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Article

Effectiveness Of The Emo Demo Module On Malaria Prevention Behavior In The Working Area Of The Sioban Community Health Center, Mentawai Islands Regency

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Abstract. Malaria remains a serious disease with high morbidity and mortality rates, particularly among vulnerable groups. Ideally, the community should possess the knowledge, attitudes, and behaviors necessary for effective malaria prevention. However, in reality, although most of West Sumatra has achieved elimination, the Mentawai Islands still have higher case rates, indicating the low effectiveness of health education. As a solution, the Emo Demo Module was used as an interactive educational method. The urgency of this research is the importance of improving the effectiveness of education to reduce malaria cases in endemic areas. The objective of this research is to assess the effectiveness of the Emo Demo Module on the knowledge, attitudes, and actions of the community. The results of the quasi-experimental study in the working area of Sioban Health Center showed an increase in knowledge scores (6.13–7.47), attitudes (42.00–43.80), and actions (41.49–44.27), as well as significant differences before and after the intervention ($p \leq 0.05$). This indicates that the Emo Demo Module is effective in improving malaria prevention behavior.

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1. Introduction

Malaria is a parasitic infection disease caused by Plasmodium that attacks erythrocytes and causes high morbidity and mortality worldwide [1]. This disease is still commonly found in developing tropical countries. Nevertheless, malaria has been successfully eliminated in several developed countries.World Health Organization reports that malaria remains a global threat in 2023. Approximately 263 million cases and 597,000 deaths were recorded [2]. This disease mainly occurs in countries with limited access to healthcare. Vulnerable groups such as children, pregnant women, and the poor are at higher risk of infection [3].

Malaria is still commonly found in Southeast Asia, including Indonesia, which is an endemic country with a high risk in remote areas, forests, and coastal regions. These environmental factors support the proliferation of malaria mosquito vectors [3]. Indonesia even ranks second in the highest number of malaria cases in the world after India [4].

Malaria cases in West Sumatra, particularly in the Mentawai Islands, have decreased but have not been eliminated. This condition still requires studies on risk factors and prevention [5]. The Sioban Mentawai community still has the habit of nighttime activities, living near the forest, using traditional medicine, and limited access to healthcare, which leads to low malaria prevention behavior. Therefore, culturally-based education and hands-on practices are needed to improve malaria prevention [6]. The Sioban Mentawai community is more receptive to health education thru direct practice, demonstrations, simple communication, and involving community leaders and local culture compared to formal lectures [7].

The Emo Demo method is more effective because it involves emotions, making the message easier to understand and remember, whereas lectures are less interactive and have less impact on changing knowledge and perceptions [8]. The lecture method is less effective because the community better understands education through direct practice, demonstrations, and cultural approaches rather than the delivery of formal theory [9]. Emo Demo also has the advantage of using props, making it simpler and easier to understand [10]. This approach improves knowledge and prevention practices. The results are better than lectures and leaflets [11].

The formulation of the problem in this research is the effectiveness of the Emo Demo module on malaria prevention behavior in the working area of the Sioban Health Center. The objective of the research is to assess the increase in knowledge, attitudes, and actions of the community after the intervention as a malaria prevention effort.

2. Experimental Section

2.1. Materials

This study uses a quasi-experimental design with a one group pretest-posttest approach without a control group to assess the effectiveness of the Emo Demo module in improving knowledge, attitudes, and malaria prevention actions in the working area of Sioban Health Center, Mentawai Islands Regency. A sample of 45 respondents aged $\geqslant$18 years was selected using the fixed exposure sampling technique.

The materials used in this study include the Emo Demo module as an educational intervention medium, a structured questionnaire that has been tested for validity and reliability to measure knowledge, attitudes, and actions, as well as demonstration aids that support the delivery of material

on malaria transmission, symptoms, and prevention. In addition, respondent consent forms and writing instruments were used for data recording during the research process.

Figure 2. Emo Demo/Sticker Board

2.2. Tips

The measurement used the Malaria Indicator Survey questionnaire. The instrument's validity and reliability were tested before data collection [12] The research was conducted at Sioban Health Center, Mentawai Islands. Research period: January–November 2024.The researchers used a structured questionnaire to assess knowledge, attitudes, and practices regarding malaria prevention [13]. The questionnaire follows WHO guidelines and relevant literature and is adapted to the local social and cultural context [14].

This study involves a population of individuals aged ⩾18 years in the working area of Puskesmas Sioban, with a sample of 45 respondents selected using the fixed exposure sampling technique according to the inclusion criteria.The inclusion criteria were: (1) adults aged 18 years or older, (2) residents of the community surrounding the Sioban Community Health Center, (3) able to communicate effectively, and (4) willing to participate by providing informed consent.

Exclusion criteria include: (1) individuals with cognitive or communication impairments, (2) those who were seriously ill during the study period, and (3) respondents who did not complete the pre-test or post-test assessments.The research instrument was a structured questionnaire that had

undergone validity and reliability testing on a similar population, consisting of 10 items each for knowledge, attitude, and action.

The research procedure begins with the completion of a pre-test, followed by the provision of an intervention thru the Emo Demo module in 3 sessions over 2 weeks, and concludes with a post-test immediately after the intervention.

Data collection in this study was conducted using a questionnaire obtained thru a questionnaire. The analysis used is univariate and bivariate analysis, with data presented in the univariate analysis in the form of descriptive statistics, including mean and standard deviation.In the bivariate analysis, the statistical test used is the paired sample t-test; if the data is not normally distributed, the Wilcoxon test is used with a 95% confidence level, and it is considered significant if the p-value < 0.05.

This study assumes that respondents understand the questions and answer honestly, and that the intervention is administered consistently. This study also involves a control group consisting of respondents who are not affected by malaria as a comparison. However, the limitation is the relatively short observation period, so the results may be influenced by external factors and do not yet reflect the long-term impact.

2.3. Ethical Considerations

The Health Research Ethics Committee of Health Polytechnic of Padang, approved the study (Ethical Approval No. EC-001/KEPK-PDG/VI/2024). All participants provided written informed consent prior to data collection and participated voluntarily. The researchers strictly maintained respondent confidentiality and anonymity throughout the research process.

This study was conducted in accordance with the principles of the Declaration of Helsinki, ensuring respect for participants' rights, safety, and well-being throughout the research process. To ensure data protection and confidentiality, all participant information was anonymized using unique identification codes. Personal identifiers were not included in the dataset.

Data were stored securely in password-protected digital files and locked physical storage, accessible only to authorized members of the research team. In addition, data were used solely for research purposes and were not shared with third parties without prior authorization. All procedures involving human participants were designed to minimize risk and ensure privacy, including conducting interviews in a confidential setting and maintaining strict confidentiality throughout data handling, analysis, and reporting.

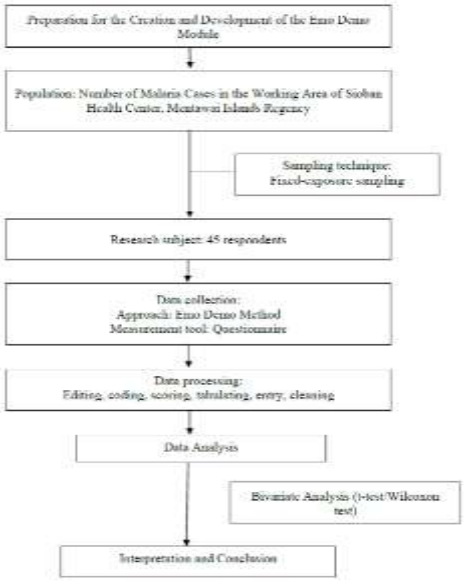

Figure 1. Schematic/Flowchart of research

4. Results and Discussion

Malaria remains one of the public health issues in the Mentawai Islands Regency due to geographical and environmental conditions, as well as community behavior factors that support the transmission of the disease.

Efforts to control malaria continue thru surveillance, prevention, treatment, and health education programs by the local government and healthcare facilities. Monitoring malaria cases from year to year is important for understanding disease trends and the effectiveness of implemented control programs.Table 1 presenting in 2023, there was a decrease in malaria cases, based on a report from the Mentawai Islands Regency Health Office, the number of cases was only 32 as of July 2023.

Table 1. Malaria cases in Mentawai islands regency until July 2023

1	Community Health Center Malakopa	PCD	6	Man	
2	Community Health Center Sikakap	Contact Survey	38	Woman	Not Pregnant
3	Community Health Center Sikakap	PCD	41	Man	
4	Community Health Center Peipei Passover Taileleu	PCD	59	Woman	Not Pregnant
5	Community Health Center Peipei Passover Taileleu	PCD	68	Man	
6	Community Health Center Sikakap	Screening Pregnant women	33	Woman	Pregnant
7	Community Health Center Sikakap	Contact Survey	43	Woman	Not Pregnant
8	Community Health Center Peipei Passover Taileleu	PCD	16	Woman	Not Pregnant
9	Muara Siberut Community Health Center	PCD	45	Man	
10	Community Health Center Simatula	PCD	13	Man	
11	Community Health Center Simatula	PCD	5	Woman	
12	Community Health Center Sikakap	Screening Pregnant women	22	Woman	Pregnant
13	Community Health Center Peipei Passover Taileleu	PCD	3	Man	
14	Community Health Center Peipei Passover Taileleu	PCD	64	Man	
15	Community Health Center Peipei Passover Taileleu	PCD	39	Woman	Not Pregnant
16	Community Health Center Peipei Passover Taileleu	PCD	39	Man	
17	Community Health Center Sikakap	Screening Pregnant women	33	Woman	Pregnant
18	Community Health Center Sikakap	PCD	42	Man	
19	Community Health Center Sikakap	PCD	13	Man	
20	Community Health Center Betaet	Integrated Health Post	19	Woman	Not Pregnant
21	Community Health Center Peipei Passover Taileleu	PCD	14	Man	
22	Muara Siberut Community Health Center	PCD	38	Woman	Not Pregnant
23	Community Health Center Simatalu	PCD	16	Man	

24	Community Health Center Simatalu	PCD	13	Woman	Not Pregnant
25	Community Health Center Simatalu	PCD	8	Woman	
26	Muara Siberut Community Health Center	PCD	19	Man	
27	Community Health Center Betaet	Integrated Health Post	30	Man	
28	Community Health Center Peipei Passover Taileleu	PCD	4		
29	Muara Siberut Community Health Center	PCD	17	Man	
30	Community Health Center Simatalu	PCD	32	Man	
31	Community Health Center Sikakap	PCD	2	Man	
32	Community Health Center Peipei Passover Taileleu	PCD	61	Man	

(Source: Health Service of Mentawai Islands Regency)

This study involved 45 respondents, comprising a case group (malaria) and a control group (non-malaria). This grouping of respondents was used to describe the frequency distribution characteristics of the study subjects, thereby determining the proportion of each group in the study. The details of the respondent distribution are presented in the following Table 2.

Table 2. Characteristics subject study

No	Characteristics	Frequency	Percentage (%)
1	**Type sex**		
	Woman	42	93.3
	Man	3	6.7
	Total	**45**	**100.0**
2	**Age**		
	< 50 years	36	80.2
	≥ 50 years	9	19.8
	Total	**45**	**100.0**
3	**Marital Status**		
	Not Married	5	11.1
	Marry	37	82.2
	Widow	2	4.4
	Widower	1	2.2
	Total	**45**	**100.0**
4	**Education**		
	Elementary School	17	37.8
	JUNIOR HIGH SCHOOL	10	22.2
	SENIOR HIGH SCHOOL	14	31.1
	Academy/Higher Education	4	8.9
	Total	**45**	**100.0**
5	**Work**		
	Private employees	1	2.2
	Self-employed	2	4.4
	Farm workers	9	20.0
	Fisherman	2	4.4
	Trader	2	4.4
	Doesn't work	29	64.4
	Total	**45**	**100.0**

6	**Suffering from Malaria**		
	Yes	5	11.1
	No	40	88.9
	Total	**45**	**100.0**

Out of a total of 45 research respondents, the majority were women, with 42 individuals, while men only accounted for 3. The majority were under 50 years old, with 36 individuals. A total of 29 individuals were unemployed, and 5 individuals had a history of having suffered from malaria before.The description of the variables studied univariately is conducted to understand the characteristics of the data of the variables being studied. In each variable studied, including the average value, knowledge, attitudes, and actions before and after the intervention thru education using the Emo Demo module on malaria prevention.

The results of the univariate analysis describe the characteristics of the variables of knowledge, attitudes, and actions of the respondents before and after the health education intervention using the Emo Demo module on malaria prevention [15].The intervention using the Emo Demo module resulted in consistent improvements in all three measured variables [16]. The three variables show interrelated patterns of change, reflecting the effectiveness of an educational approach that combines visual, emotional, and direct demonstration elements [14] .

For the knowledge variable, the mean score increased from 6.13 (SD = 1.440) before intervention to 7.47 (SD = 0.919) after intervention, indicating that health education effectively improved community understanding of malaria prevention [18].The decrease in the standard deviation indicates that the respondents' understanding has not only improved but has also become more homogeneous, which means the Emo Demo module has successfully bridged the understanding gap among respondents [19].The statistically significant increase of 1.34 points was nonetheless moderate, likely due to limited educational backgrounds and restricted access to information in remote island regions such as the Mentawai Islands [20].

The improvement in knowledge subsequently contributed to changes in respondents' attitudes. The mean attitude score increased from 42.00 (SD = 5.248) to 43.80 (SD = 4.822), with the most notable improvements observed in cooperation for malaria mosquito eradication (3.29 → 3.84) and medication adherence (4.22 → 4.64) [15].The increase of 1.80 points was the smallest among the three variables, which is understandable given that attitudes represent a more complex psychological construct resistant to change, as they are shaped by deeply rooted cultural values and social norms, particularly within the local wisdom of the Mentawai Islands community.

Table 3. Average knowledge score of respondents before and after intervention

Parameter	n	Mean	Standard Deviation
Knowledge Before	45	6.13	1.440
Knowledge After	45	7.47	0.919

Table 4. Average respondents' attitude scores before and after intervention

Parameter	n	Mean	Standard Deviation
Attitude Before	45	42.00	5.248
Attitude After	45	43.80	4.822

Table 5. Average respondents' action scores before and after intervention

Parameter	n	Mean	Standard Deviation
Actions Before	45	41.49	5.627
After Action	45	44.27	4.570

This is consistent with recent research indicating that changes in health behavior are a complex process because they involve the interaction of individual, social, and environmental factors, so that changes in attitude tend to occur more slowly than changes in cognitive aspects [21]. In addition, social norms and cultural values play a significant role in shaping and sustaining health behaviors, making attitude change a gradual process that requires a contextual approach, particularly in communities with strong local traditions [22].

Furthermore, the attitudinal changes grounded in improved knowledge were reflected in respondents' actual practices, which recorded the highest increase of 2.78 points, rising from 41.49 (SD = 5.627) to 44.27 (SD = 4.570). The most notable improvement was observed in medication adherence according to physician instructions (2.96 → 3.91).

This phenomenon confirms that the design of the Emo Demo module, which demonstrates practical steps directly, effectively transforms cognitive understanding into real behavior, the main goal of any public health intervention [23]. Practice-based modeling behavior is effective in driving behavioral change because it allows individuals to observe, imitate, and directly apply actions in their daily lives [24].

Bivariate analysis was used to examine differences in knowledge before and after the intervention through the use of the Emo Demo module on malaria prevention. The methods employed included the paired t-test; when data were not normally distributed, the Wilcoxon test was used, with a 95% confidence level, and results were considered statistically significant if the p-value < 0.05.

Statistical analysis revealed significant differences across all three measured variables following the Emo Demo module intervention. For the knowledge variable, a p-value of 0.000 ($p < 0.05$) indicated a meaningful difference between pre- and post-intervention scores [25].This finding is consistent with Muyassaroh & Fatmayanti (2021), who reported a significant difference in mean attitude scores among pregnant women following anemia prevention education between the Emo Demo and control groups ($p < 0.0001$) [26].

Table 6. Differences in respondents' knowledge about malaria prevention before and after the intervention

Difference Knowledge	n	Mean±SD	*p-value*
Before	45	6.13 ± 1.440	0.000
After	45	7.47 ± 0.919	

Table 7. Differences in respondents' attitudes regarding malaria prevention before and after the intervention

Difference Attitude	n	Mean±SD	*p-value*
Before	45	42.00 ± 5.248	0.038
After	45	43.80 ± 4.822	

Table 8. Differences in respondents' actions regarding malaria prevention before and after the intervention

Difference in Action	n	Mean±SD	*p-value*
Before	45	41.49 ± 5.627	0.000
After	45	44.27 ± 4.570	

Consistent with the knowledge changes reported by Mutiarani et al. (2022), the attitude variable also demonstrated a significant difference with a p-value of 0.038 ($p < 0.05$) [27]. However, the p-

value approaching the significance threshold suggests that the intervention's effect on attitudes was comparatively weaker than on the other variables.

This is understandable given that attitudes represent a more complex psychological construct, influenced not only by rational knowledge but also by affective dimensions, social norms, and deeply rooted cultural values, suggesting that short-term interventions may be insufficient to produce substantial and lasting attitudinal change [28].

Furthermore, the concurrent changes in knowledge and attitudes ultimately manifested in respondents' actual practices, which recorded the strongest difference with a p-value of 0.000 ($p < 0.05$) [29]. This finding is in line with previous research and is theoretically noteworthy because it contradicts the conventional hierarchy of behavioral change, where practice is usually the most difficult variable to modify [23] .

This can be explained by the unique characteristics of the Emo Demo module, which focuses on demonstrating concrete actions, directly exposing respondents to behavioral models that are easy to replicate, relevant, and engaging to practice in daily life.This is supported by previous research, which found that behavior change interventions that integrate hands-on practice and demonstrations are more effective in promoting behavior adoption than theory-based approaches alone, as they simultaneously enhance understanding and practical skills [30].Furthermore, previous research explains that modeling and demonstration techniques allow individuals to observe, imitate, and internalize behaviors more quickly, enabling behavioral changes to occur even when attitude changes have not yet fully consolidated [31].

5. Conclusion

This study demonstrates that the Emo Demo module effectively improved respondents' knowledge (6.13 → 7.47), attitudes (42.00 → 43.80), and practices (41.49 → 44.27) regarding malaria prevention in the working area of Puskesmas Sioban, Mentawai Islands Regency, with all results statistically significant ($p < 0.05$).

The greatest improvement in the practice variable demonstrates that the participatory, demonstrative, and emotionally engaging nature of the Emo Demo approach not only enhances cognitive understanding but also converts it into tangible behavioral change. Therefore, the Emo Demo module is recommended as a health education strategy for malaria control programs, particularly in remote and island communities.

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