Journal Health of Indonesian
Volume 1, Number 01, January 2023 (No 50-60)
DOI 10.
E.SSN 2987-0313 (Online)

The Relationship between Knowledge, Community Action and Home Environmental Conditions with Malaria Incidence in the Community Health Center Work Arealdanogawo, Nias Regency, Nias Regency

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ABSTRACT

Indonesia is one of the countries in the world that still faces the risk of malaria. Idanogawo subdistrict is one of the malaria endemic areas in Nias district, North Sumatra with the Annual Parasite Incidence (API) figure in 2019 reaching 100%. The transmission of malaria is caused by the bite of female Anopheles mosquitoes and humans which is supported by the conditions of the home environment. The aim of this research is to determine the relationship between knowledge, community actions and home environmental conditions and the incidence of malaria in the working area of the Idanogawo Health Center, Idanogawo District, Nias Regency 2021. Research This is an analytical research with a cross sectional study. The population in this study is 250 people who visit the Idanogawo health center working area and a sample of 71 people using the Slovin formula and sampling can be done using simple random sampling technique. The results of the research show that there is a relationship knowledge and the incidence of malaria (p=0.013), there is a relationship between community action and the incidence of malaria (p=0.012), and there is a relationship between environmental conditions and the incidence of malaria (p=0.000). It was concluded that knowledge, community actions and home environmental conditions showed a relationship with the incidence of malaria, so it was recommended that health workers carry out outreach to the community, evaluate malaria programs, wear closed clothing when going out at night, and clean the home environment.

Keywords:
Knowledge, Community Actions, Home Environmental Conditions, Malaria Incidence.

INTRODUCTION

Malaria is an infectious disease caused by Plasmodium which consists of many species, but those that generally cause malaria are Plasmodium vivax, Plasmodium falciparum, Plasmodium malariae, and Plasmodium ovale. Malaria is transmitted by Anopheles mosquitoes which contain Plasmodium in their bodies. The spread and endemicity of Malaria is greatly influenced by the presence of breeding sites for Anopheles mosquitoes as the transmission vector (Ministry of Health of the Republic of Indonesia, 2020)

The spread of malaria can be influenced by local regional characteristics, including regional ecological differences. Geographically, Indonesia is a country with a tropical climate, which is divided into several very specific ecological areas. It is known that malaria is transmitted by Anopheles mosquitoes, and each species has different behavior or bionomics according to its environment and habitat. Rice fields, hills and beaches are characterized by different heights, types of vegetation, types of mosquito breeding sites, and different types of Anopheles species and malaria transmission patterns can also be determined (Ministry of Health of the Republic of Indonesia, 2020).

In 2019, there were three provinces whose entire districts/cities were declared malaria-free, namely DKI Jakarta, Bali and East Java. Five provinces in eastern Indonesia do not yet have districts/cities with malaria elimination status, namely East Nusa Tenggara, Maluku, North Maluku, West Papua and Papua. Nationally, there were 300 districts/cities that were declared malaria free in 2019. This number increased compared to 2018 when 285 districts/cities had malaria elimination status (RI Ministry of Health, 2020).

On the map of the spread of malaria according to the 2019 health profile, the malaria morbidity rate is depicted using the Annual Parasite Incidence (API) indicator per 1,000 population, namely the proportion of malaria positive patients to the population at risk in the area with a constant of 1,000. The malaria API in Indonesia in 2019 increased compared to 2018, namely from 0.84 to 0.93 per 1,000 population. However, the malaria API in Indonesia has shown a decreasing trend since 2009.

It is known that the malaria API in 2009 was 1.8 per 1,000 population, decreasing to the lowest figure in 2018 of 0.84 per 1,000 population. At the provincial level, the provinces of Papua, NTT and West Papua contribute the most cases and have a high malaria API compared to other provinces. The provinces of Papua, West Papua and East Nusa Tenggara have a very high malaria API compared to other provinces in Indonesia, namely 64. 03, 7.38, and 2.37 per 1,000 population. Most provinces, namely 31 provinces (91.2%) have a malaria API < 1 per 1,000 population. The malaria API per 1,000 population is also the basis for malaria endemicity levels being low (<1), medium (1-5), and high (>5). In 2019 there were 160 districts/cities (31.9%) low endemic, 31 districts/cities (5.4%) moderate endemic, and 23 districts/cities (4.3%) high endemic (Indonesian Ministry of Health 2020). The percentage of districts/cities with low endemic status by province can be seen that the majority of districts/cities in Indonesia have malaria-free status or have an API < 1 per 1,000 population. Only 11 provinces have not met these two criteria, namely North Sumatra, West Sumatra, Southeast Sulawesi, Lampung, Riau Islands, North Maluku, East Kalimantan, Maluku, East Nusa Tenggara, West Papua and Papua (Indonesian Ministry of Health, 2020).

In North Sumatra itself, in the last 2 years, namely from 2018 to 2019, there has been no additional achievement, but there are still 21 districts/cities that have been eliminated in 2017, namely North Tapanuli Regency and Padang Lawas Regency, in 2016 namely North Padang Lawas Regency and in 2015 for Districts, namely Deli Serdang, Serdang Bedagei, Labuhan Batu Selatan, Samosir, Toba Samosir, Humbang Hasundutan, Pakpak Bharat, Simalungun, Karo, South Tapanuli, Dairi, for cities namely Padang Sidimpuan, Binjai, Medan, Tebing-Tinggi, Pematang Siantar , Tanjung Balai, Sibolga. Meanwhile, 12 other regencies/cities have not met the requirements for elimination because there are still indigenous cases (North Sumatra Health Office, 2019).

In 2019 There are 14 districts/cities with a percentage of Malaria suspect

examinations in the laboratory reaching 100%, namely Nias, Gunung Sitoli, Pemantang Siantar, Sibolga, West Nias, North Nias, North Padang Lawas, Serdang Berdagai, South Nias, Asahan, Toba Samosir, North Tapanuli, Central Tapanuli, South Tapanuli, Langkat, 2 districts achieved figures above 90%, namely Langkat Regency, Mandailing Natal, while there are 14 regencies/cities where the percentage is not 0%, namely Padang Sidempuan Regency/City, Medan, Binjai (North Sumatra Health Office, 2019).

Nias is one of the areas where malaria is endemic. Based on data on the percentage of malaria suspects examined by laboratories by Regency/City in 2019, the 2019 North Sumatra health profile states that the incidence of malaria reached 100% in the Regency/City of Nias, Gunung Sitoli, South Nias, West Nias. , North Nias (North Sumatra Health Office, 2019).

The factors that cause malaria are the host (humans and mosquitoes), the agent (plasmodium), the environment. The factor that most influences the occurrence of malaria is the lack of knowledge of the people in Nias Regency, namely clean and healthy living behavior. This shows that someone who has good knowledge about health tends to behave healthily. Knowledge is defined as the result of human sensing through the senses they possess (ears, eyes, nose, taste and touch). Public knowledge about malaria in Nias district is still very low, one of which is in Idanogawo sub-district, there are still a number of residents who have very low educational backgrounds, where people still don't understand what is meant by malaria control and prevention.

Mosquitoes are also one of the factors that have the biggest impact on the occurrence of malaria. One of the mosquitoes that causes malaria is the female Anopheles mosquito. The cause of mosquitoes is the environment. An unclean environment can cause malaria. The community environment in Idanogawo sub-district has an environment that is still less clean, many people pay less attention to it. home environment where there is still standing water, rubbish, livestock pens, and bushes, the Nias area has high rainfall, causing water to stagnate around the house which can cause mosquitoes to breed. Health workers at the Idanogawo Health Center have taken measures to control and prevent malaria but there are still many people who still do not want to accept and implement malaria prevention due to a lack of public knowledge and awareness about the causes of malaria.

Based on the background stated above, the author is interested in conducting research to determine the relationship between community behavior and home environmental conditions and the incidence of malaria in the work area of the Idanogawo Community Health Center, Idanogawo District, Nias Regency. The formulation of the problem of this research is whether there is a relationship between knowledge, community action and home environmental conditions and the incidence of malaria in the working area of the Idanogawo Health Center, Idanogawo District, Nias Regency.

a. To determine the relationship between knowledge and the incidence of malaria in the working area of the Idanogawo Health Center, Idanogawo District, Nias Regency.
b. To determine the relationship between community actions and the incidence of malaria in the working area of the Idanogawo Health Center, Idanogawo District, Nias Regency.
c. To determine the relationship between home environmental conditions and the incidence of malaria in the work area of the Idanogawo Health Center, Idanogawo District, Nias Regency.

METHOD

This research is an analytical research with a cross sectional study which is used to determine the relationship between community behavior and home environmental conditions with the incidence of malaria in the work area of the Idanogawo health center, Idanogawo District, Nias Regency. to obtain statistical information about the entire population and sample. The sample size in this study was 71 people from a population of 250 people. The sample in this study was obtained using the Slovin formula

Method of collecting data

1. **Primary data**
   Primary data is data obtained directly from the community health center by distributing questionnaires to respondents. In this case, researchers directly gave questionnaires to people who had experienced malaria incidents who visited the work area of the Idanogawo Community Health Center, Idanogawo District, Nias Regency (Sri Dwi Astari, 2017).
2. **Secondary Data**
   Secondary data in this research was obtained through reports and documents from medical records in the work area of the Idanogawo Community Health Center, Idanogawo District, Nias Regency.

Operational Definition

No	Variable	Operational Definition	Measuring instrument	Measuring scale	Measuring results
1.	Knowledge	Everything the respondent knows about malaria, how malaria is transmitted, malaria vectors and disease prevention malaria.	Questionnaire 10 question	Nominal a. Good If Response Value n ≥75%. b. LessIf ValueRespond n ≤ 75%	1. Good 2. Not good
2.	Community Action	Actions taken by respondents were real about malaria and how to deal with it and malaria treatment	Questionnaire 10 question	Ordinal Always =4, Often =3, Sometimes = 2, Never = 1	1. Positive26-40 2. Negative 10-25
3.	Home environmental conditions	Response Community attitudes are still lagging behind regarding the incidence of malaria regarding its	Questionnaire 4 Question	Nominal	1. There is 2. There isn't any

		definition, signs and symptoms as well as causes and prevention			
4.	Malaria Occurrence	Publicexperiencing symptoms of fever, anemia, convulsions which are sometimes accompanied by high fever and even coma.	Questionnaire 1 Question	Nominal	1. Yes 2. No

Data processing

Data processing is carried out using the Editing, Coding, Entry, Cleaning and Tabulation processes.

1. Data checking (editing)
   Data editing is checking the list of questions that have been filled in according to the respondent's answers. Checking the list of questions that have been filled in includes:
   a. completeness of answers, whether each question has an answer.
   b. Clarity or readability of the answer, whether the writing of the answer is clear and readable.
2. Giving (coding)
   The coding process is the stage of coding answers to questionnaires that respondents have answered during the research. This code is given in the form of numbers so it is easier and simpler.
3. Data entry
   The answers from each respondent, which are already in code form, are then entered into a computer program or software. The program used in this research is the SPSS program, what needs to be considered in this process is accuracy in carrying out data entry.
4. Data cleaning (cleaning data)
   The data cleaning process is the process of re-checking data that has been entered into master data or statistical software such as SPSS. This data cleaning process aims to find out whether the data that has been entered has errors or not.
5. Data preparation (tabulating data)
   The process of compiling this data is the process of arranging data in such a way that it is easy to add up, arrange for presentation and analysis. Data preparation can be done by compiling data in the form of frequency distribution tables, cross tables and so on.

Data Analysis

After the data is collected from the field through research activities, the collected data

is processed using data processing and analysis techniques, namely:

1. Univariate analysis is an analysis that aims to determine the frequency distribution of each research variable.
2. Bivarate analysis aims to determine the relationship between the independent variables and the dependent variable. To prove whether there is a relationship, a statistical Chi-Square test was carried out with a confidence level of 95% (α=0.05). In this research, data processing uses a statistical data processing software program, which will later obtain a p value. The p value will be compared with the α value. With the following conditions:
   a. If the p value ≤ α (p ≤ 0.05), then the hypothesis (Ho) is rejected, meaning the sample data supports the existence of a significant relationship.
   b. If the p value > α (p > 0.05), then the hypothesis (Ho) is accepted, meaning the sample does not support the existence of a meaningful relationship.

RESULTS AND DISCUSSION

Univariate Analysis

Respondent Characteristics

Table 2 Frequency Distribution of Respondents Based on Gender, Age, Education

Respondent Characteristics	Amount	Percentage (%)
Gender		
Male	25	35.2
Female	46	64.8
Age		
< 30 Years	23	32.4
30-39 Years	28	39.4
40-49 Years	15	21.1
>= 50 years	5	7.0
Education		
Junior	4	5,6
High School	34	47.9
S1	33	46.5

Based on table 2, it shows that of the 71 respondents, the majority were female respondents with a percentage of 64.8%. The respondent age classification of 30-39 years had the largest number with 28 people with a percentage of 39.4%. Respondents in the SMA education classification had the largest number with 34 people (47.9%) while the smallest respondents were respondents in the SMP education classification, totaling 4 people (5.6%).

Community Knowledge Distribution

Table 3 Frequency and Percentage Distribution Based on Community Knowledge of Malaria Incidence in the Idanogawo Community Health Center Working Area

No	Knowledge	Amount	Percentage (%)
1	Not good	36	50.7
2	Good	35	49.3
	Total	71	100.0

Based on table 3 , you can see the frequency distribution of public knowledge from 71 respondents, namely 50.7% with bad knowledge and 49.3% with good knowledge.

Community Action Distribution

Table 4 Frequency and Percentage Distribution Based on Community Actions Regarding Malaria Incidents in the Idanogawo Community Health Center Working Area

No	Community Action	Amount	Percentage (%)
1	Are not done	34	47.9
2	Done	37	52.1
	Total	71	100.0

Based on table 4 , it can be seen that the frequency distribution of community actions from 71 respondents, namely 47.9% of actions not taken, and 52.1% of actions taken.

Distribution of Home Environmental Conditions

Table 5 Frequency and Percentage Distribution based on Home Environmental Conditions with the incidence of malaria in the Idanogawo Community Health Center working area

No	Home Environmental Conditions	Amount	Percentage (%)
1	Not feasible	23	32.4
2	Worthy	48	67.6
	Total	71	100.0

Based on table 5, you can see the frequency distribution of the home environmental conditions of the 71 respondents, namely 32.4% with inadequate environmental conditions, and 67.6% with adequate home environmental conditions.

Malaria Occurrence Conditions

Table **6** Frequency Distribution of Malaria Incidents and Malaria Incidents in the Idanogawo Community Health Center Working Area

No	Malaria Occurrence	Amount	Percentage (%)
1	No	34	47.9
2	Yes	37	52.1
	Total	71	100.0

Based on table 6 you can see the frequency distribution of malaria incidents from 71 respondents, 47.9% had no malaria incidents, and 57.1% had Yes with malaria incidents.

Bivariate Analysis

Relationship between Knowledge and Incidence of Malaria

Table 7 The Relationship Between Knowledge and Malaria Incidence and Malaria Incidence in the Idanogawo Community Health Center Working Area

Knowledge		Malaria incidence		Total	*p-value*
		No	Yes		
Not good	n	12	24	36	
	%	33.3%	66.7%	100.0%	0.013
Good	n	22	13	35	
	%	62.9%	37.1%	100.0%	
Total	n	34	37	71	
	%	47.9%	52.1%	100.0%	

Based on the results of the chi-square test, table 7 above shows that people who have poor knowledge have no malaria incidence of 33.3% and the presence of malaria is 66.7%. For people who have good knowledge, the incidence of malaria is 62.9% and the incidence of malaria is 37.1%. The results of the chi-square test obtained a value of p =

0.013 < 0.05, so it was concluded that there was a significant relationship between knowledge and the incidence of malaria in the work area of the Idanogawo health center.

Relationship between Community Action and Malaria Incidence

Table 8 The Relationship Between Community Actions and Malaria Incidences and Malaria Incidences in the Idanogawo Community Health Center Working Area

Community action		Malaria Occurrence		Total	*p-value*
		No	Yes		
Are not	n	11	23	34	0.012
done	%	32.4%	67.6%	100.0%	
Done	n	23	14	37	
	%	62.2%	37.8%	100.0%	
Total	n	34	37	71	
	%	47.9%	52.1%	100.0%	

Based on the results of the chi-square test in table 8 above, it was found that community action that was not taken resulted in the absence of malaria incidents amounting to 32.4% and the presence of malaria incidents amounting to 67.6%. For community actions taken, the incidence of malaria was 62.2% and the incidence of malaria was 37.8%. The chi-square test results obtained a p value = 0.012 < 0.05, so it was concluded that there was a significant relationship between community actions and the incidence of malaria in the Idanogawo health center working area.

Relationship between Home Environmental Conditions and Malaria Incidence

Table 9 The Relationship Between Home Environmental Conditions and Malaria Incidences with Malaria Incidences in the Idanogawo Community Health Center Working Area

Home environmental conditions		Malaria incidence		Total	*p-value*
		No	Yes		
Not feasible	n	18	5	23	0,000
	%	78.3%	21.7%	100.0%	
Worthy	n	16	32	48	
	%	33.3%	66.7%	100.0%	
Total	n	34	37	71	
	%	47.9%	52.1%	100.0%	

Based on the results of the chi-square test in table 8 above, it was found that the condition of the home environment was inadequate with the absence of malaria incidence of 78.3% and the presence of malaria incidence of 21.7%. For decent home environmental conditions, the incidence of malaria is 33.3% and the incidence of malaria is 66.7%. The chi-square test results obtained a p value = 0.000 < 0.05, so it was concluded that there was a significant relationship between the condition of the home environment and the incidence of malaria in the work area of the Idanogawo health center.

Discussion

The Relationship between Knowledge and Malaria Incidence

Knowledge is a clean and healthy living behavior. This shows that someone who has good knowledge about health tends to behave healthily. Knowledge is defined as the result of human sensing through the senses they possess (ears, eyes, nose, taste and

touch). Knowledge can also make someone have awareness so that someone will behave according to the knowledge they have. (Shaqiena, 2019).

The research results show that knowledge. Based on the results of the chi-square test, table 4.6 above, it was found that people who had poor knowledge had no malaria incidence of 33.3% and the incidence of malaria was 66.7%. For people who have good knowledge, the incidence of malaria is 62.9% and the incidence of malaria is 37.1%. This is because there are still many people who have low education and lack information about malaria.

The results of bivariate analysis using Chi Square show that there is a relationship between knowledge and the incidence of malaria which has a value of $p = 0.013 < 0.05$, which can be concluded that there is a significant relationship between knowledge and the incidence of malaria in the Idanogawo health center working area.

From the results of the data obtained by researchers, it is known that people in Idanogawo sub-district, Nias district still have a lack of knowledge, where people still don't know how to control malaria, where people still don't care about their health and the condition of their home environment. This is because there are still many people who have low education and lack of information about malaria.

Similarly, the results of Sri Dwi Astari's (2017) research show that there is a significant relationship between the level of knowledge and the incidence of malaria in the working area of the Tanjung Tiram Community Health Center. People with low knowledge have a 9.636 times greater risk of suffering from malaria compared to people with high knowledge.

Relationship between Community Action and Malaria Incidence

Actions are all concrete forms of a person's behavior to prevent disease. The actions of respondents in this study were included in the category of poor actions against malaria because in preventing malaria the respondents were less active. One of the community's actions, namely community awareness, can be seen from the preventive actions taken by the community (Restu Alami, 2016).

The results of the research show that based on the results of the chi-square test, table 4.7 above, it was found that community action which was not carried out in the absence of malaria incidents was 32.4% and the presence of malaria incidents was 67.6%. For community actions taken, the incidence of malaria was 62.2% and the incidence of malaria was 37.8%. The results of bivariate analysis using the chi-square test, obtained a value of $p = 0.012 < 0.05$, so it was concluded that there was a significant relationship between community actions and the incidence of malaria in the Idanogawo health center working area.

From the results of the data obtained by researchers, it can be seen that community action is still very lacking, where there are still people who do not care about educating health workers. This is because there are still many people who rarely clean the environment and have the habit of leaving the house at night without using personal protection. namely wearing long-sleeved shirts and long trousers.

The results of this study are in accordance with research by Zupriwidani (2013), which shows that there is a significant relationship between respondents' actions and the incidence of malaria. Someone who has the habit of leaving the house at night without wearing clothes and trousers is very easily bitten by Anopheles mosquitoes, making it more likely that malaria infection will occur.

Relationship between Home Environmental Conditions and Malaria Incidence

The environmental conditions around the house are conditions that support mosquito breeding, whether there are mosquito breeding and stopping places around the house. Mosquitoes can be found in bushes and in livestock pens made of bamboo. The breeding places for mosquitoes are usually in ditches or ditches and in pools of clear water. Environment and behavior is something that has a big influence on the development of public health, there needs to be a more in-depth joint study between environmental factors and behavior (Ahmad Faizal Rangkuti, 2017).

The results of the research conducted by the author show that based on the results of the chi-square test in table 4.8 above, it was found that the condition of the home environment was inadequate with the absence of malaria incidence of 78.3% and the presence of malaria incidence of 21.7%. For decent home environmental conditions, the incidence of malaria is 33.3% and the incidence of malaria is 66.7%.

The results of bivariate analysis using the chi-square test, obtained a value of p = 0.000 < 0.05, so it was concluded that there was a significant relationship between home environmental conditions and the incidence of malaria in the work area of the Idanogawo health center. From the results of the data obtained by researchers, it is known that many people still do not care about the condition of their home environment, as in the photos obtained by researchers where there are still puddles of water, bushes, and also rubbish around the house, thus providing opportunities as a resting place or stopover for mosquitoes and as a place to live. reproduction of Anopheles mosquitoes. People also often burn rubbish around their homes, which can cause air pollution which can disrupt the respiratory system. The results of this research are the same as research by Riska et al, (2019) which states that many health problems, especially malaria, are caused by environmental conditions around the house with dense bushes or trees which provide a comfortable place for mosquitoes to breed.

CONCLUSION

Based on the results of the research "Relationship between Community Behavior and Home Environmental Conditions and the Incidence of Malaria in the Working Area of the Idanogawo Health Center, Idanogawo District, Nias Regency 2021," the following conclusion can be drawn: There is a significant relationship between knowledge and the incidence of malaria in the working area of the Idanogawo Public Health Center with p = 0.013 . There is a significant relationship between community action and the incidence of malaria in the work area of the health center, with p = 0.012. There is a significant relationship between home environmental conditions and the incidence of malaria in the Idanogawo health center working area with p = 0.000.

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