Muara Satu District and Blang Mangat District. There are 68 villages with 44 endemic villages, 10 sporadic villages and 12 villages not found DHF in the last three years.

2.2 Extraordinary Occurrence of Dengue Fever

Extraordinary events are the emergence or increase in the incidence of morbidity or death that is epidemiologically significant in an area in a certain period of time (Ministry of Health, 2004). And according to the Ministry of Health (2000) Extraordinary Events are the emergence or increase in the incidence of morbidity or death that is epidemiologically significant in a certain period of time and region.

Prevention of Extraordinary Events (KLB) DHF is a response effort that includes: treatment / care for patients, breaking the chain of transmission, eradication of vectors with 3M Plus PSN movement simultaneously and evaluation of countermeasures conducted in all areas experiencing outbreaks.

To determine the status of KLB in an area regulated in the Minister of Health Regulation of the Republic of Indonesia No. 15 of 2010 there are 7 criteria in determining the status of an outbreak of an area but in efforts to control DHF there are 3 recommended criteria, namely:

(1) Arise of a certain infectious disease (DHF) that did not previously exist or was not known in an area.
(2) The number of new DHF sufferers in a period of one month shows an increase of two or more times compared to the average monthly rate in the previous year.
(3) The case fatality rate (Case Fatality Rate) within a certain period of time shows an increase of 50 percent or more compared to the case fatality rate for an earlier period in the same time period.

2.3 Family

The family is one or more individuals who live together who are united in a bond of sharing and emotional closeness and introduce themselves as part of the family (Friedment, 2003). While the definition of family according to Alder, et al (2014) states that the family includes adults who live together in one house, without marriage ties with or without children, single parents, divorced and remarried parents by bringing the children of previous marriages, homosexual relations with or without children.

The family has a structure that refers to individual characteristics and demographics of family members such as age, sex and number of family members who then form a family unit. The family structure then changes over time to meet family needs and social needs (Lancaster and Stanhope, 2012).

2.4 Preparedness

Preparedness is one of the efforts made to anticipate the possibility of disaster to avoid the loss of life, loss of property and changes in people's lives in the future (Sutton and Tierney, 2006).

National National Disaster Management Agency (2012) preparedness is a series of activities carried out to anticipate disasters through organizing as well as through appropriate and efficient steps. Whereas Kent (1994) defines preparedness to be broader namely "minimizing the adverse effects of a hazard through effective, rehabilitative and recovery preventive measures to ensure the organization and delivery of assistance and assistance after a disaster occurs in a timely and effective manner. While preparedness according to Law No. 24 of 2007 preparedness is carried out to ensure rapid and appropriate efforts in dealing with disaster events.

According to the Indonesian Institute of Sciences and UNESCO / International Strategy for Disaster Reduction (ISDR) (2006), preparedness is part of the way disaster management is and in the ideas of disaster managers that are growing today. Rising disaster is one of the absolute elements of reducing disaster risk activities that are pro-active before experiencing disaster.

III. Research Method

This type of research is a quantitative analytic study with a cross sectional design which is a research approach that studies the relationship between risk factors and effects and data collection both dependent and independent variables carried out simultaneously at the same time (Notoatmodjo, 2010).

The study was conducted in 20 villages, in 3 districts namely Muara Dua District, Banda Sakti, Muara Satu Lhokseumawe City. The selection of this location is considered to be a DHF endemic village where every year DHF free larvae cases are found below 95 percent with the number of cases 111 in 2018

The population in this study were all family heads in 20 endemic villages in the Lhokseumawe City area, as many as 20,766 families, the consideration of choosing the head of the family (KK) was assumed as the decision maker and action in realizing family preparedness in facing DHF events in Lhokseumawe City. Based on reports from the Lhokseumawe City Health Office the larvae free rate is still below 95 percent. This allows an increase in cases and the potential for extraordinary events, especially when entering the rainy season.

In this study is the head of the family, to determine the number of samples carried out by using a large sample formula Lameshow et al., 1997 namely:

$$n = \frac{N.Z^2 1\alpha/2.p.(1-p)}{(N-1)d^2 + Z^2 1-\alpha/2.p.(1-p)}$$

Information:
n = Minimum sample size.
$Z_{1-\alpha}$ = Standard normal distribution value (table Z) at α 5% = 1.96
P = Proportion of DHF Incidence rate in Aceh Province = 49.3% (0.493)
d = error (absolute) that can be tolerated
N = Total in population

$$n = \frac{N.\ Z^2\ 1\alpha/2.\ p.\ (1\text{-}p)}{(N\text{-}1)\ d^2 + Z^2 1\text{-}\alpha/2.p\ (1\text{-}p)}$$

$$n = \frac{20766.\ 3{,}841.\ 0{,}49.\ 0{,}51}{20{,}765.\ 0{,}01 + 3{,}841.\ 0{,}49.\ 0{,}51}$$

$$n = \frac{19.927{,}3}{208{,}6}$$

$$= 95{,}52$$

Based on the above calculation, the number of samples obtained in this study was 95.52 respondents and was fulfilled to 96 respondents. To anticipate the chosen sample of Loss to Follow-up, twenty percent is added, bringing the total sample to 115 respondents.

The technique of determining the sample by taking the population of the number of villages in 3 districts, namely 20 DHD endemic villages in the city of Lhokseumawe. Selection of 20 villages as samples with consideration (1) is a village found in dengue cases every year (2)

areas with a lot of population / households. The selection and determination of samples is done by Systematic Random Sampling, which is sampling with sequential techniques or with multiples of 180 to meet the specified number of samples in each village. To determine the number of samples in each village, it is done based on proportions because the number of subjects in each region is not the same and can be determined by the following formula:

$$Sample = \frac{Total\ of\ Family\ Register\ in\ each\ Village}{Total\ of\ Family\ Register\ in\ Village} \times Total\ Sample$$

The number of families sampled in each village is calculated as follows:

Table 1. Distribution of Calculation of Number of Research Samples in Every Village in Lhokseumawe City

No.	Village	Total of Family Register	Calculation	Sample
1	Lancang Garam	467	(467/20,765) x115	3
2	Tempok Teungeh	1.994	(1.994/20,765) x115	11
3	Uten Bayi	1082	(1082/20,765) x115	6
4	KP Jawa Lama	2007	(2007/20,765) x115	11
5	KP. Jawa baru	289	(289/20,765) x115	2
6	Hagu Selatan	1223	(1223/20,765) x115	7
7	Hagu Teungeh	1113	(1113/20,765) x115	6
8	Ujong Blang	1012	(1012/20,765) x115	6
9	Ulei Jalan	557	(557/20,765) x115	3
10	Kuta Blang	1129	(1129/20,765) x115	6
11	Hagu Barat Laut	853	(853/20,765) x115	5
12	Banda Masen	666	(666/20,765) x115	4
13	Mon Geudong	1257	(1257/20,765) x115	7
14	Keude Aceh	632	(632/20,765) x115	4
15	Simpang Empat	1145	(1145/20,765) x115	6
16	Munasah Kota	580	(580/20,765) x115	3
17	Pusong Baru	809	(809/20,765) x115	4
18	Pusong Lama	1141	(1141/20,765) x115	6
19	Alue Awe	1449	(1449/20,765) x115	8
20	Panggoi	1360	(1360/20,765) x115	7
		20.765		115

Source: Lhokseumawe City Health Office Document, 2019

Family preparedness is a series of family actions in anticipating the incidence of DHF that may occur at some time, preparedness questions consist of 14 questions, the highest score of 28 and the lowest. 1. Based on the total score according to Arikunto (2003) with categories:

a. Ready, if the respondent eradicates mosquito nests (PSN 3 M plus other activities) ≥ 75% (Score ≥ 21).
b. Not quite ready, if the respondent eradicates mosquito nests (PSN 3 M plus other activities) <75% (Score <21).

If the bivariate test results obtained p value <0.25 then the variable is entered into the multivariate test, with the equation:

$$Z = \alpha + B_0X_1 + B_2X_2 + \ldots\ldots + B_iX_i$$

Terms for using logistic regression:

- If the bivariate test results have a p value <0.25.
- In this study using the backward method.

IV. Discussion

Based on interviews with 115 heads of families obtained the results, knowledge about family preparedness in dealing with dengue in Lhokseumawe City can be seen in Table 9 below:

Table 2. Distribution of Respondents Based on Family Knowledge in Lhokseumawe City

No	Knowledge	Yes		No		Total	
		n	%	n	%	n	%
1	Dengue hemorrhagic fever (DHF) is an infectious disease caused by mosquito bites.	92	80,0	23	20,0	115	100,0
2	Mosquitoes that cause dengue fever bite in the afternoon and evening.	82	71,3	33	28,7	115	100,0
3	If a family member has a fever that has not gone down for more than three days, it is necessary to immediately check with a doctor	77	67,0	38	33,0	115	100,0
4	Ever heard of eradicating mosquito nests by draining, burying and recycling (PSN 3M Plus).	84	73, 0	31	27,0	115	100,0
5	3M PSN activities aim to prevent transmission of dengue disease by breaking the chain of transmission.	84	73,0	31	27,0	115	100,0
6	Families in the face of DHF do not need to do PSN 3M Plus a week	52	45,2	63	54,8	115	100,0
7	Preparedness at the household level in dealing with DHF events is the responsibility of all family members.	69	60,0	46	40,0	115	100,0
8	Fogging (Fogging) is one of the efforts made to prevent dengue fever.	75	65,2	40	34,8	115	100,0
9	One of the preparedness efforts at the household level is by providing larvae powder (abate powder).	79	68,7	36	31,3	115	100,0
10	Dengue DHF disease will heal itself so it does not need to watch out and deal with ordinary.	50	43,5	65	56,5	115	100,0

Based on Table 11 above it is known, as many as 92 people (80.0%) know that DHF is an infectious disease caused by mosquito bites in the afternoon and evening as many as 82 people (71.3%). If there is a family member who has a fever for more than three days without coming down, it is necessary to immediately check with the doctor / health center. Most of the responses know 77 people (67.0%) of the respondents have heard of eradicating mosquito nests by taking care of, burying and recycling (PSN 3M Plus) 84 people (73.0%) of respondents knew the purpose of 3M Plus PSN as many as 84 people (73.0%) and there was no need to do 3 M Plus PSN once a week as many as 63 people (54.8%).

Preparedness at the household level is the responsibility of all family members as many as 69 people (60.0%) and dengue prevention efforts by fogging (Fogging) as many as 75 people (65.2%) provide larvae powder (abate powder) as many as 79 people (68.7%). Generally, respondents stated that DHF was dangerous as many as 65 people (56.5%).

Overall knowledge of the head of the family about family preparedness in dealing with dengue hemorrhagic fever with a good category as many as 74 people (64.3%) and with less categories as many as 41 people (35.7%) in Lhokseumawe City can be seen in Table 12 below:

Table 3. Distribution of Respondents Based on Family Knowledge in Lhokseumawe City

Category	Frequency	Percentage
Good	74	64,3
Bad	41	35,7
Total	115	100,0

Bivariate analysis was performed to determine the relationship of each variable consisting of knowledge, with family preparedness in dealing with dengue fever. Data analysis using Simple logistic regression test from the test results obtained p<0.25 stated significant variables were included in the multivariate model.

Table 4. Effect of Knowledge, on Family Preparedness in Facing Dengue Hemorrhagic Fever in Lhokseumawe City Based on Simple Logistic Regression Test Results

Variable	Preparedness				Total		p-Value	RP	(95%CI)
	Less Ready		Ready						
	n	%	n	%	n	%			
Knowledge									
Bad	24	58,5	17	41,5	41	100,0	0,000	5,553	(2,395-2,875)
Good	15	20,3	59	79,7	74	100,0			

Table 5. Logistic Regression Analysis: The Relationship Factor of Family Preparedness in Facing Dengue Fever in Lhokseumawe City in 2019

Variable	β	p	RP	*95% C.I. for Exp(B)*	
				Lower	*Upper*
Selection 1 Knowledge After Elimination	0,823	0,146	2,276	0,751	6,901
Seleksi 2 Knowledge	0,966	0,073	2,626	0,912	7,558

Based on the results of research from 41 families obtained families with a lack of level of knowledge have less preparedness in dealing with the incidence of DHF as many as 24 (58.5%) families and ready 17 (41.5%) families. After a simple logistic regression test was obtained (p = 0.00) or (p<0.05) shows that knowledge has a significant relationship with family preparedness in Lhokseumawe City.

Based on the statistical analysis it can be explained that a person's knowledge will affect family preparedness in Lhokseumawe City. This is supported by the theory of Potter and Perry (2004) which states that knowledge is one of the variables that influence individual behavior and beliefs, where the higher a person's knowledge of health the higher one's desire to maintain health. Knowledge is the result of knowing someone about an object through

their senses and is influenced by the intensity of attention and perception of the object. From the results of the study, it was known that most respondents were well-informed (64.3%) about their preparedness to face dengue fever.

In this study respondents did not know that dengue was an infectious disease caused by mosquito bites 23 (20%) HH, did not know the mosquitoes that cause DHF bite in the afternoon and 33 (28.7%) HH, never heard of eradicating mosquito nests by drain, bury and recycle (3M Plus PSN) 31KK (27.0%) preparedness at the household level in the face of DHF events is the responsibility of all family members 69 (60.0%) HH, no need for fogging (Fongging) to prevent dengue hemorrhagic fever 40 (34.8%) HH, not providing larvae powder (abate powder) as an effort to prepare at the household level 36 (31.3%) HH, stated harmless DHF would heal itself 50 (43, 5%) Family Register.

This is in line with the results of Mirzana's study (2015) in Jaya Baru District, Banda Aceh City, showing that there is a relationship of knowledge with family preparedness in the face of DHF (p = 0.023) and these results are also consistent with Novrita's (2017) research in Ogan Komengan Ilir Regency South Sumatra shows there is a relationship of knowledge with the eradication of mosquito nests (PSN) by carrying out 3 M Plus activities, namely draining, burying and recycling used goods.

A person's behavior is influenced by education. Lack of knowledge can lead to lack of implementation, communication, information to the public about the causes, symptoms, ways of transmission, ways of prevention, ways of treatment and how to deal with and the dangers of dengue fever. The public only knows and understands about DHF but has not been able to apply it Notoadmodjo (2012) explains knowledge is indeed an important factor but does not underlie changes in health behavior, even though people know about DHF, they do not necessarily want to implement it in the form of eradication, prevention and control.

Knowledge is very demanding for someone to behave, for example actions to prepare for dengue events, eradicate mosquito nests with 3 M Plus, routine schedule draining water reservoirs, closing water reservoirs, utilizing used goods that can hold rain water, avoiding the habit of hanging clothes, using clothes anti-mosquito medication to prevent mosquito bites prepare important numbers that can be contacted if there are families suffering from DHF and already have a health insurance card and prepare a vehicle that can be used to bring the family to the hospital.

V. Conclusion

Family preparedness in the face of dengue fever in Lhokseumawe City is mostly 76 families ready (66.1%). Knowledge has no effect on family preparedness in the face of dengue fever in Lhokseumawe City (p = 0.073).

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