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Relationship between Behaviour of Malaria Prevention with Malaria Accident by Community in Calumta Health Centre, Siko, and Kalumpang, City of Ternate

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Abstract: ***Malaria is the main cause of death is diseases of the tropics which are estimated one million population dead of one year cases. It occurs around 200-300 million/yeas. This case is one of the major public of health problem because it is affected to the mortality number baby, toddler and pregnancy. This research aims to look at the relationship between the behaviors of the community about the prevention of malaria incidence in the third with a working area of clinics. This research method used analytic approach with case-control study. Sampling technique performed with total sampling as much as 36 cases and 36 controls and the test is performed with the chi-square by deviation standard was α = 5% (0.05). The results of the analysis showed the existence of a meaningful relationship between the behavior modification with the incidence of malaria with P value =0.002. There is a meaningful relationship between environmental modification with malaria with P value =0.004 and no relationship between the behavior of personal protection with gen of malaria with p value =0.343. So, summarize of this study shown there is no meaningful relationship between the behaviors of personal protection with malaria, there is a meaningful relationship between environmental modification and behavior modification with the incidence of malaria. Therefore, it is expected to do outreach clinics periodically about malaria prevention and efforts.***

Keywords: Personal Protection Behavior, Behavior modification, Environmental Modification and Malaria

1. Introduction

Malaria is an infectious disease caused by the *protozoa obligatintraselular* of *the genus plasmodium*. *Plasmodium* transmitted to humans mainly through *anopheles* mosquito bites the infected females. Malaria is the main cause of death is diseases of the tropics is estimated to be one million population die each year of malaria cases occur and new 200-300 million/year. Malaria infection is the largest of more than 100 countries in Africa, Asia, the Americas and the Karabia Islands. More than 1.6 trillion humans exposed by malaria with suspected morbidities 200-300 million and mortality over 1 million per year or one death every 30 seconds. (Harijanto, 2009).

Almost all of the County/city in North Maluku province categorized as an endemic of malaria area including the city of Ternate. In the year 2010, in the city of Ternate, although the number of malaria has been a pretty meaningful decline but still belongs to high, i.e. as many as 579 positive cases than the number of cases of malaria in 2009 totaling 846 cases of positive Malaria (Ternate City Health Office, 2011).

Ternate city is one of the areas in the North Maluku that figure case of malaria still belongs to high. Ternate City Health Office data released in the year 2000 with the number of occurrence *of Annual Malaria Incidence* (AMI) amounted to 31.26 per 1000 population, the incidence and the number *of Annual Parasite Incidence* (API) of 1.83 per 1000 inhabitants. The year 2010 has declined, with *the Annual Malaria Incidence* (AMI) of 24.42 per 1000 inhabitants and the Genesis *of Annual Parasite Incidence* (API) of 1.18 per 1000 population (health service of the city of Ternate, 2011).

The efforts of the most effective malaria prevention are avoiding mosquito bites of anopheles such us efforts in the form of personal protection, behavior modification and environmental modifications. Personal protection using insecticide and repellent, use dresses long sleeves and long pants. Behavior modification in the form of reduced activity outside the House began to dawn dusk when mosquitos anopheles generally bite, home window closed from afternoons or preferably given mosquito kassa, and sleep in mosquito nets. Environmental modifications aimed at reducing mosquito breeding habitat in the form of improvements to the drainage system in order to reduce standing water, eliminating mosquito breeding places such as tins, baths and used tires (Dasril, 2005).

Based on the description, then Research This is in the do to knowing relationship with malaria prevention behaviour by people in work wlayah Clinics Kalum a ta, Siko, Kalumpang and Ternate city.

2. Formulation of the Problem

Malaria is the main cause of death which is diseases of the tropics estimated to be one million population die each year of malaria cases occur and new 200-300 million/year. This disease is one of the problems of public health in General, and in particular can affect the number of morbidity of infants, toddlers, and mothers giving birth.

3. The Question Research

Based on the formulation of the problem, then the research question is whether there is a connection with malaria

prevention behavior by community health centers in the region Kalumata, Kalumpang, Siko and town of Ternate?

4. Research Objectives

General Purpose

To knows the relationship with the occurrence of malaria prevention behavior by community health centers in the region Kalumata, Kalumpang, Siko and town of Ternate.

Specific Purpose

a) Knew the relationship with personal protection behavior of malaria in the region, Siko Kalumata of clinics, and Kalumpang Ternate city.
b) Knew the relationship of behavior modification with the incidence of malaria in the region, Siko Kalumata of clinics, and Kalumpang Ternate city.
c) Knew the relationship behavior modification in the environment with malaria in the region, Siko Kalumata of clinics, and Kalumpang Ternate city.

5. Method of Research

Design Research

The research is the research *explanatory research* (research description) and that is to explain the relationship between variables through benchmarking using the method of *analytic survey* i.e. researchers retrieve data from a sample by using the questionnaire as a tool of data collection for further analysis. This research uses the approach of *case control study* with the objective of assessing the influence of independent variables with the occurrence of malaria sufferers in the family by way of comparing a group of families of those afflicted as the case and a group of families of people not diseased as control (Dahlan, 2014).

Research on place and time

This research was carried out in the region of clinics, Siko Kalumata, Kalumpang and Ternate city, with consideration is within easy reach of researchers. The study lasted for a little over 2 months i.e. starting on 28 September until November 20, 2014.

Populations and Samples

The population in this research is the whole communities who've been on medical treatment and was diagnosed with malaria diagnosis based on microscopic examination in medical or public health Kalumata, Kalumpang, Siko and town of Ternate on the Moon January up to September 2014 with a total of 36 patient people.

Sample

The sample in this study consisted of two, namely:

a) The Group's case is a family member of his family has ever suffered from malaria based on diagnosis or medical examination mokroskopis listed in note 3 Medic clinics in January-September 2014 with a total of 36 cases.
b) The control group is a family member of his family is never listed as malaria sufferers in medical records in 3 clinics, or have symptoms similar to malaria.

6. Result

This research was carried out in the region Kalumata health centers work, Siko, Kalumpang and The city of Ternate, start date September 28th up to date November 20, 2014 , entitled Prevention behavior relationship with incidence of malaria by people in the region Kalumata health centers work, Siko, Kalumpang and The City Of Ternate. The samples on this research totaled 72 people consisting of 36 people who once suffered from malaria (cases) and 36 people who never suffered from malaria (controls) that are listed in the register of clinics, Siko Kalumata, Kalumpang and Ternate city in In January and September 2014.

Univariate Analysis

This analysis was conducted to find out the characteristics of the site, in general the characteristics of respondents, the characteristics of the object of research with described based on the characteristics of each sample is examined.

Table 1 Characteristics of respondents based on age, gender, education, and work in the area of public health work, and Siko Kalumata, Kalumpang Ternate City

Characteristics Of Respondents	The Incidence Of Malaria			
	Case		Control	
	f	%	f	%
Age Group (Years)				
16-25	7	19.5	2	5.6
26-35	8	22.2	12	33.3
36-45	14	38.9	11	30.6
46-55	6	16.7	11	30.6
> 56	1	2.8	0	0
Gender				
Male	20	55.6	17	47.2
Women	16	44.4	19	52.8
Education				
No School	5	13.9	7	19.4
Elementary	16	44.4	10	27.8
Junior School	6	16.7	1	2.8
High School	8	22.2	15	41.7
Bachelor	1	2.8	3	8.3
Jobs				
Farmer	15	41.7	19	52.8
Self employed	4	11.1	4	11.1
Government	2	5.6	3	8.3
Police	1	2.8	0	0
Employed	3	8.3	2	5.6
Un employed	11	30.6	8	22.2
Total	36	100.0	36	100.0

The primary Data sources: 2014

Table 1 menunjukkann that the frequency of most malaria cases occurred in the age group of respondents between 36 – 45 years, namely a number of 14 people (38.9%) and the least was the respondent (2.8%) that occurred in the group aged > 56, while in most malaria cases with negative found in the group aged 26 – 35, i.e. as many as 12 (33.3%) of the respondents. With regard to gender shows that the highest number of positive malaria occurrence experienced by men that is as much as 20 people (55.6%). So instead of the woman more negative with malaria that is as many as 19 people (52.8%). Educational level of respondents as many as 16 people (44.4%) of positive malaria occurs at the level of Eelementary education, and at least at the level of higher

education that is as much a 1 person (2.8%), and vice versa in the case of negative Malaria is the highest in level of education high school, i.e. as many as 15 people (41.7%). The type of work the most respondents suffer from malaria positive: with as much as 15 people (41.7%) occur in the peasant, while respondents least i.e. 1 person (2.8%) with positive malaria occur on the respondents working as the national police.

Table 2 the distribution of respondents based on behavior with malaria in the region work The clinic Kalumata, Kalumpang, Siko and town of Ternate

Community Behavior	The Incidence Of Malaria			
	Case		Control	
	f	%	f	%
Personal Protection Behavior				
Personal Protection	22	61.1	18	50.0
Not Personal Protection	14	38.9	18	50.0
Behavior Modification				
Behavior Modification	11	30.6	24	66.7
Not Behavior Modification	25	69.4	12	37.3
Behavior Modification In The Environment	10	27.8	22	61.1
Environmental Modification	26	72.2	14	38.9
Not Environmental Modification				
Total	36	100.0	36	100.0

The primary Data sources: 2014

In table 2 shows that as many as 22 people (61.1%) of respondents with a positive 36 dai malaria have personal protection, likewise negative malaria each of 18 people (50%) have personal protection behavior and 50% not personal protection. On a behavior modification suggest that as many as 11 people (30.6%) of the 36 respondents positive malaria do behavior modification, while the 36 respondents negative malaria, as many as 12 people (37.3%) does not modify behavior. Further explained that on the behavior modification the environment shows a total of 10 people (27.8%) of the 36 respondents with a positive malaria do environmental modification, while 14 persons (38.9%) of the 36 respondents who negative malaria does not do modifications to the environment.

Table 3 the distribution of the respondents based on the behavior of Personal Protection in the area of employment The clinic Kalumata, Kalumpang, Siko and town of Ternate

Items Of Personal Protection Questions	The case n = 36		Control n = 36	
	Yes	Not	Yes	Not
Ownership of the anti-mosquitos	26	10	31	5
Easy to get the anti-mosquitos	26	10	30	6
Wear clothes covered while being outdoors	23	13	30	6
Sleep medication anti mosquito	22	14	23	13
Use anti mosquitoes while sleeping the night routine	16	20	7	29
Never had a problem with drug use anti mosquitoes	14	22	13	23
Use the anti-mosquitos well	10	26	22	14
Use the anti-mosquitos when being outdoors	3	33	4	32
use the anti-mosquitos routinely while outside the home at night	0	36	1	35

The primary Data sources: 2014

On table 3 illustrates the behavior of personal protection of the most high with answer Yes from the 36 respondents in the case of positive malaria is equal to the negative case of malaria that is the question of ownership of the anti-mosquitos and easily get the anti-mosquitos IE 26 respondents, and malaria cases in the group there were no respondents who used the anti-mosquitos regularly when being outdoors at night.

Table 4 the distribution of the respondents based on behavior modification in the area of public health work Siko, Kalumata, Kalumpang and Ternate city

Behavior Modification	The case n = 36		Control n = 36	
	Yes	Not	Yes	Not
Ownership of the nets	32	4	33	3
Ownership of nets on air grilles	29	7	33	3
Outside the House of night	28	8	30	6
Bed using bed nets	19	17	25	11
Netting still good condition	18	18	26	10
Using the fan	18	18	15	21
Routine to the outside of the House night	16	20	11	21
Ownership of the nets quite	15	21	29	7
Uninterrupted use of mosquito nets	11	25	8	28
Air grilles in good condition	10	26	25	11
Use mosquito nets to sleep routine	5	31	13	23
Routine with a fan	4	32	4	32

The primary Data sources: 2014

In table 4 that the item on the question of behavior modification, the questions with answers Yes by the respondent in the case of positive malaria are on the question of ownership i.e. netting 32 respondents from the 36 respondents, respondents from 33 and 36 respondents to the case were negative for malaria, while the lowest question answered Yes in the case of positive malaria is equal to the negative case of malaria namely 4 respondents on the question of routine with the fan.

Table 5 distribution of Respondents based on Behavior modification of the environment in the area of employment The clinic Kalumata, Kalumpang, Siko and town of Ternate

Environmental Modification Question Item	The case n = 36		Control n = 36	
	Yes	Not	Yes	Not
Ownership of the water shelter	36	0	35	1
Drainage channel ownership	36	0	36	0
Around the House there is a second-hand goods	31	5	18	18
Around the House there is a bushland	29	7	17	19
Dispose of the waste in place	20	16	32	4
Clean the water shelter every week	18	18	27	9
The shelter be closed water	13	23	18	18
Frequently clean secondhand goods	10	26	30	6
Second-hand goods buried/burned	8	28	21	15
Bush often cleared	7	29	19	17
Frequently clean the drainage channel	7	29	22	14
Water shelter be closed meetings	4	32	11	25

The primary Data sources: 2014

In table 5 that the item on the question of behavior modification in the environment of the most high with answer Yes from the 36 respondents in the case of positive malaria question of ownership of water and shelter drainage channels ownership of all respondents answer Yes, and questions answered at least in the case of malaria that is positive on the question of water shelter be closed only 6 respondents who answered Yes from the 36 respondents.

Bivariate Analysis

Analysis on the research of bivariate aims to see the relationship with the independent variable dependent through cross-tabulations and continued with the test of *chi-square* fit a specific purpose this study as follows:

Table 6 Personal Protection Behavior Relationship with incidence of Malaria in the region work The clinic Kalumata, Kalumpang, Siko and town of Ternate

The behavior	The Incidence Of Malaria				Total		*p*	*or*
	Case		Control					
	f	%	f	%	f	%		
Personal Protection	22	61.1	18	50	40 32	55.6 44.4	*p* = 0343	1,571
Not Personal Protection	14	38.9	18	50.				
Total	36	100.0	36	100.0	72	100.0		

Source: primary Data, 201

Table 6 shows that as many as 61.1% of respondents with a positive malaria have personal protection, While respondents with negative malaria respectively 50% have personal protection behavior and 50% other don't have personal protection behavior. Test results *Chi Square* shows no relationship between the behavior of personal protection with malaria incidence (*p* =0343) *or* value = 1,571, This means that respondents with no personal protection behavior likely 1,571 times suffer from malaria than have personal protection behavior.

Table 7 Relationship behavior modification with the incidence of Malaria in the region of Kalumata, health centers work Siko, Kalumpang and Ternate city

The behavior of the	The Incidence of Malaria				Total			
	Case		Control					
	F	%	f	%	f	%	*p*	*or*
Behavior Modification	11	30.6	24	66.7	35	48.6	*P* = 0002	0220
Not Behavior Modification	25	69.4	12	37.3	37	51.4		
Total	36	100.	36	100.	72	100.		

Source: primary Data, 2014

Table 7 shows as much as 30.6% of respondents with a positive behavior modification have malaria, while 37.3% of respondents that malaria does not modify negative behavior. Test results *Chi Square* showed a significant relationship between the behavior modification with the malaria incidence (*p* =0.002) with a value *or* = 0220, This means that respondents with behavior modification could 0220 times idak suffered malaria than not behavior modification.

Table 8 Relationship with Environmental Modification of Malaria Incidence in the region work The clinic Kalumata, Kalumpang, Siko and town of Ternate

The behavior	The Incidence Of Malaria				Total		p	Or
	Case		Control					
	f	%	f	%	f	%		
Environmental Modification	10	27.8	22	61.1	32	44.4	P = 0.004	0245
Not Environmental Modification	26	72.2	14	38.9	40	55.6		
Total	36	100	36	100	72	100		

Source: primary Data, 2014

Table 8 shows as much as 27.8% of respondents with positive malaria do environmental modification, while 38.9% of respondents negative malaria does not do modifications to the environment. Test results *Chi Square* showed a significant relationship between environmental modification with malaria incidence (*p* =0.004) *or* value = 0245, meaning that respondents who do the environmental modification could not suffer from malaria by as much as a comparable time 0245 does not modify the environment.

7. Discussion

Most of the health problems, in particular the diseases that arise as result of by an unhealthy society behavior such as malaria, because of the behavior of the community less keep their surroundings making the neighborhood as a growing place and the source of transmission of the disease. Thus efforts are more effective in addressing the health problems is to maintain and promote health and prevent disease with healthy and behave clean, but this turns out to have not been realized and performed by all the layers the community.

This research aims to analyze the behavior of the public about the prevention of relationship with incidence of malaria in the community health centers in the region Kalumata, Siko, Kalumpang and Ternate city of the year 2014. Research results can be seen from the dependent and independent variable relationships are demonstrated through analysis using *Chi-Square test of the* outlined as follows:

Personal Protection Behavior relationship with incidence of Malaria

Test results *Chi Square* with the value significance of *p* > 0.05 shows no relationship between the behavior of personal protection with malaria incidence (*p* =0343). This is not in line with the theory (Prabowo, 2004) stating that for the prevention of malaria is done by avoiding mosquito bites by wearing long sleeves and long as well as the use of underwear upon exiting the House especially at night. The results of the study also contradicts the view of Harjianto (2014), which States that the most effective efforts to prevent malaria is to avoid mosquito bites through personal protection with using, *insecticides* and use the dress body armor.

Human behavior is in fact an activity form the habit of doing an activity in repeatedly. These habits can be influenced by

various factors, such as culture, the environment, family, religion, and others who have an impact on either the bad health problems.

The use of the anti-mosquitos is one of the efforts to prevent or avoid mosquito bites, but it is effective if the used is done routinely. While the time biting mosquito *anopheles* vector which is the transmission of malaria occurred at dusk until the evening, when drug use anti mosquitoes not used at that time then the mosquito *anopheles* can bite a good person outside the home nor in the home, remember the mosquito *anopheles* can rest both inside and outside the home.

The existence of previous research results with the difference the study i.e. no meaningful relationships with the private potektif behavior incidents of malaria , more is made possible because there are still in this research most respondents who do not regularly use anti mosquitoes if you are outside of the home, which is just 4 of 72 respondents who regularly use anti mosquitoes when being outdoors and 27 respondents who came out of the House at night. This can give a chance occurrence of mosquito bites because without protection resulting in the occurrence of malaria transmission.

Relationship behavior modification with the incidence of Malaria

Test results *Chi Squere* showed a significant relationship between the behavior modification with the malaria incidence (p =0.002). This is in line with the study of literature from the Kaiser, et al in Harjianto (2014) stating that human behavior modification effectively reduces the risk of malaria-affected up to 80-88%.

Based on the results of interviews by investigators with some of the respondents who claimed to have a wire gauze but no decent or already torn, there is even the respondents stating do not use wire gauze, so easily passed by mosquitoes to upon entry into the bedroom. Data obtained in this study that of 62 respondents who stated a wire gauze has just 35 respondents who stated wire gauze in good condition. The use of wire gauze has a meaningful relationship with the occurrence of malaria with a value of p= 0.002.

The habit of being outdoors is until late at night, where whose vectors are eksofilik and eksofagik will make it easier for mosquito bites. The level of public awareness about the dangers of malaria will affect the willingness of society to eradicate malaria, among others, with the salubrious environment, use mosquito nets, put up wire gauze on the House. When are reviewed in terms of human interaction with nature, is intended to make a profit but when natural resources do not support human health then it could happen the opposite State, among others, the occurrence of the disease.

The results of this study showed that respondents with behavior modification could 0220 times without suffered malaria without behavior modification. This is in line with Research Waluyo (2001) States a habitual sleep using a mosquito net at night has a very meaningful relationship with incidence of malaria in district Kokap. Residents who never use mosquito netting when sleeping at night have a risk of getting malaria is 5.2 times more likely compared to always use mosquito nets. Similarly, Pebrorizal (2007) in the results of the research conducted in the province of Bengkulu that the habit of using mosquito nets at bedtime have a meaningful relationship with incidence of malaria (p= 0.001).

To get used to it becoming a habit attached to community takes a relatively long time, but this does not mean it cannot at all to be applied, to it, the use of mosquito nets is still that initially uncomfortable and hot for most of society, must always get intensive socialization from related parties, besides the availability of support in the market so that easy for the public can acquire it.

In this research found several respondents that have netting in a damaged condition, even still there are respondents who do not use bed nets on a regular basis, so there is still this causes respondents that do behavioral protection as well as modifications but not implemented in that it affects the incidence of malaria.

The relationship of behavior modification in the environment with the incidence of Malaria

Test results *Chi Squere* showed a significant relationship between environmental modification with Genesis malaria (p =0.004), that is to say in accordance with the study of literature from the Kaiser et all (Harjianto, 2014) stated that behavior modification and the environment effectively reduces the risk of exposed to malaria to 80-88%.

This environmental health conditions from time to time, and from one community to the other community are varied and stratified by considering factors that affect the transmission of diseases such as: home ventilation, enclosure a dirty puddle, livestock and so on, in a way always keep clean environment inside and outside the home. The man who set his work in the forest has a risk for contracting malaria because forest was a place of life and growing the mosquito *Anopheles sp* with high density. The forest is a natural environment (*natural environment*) which is one of the kinds of environments in the socio-environment.

Here it can be seen that the personal protection of the respondents there are suffering from malaria while there are respondents who are not personal protection but not contracted malaria, the assumption of researchers stated that this occurrence likely influenced by the dominant respondents employment rates on farmers which the respondents more were outside the House. Environmental conditions can affect the life of the malaria vectors such as coastal areas, swamps, as well as standing water that continuously and this is in addition to natural conditions that are not easy to do manipulation as a healthy environment is also associated with the problem of behavior society, for example on the grounds of the House contained household a very potential as the place for being wise as well as reduce mosquito place with mosquito nets eradication activities

around the neighborhood place live, kill larva and adult mosquitoes.

The more dense populations of the mosquito *Anopheles*, the higher the risk of being infected with the malaria spread more quickly that the number of cases of malaria disease quickly increased which ultimately resulted in an increase in cases of Malaria in the local area. Thus the program community health outreach in the form of Government in tackling malaria, among others, by the way, bury, close the drain and sow powder abate plus very precisely and need extensive support from the community in the its implementation.

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Autobiography

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