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AN ANALYSIS OF FACTOR RELATED TO MALARIA INCIDENT
AT ELEMENTARY SCHOOL STUDENTS

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ABSTRACT

Malaria is an infectious disease caused by parasit of genus *plasmodium*, it is infected to human through bite of female anopheles mosquito and it cannot transmitted to other people directly. Determination of malaria endemicity level in Gorontalo area is done based on Annual Malaria Incidence (AMI) and Annual Parasite Incidence (API) size. AMI percentage of malaria patients in Gorontalo provinsi particularly in District of Gorontalo Utara is 9,3% and its API is 1,54%. Based on standard, this district is in medium level of endemicity. This research aims to analysis factors related to malaria incidents at elementary school students. This is an observational analytical research with cross sectional study design. Research samples are 105 student from age 7-12 years at SDN 5 Sumalata Timur. Independent variabels are level of parents education, mosquito net use habit and condition of house circumstance. Research date are analyzed by chi-square statistics test with significance of 95% ($\alpha = 0,05$).

Research finding reveals that based on chi-square test, it shows that there is significant correlation between level of parents Education ($\chi^2=8,409$ p value=0,006), mosquito net use habit ($\chi^2=20,114$ p value=0,000) and condition of house circumstance ($\chi^2=24,563$ p value=0,000) with malaria incident. Thus it is suggested to do socialization about malaria incident by using media that is easy to be understood by society particularly those who are with low level of education as well as improve society empowerment in preventing and controlling vectors with keep the cleanliness of environment and healthy life behavior.

Keyword: Malaria, level of parents education, mosquito net use habit and condition of house circumstance

INTRODUCTION

Malaria disease is still a world problem in developing countries. This issue is one of the points discussed and set out in the 2015 Millennium Development Goals (MDGs) agreement on the 6th point on combating HIV/AIDS, malaria and other diseases. Likewise at the 60th World

Health Assembly (WHA) meeting on May 18, 2007 has resulted in a global commitment on the elimination of malaria for every country. Guidance on the implementation of malaria elimination that has been formulated by World Health Organization (WHO) in the Global Malaria Program (Kemenkes, RI 2009).

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INTRODUCTION

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WHO (2014) recorded incidences of malaria incidence in 2013 of approximately 198 million cases with deaths of approximately 584,000 cases (case fatality rate = CFR = 0.29%). The highest risk of transmission occurs in the African region with a total estimated death of about 528,000 cases (0.32%).

The WHO 2014 report estimates that 3.3 billion people are at risk of being infected with malaria where its 1.2 billion is at risk with Annual Parasite Incidence (API) > 1 per 1000 population. Plasmodium falciparum and vivax are the most common plasmodium found worldwide.

The determination of malaria endemicity level in Gorontalo area is done based on Annual Malaria Incidence (AMI) and Annual Parasite Incidence (API). The value of AMI for malaria patients in Gorontalo Province, especially in Kabupaten Gorontalo Utara is 9.3% and API 1.54%. The national standard of malaria endemicity determination in a region is said to be low if API <1%, AMI <25%, while API 1-5% or AMI 25 - 50% and high endemicity if API > 5% or AMI > 50%. Based on these standards, Kabupaten Gorontalo Utara is located at a moderate level of endemicity

METHOD

This research was conducted at SDN 5 Sumalata Timur. This was an observational analytic study with cross sectional study design. The sample was 105 children aged 7-12 years. All the children were taken of blood and examined malaria microscopically and by Immunochromatographic Test (ICT). Of the total number of students who were 105 children, positive malaria falciparum 79 people (75.2%) and 5 children (6.32%) were detected in the form of gametes. Positive samples counted the number of parasitemia and then the students who tested positive were given treatment with anti-malarial drugs ie Artemisinin Combination Therapies (ACT) and antacids to avoid nausea caused by taking malaria drugs and respondents are parents of children.

Dependent variable in this study is the incidence of malaria, the respondent whose blood test results showed positive results of one or combination of plasmodium malaria from laboratory examination with microscope, while the independent variables in this study are the level of parents education, *mosquito net use habit and condition of house circumstance*.

The level of parents Education is the last formal education level has been completed by the respondent who is categorized to be high if the respondent

is educated $> SMP$ and low if respondent $\leq SMP$.

Mosquito net use habit in this research is way to avoid contact or bite of anopheles mosquito at bedtime by using mosquito net. Objective criteria, wear: if wearing bed nets at bedtime or ventilation using wire netting and not wearing, if not wearing bed nets at bedtime or ventilation not using wire netting.

The variable of house environment condition in this research is the circumstances around the respondent's house which consist of: bush and cattle livestock as mosquito breeding place, ditch or ditch as breeding place of malaria mosquito with objective criterion, not qualified if there is one of criteria (there are bushes, there are puddles around the house, and a cattle bar <10 meters away from the house) and qualify if it has a gutter, no puddles around the house and a cattle bar > 10 meters from the house.

The data collecting of parent education level, *mosquito net use habit and condition of house circumstance* is done by interview and direct observation to respondent's house. Data on malaria

incidence, age and sex were taken at the visit register of puskesmas. Data were analyzed using Chi-square test with 95% significance ($\alpha = 0,05$).

RESULTS

Malaria is a highly contagious infectious disease in the tropics and sub-tropics and can be deadly. At least 270 million people of the world suffer from malaria and more than 2 billion or 42% of the population of the earth has a risk of malaria. WHO records annually that no less than 1 to 2 million people die from Anopheles mosquito-borne diseases.

The source of infection for humans is another human who suffers from malaria with no symptoms or clinical symptoms. In endemic areas malaria-infected children have not developed immunity to malaria in their bodies when compared with adults, so the severity of malaria will be more severe. Conversely in areas with low endemicity, adults do not have the same sensitivity and severity as children and migrants from non-endemic areas of malaria.

Table 1. Description of the variables studied (age, gender, level of parents education, mosquito net use habit and condition of house circumstance with malaria incidence in students at SDN 5 Sumalata Timur

Variable	Malaria	Not Malaria	Amount
Age			
7-9 years	17 (21,5%)	5 (19,2%)	22 (20,9%)
10-12 years	62 (78,5%)	21 (80,8%)	83 (79,1%)
Gender			
Women	30 (38,0%)	9 (34,6%)	39 (37,1%)
Man	49 (62,0%)	17 (65,4%)	66 (62,9%)
Level of Parents Education,			
SD	21 (26,6%)	4 (15,4%)	25 (23,8%)
SMP	46 (58,2%)	11 (42,3%)	57 (54,3%)
SMA	11 (13,9%)	10 (38,5%)	21 (20,0%)
PT	1 (1,3%)	1 (3,8%)	2 (1,9%)
Mosquito Net Use Habit			
Not wear	68 (86,1%)	11 (13,9%)	79 (75,2%)
Wear	11 (42,3%)	15 (57,7%)	26 (24,8%)
Condition of House Circumstance			
not eligible	63 (79,7%)	19 (33,3%)	35 (33,3%)
qualify	16 (20,3%)		
Jumlah	79 (75,2%)	26 (24,8%)	105 (100,0%)

Table 1 shows that out of 105 samples, there are 79 students (75.2%) who are malaria positive and 26 students (24.8%) are not malaria. Based on the age variable, it was found that both malaria and non malaria, the age group was 10-12 years old (62,5%) and 21 students (80,8%). Based on sex, malaria-positive and non-malarial students, male is the most gender, 49 students (62,0%) and 17 students (65,4%).

Based on *level of parents education* showed that malaria positive and non malaria, low education level (\leq SMP, Junior high school) is the highest level of education, each of 67 students (84.8%) and 15 students (57.7%). Based on data

analysis using Chi-Square statistical test in table 2 then χ^2 count 8.409 > value χ^2 table 3,841. Because χ^2 count > χ^2 table and p value (0.004 < α 0.05) this means that H_0 is rejected means there is significant relation between level of parents education and malaria incidence.

Based on mosquito net use habit, it was shown that out of 79 malaria positive students who did not use bed nets as much as 68 students (86,1%) and those who did not have malaria, were mostly distributed with 15 students (57,7%) while the most malarial homes in the neighborhood have 63 households (79.7%) and the non-malaria has the most eligible environment

with 19 students (73.1%). Based on data analysis using Chi-Square statistical test in table 2 then χ^2 count 20,114 > value χ^2 table (3,841). Because χ^2 count > χ^2 table

and p value (0,000 < α 0,05) this means that H0 is rejected means there is significant relation between mosquito net use habit and malaria incidence.

Table 2 Result of analysis of Independent Variables and Dependent Variables

Variable	χ^2	p value
level of parents education,	8,409	0,004
mosquito net use habit	20,114	0,000
condition of house circumstance	24,563	0,000

DISCUSSION

1. Correlation between level of parents education with malaria incidence

The results of analysis using Chi-Square statistical test obtained χ^2 count 8.409 > value χ^2 table 3,841. Since χ^2 count > χ^2 table and p value (0,000 < α 0.05) this means that H0 is rejected means there is significant correlation between level of parents education with malaria incidence.

The level of education affects the knowledge of a person, in general, people who have a high level of education easier to know about malaria because it is easier to understand information about malaria. The results showed that malaria incidence occurred in many samples with poorly educated parents. This shows the low knowledge of parents about malaria

Education is a process that will result in a change in target behavior that is expected by a particular

organization / institution by providing a formal education that has received someone will increase the power of reason and the basic development of reasoning power allows one to accept motivation (Notoatmodjo, 2007).

This study is in line with research conducted by Indarti (2010) where low-educated people are at high risk for contracting malaria. In educational theory is a process that will result in a change in target behavior that is expected by a particular organization by providing formal or informal education to its members.

2. Correlation between mosquito net use habit with malaria incidence

The results of data analysis using chi-Square statistical test showed a significant correlation between the mosquito net use habit with the incidence of malaria with the value of χ^2 count 20,114 > value χ^2 table 3,841.

Therefore χ^2 count $>$ χ^2 table and p value value ($0,000 < \alpha 0.05$).

Based on interviews with respondents about the habit of wearing bed nets each before bed that suffered from malaria and not wearing bed nets as much as 68 children (86.1%), they reasoned that children feel hot / hot when using bed nets during sleep and also the economic status of the community low so that the provision of mosquito nets is not a top priority in the fulfillment, on the other hand they reasoned not used to use bed nets while sleeping while if using other anti mosquito alternatives, they feel disturbed by the smoke and also the cost to be spent for the procurement of anti-mosquitoes.

This research is in line with the research conducted by Datau (2010) where an unqualified environment is one of the factors causing the incidence of malaria.

3. Correlation between condition of house circumstance with malaria incidence

Based on data analysis using Chi-Square statistical test by value χ^2 count $24,563 >$ value χ^2 table $3,841$. Since χ^2 count $>$ χ^2 table and p value value ($0,000 < \alpha 0.05$) this means that H_0 is rejected means there is a

significant correlation between condition of house circumstance with malaria incidence.

In this study obtained respondents who are high risk of having a home environment that does not meet the requirements of 63 samples (79.7%). Based on the results of the research with respondents, the condition of the respondent's living environment still does not meet the requirements due to their home environment there are bushes around the house, do not have ditch and water ditok not flowing.

The presence of thick shrubs will reduce sunlight entering / penetrating the soil surface, so that the surrounding environment will be shady and humid. This condition is a good place to rest for the mosquitoes and also the mosquito breeding place under the bush there is stagnant water. Stagnant household waste can be a breeding ground for mosquitoes. Female mosquitoes will lay eggs in stagnant water. These eggs will develop into larvae and then change into adult forms within 10 days. So that the number of mosquito population around the house increases and causes the families living in the house that there are ditches around the house have a risk for the occurrence of transmission of malaria compared with

families who live in the house that there is no ditch / ditch around it.

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CONCLUSION

Based on the result of the research, it can be concluded that: there is a correlation between parent education level, habit of wearing mosquito net and environmental condition of house with malaria incident on student of SDN 5 Sumalata Timur Kabupaten Gorontalo Utara.

SUGGESTION

Demographic factors such as age, and education level associated with malaria incident by using media that is easy to be understood by society particularly those who are with low level of education as well as improve society empowerment in preventing and controlling vectors with keep the cleanliness of environment and healthy life behavior.

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