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The effectiveness of pocketbooks in improving the knowledge and attitudes of *Jumantik* cadres

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Abstract

Background: Dengue Hemorrhagic Fever (DHF) remains a public health issue in Indonesia, especially in endemic areas such as the Aur Duri Community Health Center. In 2024, there were 25 cases recorded, a significant increase compared to 2023, which only recorded 9 cases. Integrated Vector. **Objective:** To increase the active role of the community in controlling DHF. Jumantik cadres are empowered by increasing their knowledge and attitudes through the use of the Pocketbook of mitigation DHF. The variable in this study was the training of Jumantik cadres in order to increase their knowledge in eradicating mosquito breeding sites with the ultimate goal of reducing the incidence of dengue fever in the Aur Duri Community Health Center area of Jambi City. **Methods:** The statistical test in this study was to compare the incidence rates between the month before the intervention and the previous year in the month of the intervention. The dependent T-Test and Wilcoxon alternative test were also conducted to determine the significance of the increase in cadres' knowledge before and after training. **Results:** The results of the data analysis showed a significant difference between the pretest and posttest scores after education using the Pocketbook of mitigation DHF with p.value (0.023). **Conclusion:** it can be concluded that Pocketbook is an effective and informative medium for increasing the knowledge and attitudes of jumantik cadres as an effort to control dengue fever in the working area of the Aur Duri Community Health Center.

Keywords: Dengue Hemorrhagic Fever; Jumantik; Pocketbook.

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INTRODUCTION

Dengue Hemorrhagic Fever is an environmentally-based disease caused by exposure to the dengue virus, which is transmitted by the Aedes Aegypti mosquito. This disease is also commonly referred to as DHF (Dengue Hemorrhagic Fever), which is an infectious disease caused by the dengue virus, characterized by initial symptoms of fever and bleeding, followed by rapid disease progression carried by the virus-carrying vector (1). Dengue fever was first discovered in Indonesia in Surabaya in 1968. The vector that carries the dengue virus is a type of vector that breeds in clean water puddles. Generally, the *Aedes aegypti* mosquito can live in areas with high rainfall, hot temperatures, humidity, and a tropical climate (2).

Dengue fever is often the cause of outbreaks and can even lead to death. Prevention of dengue should focus on reducing the sources of transmission themselves, starting as early as possible and continuing up to four months before the peak of the dengue season (3). Preventive measures need to be taken in areas with low to high risk of dengue transmission. Areas with a high risk of dengue transmission should receive special attention at least one month before the peak of the dengue season. Environmental management methods consist of reducing vector breeding sources (source reduction), solid waste management, modifying man-made items that can become breeding grounds for vectors (modification of man-made breeding sites), and improving house design (improved house design) (4).

Dengue fever cases have increased every year in all cities in Indonesia, which also have relatively high mortality rates. In 2022, Indonesia's health profile recorded 143,266 cases of dengue fever with 1,237 deaths. This represents an increase compared to 2021 (5). Dengue fever cases in Jambi Province also increased, with 1,381 cases and 9 deaths recorded in 2022. This data also indicates that dengue fever in Jambi Province has increased compared to 2021, which had 357 cases and 5 deaths. Therefore, dengue fever control activities were carried out using the Incidence Rate (IR) per 100,000 population and the Case Fatality Rate (CFR). Based on the available data, the Incidence Rate (IR) of dengue fever per 100,000 population showed an increase in 2019, followed by a decrease from 2019 to 2021, and then another increase in 2022. It is also evident that the CFR for dengue fever in Jambi Province tended to increase between 2018 and 2021, from 0.36% to 1.40%, and then decreased in 2022 to 0.65% (6,7).

Based on data from RISKESDAS (Basic Health Research) in 2024 in Jambi City, as of July there were 424 cases, which is an increase from 312 cases in 2023. The highest number of dengue fever cases was in Jambi City, occurring in the districts of Alam Barajo and Kota Baru. Jambi City is one of the endemic areas in Jambi Province.

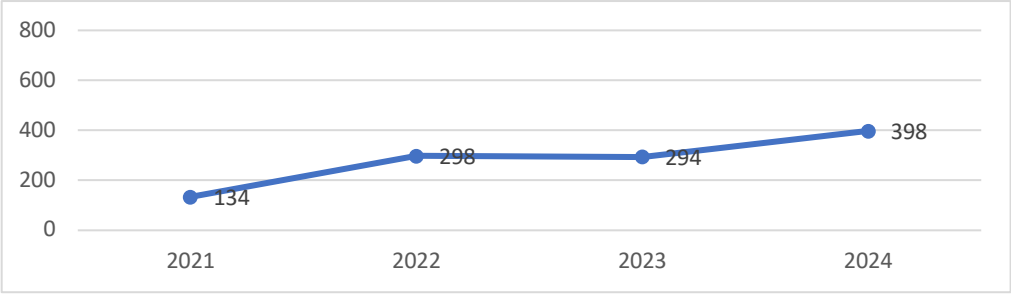

Figure 1. Number of Dengue Hemorrhagic Fever (DHF) Cases in Jambi City, 2018-2022. Source: Jambi City Health Office Data

Based on the data graph above obtained from the Jambi City Health Office, out of 20 community health centers in Jambi City, there were 134 cases in 2021, then in 2022 there was an increase of 298 cases. In 2023, there was a decrease in the number of cases, with 294 cases reported, followed by another increase in 2024 to 398 cases of people affected by dengue fever (8). The Aur Duri Community Health Center is located in the city of Jambi, in the Aur Duri Community Health Center working area, which is also one of the dengue fever endemic areas in the city of Jambi. Data obtained at the beginning of 2024 (January-September) shows that there were 25 cases, compared to only 9 cases recorded in 2023 (9).

Efforts to prevent dengue fever have been carried out by the Jambi City Health Office and the Aur Duri Community Health Center through leaflets, brochures, flyers, and health education, but these efforts have not been optimal due to the lack of community participation and the difficulty of empowering local health cadres. As a result, PSN behavior in the Aur Kenali sub-district is still considered low, and the community still has a habit of littering. There is a need for education on the importance of PSN, in line with research conducted by Masruroh & Santik, which states that the level of knowledge affects the consistency of PSN behavior. It is hoped that the innovative pocketbook education model for dengue fever mitigation will be able to solve health problems, especially those related to dengue fever cases in the working area of the Aur Duri Community Health Center in Jambi City.

METHODS

Study design and setting

The research method used in this study was quantitative research with a Research and Development (R&D) design using a one-group pretest-posttest design.

Population, samples and sampling

This study was conducted in the Aur Duri Community Health Center working area in Jambi City. The population in this study consisted of 20 jumantik cadres, all of whom were sampled at the Aur Duri Community Health Center to undergo intervention using the dengue fever mitigation pocketbook.

Instruments and criteria

The instruments or tools used for data collection include pocket books containing information on PSN DBD, larval monitoring reports, questionnaires, observation sheets, and larval monitoring equipment. Questionnaires are used to determine the level of knowledge and attitudes after educational media is provided, while observation sheets are used to check PSN DBD practices before and after educational media is provided.

Procedure and data collection

Data collection techniques in this study included observation, interviews, and documentation. The primary data required were pretest and posttest data on knowledge, attitudes, mosquito breeding site eradication practices, and media validation. Secondary data in this study were taken from dengue fever data at the Jambi City Health Office and the Aur Duri Community Health Center.

Statistical analysis

The statistical test used in this study was the McNemar hypothesis test to test the research hypothesis with a one-group pretest-posttest design, with both variables measured on a categorical scale.

RESULTS

A pocketbook, as defined in the Big Indonesian Dictionary (KBBI), is a small book that is easy to carry and can be put in a pocket. This pocketbook contains information about everything related to dengue fever, from its definition to how to practice 3M Plus, and the contents of the pocketbook are applied to the practice of 3M Plus (11,12). The report card is used to assess the implementation of PSN DBD in each household by checking containers (water storage) in the neighborhood. If larvae are found, a (+) is marked, and if no larvae are found, a (-) is marked on the container table, which is monitored once a week by researchers. The purpose of this study is to create promotional media (Dengue Fever Mitigation Pocketbook) and apply it to Jumantik cadres to observe changes in knowledge and attitudes regarding PSN.

Figure 2. Pocketbook Intervention Media for Dengue Fever Mitigation

Table 1. Frequency distribution of knowledge and behavior of jumantik cadres before and after intervention using the DHF mitigation pocketbook

Variable	Average score	Standard Deviation	Min - max	Mean Difference	%success rate [(mean post – mean pre)/mean pre x 100%]
Prior Knowledge	8,7	1,922	6 – 12	4,2	48,3%
Post-Knowledge	12,9	1,483	9 – 15		
Behavior Before	9,35	1,496	8 – 13	1,6	17,1%
Behavior After	10,95	1,538	8 – 14		
		Total			**65,4%**

Based on the results of the study in Table 1, it is known that there was an increase in the knowledge of *JUMANTIK* cadres after the intervention with the DHF mitigation pocketbook (*JUMANTIK* cadre guide). The average knowledge score of Jumantik cadres before the intervention was 8.7/15 points. After the intervention using the DBD mitigation pocketbook, the average knowledge score increased to 12.9 points out of 15 points (maximum score). The average difference in knowledge scores before and after the intervention was 4.2, with a minimum-maximum score before the intervention ranging from 6 to 12 points and a minimum-maximum score after the intervention ranging from 9 to 15 points.

Based on the results of the study in Table 1, there was an increase in the behavior of jumantik cadres. The average score for jumantik cadre behavior before the intervention was 9.35/15 points. After the intervention using the DBD mitigation pocketbook, the average behavior score increased to 10.95 points out of 15 points (maximum score). The difference in the average behavior score before and after the intervention was 1.6, with a minimum-maximum value before the intervention of 8 to 13 points and a minimum-maximum value after the intervention of 8 to 14 points. Based on the analysis, the success rate of the DBD mitigation pocketbook implementation was 65.4%, meaning it is highly effective for improving the knowledge and behavior of jumantik cadres in carrying out larval monitoring tasks in the Aur Duri Health Center work area.

Effect of the DHF mitigation pocketbook in improving knowledge and behavior of PSN

The next step to determine whether the data used is normally distributed or not is to perform the Kolmogorov-Smirnov and Shapiro-Wilk normality tests. The analysis results obtained a p-value <0.05, which indicates that the data is not normally distributed. Therefore, the Wilcoxon Signed Rank Test was used, the results of which can be seen in Table 2.

Table 2. Kolmogorov-smirnov and shapiro-wilk normality tests

Variable Prior Knowledge	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Post-Knowledge	0,192	20	0,051	0,917	20	0,086
Behavior Before	0,277	20	<.001	0,888	20	0,024
Behavior After	0,242	20	0,003	0,818	20	0,002
Variable	0,182	20	0,083	0,957	20	0,486

Table 3. Wilcoxon signed rank test

Variable	Time	Ranks	N	Ties	Mean Ranks	Sum of Ranks	*p.value*
Knowledge	Before	Negatif Ranks	0	0	0	0	0,001
	After	Positif Ranks	20		10,5	210	
Behavior	Before	Negatif Ranks	0	5	0	0	0,001
	After	Positif Ranks	15		8	120	

Based on the results of the Wilcoxon Signed Rank Test in Table 3, it is known that there is a significant relationship between the use of the DHF mitigation pocketbook (Jumantik Cadre Guide) as an educational medium in increasing the knowledge and attitudes of jumantik cadres in Mosquito Breeding Site Eradication (PSN) in the working area of the Aur Duri Health Center in Jambi City, where both knowledge and attitude variables each showed a significant increase in post-test results (p-value = 0.001), with positive ranks (difference) of 20, meaning that all Jumantik cadres experienced an increase in knowledge and attitude regarding PSN, with an average increase of 10.5 and a sum of ranks of 210.

DISCUSSION

The results of the study show a significant increase in the knowledge and attitudes of jumantik cadres regarding Mosquito Nest Eradication (PSN) after being given an intervention in the form of a dengue fever mitigation pocketbook. Before the intervention, most cadres had limited knowledge about the basic concepts of PSN, the life cycle of Aedes aegypti mosquitoes, and appropriate preventive measures to control mosquito larvae in residential areas. This may be due to a lack of access to interesting and sustainable educational media, as well as conventional extension activities.

After implementing the dengue fever mitigation pocketbook, there was an increase in cadres' understanding of the 3M Plus concept (draining, covering, and recycling water containers), the use of larvicides, and the importance of the role of jumantik cadres in routine monitoring of larvae. This pocketbook is designed as a practical and portable health promotion medium, with attractive visuals and simple language to help cadres understand and remember information more effectively.

This increase in knowledge had a positive impact on the attitudes of cadres in carrying out PSN activities. Cadres who were previously passive became more motivated and had a greater sense of responsibility towards dengue fever control efforts in their communities. According to Notoatmodjo's (2012) health behavior theory, knowledge is a cognitive domain that forms the basis for attitudes and behaviors. With increased knowledge, individuals tend to have more positive attitudes toward recommended health behaviors (10,11).

In addition, field observations show that jumantik cadres have begun to implement PSN behaviors more consistently, such as conducting house-to-house inspections for mosquito larvae, providing direct education to residents, and playing an active role in environmental hygiene activities. This proves that educational media such as pocketbooks can be an effective means of intervention in changing health behaviors based on community empowerment.

These findings are in line with research by Lidyani (11), which states that the use of educational print media such as pocketbooks and leaflets can significantly increase public knowledge and attitudes towards dengue prevention. Thus, the dengue mitigation pocketbook has proven to be an effective educational tool for jumantik cadres in supporting the continued success of the PSN program.

In line with the findings of this study, similar results were also obtained from studies conducted by David Nakka in 2023, Nuur Ramdhani in 2022, and Sembiring in 2022. All of these studies showed significant results, in which respondents experienced an increase in knowledge and attitudes towards dengue fever control after being given various educational media such as pamphlets, videos, and booklets, with a p-value of 0.000 (11–13). Based on the results of this study, which are supported by various literature, researchers assume that good knowledge about the

prevention and control of dengue fever and PSN plays an important role in reducing the risk of these diseases.

The difference in respondents' knowledge levels before and after education shows that there was an effective learning process. At the initial stage of education, respondents received and listened to information, then remembered and understood the steps for preventing and controlling dengue fever. This process made the information received more effective in supporting improvements in public health. In addition, the use of educational media in the form of booklets with simple, easy-to-understand language, accompanied by attractive and colorful pictures, proved to be able to attract respondents' interest in reading. Its practical form also makes it easy to carry and read repeatedly, thereby strengthening the understanding and application of the information obtained.

Based on the researchers' assumptions, the positive attitude of Jumantik cadres in Mosquito Nest Eradication (PSN) and identifying the presence of mosquito larvae is closely related to their level of knowledge. Initially, Jumantik cadres received stimuli in the form of information during educational activities, then attempted to recall various things related to dengue fever control that they had learned previously. This process made it easier for cadres to form and determine the right attitude towards PSN efforts and reducing the mosquito larvae population. However, in order for these attitude changes to be long-lasting and develop into behavioral changes, continuous education and reinforcement through concrete actions are needed.

CONCLUSIONS

Based on the results of the study, it can be concluded that the intervention in the form of a dengue fever mitigation pocketbook was effective in increasing the knowledge and attitudes of jumantik cadres towards mosquito breeding site elimination (PSN) activities. Before the intervention, most cadres had sufficient but not optimal levels of knowledge and were still passive in their attitudes towards the implementation of PSN activities in the community. After implementing the dengue fever mitigation pocketbook, there was a significant increase in cadres' understanding of the 3M Plus concept, the life cycle of *Aedes aegypti* mosquitoes, and the importance of cadres' role in early detection and prevention of dengue fever in the surrounding environment. The attitudes of cadres also showed positive changes, reflected in increased motivation, responsibility, and consistency in conducting larval inspections, educating residents, and maintaining environmental cleanliness. The pocketbook educational media proved to be an important tool for effective health promotion, as it was able to present information in a simple, interesting, and easy-to-understand manner. Thus, the use of the dengue fever mitigation pocketbook can be used as a strategy to increase the capacity of jumantik cadres and support efforts to eradicate mosquito breeding sites in a sustainable manner in the working area of the Aur Duri Community Health Center in Jambi City.

CONFLICT OF INTEREST

This research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

We hereby confirm that no artificial intelligence (AI) tools or methodologies were utilized at any stage of this study, including during data collection, analysis, visualization or manuscript preparation. All work presented in this study was conducted manually by the authors without the assistance of AI-based tools or systems.

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