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RISK FACTOR OF HOUSE CONDITIONING AND ENVIRONMENTAL FACTORS ON MALARIA INCIDENCE AND PREVENTION EFFORTS IN WATUPUDA AND PATAWANG VILLAGES, MELOLO SUB-DISTRICT, EAST SUMBA DISTRICT

Yohanes Desidarius Alfando[1], Hasanuddin Ishak[2], Anwar Mallongi[3], Hasnawati Amqam[4], Syahribulan[5], Isra Wahid[6]

[1,2,3,4]Department of Environmental Health, Faculty of Public Health, Hasanuddin University, 90245 Tamalanrea, Makassar, Indonesia

[5]Departement of Occupational Health and Safety, Faculty of Public Health, Hasanuddin University, 90245 Tamalanrea, Makassar, Indonesia

[6]Department of Science and Nutrition, Faculty of Public Health, Hasanuddin University, 90245 Tamalanrea, Makassar, Indonesia

* **Correspondence:** Email address of corresponding author yohanesdesidariusalfando@gmail.com; Telp: +6282335073088; Fax: -.

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Background: Malaria is a contagious disease of global concern. It is still a public health problem as it often causes extraordinary events (ECOs) that have a broad impact on the quality of life and the economy and can lead to death. Aim. The Aim of this research is to analyze the relationship of risk factors of home and environmental conditions with the history of malaria incidents and prevention efforts in the village of Watupuda and Patawang village of Melolo district of East Sumba province of East Nusa Tenggara. Method.This type of study is a quantitative descriptive study with a case control approach or a retrospective study, a control group sample is validated based on the number of case samples of 48, a 1:1 comparison with a total of 96 respondents.Result. The results of bivariate analysis of the environment in the house show that the type of wall is a risk factor (OR = 2.235) house ventilation is a risk factor (OR = 3.262), house windows are a risk factor (OR = 4.175), occupancy density is a risk factor (OR = 4.414) and environmental factors Outside the house shows the presence of livestock is a risk factor (OR = 5, 057) and which is not a risk factor is the distance of the house with stagnant water (OR = 0.507) and behavioral factors show the habit of going out at night is a risk factor (OR = 6.854), the use of mosquito nets is a risk factor (OR = 4.892), the use of anti-mosquito drugs is a risk factor (OR = 7.457), the habit of hanging pakayan is a risk factor (OR = 4.287). Multivariate analysis showed that the habit of leaving the house at night was the most influential risk factor for malaria incidence with an OR = 6.854 and CI (95%)=(7.606¬-11.393).Conclusion. The type of wall, house ventilation, house windows, density of house occupants and the presence of animals, the habit of going out at night, the use of mosquito nets, the use of anti-mosquito drugs, the habit of hanging clothes are risk factors where the OR value> 1 and the habit of going out at night which is the most influential risk factor for the incidence of malaria and the distance between the house and puddles is not a risk factor for the external environment that affects the occurrence of malaria.

Keywords : Malaria, breeding place, anopheles sp, watupuda, patawang.

1. Introduction

Malaria is an infectious disease of global concern. It is still a public health problem because it often causes extraordinary events (outbreaks) that have a broad impact on quality of life and the economy and can result in death. The disease can be acute, latent, or chronic. Although this disease is reported throughout the world, tropical areas are endemic to malaria, and Indonesia is included in the tropics, where malaria is spread throughout the archipelago, especially in eastern Indonesia (Irawati et al., 2017).

Malaria is an infectious disease transmitted to humans by female Anopheles mosquitoes infected with plasmodium parasites (Anda et al., 2017). Malaria is a disease caused by a protozoan-type parasite of the genus Plasmodium that is naturally transmitted through the bite of a female Anopheles mosquito. To date, 4 species can attack humans, namely Plasmodium falciparum, plasmodium vivax, plasmodium ovale, and Plasmodium malariae (Paula et al., 2023). Malaria is one of the infectious diseases whose control efforts are a priority target of the global commitment to the Global Millennium Development Goals until 2030. The transmission of malaria in some areas is strongly influenced by environmental conditions.

The World Health Organization (WHO) and the Indonesian Ministry of Health estimated the number of cases for 2022 for each district or city that is still endemic to malaria. The results indicate that 3,885,653 people are malaria suspects, and 1,700 of them are malaria patients. The realization of the malaria program has examined 3,358,447 people (86%), found 443,530 (56%) malaria patients, and recorded them in the SISMAL malaria surveillance and information system. Malaria in Indonesia is still a serious health problem. The Indonesian Ministry of Health noted that the latest number of malaria cases in 2023 as of April 27 was 55,525 cases, the majority of which came from the provinces of Papua, East Nusa Tenggara, and West Papua.

NTT Province is the second-highest endemic area in Indonesia, as can be seen from the API data from the East Nusa Tenggara Provincial Health Office. In 2018, the number of cases was 17,150; in 2020, the number of cases was 14,850; in 2021, the number of cases was 366,632; and in 2022, the number of cases was 15,830. In NTT, several districts with the highest API are West Sumba District at 1,903. Furthermore, in 2022, Southwest Sumba Regency had 5,730 cases and East Sumba Regency had 5,540. From January to August 2023, East Sumba Regency became highly endemic; namely, in 2020, the number of malaria cases was 1,639; in 2021, the number of cases was 1,758; in 2022, there was an increase of 5,540 cases; and in 2023, from January to December, there were 1,827 cases, while West Sumba Regency and Southwest Sumba Regency were medium endemic and Central Sumba was low endemic. Malaria incidence at Melolo Health Centre in 2021 was 389 cases, in 2022, 703 cases, and in 2023, from January to December, 657 cases. The village with the highest malaria incidence rate at Puskesmas Melolo is Watupuda village.

To support this decision, the NTT government made efforts to accelerate malaria eradication through NTT Governor Regulation No. 11 of 2017 concerning malaria elimination. Malaria prevention in NTT is carried out by distributing 973,800 pieces of mosquito nets to targeted communities. The largest allocation of mosquito nets was distributed to communities in high-endemic areas based on the number of sleeping groups in and outside the house. The results of monitoring after the distribution of mosquito nets found that mosquito nets have been used for sleeping at night, but mosquito nets have been washed away or damaged after natural disasters. The challenge is vector control;

the problem of malaria must be resolved across sectors because it is related to malaria breeding grounds.

2. Materials and methods

a. Type of Research

This research design uses a case-control or retrospective study because it is done by identifying or looking for relationships between risk factors that affect the occurrence of a disease. The research method is quasi-experiment type with the type of planning used, namely the design approach using one group pretest-posttest design, namely the case group, to see if there are changes in the group before and after being given treatment.

b. Sample Collection

The sample in the study amounted to all malaria sufferers in Watupuda Village, totaling 48 people as a case group and 48 people with low malaria incidence or not suffering from malaria as a control who lived in a different village, namely Patawang Village, with a ratio of 1: 1. The number of samples in this study was 96.

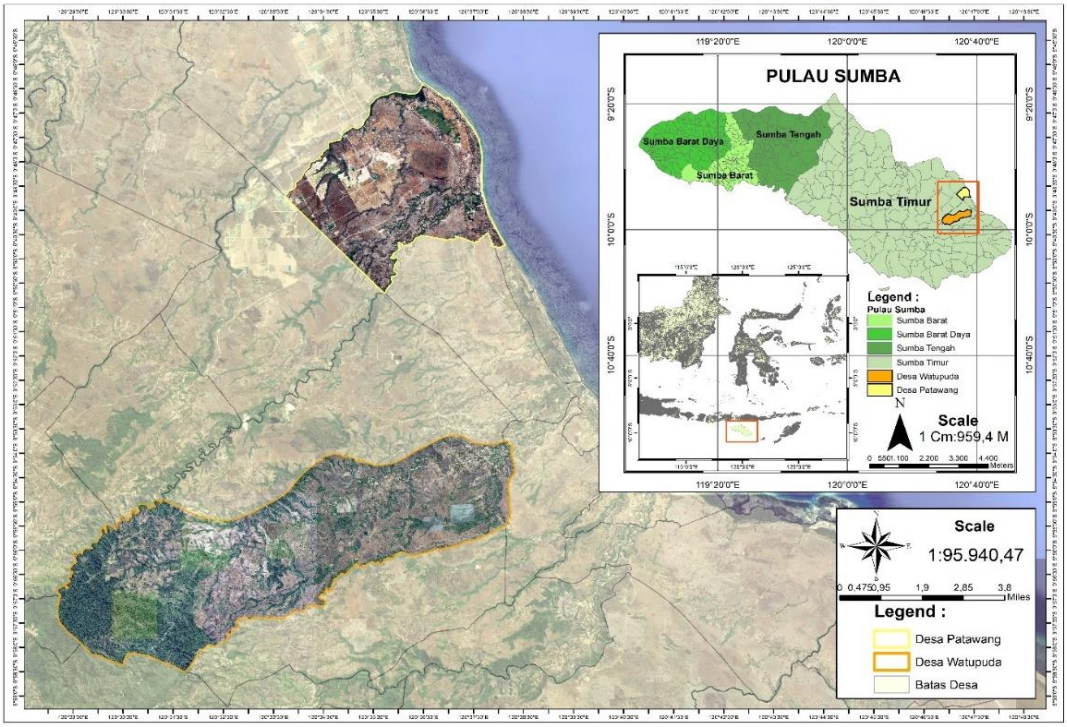

Figure 1. Location of Research Sample

The study was conducted in Watupuda Village and Patawang Village, Melolo District, East Sumba Regency, East Nusa Tenggara Province. The main reason for choosing this location is because the village is in an area with a high incidence of malaria and a village with a low number of malaria cases.

3. Result

a. Respondent Characteristics

Respondents in this study totaled 110 people: 55 respondents in Watupuda Village and 55 people in Patawang Village. The distribution of respondents can be seen in Table 1 below:

Table 1. Characteristics of Respondents Based on Gender, Last Education, and Occupation in 2024 (N = 55)

	Incidence of malaria			
	Case		**Control**	
Characteristics	(n)	%	(n)	%

Gender				
Man	24	50,0	24	50,0
Women	24	50,0	24	50,0
Last education				
Elementary school	20	41,7	6	12,5
Junior High School	15	31,3	9	18,8
Senior High School	10	20,8	20	41,7
Bachelor	1	2,1	8	16,7
No school	2	4,2	5	10,4
Work				
Farmer	24	50,0	6	12,5
Student	6	12,5	10	20,8
Housewife	12	25,0	7	14,6
College students	2	4,2	2	4,2
Doesn't work	2	4,2	5	10,4
laborer	1	2,1	1	2,1
Government employees	1	2,1	6	12,5
Fisherman			9	18,8
Honorary			2	4,2

Source: Data Primer, 2024

Table 1.1 shows that the respondents in the case and control groups who were male were 24 people (50.0%) and those who were female were 24 people (50.0%). respondents who had the most recent education in the elementary school category were 20 people (41.7%), and the least in the S1 last education category was 1 person (2.1%). the most respondents' jobs were as farmers as many as 24 people (50.0%), and the least jobs were laborers and civil servants as many as 1 person (2.1%).

Respondents in the control group who had the most recent education in high school as many as 20 people (41.7%) and the least in the category who did not go to school as many as 5 people (10.4%). the most respondents' occupations were as students as many as 10 people (20.8%) and the least in laborers, as many as 1 person (2.1%).

b. Relationship between Home Environmental Variables, Outdoor Environment, and Prevention Behavior

Table 2. Indoor Environment Variables, Outdoor Environment, and Prevention Behavior

Variabel	Kasus Kejadian Malaria				OR (95% CI)
	Kasus		Kontrol		
	n	%	n	%	
Wall Type					
wood, planks, woven bamboo	41	85,5	18	37,5	2,235 (1,026 -3,137)
Wall	7	14,6	30	62,5	
Ventilation					
there is ventilation	37	77,1	39	81,2	3,262 (4,159-8,997)
No ventilation	11	22,9	9	18,8	
Window					
open <24 hours/day	38	79,2	16	33,3	4,175 (6,238- 9,801)
Not open <24 hours/day	10	20,8	32	66,7	
House Occupancy Density					
congested	35	72,9	36	75,0	4,814 (7,038-12,684)
not solid	13	27,1	12	25,0	
Distance from house					

to body of water					
Near	23	47,9	16	33,3	0,507 (0,250-1,838)
Far	25	52,1	32	66,7	
The Existence of Farm Animals					
There is	36	75,0	32	66,7	5,057 (6,510- 10,816)
There isn't any	12	25,0	16	33,3	
Night Out Habits					
No	40	83,3	30	62,5	6,854 (7,606-11,393)
Yes	8	16,7	18	37,5	
Use of Mosquito Nets					
No	26	54,2	17	64,5	4,892 (6,984-10,436)
Yes	22	45,2	31	35,4	
Use of Anti-Mosquito Medication					
No	40	83,3	19	39,6	7,457 (7,640-12,703)
Yes	8	16,7	29	60,4	
Habit of Hanging Clothes					
yes	36	75,0	32	66,7	4,287 (5,267-9,976)
No	12	25,0	16	33,3	

Source: Data Primer, 2024

Table 2 shows that in the case category respondents who have house walls made of wood, boards, woven bamboo 41 houses (85.5%), and who have house materials made of cement 7 houses (14.6%). Whereas in the control category respondents who had house walls made of wood, boards, woven bamboo 18 houses (37.5%), and who had house materials made of cement 30 houses (62.5%).

In the case category, respondents who had open ventilation 37 houses (77.1%), and those who had closed ventilation 11 houses (22.9%). Whereas in the control category respondents who had open ventilation 39 houses (81.2%), and those who had closed ventilation 9 houses (18.8%).

In the case category, 38 houses (79.2%) had open windows, and 10 houses (20.8%) had closed windows. While in the control category respondents who had open windows were 16 houses (33.3%), and those who had closed windows were 32 houses (66.7%).

In the case category, respondents who had densely populated houses were 35 houses (72.9%), and not densely populated were 13 houses (27.1%). Meanwhile, in the control category, respondents who owned houses and were densely populated were 36 houses (75.0%), and those who were not densely populated were 12 houses (25.0%).

In the case category, 23 houses (47.9%) had close proximity to puddles in their outdoor environment, and 25 houses (52.1%) had long distance from puddles. Whereas in the control category, respondents who had close proximity to stagnant water were 16 houses (33.3%), and those who had long distance to stagnant water were 32 houses (66.7%).

In the case category, respondents who had livestock in their outdoor environment were 36 houses (75.0%), and those who did not have livestock in their outdoor environment were 12 houses (25.0%). Meanwhile, in the control category, respondents who have livestock outside their homes are 32 houses (66.7%), and those who do not have livestock outside their homes are 16 houses (33.3%).

In the case category, 40 respondents (83.3%) had the habit of leaving the house at night, and 8 respondents (16.7%) did not have the habit of leaving the house at night. While in the control category respondents who have the habit of leaving the house at night 30 people (64.5%), and who do not have the habit of leaving the house at night 18 people (35.4%).

In the case category, respondents who have the habit of not using mosquito nets 26 people (54.2%), and those who have the habit of using mosquito nets 22 people (45.2%). Whereas in the control group respondents who had the habit of not using mosquito nets 17 people (64.5%), and those who had the habit of

using mosquito nets 31 people (35.4%).

In the case category, 40 respondents (83.3%) did not use mosquito repellent, and 8 respondents (16.7%) used mosquito repellent. While in the control category respondents who have the habit of not using mosquito repellent 19 people (39.6%), and who have the habit of using mosquito repellent 29 people (60.4%).

In the case category, respondents who have the habit of hanging clothes 36 people (75.0%), and who do not have the habit of hanging clothes 12 houses (25.0%). While in the control category respondents who have the habit of hanging clothes 32 people (66.7%), and who do not have the habit of hanging clothes 16 houses (33.3%).

c. Multivariate Analysis

Multivariate analysis was carried out using the logistic regression test. In testing, the logistic regression test can be explained as follows:

1) Case and Control Group

Table 3. Results of Logistic Regression Test of Risk Factor Variables on Malaria Incidence in Watupuda and Patawang Villages

NO	Variabel	B	S.E.	Wald	Exp(B)
1	Wall Type	4.354	1.864	5.865	3.575
2	Ventilation	9.835	11.435	5.436	25.152
3	Windows	5.586	2.468	6.747	12.477
4	House Occupancy Density	-3.486	10.346	4.244	4.246
5	The Existence of Farm Animals	2.585	.835	5.324	7.864
6	Night Out Habits	8.856	12.876	3.547	72.452
7	Use of Mosquito Nets	6.546	2.640	5.341	19.355
8	Use of Anti-Mosquito Medication	3.742	1.535	3.325	25.542
9	Habit of Hanging Clothes	-4.644	9.867	3.467	5.531

Source: Data Primer, 2024

Table 3 multivariate analysis results show that after logistic regression test to see the most influential risk factors of all the variables studied, it was found that the dominant factor that significantly influenced the incidence of malaria was the habit of leaving the house with an exp. (B) or odds ratio = 72.452. The OR value > 1, indicates a positive relationship between the habit of going out at night as the dominant factor that is most influential in this study.

4. Discussion

a. The Relationship between House Materials and Malaria Cases

House materials such as walls used in a house determine its density; if it is made of walls, then the walls of the house will be tight, but if the walls of the house are made of boards or plywood, there is a chance that there will be a gap that can be an entry point for Anopheles into the house, which allows contact between mosquitoes and residents of the house.

The results of the OR calculation analysis obtained OR = 2.235 with Confidence Interval (CI) 95% = 1.026-3.137. This means that houses that use walls made of wood, boards, woven bamboo have a risk of 2.235 times compared to houses that use walls. So houses that use wood, planks, woven bamboo are a risk factor for things seen

from OR> 1

This contradicts research conducted by Madayanti et al. (2022) where a significant value of p = 0.018 was obtained so that the value of Ha was accepted and H0 was rejected. If it consists of concrete walls, then the walls of the house are sturdy, but the walls of houses made of boards or plywood may have holes that can be used by Anopheles to find a way in and out of the house. This can lead to contact between houses. Mosquitoes and householders.

b. The Relationship between Home Ventilation and Malaria Cases

Ventilation is the process of providing fresh air into the house, where dirty air is released from a closed room, either naturally or mechanically. The availability of fresh or clean air in a house or room is needed by humans, so if a room does not have a good ventilation system, it can cause conditions that can be detrimental to health.

The results of the OR calculation analysis obtained OR = 3.262 with a Confidence Interval (CI) 95% = 4.159-8.997. This means that houses that have open ventilation have a risk of 3.262 times compared to houses that do not have ventilation. So a house that has ventilation is a risk factor in terms of OR> 1

This study is in line with research conducted by Mursid et al. (2022), where the ventilation variable (OR = 0.087) is associated with the incidence of malaria. There is a significant relationship between ventilation (p = 0.016) and the incidence of malaria, based on research conducted by Zaman (2024). Residential ventilation (P = 0.167) is significantly associated with the incidence of malaria in the PTFI lowlands.

c. The Relationship between House Windows and Malaria Cases

The condition of the house is not in a condition where mosquitoes can easily enter the house so that interaction with mosquitoes is not too high, so it is necessary to try not to open windows at night so that mosquitoes do not enter the house.

The results of the OR calculation analysis obtained OR = 4.175 with Confidence Interval (CI) 95% = 6.238-9.801. This means that houses that have open windows have a risk of 4.175 times compared to houses that have closed windows. So houses that have open windows are a risk factor in terms of OR> 1.

Based on the results of observations, it is known that the activity of Anopheles mosquitoes has begun to appear since dusk, making it possible for respondents who do not close doors and windows at dusk to make it easier for mosquitoes to enter the house and increase the risk of malaria mosquito bites because the average person in the area uses windows. open without using coverings such as curtains or other things.

This is in line with research conducted by Wahyudi et al. (2020) that shows there is a relationship between the habit of opening doors and windows at night and the incidence of malaria in Jatirejo Village (p-value = 0.013).

d. The Relationship between House Occupancy Density and Malaria Cases

From research conducted in Watupuda village and Patwang village, it can be seen that the density of houses in the dense category is greater than in the non-dense category. Theoretically, the variable housing density has a close relationship with the incidence of malaria. The level of bedroom occupancy density is due to the large number of family members sleeping in one bedroom. Crowded housing makes it easier for disease transmission to occur.

The results of the OR calculation analysis obtained OR = 4.414 with Confidence Interval (CI) 95% = 7.038-12.684. This means that houses that have densely populated have a risk of 4.414 times compared to houses that are not densely populated. So a densely populated house is a risk factor in terms of OR> 1.

Based on the results of interviews and observations, information was obtained that in each house there are still many married family members who still live with their parents, which can cause and facilitate the transmission of malaria.

According to Minister of Health Regulation No. 1027 of 2011, residential density meets the requirements if it is ≥ 9 m2/person by comparing the floor area of the house divided by the number of occupants of the house. Residential density can influence the incidence of malaria. To prevent overcrowding, bedrooms with a minimum size of 8 m2 are not recommended for more than 2 people sleeping.

This is in contrast to the research conducted (Widya., 2023). Based on the research results, residential density in the house did not have a significant effect on the incidence of malaria at the Marike Community Health Center, Kutambaru District, Langkat Regency, as proven by Chi-Square experimental analysis (P = 0.370 > 0.05). In the group of case respondents who met the requirements, 43 (51.2%), and those who did not meet the requirements, were 4 (40.0%). Meanwhile, in the control group of respondents, 41 (48.8%) met the requirements and 6 (60.0%) did not meet the requirements.

e. The relationship between the distance between a house and standing water and cases of malaria

The presence of mosquito breeding sites around the house is a risk factor for malaria transmission. Stagnant water is an ideal place for breeding Anopheles mosquitoes. As breeding places increase, the Anopheles mosquito population will increase. This is of course very risky, increasing the chance of contact between mosquitoes as malaria vectors and people whose homes are near puddles of water.

The results of the OR calculation analysis obtained OR = 0.507 with 95% Confidence Interval (CI) = 0.250-1.838. This means that houses that are close to puddles have a risk of 0.507 times compared to houses that are far from puddles. So the distance of the house from the water puddle is not a risk factor in terms of OR < 1.

This is in line with research (Hasyim et al., 2020). The distance from home to the breeding place is not significantly related to malaria cases (p value = 0.145) because it is still the flying distance for Anopheles mosquitoes, so mosquitoes are able to reach nearby houses. The risk of malaria transmission depends on the distance the Anopheles mosquito flies, 2-3 km from its breeding place. In Nandi Hills, a highland area of western Kenya, multivariate analysis found the risk of malaria was higher in those living less than 250 m from the forest, less than 250 m from the swamp, less than 200 m from the corn field, and less than 200 m from the treeless area. Spatial analysis found that regional characteristics and residential environmental conditions were very homogeneous.

f. The Relationship between the Presence of Livestock and Malaria Cases

The livestock pens in the study were a resting place for malaria mosquito vectors before and after contact with humans because they were protected from sunlight and moisture. Apart from that, several types of Anopheles mosquitoes are zoophilic and anthropophilic, like animal blood and human blood. So the existence of livestock pens poses a risk for malaria cases.

OR calculation analysis results obtained OR = 5.057 with Confidence Interval (CI) 95% = 6.510-10.816. This means that houses that have livestock around the house have a risk of 5.057 times compared to houses that do not have livestock around the house. So the presence of livestock is a risk factor in terms of OR> 1.

This is in line with research by Aprilia Ayu Pamela in Ketosari Village, Bener District, Purworejo Regency (2020) on 42 respondents showing that the home environment with livestock pens tends for malaria to occur with p (value) = 0.000 with a risk of malaria incidence of 0.012.

g. The relationship between the habit of leaving the house at night and cases of malaria

The incidence of malaria caused by activities outside the home at night is related to the habit of several species of mosquitoes, which are esophagus at night. Exophagic mosquitoes are mosquitoes that mostly bite outside the house but can enter the house if humans are the preferred main host.

The results of the OR calculation analysis obtained OR = 6.854 with Confidence Interval (CI) 95% = 7.606-11.393. This means that people who have the habit of leaving the house at night have a risk of 6.854 times compared to people who do not have the habit of leaving the house at night. So the habit of going out at night is a risk factor seen from OR> 1.

One of the risk factors for contracting malaria is having the habit of doing activities outside the house at night. This is also related to the large number of respondents who do activities outside the home, such as weaving, protecting crops from theft, fishing at night, and looking after livestock such as horses, pigs, and cows.

The results of this study are in line with research (Nababan et al., 2021), which shows that there is a correlation between the behavior of being outside the house at night and the incidence of malaria in the work area of the Winong Health Center, Purworejo district (p = 0.01; OR = 3.6; 95% CI = (1.306–10.161).

h. The Relationship between the Use of Mosquito Nets and Malaria Cases

Using mosquito nets while sleeping is the most effective measure to prevent mosquito bites compared to other measures. Using mosquito nets is better than using mosquito repellent, with various ways of using it that hurt the user. If you use a mosquito net while sleeping, you still have the chance of being bitten by a mosquito because it has to be opened and closed. Although this is unlikely, there is still a chance for mosquitoes to sneak into the mosquito net.

The results of the OR calculation analysis obtained OR = 4.892 with Confidence Interval (CI) 95% = 6.984-10.436. This means that people who have the habit of not using mosquito nets have a risk of 4.892 times compared to people who have the habit of using mosquito nets. So the habit of not using mosquito nets is a risk factor in terms of OR> 1.

The results of this research also found that people who use mosquito nets suffer from malaria. This is because people do not always or sometimes use mosquito nets at night. The reasons why people do not use mosquito nets

include the distribution of insecticide-impregnated nets by the Community Health Center only once every 3 years, and they prioritize homes with children under five. Some people also feel uncomfortable using mosquito nets because they feel hot and stifling. and have used mosquito repellent at bedtime. Apart from that, many people say that the price of mosquito nets is expensive, so they use them for other purposes..

The results of this study are in line with research conducted by Palupi Niken (2020), which stated that respondents who did not use mosquito nets when sleeping at night had a 2,047 times higher risk of contracting malaria than those who used mosquito nets. These results are in line with research (Ristadeli T et al., 2021) showing that respondents who have a habit of not using mosquito nets at night have a 2.6 times higher risk of suffering from malaria compared to respondents who use mosquito nets (p-value = 0.017 at 95% CI = 1, 2, and 5.5).

i. The relationship between the use of anti-mosquito medication and cases of malaria

Another preventive measure that can be taken to reduce the incidence of malaria is by using anti-mosquito medication. The types of anti-mosquito drugs that are widely circulated in the community are mosquito coils (fumigants), mosquito sprays (aerosol), electric anti-mosquito drugs (electric), and mosquito repellent (repellent). Based on the results of interviews with respondents, this research also shows that there are several reasons why respondents do not use mosquito repellent. These reasons include, among other things, the economic status of those who are still middle- to lower-income, assuming that the money they have will be spent for other purposes than buying anti-mosquito medicine.

The results of the OR calculation analysis obtained OR = 7.457 with Confidence Interval (CI) 95% = 7.640-12.703. This means that people who have a habit of not using mosquito repellent have a risk of 6.854 times compared to people who have a habit of using mosquito repellent. So the habit of not using mosquito repellent is a risk factor seen from OR> 1.

The results of this research are in line with research (Florentina et al., 2022), which obtained a p-value of 0.007, an OR of 4.074, and a 95% CI of 1.545–10.599, so it can be said that people who do not use anti-mosquito medication have a 4.074 times greater risk of malaria than people who use anti-mosquito medication.

j. The Relationship between the Habit of Hanging Clothes and Cases of Malaria

The habit of hanging clothes inside the house is bad. Judging from the characteristics of mosquitoes, several groups of mosquitoes tend to stick to damp and dim places in the house after sucking blood. If there are lots of hanging clothes, they can be used as hiding places for mosquitoes. This will certainly increase the potential for mosquitoes to come into contact with humans.

The results of the OR calculation analysis obtained OR = 4.287 with Confidence Interval (CI) 95% = 5.267-9.976. This means that people who have the habit of hanging clothes have a risk of 4.287 times compared to people who do not have hanging clothes. So the habit of hanging clothes is a risk factor seen from OR> 1.

Public awareness of the importance of creating and maintaining environmental sanitation is still very minimal. People's bad habits that were found were: hanging clothes on the bed, hanging hangers behind bedroom doors, on windows, on chairs, in the kitchen, and in the bathroom or toilet. Dirty clothes that are hung in any place and scattered all over the house become mosquito nests.

This is in line with research conducted by Lala Nurbayani (2022). Based on the results of the chisquare test, a significance value (p) of 0.019 was obtained, which means there is a relationship between the habit of hanging clothes indoors and the incidence of malaria in the Mayong Community Health Center area.

k. The habit of leaving the house factor is the variable that has the most influence on the incidence of malaria.

The results of the multivariate analysis showed that after the logistic regression test was carried out to see the most influential risk factors of all the variables studied, it was found that the dominant factor that significantly influenced the incidence of malaria was the habit of leaving the house with the value of Wal exp. (B) or odds ratio = 72.452. The OR value > 1, indicates a positive relationship between the habit of going out at night as the most influential dominant factor in this study. ..

According to the researcher's assumption, the conditional variable, house ventilation, is the most influential variable compared to other variables. This is because most of the houses where malaria occurs have a large number of vents / vents in people's homes, especially the average does not use wire mesh, making it easier for mosquitoes to enter. Anopheles enters the respondent's house and bites him so that it is likely to cause malaria in the respondent. This is influenced by the level of knowledge of local residents. Local residents do not know how malaria is transmitted or how mosquitoes are transmitted, so they consider it normal if the house has a lot of ventilation.

5. Conclusion

From the results of the research conducted, researchers can draw the following conclusions:

a. Wall type is a risk factor for malaria
b. House ventilation is a risk factor for malaria
c. House windows are a risk factor for malaria
d. Overcrowding in the house is a risk factor for the incidence of malaria
e. The presence of livestock is a risk factor for malaria
f. The distance between the house and a body of water is not a risk factor for malaria
g. The habit of leaving the house at night is a risk factor for malaria
h. The use of mosquito nets is a risk factor for malaria
i. The use of anti-mosquito medication is a risk factor for malaria
j. The habit of hanging clothes is a risk factor for malaria
k. The results of the multivariate analysis showed that the variables that had an influence on the incidence of malaria were: after carrying out a logistic regression test to see the most influential risk factors of all the variables studied, it was found that the factor that had a significant dominant influence on the incidence of malaria was the habit of leaving the house..

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Use of AI tools declaration

The author used Grammarly to improve the language in this research.

Conflict of interest

The authors declare that they have no conflict of interest

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