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Effectiveness of Extension as a Means of Improving Knowledge About Malaria in Olaroa Village Kwamki Narama District, Mimika Regency in 2024

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ABSTRACT
Indonesia is the second country in Southeast Asia with malaria cases, while in Mimika Papua it is still relatively high for cases of the disease. The purpose of this study was to see the effectiveness of counseling in increasing knowledge about Malaria. This study is a Pre-Experimental study with a pretest-posttest design with a sample of 50 respondents taken using the accidental sampling technique. The results of the study explained that before being given counseling, respondents who had a high level of knowledge were 26% and after being given counseling, respondents who had a high level of knowledge increased by 76%, from the results of the data analysis stated that there was an effect of health counseling on the level of knowledge about malaria. Counseling can provide information that can increase respondent knowledge.

Keywords : Counseling, Knowledge, Malaria

INTRODUCTION

Malaria is an infectious disease that can reduce productivity and cause economic losses and contribute greatly to infant, child and adult mortality rates. Malaria infection during pregnancy can cause abortion and low birth weight. Malaria is influenced by several factors, namely the environment, behavior, health services. For example, good human behavior can have a positive influence on changes in the physical environment. In addition, the existence of health services from health workers can change the behavior of a person/community to come for treatment at the health center.

Poor sanitation and environmental conditions are factors related to the breeding of mosquitoes as a cause of malaria as one of the breeding places for Anopheles mosquitoes, namely resting places and breeding places such as environments that still have many swamps, gutters with stagnant water, and conditions of the ceiling of the house (Lathifatun. 2019). In mountainous or hilly areas, it is a place that is very popular with Anopheles mosquitoes, including rice fields and beaches because it is a place where water stagnates as a place to breed. This greatly accelerates

Malaria transmission occurs through the bite of the Anopheles mosquito (Fitri. 2022). Environmental management includes environmental modification activities or their interactions with humans, which aim to prevent, limit vector development and reduce mosquito contact with humans. Environmental modification is an environmental management effort that includes permanent physical changes to water and plants, which aims to prevent, eliminate or reduce vector habitats without disrupting the quality of the environment for human life.

Healthy living behavior is behavior related to a person's efforts or activities to maintain and improve their health. Healthy living behavior is one of the parts of health behavior besides illness behavior and the sick role behavior. Healthy living behavior consists of eating a balanced diet, regular exercise, not smoking, not drinking alcohol and drugs, getting enough rest, controlling stress, and other positive behaviors or lifestyles for health such as recreation and maintaining environmental cleanliness (Notoatmojo. 2007).

Each person's behavior is different even though the stimulus given to them is the same. The differentiating factors are internal and external factors. Human behavior used for health education measurement results is knowledge and practice or action. Behavior based on knowledge and awareness.

Mosquitoes have high adaptation, so they can quickly cope with environmental changes, because they are cold-blooded which makes it easy to adapt. If one or more environmental factors needed by mosquitoes are limited or abundant, then mosquitoes cannot survive. So in the minimum or maximum conditions that can be tolerated by mosquitoes in order to survive, this is what makes it difficult to eradicate vectors (Munif. 2010).

Various types of mosquitoes are also found in Indonesia and their distribution covers the entire territory of Indonesia. In Papua Province there are many types of mosquitoes from the Australian Region and a few types of mosquitoes from the oriental region. In Indonesia, it has been reported that the number of Anopheles species consists of approximately 80 species of Anopheles, but only 20 species of which have been proven to be able to transmit Plasmodium sp and are spread across various islands (Munif. 2010).

Malaria is an infectious disease caused by parasites. The parasites consist of Plasmodium Vivax, Plasmodium Falciparum, Plasmodium Malariae, Plasmodium Ovale, and Plasmodium Knowlesi. Of the five species, Plasmodium Vivax and Plasmodium Falciparum are the two most dangerous species. Plasmodium Vivax often causes relapses several months after the first infection because the hypozoite form of the species can survive for a long time in the liver (Naully et al. 2018). Plasmodium Falciparum is the cause of most malaria deaths. The vector of Plasmodium sp. is the female Anopheles mosquito (Naully et al. 2018). The parasite will live and reproduce in human blood cells. Malaria attacks all age groups, both men and women (Febryan et al., 2019).

People who are infected with malaria will generally experience fever with regular temperature fluctuations, anemia, swelling of the spleen and the presence of pigment in the tissue (Arsin. 2012). Infection by Plasmodium sp., is characterized by the discovery of HRP2 protein (Plasmodium Faciparum), pLDH (Plasmodium Vivax), or anti-Plasmodium sp. antibodies in the blood which are formed as a response to the body's defense. Anti-Plasmodium sp. antibodies can be used as a marker of malaria, especially in endemic areas where mild infections and reincarnation often occur (Febryan et al., 2019).

Based on data from the World Health Organization (WHO) globally, there were an estimated 247 million cases of malaria in 2021 in 84 malaria-endemic countries (including French Guiana), up from 245 million cases in 2020, with most of this increase coming from countries in the African region. The incidence of malaria cases (i.e. cases per 1000 population at risk) decreased from 82 in 2000 to 57 in 2019, before increasing to 59 in 2020. Most malaria cases occur in Africa and Southeast Asia. One of the countries in Southeast Asia with the highest number of cases is Indonesia. Indonesia holds the second highest country ranking (after India) in Southeast Asia. (WHO. 2022)

Indonesia is one of the countries in Southeast Asia that is endemic to malaria in the world. Malaria cases in Indonesia have actually decreased from year to year, but the numbers are still considered high. The national malaria morbidity rate during 2013-2018 tended to decrease, namely from 1.38 per 1,000 population in 2013 to 0.99 per 1,000 population in 2017 to 0.68 per 1,000 population in 2018. The Ministry of Health recorded 415,140 cases of malaria in Indonesia in 2022. while the latest number of malaria cases in 2023 as of April 27 was 55,525 cases.

According to data from the Indonesian Ministry of Health (2016), malaria cases in Indonesia are still concentrated in the Eastern region. There are several areas in Indonesia that are endemic to malaria, including Papua, East Nusa Tenggara, Maluku, and Bengkulu. Although only four of these areas are endemic, malaria cases can still be found in Sulawesi and

Kalimantan. This is closely related to the natural environmental conditions that strongly support and influence the spread of malaria vectors, such as climate, temperature, and rainfall (Naully, PG et al. 2018). Papua Province is an endemic area for malaria. Based on the report of the Papua Provincial Health Office, malaria cases in 2021 reached 86,022 cases (90.9%) of the total cases in Indonesia (Ministry of Health. 2021).

Malaria is still one of the health problems in Mimika Regency, Central Papua Province. Several years ago until now, the disease has always been ranked first out of 10 diseases. Based on data obtained from the Health Problem Control sector, the number of malaria sufferers in 2021 was 85,726 cases or an average of 7,144 cases per month or the equivalent of 238 cases per day. Malaria cases in Mimika Regency decreased in 2022, amounting to 77,379, while malaria cases from early January 2023 to the end of April 2023 in Mimika were 31,383 cases. Even though there has been a decrease, this number is still relatively high (Mimika Health Office. 2023).

Olaroa Village is one of the villages in the Kwamki Narama District, Mimika Regency and is one of the contributors to malaria cases. The Mimika Regency Health Office noted that from the first week of January to October 2024, there were 490 cases of malaria in Olaroa Village. When viewed from the environmental conditions in the Olaroa Village area, it is quite favorable for the development of mosquito vectors, namely the many forests, bushes, livestock pens next to the house and the gutters are not properly channeled which greatly supports the transmission of malaria.

One of the Mosquito Nest Eradication (PSN) activities is 3M plus, 3M plus is using mosquito repellent or mosquito repellent to protect against mosquito bites. This method is considered quite easy to use by the community, especially in households using mosquito repellent (48.4%), followed by the use of mosquito nets (25.9%), repellents (16.9%), insecticides (12.2%) (Widoyono, 2011). Therefore, the aim of this study was to see the effectiveness of counseling in increasing knowledge about malaria in Olaroa, Mimika Regency.

METHODS

Research Design: Quantitative research with Pre-Experimental design (one group pretest-posttest). Population and Sample: The population of the study was 261 heads of families in Olaroa Village, with a sample of 50 respondents selected by accidental sampling. Research Instrument: Malaria knowledge questionnaire consisting of 19 questions. Procedure: Pretest: Completing the questionnaire before counseling. Intervention: Counseling about malaria including causes, symptoms, prevention, and treatment. Posttest: Completing the questionnaire after counseling. Data Analysis: Data were analyzed univariately (frequency distribution) and bivariately (Wilcoxon Signed Rank Test).

RESULTS

Table 1. Research Variables

Variable		n	%
Characteristics			
Gender	Male	22	
	Female	28	56
Knowledge (Pre)	High	13	26
	Medium	24	48
	Low	13	26
Knowledge (Post)	High	38	76
	Medium	9	18
	Low	3	6

The majority of respondents were female, namely 28 respondents (56%), aged between 36-40 years old were 15 respondents (30%), had a high school education of 13 respondents (26%), and worked as fishermen of 13 respondents (26%).

In the knowledge variable before being given counseling, most had moderate knowledge of 24 people (48%) while those with high or low knowledge levels were 13 people (26%) each. After being given counseling, there was an increase in knowledge as seen from the data, namely those with high levels of knowledge were 38 people (76%). The results of the Wilcoxon test showed a significant increase ($p < 0.05$) with a mean rank of 25.50 and a total rank of 1,275.00

DISCUSSION

This study aims to evaluate the effectiveness of health education in improving the knowledge of the Olaroa Village community, Kwamki Narama District, Mimika Regency about malaria. The results showed a significant increase in the level of knowledge of respondents after being given education. At the level of knowledge before education (pre-test), the majority of respondents had a moderate level of knowledge (48%), high knowledge (26%), and low (26%). After education (post-test), there was a drastic increase in the high level of knowledge (76%), while moderate knowledge decreased to 18% and low knowledge was only 6%.

Extension Methods Interactive delivery of materials with simple language and local case examples makes it easier for the community to understand. According to Notoatmodjo (2007), participatory extension methods that actively involve the community are more effective in increasing knowledge because they allow direct discussion and clarification of things that are not yet understood.

The use of images or props such as the life cycle of the Anopheles mosquito and the Plasmodium parasite helps clarify information. This is in line with the research of Sholihah and Prasetyo (2014) which states that visual media can increase information retention, especially in people with low levels of education.

The Olaroa Village community has had direct experience with malaria cases around them, so the counseling materials are more relevant and easily accepted. Research by Rahmawati et al. (2012) shows that communities in endemic areas tend to be more responsive to malaria-related health interventions because of their awareness of the impact of the disease.

Most respondents have a high school education (26%) and junior high school (22%), which allows them to absorb information more easily. However, the presence of respondents with low education (14% did not attend school) indicates the need for a simpler and more repetitive approach in counseling. Fitriani and Andriyani (2015) emphasize that formal and non-formal education play an important role in shaping a person's knowledge.

The results of this study are consistent with the findings of Mayasari et al. (2016) which showed that health education significantly increased knowledge about malaria prevention in Manado. In addition, research by Warto (2013) also proved that health education interventions can change community behavior in preventing vector-borne diseases.

CONCLUSION

Based on the results of research conducted in Olaroa Village, Kwamki Narama District, Mimika Regency, it can be concluded that health education about malaria is effective in increasing public knowledge. This is evidenced by a significant increase in the level of knowledge of respondents after being given education, where the percentage of high knowledge increased from 26% to 76%, while low knowledge decreased from 26% to 6%.

Factors that support the success of counseling include interactive delivery methods, the

use of visual media, and the relevance of the material to the malaria-endemic environmental conditions in the area. However, this study has limitations, such as the research design did not involve a control group and knowledge measurement was only carried out once after the intervention.

Therefore, it is recommended that health education be conducted periodically with a more diverse approach, including long-term evaluation to measure knowledge retention and changes in community behavior in malaria prevention. This effort needs to be supported by collaboration between health workers, local government, and the community to reduce the number of malaria cases in endemic areas such as Olaroa Village.

REFERENCE

Arsin, A. A. (2012). *Malaria di Indonesia: Tinjauan Aspek Epidemiologi*. Yogyakarta: Gosyen Publishing.

Febryan, F., et al. (2019). "Faktor Risiko Lingkungan dan Perilaku terhadap Kejadian Malaria di Daerah Endemis." *Jurnal Kesehatan Masyarakat Nasional*, 14(2), 78-85.

Fitri, L. (2022). "Hubungan Kondisi Lingkungan dengan Keberadaan Vektor Malaria di Wilayah Papua." *Jurnal Ekologi Kesehatan*, 21(1), 45-53.

Fitriani, S., & Andriyani, R. (2015). "Pengaruh Pendidikan Kesehatan terhadap Pengetahuan dan Sikap Pencegahan Malaria." *Jurnal Promosi Kesehatan Indonesia*, 10(1), 12-20.

Kemenkes RI. (2021). *Laporan Tahunan Kasus Malaria di Indonesia*. Jakarta: Kementerian Kesehatan Republik Indonesia.

Kemenkes RI. (2023). *Profil Kesehatan Indonesia Tahun 2022*. Jakarta: Kementerian Kesehatan Republik Indonesia.

Lathifatun, K. (2019). "Sanitasi Lingkungan dan Kejadian Malaria di Daerah Endemis." *Jurnal Kesehatan Lingkungan*, 11(2), 112-120.

Mayasari, D., et al. (2016). "Efektivitas Penyuluhan Kesehatan dalam Meningkatkan Pengetahuan tentang Malaria." *Jurnal Ilmu Kesehatan Masyarakat*, 7(3), 145-152.

Munif, A. (2010). *Vektor Penyakit Tropis: Biologi dan Pengendaliannya*. Jakarta: EGC.

Naully, P. G., et al. (2018). "Distribusi Spesies *Anopheles* dan Hubungannya dengan Kasus Malaria di Papua." *Jurnal Vektor Penyakit*, 12(1), 34-42.

Notoatmodjo, S. (2007). *Promosi Kesehatan dan Ilmu Perilaku*. Jakarta: Rineka Cipta.

Pratiknya, A. W. (2014). *Dasar-Dasar Metodologi Penelitian Kedokteran dan Kesehatan*. Jakarta: Rajawali Pers.

Raharjo, B. (2018). "Strategi Pengendalian Malaria Berbasis Masyarakat." *Jurnal Manajemen Kesehatan Indonesia*, 6(2), 89-97.

Rahmawati, S., et al. (2012). "Respon Masyarakat terhadap Intervensi Kesehatan di Daerah Endemis Malaria." *Jurnal Kesehatan Komunitas*, 3(1), 56-64.

Sholihah, Q., & Prasetyo, B. (2014). "Pengaruh Media Visual dalam Penyuluhan Kesehatan terhadap Peningkatan Pengetahuan Malaria." *Jurnal Pendidikan Kesehatan*, 3(2), 78-85.

Warto, W. (2013). "Intervensi Pendidikan Kesehatan dan Perubahan Perilaku Pencegahan Malaria." *Jurnal Kesehatan Masyarakat*, 8(1), 23-30.

Widoyono, W. (2011). *Penyakit Tropis: Epidemiologi, Penularan, dan Pencegahannya*. Jakarta: Erlangga.

WHO. (2022). *World Malaria Report 2022*. Geneva: World Health Organization.