

Effect of the Role of Cadres on Decreasing the MoPI (Monthly Parasite Incidence) Numbers Malaria in Supiori District

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ABSTRACT

Background: The large number of malaria sufferers in Supiori District requires the role of malaria cadres in the village as a fast and appropriate step to reduce malaria MoPI (Monthly Parasite Incidence) by expanding the scope of patient discovery and treatment both ACD (Active Case detection) and PCD (Patient Case Detection).

Objective: To determine the role of malaria cadres in decreasing malaria MoPI (Monthly Parasite Incidence) in Supiori District

Research method: Observational analytic with cross sectional study approach. This study was conducted in October 2018 in 10 villages in Supiori District with a population of village malaria cadres with a sample of 30 people in total population. Data were obtained by questionnaire and analyzed using Chi-Square Test, and logistic binary regression test.

Research results: Obtained factors that influence the decrease in the number of malaria MoPI (Monthly Parasite Incidence) in Supiori Regency are malaria education ($p = 0,000$), community empowerment ($p = 0,001$), malaria sufferer findings ($p = 0,151$), radical treatment ($p = 0,000$), treatment follow-up ($p = 0,007$), malaria patient referral ($p = 0,118$), posmalde village mapping ($p = 0,007$), malaria meeting ($p = 0,837$), malaria reporting ($p = 0,024$). Dominant factors that influence the decrease in MoPI (Monthly Parasite Incidence) malaria are patient discovery, radical treatment, treatment follow-up, where radical treatment is the most dominant factor in decreasing malaria numbers (Monthly Parasite Incidence) in Supiori District.

Keywords: Malaria, cadre role, monthly parasite incidence (MoPI)

INTRODUCTION

The situation of the malaria case in Papua Province for the last five years has decreased slightly when seen from changes in the 2013 to 2017 API (Annual Parasite Incidence) values respectively, 103 %, 50.7 %, 55.2 %, 49.6 % and 46.79 %. However, based on the stratification of the malaria region in Indonesia, Papua Province is classified as the highest endemic area, so in the National program as stated in the Decree of the Minister of Health Number 293 / Menkes / SK / IV / 2009 concerning malaria elimination in Indonesia, Papua Province is targeted to be included in the elimination target malaria in 2030 (RI Ministry of Health, 2016). Referring to the Decree, the Papua Provincial Government issued Governor Regulation Number 44 of 2017 concerning guidelines for eliminating Malaria in Papua by prioritizing 3 Districts to be included in the elimination stage in 2020 namely, Supiori District, Biak Numfor Regency, and Lani Jaya Regency (Health Office Profile Papua, 2017).

The Supiori District Determination as one of the elimination priority priority districts in Papua Province is seen from its geographical location as Islands Regency which is favorable for control and eradication and Annual Parasite Incidence analysis which has decreased significantly in the last 3 years where the API (Annual Parasite Incidence) from 2015 amounting to 78.5 turun, down to 9.6 % in 2017, but this figure is still far from the national elimination target where API <1 atau

population or included in the Low Case Incidence (Papua Provincial Health Office, 2017). The malaria discovery and treatment program carried out in Supiori District is still using the Pasive Case Detection method in each health facility. According to the Indonesian Ministry of Health (2018) that the discovery and treatment of malaria sufferers is said to be successful if the SPR value (Slide Positive Rate) is <5%. This figure when compared with the Supiori Regency SPR (Slide Positive Rate) in 2017 of 38% is still above the expected target, the effort to find and treat malaria sufferers by applying the Pasive Case Detection method is less effective because of the limited scope of discovery and treatment of patients. This condition is certainly one of the triggers for the high rate of malaria transmission in Supiori District. According to Tuti S., ed., Al (2009) that the limited discovery of malaria cases is a trigger factor for high malaria cases in one area.

Malaria transmission and morbidity rates were still quite high in 38 villages in Supiori District. Difficulty in managing malaria due to people's behavior, geographical conditions, limited eradication budgets from local governments, so that one effective and efficient strategy is to empower communities to expand the scope of malaria discovery and treatment. According to Erni., Ed., Al (2007) that one form of community empowerment is effective and efficient through the establishment of village malaria posts (posmaldes). The village malaria post (Posmaldes) is a forum for community empowerment in the prevention and control of malaria that is formed from, by and for the community independently and sustainably (Ministry of Health, 2009), with the aim of reducing malaria morbidity and mortality, especially in areas far out of reach health services (difficult areas), and accommodating all activities carried out by the community in malaria prevention so that they can be implemented in a planned, directed, integrated, comprehensive and sustainable manner so that they can provide

optimal results in the discovery and treatment of patients and prevention of malaria transmission (Kurniasih, 2018; Mallongi A. 2014, 2016) .

The establishment of village malaria posts (posmaldes) in difficult areas in Supiori District is very useful to expand the scope of malaria discovery and treatment, so in 2017 Global Fund malaria (GF-Malaria) through YPMK PERDHAKI conducted a malaria intervention by establishing 10 village malaria posts (posmaldes) with 30 malaria cadres as part of community empowerment in the village, and assigned according to the village malaria cadre guidelines issued by the Indonesian Ministry of Health (2012) namely; conduct malaria counseling activities, empower the community, find malaria sufferers on ACD (active case detection) and PCD (passive case detection), carry out radical treatment, follow up treatment, refer malaria sufferers, conduct village mapping posmaldes, participate in and initiate malaria meetings, and report all malaria activities in the village to the Puskesmas in their working area. According to Ompusunggu., Et., Al (2005) that community participation in malaria prevention through the appointment of malaria field workers (TLM) who applied their role to the maximum would increase the percentage of population seeking treatment from 29.7% to 86.8%. This, if implemented well in difficult areas in Supiori District, certainly greatly influences the extent of malaria discovery and treatment in the field so that transmission can be suppressed.

Seeing the importance of the role of a village malaria cadre in the village malaria post (posmaldes), the authors are interested in seeing how far the role of 30 malaria cadres temporarily served in 10 remote villages in Supiori District to reduce malaria MoPI (Monthly Parasite Incidence) so that later make reference to the establishment of Posmaldes in other difficult villages in Supiori District.

2. MATERIALS AND METHODS

2.1. Research design

This study included an observational analytic study using the cross sectional approach, namely the type of research that emphasizes the time of measurement or observation of data in one time that is done on the dependent variable and the independent variable. This approach is used to see the influence of the independent variables on the dependent variable.

2.2. Research Population and Samples

i. Research Population

The population in this study were all malaria cadres in Supiori District, which numbered 30 people.

ii. Research Samples

The sample of this study was 30 malaria cadres with the reason that the population was below 100. According to the opinion of Arikunto (2013).

iii. Sampling technique

Sampling uses saturated sampling method where the determination of the sample by taking all members of the population as respondents amounted to 30 people.

3. RESULTS

Bivariate analysis was conducted to determine the effect of independent variables with the dependent variable and in this study used the Kai Square or Chi Square Test.

3.1 Effect of malaria counseling on malaria MoPI (Monthly Parasite Incidence) numbers

Table 1 Effect of malaria cure on the MoPI (Monthly Parasite Incidence) number of malaria in Supiori District in 2018

No	Malaria education	Number of MoPI (Monthly Parasite Incidence) malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	19	95	1	5	20	100
	Not Conducted						
2	Conducted	2	20	8	80	10	100
Total		21	70	9	30	30	100
p-value = 0,000, RP = 4,750, CI95% (1,370 - 16,474)							

Table 1 shows that of the 20 cadres who carried out malaria education activities in their working areas there were 19 cadres (95%) whose malaria MoPI (Monthly Parasite Incidence) rate decreased and 1 cadre (5%) did not decrease, while 10 cadres who did not carry out extension activities malaria in its working area has 2 cadres (20%) whose malaria MoPI (Monthly Parasite Incidence) number decreases and 8 cadres (80%) malaria MoPI (Monthly Parasite Incidence) number. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0,000 < \alpha (0.05)$. This means that there is a significant effect of malaria education on decreasing the number of malaria MoPI (Monthly Parasite Incidence) in their working area. Results of the value of $RP = 4,750$; $CI95\% (1,370 - 16,474)$ explains that cadres who carry out malaria counseling can reduce malaria MoPI (Monthly Parasite Incidence) number 4.8 times than cadres who do not carry out malaria counseling in their working area.

3.2 Effect of Community Empowerment on malaria MoPI (Monthly Parasite Incidence) figures

Table 2 Effect of community empowerment on MoPI (Monthly Parasite Incidence) in Supiori District in 2018

No	Community empowerment	Number of (Monthly Parasite Incidence) malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	20	87	3	13	23	100
	Not Conducted						
2	Conducted	1	14,3	6	85,7	7	100
Total		21	70	9	30	30	100
p-value = 0,001, RP = 6,087, CI95% (0,985 - 37,623)							

Table 2 shows that of the 23 cadres who carry out community empowerment activities in their working areas there are 20 cadres (87%) whose MoPI (Monthly Parasite Incidence) number decreases and 3 cadres (13%) with malaria MoPI (Monthly Parasite Incidence) numbers, while 7 cadres who did not carry out community empowerment activities in their working areas there were 1 cadre (14.3%) with decreased MoPI (Monthly Parasite Incidence) number and 6

cadres (85.7%) remained. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0.001 < \alpha (0.05)$. This means that there is a significant effect of community empowerment on decreasing malaria MoPI (Monthly Parasite Incidence) in their working area. The results of the value of RP = 6.087, CI95% (0.985 - 37,623) explain that cadres who do community empowerment can reduce the MoPI (Monthly Parasite Incidence) number 6.0 times than cadres who do not empower the community in their working area.

3.3 Effects of clinical malaria sufferer findings on malaria MoPI (Monthly Parasite Incidence) figures

Table 3 Effect of clinical malaria sufferer findings on MoPI (Monthly Parasite Incidence) in Supiori District in 2018

No	malaria sufferer findings	Number of Monthly Parasite Incidence malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	21	75	7	25	28	100
2	Not Conducted	0	0,0	2	100	2	100
Total		21	70	9	30	30	100
p-value = 0,151, PR = 0,250, CI95% (0,132 - 0,475)							

Table 3 shows that of the 28 cadres who carried out malaria discovery activities in their working area there were 21 cadres (70.0%) with decreased malaria MoPI (Monthly Parasite Incidence) and 7 cadres (23.3%) remaining or not declining. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0.151 > \alpha (0.05)$. This means that there is no significant effect of the discovery of clinical malaria sufferers on decreasing malaria MoPI (Monthly Parasite Incidence) in their working area. The results of PR values = 1,500, CI95% (0.674 - 3,339) with a lower value < 1 so that the findings of malaria sufferers are not a significant factor in decreasing the number of malaria MoPI (Monthly Parasite Incidence) in their working area.

3.4 Effects of radical treatment on malaria MoPI (Monthly Parasite Incidence) numbers

Table 4 Effect of radical treatment on MoPI (Monthly Parasite Incidence) figures in Supiori District in 2018

No	Radical treatment	Number of Monthly Parasite Incidence malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	21	91,3	2	8,7	23	100
2	Not Conducted	0	0,0	7	23,3	7	100
Total		21	70	9	30	30	100
p-value = 0,000, PR = 0,087, CI95% (0,023 - 0,327)							

Table 4 shows that of the 23 cadres who carried out radical treatment activities in their working area there were 21 cadres (91.3%) with decreased malaria MoPI (Monthly Parasite Incidence) attack rate while 2 cadres (8.7%) did not carry out radical treatment activities Fixed MoPI (Monthly Parasite Incidence) number. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0,000 < \alpha (0.05)$. This means that there is a significant effect of malaria radical treatment on decreasing malaria MoPI (Monthly Parasite Incidence) in the area of work. The results of the PR value = 0.087, CI95% (0.023-0.327) explained that cadres who carry out malaria radical treatment can reduce the MoPI (Monthly Parasite Incidence) number 0.087 times than cadres who do not carry out malaria radical treatment in their working area.

3.5 Effect of treatment follow-up on malaria MoPI (Monthly Parasite Incidence) numbers

Table 5 Effects of treatment follow-up on decreasing malaria MoPI (Monthly Parasite Incidence) in Supiori District in 2018

No	treatment follow-up	Number of Monthly Parasite Incidence malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	20	83,3	4	16,7	24	100
2	Not Conducted	1	16,7	5	83,3	6	100
Total		21	70	9	30	30	100
p-value = 0,007, PR = 5,000, CI95% (0,828 - 30,191)							

Table 5 shows that of the 24 cadres who carried out medication follow-up activities in their working areas there were 20 cadres (83.3%) with decreased MoPI (Monthly Parasite Incidence) numbers and 4

cadres (16.7%) remained. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0.007 < \alpha$ (0.05). This means that there is a significant effect of malaria treatment follow-up on decreasing malaria MoPI (Monthly Parasite Incidence) in the area of work. The results of the PR value = 5,000, CI95% (0.828 - 30,191) explain that cadres who follow malaria treatment can reduce malaria MoPI (Monthly Parasite Incidence) numbers 5 times than cadres who do not follow malaria treatment in their work area.

3.6 Influence Referral of malaria sufferers to malaria MoPI (Monthly Parasite Incidence) numbers

Table 6. Effect of malaria patient referral on MoPI (Monthly Parasite Incidence) in Supiori District in 2018

No	Malaria patient referral	Number of Monthly Parasite Incidence malaria				n	%
		Decrease		Stable			
		n	%	n	%		
1	Conducted	17	81	4	19	21	100
	Not						
2	Conducted	4	44,4	5	55,6	9	100
Total		21	70	9	30	30	100
p-value = 0,118, PR = 1,821 CI95% (0,852 - 3,892)							

Table 6 shows that of the 21 cadres who carried out patient referral activities in their working area there were 17 cadres (81%) with decreased MoPI (Monthly Parasite Incidence) numbers and 4 cadres (19%) remained. The results of the chi square statistical test on the significance value of 95% ($\alpha = 0.05$) obtained p-value $0.118 > \alpha$ (0.05). This means that there is no significant effect of malaria patient referrals on decreasing malaria MoPI (Monthly Parasite Incidence) in their working area. The results of the PR value = 1.821 CI95% (0.852 - 3.892) with a lower value < 1 so that referencing patients with malaria is not a significant factor in decreasing the case of monthly Parasite Incidence in its working area.

4. DISCUSSION

4.1 Malaria extension

Malaria extension activities are one of the main tasks of malaria cadres in

Supiori District to provide understanding to the community about the importance of malaria transmission prevention, practical efforts to avoid mosquito bite contact with the community, behaviors that are at risk of malaria, early discovery and treatment of malaria. The observation that of the 30 malaria cadres who served in Supiori District, as many as 20 cadres carried out malaria extension activities and 19 cadres (95%) experienced a decrease in malaria MoPI (Monthly Parasite Incidence) in their working area. This shows that there is a change in community behavior after malaria extension activities are carried out by cadres. Behavior changes occur due to the emergence of public knowledge about malaria prevention and eradication efforts. The results of statistical tests illustrate that there is a significant effect of malaria extension activities carried out by cadres on decreasing malaria MoPI (Monthly Parasite Incidence) in the area of their work (p-value = 0,000), where PR = 4,750, CI95% (1,370 - 16,474), explains that cadres who carry out malaria extension activities in their working area can reduce malaria MoPI (Monthly Parasite Incidence) rate 4.8 times compared to cadres who do not carry out malaria extension activities in their working area.

The results of this study are in line with the research conducted by Suwarni (2014), that there was a significant difference in the level of final knowledge between the control group and the experiment ($p = 0,000$). There were significant differences between the level of final knowledge and the initial level of knowledge in the experimental group. According to Maulana in Suwarni (2014) that knowledge is a guideline in shaping one's actions. Formed behavior especially in adults begins with knowledge, then the attitude arises towards the object he knows. After the object is known and fully realized then a response arises in the form of action. A similar theory was put forward by Notoatmodjo where the first stage of the behavior change process starts from knowledge, then followed by changes in

attitude and practice. Thus, in order for the community to be able to behave in a healthy manner, it is necessary to increase knowledge through one of them is health education

4.2 Community empowerment

Community empowerment is an effort to restore or enhance the ability of a community to be able to do according to their dignity and dignity in carrying out their rights and responsibilities as members of the community (Mubarak in Prasetyo, 2015). The community empowerment analysis conducted by 30 cadres in Supiori District can be said to be successful, because 23 cadres who carry out community empowerment activities, as many as 20 cadres (87%) with decreasing MoPI (Monthly Parasite Incidence) numbers. Statistically it shows that there is a significant influence of community empowerment activities carried out by cadres on decreasing MoPI (Monthly Parasite Incidence) malaria numbers (p -value = 0.001), where $PR = 6.087$, $CI95\% (0.985 - 37,623)$ explains that cadres do empowerment activities the community in its working area can reduce malaria MoPI (Monthly Parasite Incidence) number 6.1 times compared to cadres who do not carry out community empowerment activities in their working area. Community empowerment in Supiori includes the use of mosquito coils, the use of mosquito nets, the use of wire mesh to avoid mosquito bites, mutual cooperation activities to clean gutters, bushes, drain stagnant water to suppress and eliminate malaria transmitting populations and breeding so that the attack rate malaria as measured by API (Annual Parasite Incidence) in 2016, decreased significantly from 62.3 ‰ to 9.6 ‰ in 2017. This research is in line with the research conducted by Faizah et al (2016), that community empowerment by malaria cadres is effective in increasing community participation in efforts to control malaria in RW I of Hargorojo Village, Purworejo District ($p = 0,000$). This participation is in

the form of mobilizing the community to carry out environmental cleaning services and PSN (Eradication of Mosquito Nests) every week. According to Zega in Faizah (2016) that efforts to empower the community through malaria cadres turned out to be able to increase changes in community behavior where communities directly participate in malaria control efforts. These changes are in the form of mutual assistance activities to clean trenches, bushes and advice if there are members of the community who are sick with malaria to go to the Puskesmas or the Sub-Puskesmas.

In this view the involvement of the community in development is more directed at the form of participation, not for mobilization. Community participation in program formulation makes the community not only as program consumers, but also as producers because they have participated in the process of making and formulating it, so that people feel that they have the program and have responsibility for its success and have more motivation for participation in the next stages. Active community participation is very important in the success of the malaria control program. William Rojar in Faizah (2016), states that community participation in malaria control is effective in preventing malaria. Efforts to break the chain of transmission between hosts, agents, and environment must be carried out by the community itself in efforts to control malaria. For this reason, the community must have confidence, skills in implementing malaria control. In increasing malaria control beliefs and skills, contributions from village malaria cadres are needed in carrying out their duties. According to Kusumawati and Darnoto in Faizah (2016), the public awareness model can be more effective if carried out by health cadres or community leaders because these role models are directly involved in community activities and closer to the community.

4.3 Discovery of malaria sufferers

Statistically, there was no significant influence from malaria cadre discovery activities by malaria cadres on decreasing malaria MoPI (Monthly Parasite Incidence) in their work area ($p = 0.151$) where; $PR = 0.250$, $CI95\%$ (0.132 - 0.475), explains that cadres who carry out malaria discovery activities in their working area 5 times smaller reduce the MoPI (Monthly Parasite Incidence) rate of malaria compared to cadres who do not carry out community empowerment activities in their working area.

The results of this study are consistent with Zubaidah's (2015) study, that there is no relationship between the implementation of home visits in accordance with the cycle by the Village Malaria Interviewer (JMD) with positive malaria cases at the village level in Banjarnegara Regency ($p = 0.437$), but different from the results of research studies Sekartuti, et al. (2016) showed that the presence of malaria cadres in their work area had a significant decrease in SPR (Slide Positive Rate) from 18.9% to 3.1%, this study was in line with the research of Arga Gumilang (2010), which stated that ACD (Active Case Detection) case finding by malaria cadres was more than PCD (Pasive Case Detection) case finding. The theory says that malaria cadres are one form of community empowerment and the malaria prevention strategy developed today is on the basis of integrated partnerships based on the district with community empowerment. According to William Rojar, et al (2011) the participation of the community in malaria control is effective in preventing malaria. This theory was later corroborated by Sahat (2005), where the participation of the community can help the performance of puskesmas in increasing the coverage of active malaria case discoveries increasing by 4 times compared to before. Coverage of case finding will affect treatment so that case transmission can be reduced or even stopped.

The discovery of malaria cases by cadres in Supiori District was carried out in 2 forms of activities, namely the form of ACD (Active Case Detection) where active cadres visited 20 homes a day to find and find malaria sufferers while the PCD (Pasive Case Detection) activity in which cadres waited for malaria sufferers came to check up at the village malaria post. Since this activity has been carried out the number of malaria discoveries in the village has increased by 100% compared to before the presence of cadres. The community really heard what was conveyed by the cadres when they were encouraged to check themselves out, they assumed that cadres were the length of time the health workers and cadres were a community leader who was appointed by the community themselves so that they were valued and respected. According to Research Faizah and Febriana (2016) that the presence of cadres is only 49%-64.8% of the community hears, and is willing to take blood from cadres. Some residents who are unwilling to be taken give reasons to be afraid, because they consider cadres not yet skilled. But in general the community is happy with the presence of cadres and states that cadre activities need to be continued. Most of the Supiori District areas are remote rural areas where most people live far from health facilities; this is one of the obstacles in the malaria eradication program. This situation is one of the risk factors for malaria, so that the identification of malaria sufferers by empowering cadres is one way to expand coverage or range of services.

The results of this study indicate that the closeness of the variable influence is low (0.132) this occurs because there are concomitant factors that are not controlled. Observations on the reports from the Health Office and Puskesmas in Supiori District revealed that there were MBS (Mass Blood Survey) or MFS (Mass Fever Survey) activities, spraying and kelambunisasi in cadre work areas in 2015 and 2017 before this research was conducted, so that these factors is a supporting factor that allows a

decrease in the number of MoPI (Monthly Parasite Incidence) of malaria in the work area of cadres.

4.4 Radical malaria treatment

Radical treatment is a combination treatment of two or more simultaneous blood schizontocidal antimalarial drugs in which each drug has an independent work method and has different biochemical targets on the parasite. The combination of malaria treatment is intended to improve the efficacy of the efficacy of each of the anti-malarial drugs, increase the cure rate, and speed up treatment response (Tjitra Emeliana 2004). According to Kinansi et al (2013), a combination treatment of anti-malaria drugs currently used in Indonesia refers to WHO guidelines using ACT (Artemisinin Combination Therapy). Artemisinin derivatives were chosen as the basis for important antimalarial combination therapy because they were able to reduce parasitemia faster ten times than other anti-malarial drugs.

The results of multivariate analysis in this study show that cadres who carry out malaria radical treatment with ACT (Artemisinin Combination Therapy) have a significant effect on decreasing malaria MoPI (Monthly Parasite Incidence) in their work area (p-value = 0,000), where PR = 0.087, CI95% (0.023 - 0.327) thus cadres who carry out malaria radical treatment activities in their working areas in Supiori Regency can reduce malaria MoPI (Monthly Parasite Incidence) numbers 0.087, or 11.5 times smaller than cadres who do not carry out radical treatment activities. The results of this study are similar to those of Leunufna Esau (2009), that malaria sufferers who received malaria radical treatment with ACT (Artemisinin Combination Therapy) recovered 2.3 times compared to malaria sufferers who were not treated with ACT (Artemisinin Combination Therapy).

Appropriate treatment is a major component of the global strategy to eradicate malaria. Proper use of anti-

malarial drugs not only shortens the duration of malaria but also reduces the incidence of complications and death. In 2004, ACT (Artemisinin Combination Therapy) treatment was used as a radical malaria treatment because chloroquine treatment was proven to be resistant to plasmodium vivax in 1973. WHO (World Health Organization) calls on several countries to only use ACT (Artemisinin Combination Therapy) for malaria radical treatment to prevent the possibility of malaria immunity because ACT (Artemisinin Combination Therapy) treatment is a combination treatment to increase anti-malaria efficacy and antimalarial synergic activity and slowing the progression of parasite resistance to new anti-malarial drugs (Simamora & Fitri, 2007).

4.5 Follow-up on malaria treatment

The results of multivariate analysis in this study showed that there was a significant influence from cadres who undertook treatment follow-up on a decrease in malaria MoPI (Monthly Parasite Incidence) in their work area (p-value = 0.007), where PR = 5,000, CI95% (0.828 - 30,191) explains that cadres who follow up treatment in malaria patients can reduce malaria MoPI rates 5 times greater than cadres who do not carry out malaria follow-up activities in their working area. The results of this study are in line with the research conducted by Siswantoro et al. (2011), that good and correct treatment follow-up can minimize treatment failure and improve clinical symptoms and asexual parasitemia on H3 <50%, H7> 50% and H21 \geq 75%.

Completing the treatment to completion becomes an obstacle to treatment management, usually the community after taking the drug two days a day the body feels better and does not continue treatment to completion. Treatment with cadre supervision needs to be done and raising awareness of malaria sufferers to take medicine to completion (Kesuma AP &

Pramestuti N, 2014) One form of monitoring in medicine is to follow up with patients who have received radical treatment in the form of taking a blood re-preparation based on the type of parasite. Only a small proportion of cases given treatment were followed up by officers including taking blood preparations until the 28th day after the first day of treatment. Referring to the Indonesian Ministry of Health's rules, the malaria treatment follow-up was carried out by malaria cadres in Supiori District at p. vivax was carried out on days 3, 7, 14, 28 and 3 months after radical treatment while at p. falciparum is carried out 4 times in patients, namely the 3rd, 7th, 14th and 21st day. The follow-up results are used to analyze the occurrence of drug use according to dosage, relapse or new sufferers (Profile of Supiori Health Office, 2017)

4.6 Referring to malaria sufferers

Referral of malaria sufferers is carried out by cadres when there are people with severe malaria, complications or pregnant women who are far from the reach of health services and are one of the tasks carried out by malaria cadres. Statistically, 44.4% of malaria cases declined in the work area where cadres did not conduct malaria referral. This condition occurs because of the early discovery of malaria sufferers, radical treatment and follow-up of treatment carried out by health workers, malaria cadres in the form of ACD (Active Case Detection) and PCD (Active Case Detection). The low reference is influenced by the species found in the service area. According to WHO in Suwandi et al (2017) that patients with severe malaria occur due to plasmodium falciparum infection with complications consisting of cerebral malaria (coma), acidemia / acidosis, severe anemia, acute renal failure and hypoglycemia. Suwandi et al. (2017) further said that the value of parasitemia in plasmodium vivax was lower than plasmodium falciparum. This is related to the inflammatory response of the larger activated host when infected

with plasmodium vivax, with higher TNF- α levels compared with plasmodium falciparum infection with the same level of parasitemia, besides that plasmodium vivax is also younger found in peripheral smear on all stadiums. The difference with plasmodium falciparum, which is at an advanced stage, is difficult to find in peripheral blood. This shows the occurrence of cytoadherence in post-capillary venules. This process is a fundamental factor in the occurrence of severe malaria compared to plasmodium vivax in the adult stage, which tends not to form and usually does not occur cytoadherence or microvascular sequences.

5. CONCLUSIONS

Based on the research that has been done, it can be concluded that:

1. There is a significant effect of malaria counseling carried out by cadres on the decrease of malaria MoPI (Monthly Parasite Incidence) in Supiori District p-value = 0,000, OR = 4,750, CI95% (1,370 - 16,474) There was a significant effect of community empowerment by cadres on the decrease in malaria MoPI in Supiori District p-value = 0.001, OR = 6.087, CI95% (0.985 - 37.6623)

There is no significant effect of the malaria patient examination conducted by cadres on the decrease in the MoPI (Monthly Parasite Incidence) number of malaria in Supiori District p-value = 0.151, OR = 0.250, CI95% (0.132 - 0.475)

There is a significant effect of radical treatment carried out by cadres on decreasing the number of malaria MoPI (Monthly Parasite Incidence) in Supiori District p-value = 0,000, OR = 0.087, CI95% (0.023 - 0.375)

There is a significant effect of treatment follow-up by cadres on decreasing malaria MoPI (Monthly Parasite Incidence) in Supiori District p-value = 0.007, OR = 5,000, CI95% (0.828 - 30,191)

There is no significant effect of malaria patient referrals carried out by cadres on the decrease of malaria MoPI (Monthly Parasite Incidence) in Supiori District p-value =

0.118, OR = 1,821, CI95% (0.852 - 3,892)

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