

RELATIONSHIP BETWEEN KNOWLEDGE, ACTION OF FAMILY IN DCB (DRAIN, CLOSE, AND BURY) PROGRAM, AND THE EXISTENCE OF EGGS OF AEADES AEGYPTI MOSQUITO ON OVITRAP IN KANDAI KENDARI, INDONESIA

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ABSTRACT

Background: *Dengue Hemorrhagic Fever* (DHF) is a contagious disease caused by the dengue virus infection through *Aedes aegypti* mosquito. DHF often causes epidemics and Extraordinary Events (EE) in tropical and subtropical regions, including Indonesia.

Objective: This study aims to examine the relationship between knowledge and society action on the prevention of dengue with the amount of mosquitoes trapped in ovitrap in Kandai, Kendari, Indonesia.

Methods: The research method was an observational study with cross sectional design. The research was conducted at Kandai village, Kendari on May to July 2014. It was 87 homes with 87 families were recruited as sample size for this study. Ovitrap was used inside and outside of their homes.

Results: DCB family knowledge and the existence of *Aedes sp* mosquitoes eggs on ovitrap were analyzed and observed in this study. Chi square test showed that X2 count value (1.261) was less than X2 table value (3.814) at error level 5% ($\alpha = 0.05$) indicated that H_0 was rejected and H_a was accepted. Meanwhile, Chi square test for the action of the family about DCB and the existence of eggs *Aedes sp* mosquito on ovitrap showed that X2 count value (4.115) was greater than X2 table value (3.814) at the error level 5% ($\alpha = 0.05$), indicated that H_0 was rejected and H_a was accepted.

Conclusions: It was concluded that (1) there was no relationship between DCB family knowledge and the existence of *Aedes sp* mosquitoes eggs on ovitrap, and (2) there was a relationship between the action of family about DCB and the existence of *aedes sp* mosquitoes eggs on ovitrap in Kandai Kendari.

Key words: *dengue, mosquito eggs, ovitrap.*

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a contagious disease that caused by dengue viral infection through *Aedes Aegypti* mosquito. DHF in recent years has become an international health problem. Currently, it is

estimated that 2.5 billion people living in endemic areas of dengue fever.¹ Dengue is the most widespread and significant of *arboviral* disease, and of the 50-100 million cases reported each year, approximately 500.000 were severe and 20.000 were fatal.² DHF often

causes epidemics and extraordinary events (EE),³ tropical and subtropical regions, including Indonesia.⁴

The number of dengue cases in Indonesia in 2010 ranges from 150.000 cases with the deaths of around 1.317 people. High number of cases have made Indonesia as the first rank in the ASEAN region and the world's ranking after Brazil.^{5,6}

Factors affecting the increase of dengue cases were the development of urban areas, mobility increased, population density, climate change, lack of community participation, including the weak effort of dengue control program, so the efforts of dengue control program need more attention, especially at the level regency/city and community health center.⁷ One of reproduction chain terminations of *Aedes aegypti* mosquito is by DCB program (drain, close, and bury) that was a preventive action to avert the occurrence of dengue epidemic. The vulnerable area to the reproduction of *Aedes aegypti* and *Aedes albopictus* was an area that becomes a main priority for preventing the dengue disease endemic.

In Southeast Sulawesi, Kendari city was the highest number of dengue cases that was 602 cases and 2 people died (CFR: 0.99%). Based on the data from the Health Office Kendari city, the dengue incidence had spread almost throughout Kendari city with the number of patients in 2009 were 285 people and 4 people died (CFR: 1.6%) in 2010, the dengue incidence Kendari city was increased to 278 people and 2 people died (CFR: 0.7). While in 2011 the number of dengue fever patients rise again reached 298 people and 5 died (CFR: 1.7%). Dengue fever occurred in almost all districts in Kendari city.⁸ Based on the preliminary survey in the work area port health office in 2012, data from 4 villages in the working area of the port health offices, Kandai village was the region that most identified the density of mosquito larva with the figure of House Index (HI) amount 60.18%.

Although a variety of preventive had been done in Kendari city, such as fogging, PSN, and DCB, but the cases of dengue is still high. In Indonesia, *Aedes sp* control program,

including Kendari city generally less successful, due almost entirely dependent on fumigation is to kill adult mosquitoes. The use of chemicals insecticide fogging did not have a significant benefit, because the using of fogging just caused adult mosquitoes died,⁹ while mosquitoes larva were not died, and fogging using organophosphate insecticide can cause to vector resistance because of inaccurate dosage.¹⁰ On the other hand, the use of insecticides continuously and repeatedly over a period of 2-2- years can lead to the emergence of resistant insects.¹¹ In line with the another research that the use of synthetic insecticide continuously and repeatedly as an effort to control efforts *Aedes Aegypti* can cause environmental pollution, kill other fauna, so that vector resistance happened.¹²

At this time, some countries have applied one of ways in controlling the *Aedes* mosquito to reduce the vector density, and the use of egg traps or ovitrap. Specifically, ovitrap is used to detect manifestations of mosquitoes into new areas that had previously been wet. Some states had done the *Aedes* vector control by utilizing egg trap. To detect the presence of the *aedes* vector in Manila city was using fixed ovitrap at five hospitals and the density of *Aedes* eggs were 0.0 - 48.5 which indicated the presence of the *Aedes aegypti* vector in five hospitals in Manila city.¹³ In Sri Lanka, it was 3.075 *aedes aegypti* and 2.665 *Aedes albopictus* trapped in outdoor ovitrap as well as 2.528 *aedes aegypti* and 2.002 *Aedes albopictus* trapped in indoor ovitrap indoor.¹⁴ The aedes controlling by using ovitrap is also reported successful in Singapore by fixing 2000 ovitrap in the area of DHF endemic.¹⁴ Indonesia has utilized ovitrap to identify the existence of *Aedes aegypti* mosquito by fixing ovitrap in the Gonilan village Kartasura Sukoharjo which found that ovitrap index in Gonilan were 39.1%; Tuwa 29.5% and Keduren 16.4%. None figures larva at Gonilan was 50.0%; Tuwa 67.9%; and the highest is in Keduren 69.2%.¹⁵

The existence of mosquito eggs can be one way to detect the density of adult mosquitoes. Survey by means the detection of the mosquito eggs had the advantage because able to detect the presence of mosquito

without having the larvae directly. The previous result of studies showed that the ovitrap had the function of monitoring and controlling to *Aedes sp.* The advantages of entomology survey by using ovitrap were to produce specific data, more economical, and sensitive to choose sample population with a wider area. The use of ovitrap as one method of measuring the density of mosquitoes had never been applied in Kendari city. Based on that consideration, this study aimed to determine the relationship between knowledge and society action in Kendari city on the prevention of dengue with the existence of *Aedes* eggs on ovitrap.

METHODS

This study was an observational study with cross sectional design. The research was conducted at Kandai village Kendari city in May-July 2014. The population in this study was all the people who live in Kandai village in 2014 that consisted of 643 homes. There were 87 families selected for this study. Fixed ovitrap was applied to 87 homes, both inside and outside the home. Data were collected by counting the number of eggs in ovitrap, and checklist sheet to obtain data about the knowledge and society attitudes in the prevention of dengue. The secondary data was also collected from national annual reports and reports of Health Office Southeast Sulawesi Province.

RESULTS

Table 1. Respondents' Distribution by Age

No	Age group (years)	n	%
1	20 - 30	11	12.64
2	31 - 40	36	41.38
3	41 - 50	14	16.1
4	51 - 60	15	17.24
5	61 - 70	8	9.2
6	71 - 80	3	3.44
Total		87	100

Table 1 shows that from 87 respondents, the highest number of respondents is the group aged 31-40 years consisting of 36 respondents (41.38%), and the lowest in the group aged

71-80 years consisting of 3 respondents (3.44 %).

Table 2. Distribution by Gender, Occupation, Education

No	Sex	n	%
1	Male	32	36.78
2	Women	55	63.22
Total		87	100
No	Type of Occupation	n	%
1	Civil Servant	3	3.45
2	House hold	45	51.72
3	Entrepreneur	39	44.83
Total		87	100
No	Education	n	%
1	University	12	13.79
2	Senior High School	44	50.57
3	Junior High School	15	17.24
4	Elementary School	16	18.40
Total		87	100

Table 2 showed that the number of women (55 respondents or 63.22%) is higher than the men (32 respondents or 36.78%). Most of them are working as household (45 respondents or 51.72%), and entrepreneur (39 respondents or 44.83%). Of 44 respondents have senior high school background (50.57%), 15 respondents have junior high school (17.24%), 16 respondents have elementary school, and 12 respondents (13.79%) have university background.

Table 3. The Existence of Mosquito Eggs and the Society knowledge related to DCB Kendari

No	The Existence of Mosquito Eggs	n	%
1	Positif	69	70.4
2	Negatif	18	20.6
Total		87	100
No	Knowledge about DCB	n	%
1	Good	58	66.7
2	Less	29	33.3
Total		87	100

Table 3 shows that from 87 houses, there were 69 houses (70.4%) had the positive existence of *Aedes sp* mosquito eggs, and 18 houses (20.6%) had no eggs of mosquito. It is also shown that 58 respondents (66.7%) had a good knowledge, and 29 respondents (33.3%) had lack of knowledge.

Table 4. Relationship between DCB Family Knowledge and the Existence of *Aedes sp* Mosquitoes Eggs on Ovitrap in Kandai Kendari City

Knowledge	Eggs Existence		Number			
			Positive		Negative	
	n	%	n	%	n	%
Less	25	86.2	4	13.8	29	100
Good	44	75.9	14	24.1	58	100
Total	69	79.3	18	20.7	87	100

Action	Eggs Existence		Number			
			Positive		Negative	
	n	%	n	%	n	%
Less	45	86.5	7	13.8	52	100
Good	24	68.6	11	31.4	35	100
Total	69	79.3	18	20.7	87	100

Table 4 shows that the respondent's houses that have positive eggs in ovitrap with less knowledge were 25 (86.2%), and respondent's houses that have negative eggs in ovitrap were 4 (13.8%). Good knowledge respondents that have positive eggs of mosquito in ovitrap were 44 respondents (75.9%), and those who have negative eggs were 14 respondents (24.1%). It is also shown

DISCUSSIONS

Relationship between DCB Family Knowledge and the Existence of *Aedes sp* Mosquitoes Eggs on Ovitrap in Kandai Kendari City

Knowledge covers the memory of things learned and stored in memory that includes facts, benefits, principles and methods are known. Knowledge stored in memory, is explored as needed through the memory or knows back. Knowledge is also interpreted as object recognition through the senses, the more senses are stimulated, the more knowledge also increased.

Based on the findings of this study, it showed that the respondents' houses were positive mosquito eggs with less knowledge were 25 (86.2%), and negative eggs were 4 (13.8%), with a good knowledge with positive mosquito eggs were 44 (79.9%) and negative eggs were 14 (24.1%).

From the statistical test using chi square test obtained X^2 count value = 1.261 and X^2 table value = 3.814 at error level 5% ($\alpha = 0.05$). Because X^2 count value is less than X^2 table value, so H_a was rejected and H_o was accepted. It means there was no

that respondents' houses that have positive eggs of mosquito in ovitrap with less action were 45 (86.5%), while the negative eggs of mosquito in ovitrap with less action were 7 (13.8%). Otherwise, respondents' houses that have positive eggs of mosquito in ovitrap with a good action were 24 (68.6%), while the negative eggs of mosquito in ovitrap with a good action were 11 (31.4%).

relationship between DCB family knowledge and the existence of *Aedes sp* mosquito eggs on ovitrap in Kandai, Kendari city. Observation results indicated that the respondents' knowledge about DCB had relationship with existence of *Aedes sp* mosquito eggs.

Based on the above analysis, it showed that the respondents' knowledge about DCB was good, but respondents did not apply in the daily life. This was due to several factors such as the lack of initiative to clean the water reservoir regularly. Research conducted by Santoso and Budiyo reported that there was relationship between knowledge and dengue disease. If knowledge of how to eradicate dengue were not supported by an active attitude to apply the prevention of dengue fever, then it would not significantly impact to the decrease of the number of dengue disease.¹⁵

The Action of the Family about DCB and the Existence of Eggs *Aedes sp* Mosquito on Ovitrap in Kandai Kendari City

The action is interpreted as a reaction of the organism to its environment. This happens when something is needed to cause a

reaction happen because of stimulation. Based on the results, it showed that the respondents' houses that had positive mosquito eggs with less action were as 45 (86.5%), and negative eggs were 7 (13.5%), while respondents' houses that have positive eggs of mosquito in ovitrap with a good action were 24 (68.6%), while the negative eggs of mosquito in ovitrap with a good action were 11 (31.4%).

From the statistical test using chi square test obtained χ^2 count value = 4.115 and χ^2 table value = 3.814 at the error level 5% ($\alpha = 0.05$). Because χ^2 count value was greater than χ^2 table value, so H_0 was rejected and H_a was accepted. This means that there was relationship between the action of the family about 3M DCB and the existence of Eggs *Aedes sp* Mosquito on Ovitrap in Kendai Kendari city. This was in line with research conducted by Santoso and Anif Budiyo stating that there was relationship between dengue prevention action and dengue disease.¹⁵

CONCLUSIONS

Based on the findings of this study, it can be concluded that: 1) there was no relationship between DCB family knowledge and the existence of *Aedes sp* Mosquitoes Eggs on Ovitrap in Kendai Kendari, 2) there was a relationship between the action of family about DCB and the existence of *Aedes sp* Mosquitoes Eggs on Ovitrap in Kendai Kendari.

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