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EFFECTIVENESS OF TRAINING IN INCREASING KNOWLEDGE OF WOMEN'S HEALTH CADRES IN DENGUE HEMORRHAGIC FEVER ENDEMIC AREAS

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ABSTRACT

Background: The increasing incidence of Dengue Hemorrhagic Fever (DHF) in Banda Aceh Municipality necessitates urgent action from both the government and the community. Enhancing the knowledge of women's health cadres at Integrated Health Posts (Posyandu) regarding their roles as mosquito larvae monitors (Jumantik) in dengue-endemic areas is crucial. Training programs designed to improve their understanding and effectiveness are essential.
Method: This study utilized a quasi-experimental design to evaluate the knowledge of 27 women's health cadres in the Jaya Baru Subdistrict, a dengue-endemic area in Banda Aceh Municipality. Over six months, the cadres received training on the basic concepts of DHF using lectures, Q&A sessions, simulations, and demonstrations. Knowledge levels were measured using questionnaires administered before and after the intervention, with the data analyzed through a paired t-test.
Results: The study revealed that the average knowledge score of the women's health cadres increased from 27.70 pre-intervention to 33.96 post-intervention ($p=0.003$). The improvement in knowledge regarding the basic concepts of DHF following the training was statistically significant ($p=0.000$).
Conclusion: The training for women's health cadres effectively improved their knowledge in controlling DHF. It significantly enhanced their understanding of DHF's basic concepts, environmental-based vector control, and community outreach initiatives.

Keywords: *Dengue Hemorrhagic Fever, Knowledge, Women's Health Cadres*

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a significant global health concern, with an estimated 100-400 million infections occurring each year. This large range highlights the challenge of accurately estimating cases, as many infections are asymptomatic or mild, and thus go unreported. The burden of dengue has been increasing over recent decades, with 2023 seeing a record number of reported cases, surpassing 6.5 million globally (WHO, 2023).

DHF is caused by the dengue virus, which is transmitted by the Aedes aegypti mosquito and remains a significant public health issue in Indonesia. The incidence of dengue has dramatically increased globally in recent decades. DHF in Aceh Province has been categorized as an extraordinary occurrence (KLB). In 2015, there were 1,510 cases with 6 deaths (Incidence Rate=30 per 100,000 population, CFR=0.4%). In 2014, the number of cases decreased slightly to 2,211 with the same CFR. Despite these fluctuations, the overall trend of dengue cases and mortality in Aceh Province has remained concerning (Zulfikar, 2017).

The incidence rate of DHF cases in Banda Aceh Municipality in 2019 was 344 cases. This number increased from the previous year, 2018, which had 236 cases, 2017 with 105 cases, 2016 with 152 cases, and 2015 with 127 cases. Among the 11 Public Health Centers (Puskesmas) in Banda Aceh Municipality, the highest number of DHF cases were reported in Jaya Baru (42 cases), Meuraxa (41 cases), and Jeulingke (40 cases), while the lowest number of DHF cases was at Puskesmas Lampaseh Kota (15 cases) (Aceh Health Office, 2020).

The increase in dengue incidence is closely linked to environmental sanitation and the availability of breeding sites for female mosquitoes, such as clear water containers (e.g., bathtubs, used cans, and other water reservoirs) (Aceh Health Office, 2020). Research by Hermansyah (2012) in Banda Aceh Municipality found that areas heavily affected by the tsunami had the highest positive mosquito larvae rates, particularly in bathtubs inside homes and in used cans outside. The larvae-free rate (ABJ) was 34.5%, and the Container Index (CI) was 71.4%, indicating that the environmental conditions in these settlements were at high risk (51.6%). In the Candirejo Public Health Center area, Magetan District, 59.65% of DHF cases from 2015-2017 involved women, indicating a higher risk for this group. This highlights the need for surveillance and community empowerment through clean and healthy behavior (Santosa, et al., 2018). Managing DHF cases effectively is crucial for developing solutions and providing comprehensive treatment. Although the Ministry of Health of the Republic of Indonesia has implemented various strategies to control DHF, the incidence rate (IR) continues to rise annually, indicating that these efforts have not yet yielded positive results (Taamu, et al., 2017).

Various methods for controlling DHF have been implemented, but cases persist, often increasing at the onset of the rainy season (Sukowati, 2010). DHF control can be achieved by addressing the source, such as patients who can transmit the disease, vector-based environmental management, and community education (Kemenkes RI, 2015). Evidence suggests that women can effectively engage in vector-borne disease control. However, they still face unequal opportunities in participation, leadership, and decision-making in dengue prevention and vector control programs. Despite this, women often take on informal environmental management roles within their households to prevent the establishment of mosquito vectors (Baldwin, 2018). This study was conducted to assess the effectiveness of training in enhancing the knowledge of women health cadres in the prevention of Dengue Hemorrhagic Fever (DHF).

METHODS

Utilizing a quantitative approach, the research employed a quasi-experimental design with a one-group pre-test and post-test model to measure the effectiveness of the training interventions. The training focused on enhancing the understanding of basic DHF concepts among the women health cadres. The study population consisted of all 27 women's health cadres from nine villages: Punge Blang Cut, Geuceu Meunara, Lamteumen Barat, Lamteumen Timur, Lampoh Daya, Bitai, Emperum, Lamjame, and Ulee Pata, with each village providing three cadres as determined by the local Public Health Center.

The research was conducted in multiple stages, beginning with a Self-Inspection Survey and the distribution of questionnaires to participants, who were recommended by village heads (Keuchik). A three-day training session was then held, incorporating lectures, Q&A, simulations, and demonstrations, all coordinated by Public Health Center staff. The effectiveness of the training was evaluated over a six-month period in the Jaya Baru Subdistrict of Banda Aceh Municipality.

Data collection was carried out using pre-test and post-test questionnaires, each containing 30 questions on the Guttman scale, with answers marked as true (T) or false (F). Correct answers were scored as 1, and incorrect answers as 0 (Pratiknya, 2010). Data were analyzed descriptively using SPSS Version 20.0 (SPSS Inc., Chicago, IL, USA). The paired t-test was applied to determine the differences in mean knowledge scores between the pre-test and post-test results. A p-value of less than 0.05 was considered statistically significant (α=0.05; CI = 95%).

RESULTS AND DISCUSSION

Characteristics of Respondents

The study involved 27 women's health cadres with an average age of 37.2 years, ranging from 18 to 61 years old. The majority of respondents were married (81.5%), had a high school education (55.6%), were housewives (70.4%), and most had never received prior training as women's health cadres (96.3%).

Comparison of DHF Knowledge Before and After Intervention

The study assessed the knowledge of the participants on Dengue Hemorrhagic Fever (DHF) through a series of 30 questions before and after the training intervention. Table 1 below shows the distribution of correct answers from the respondents before and after the training.

Table 1. Distribution of Respondents' Correct Answers Based on Pre-test and Post-test Results of Women's Health Cadres' Knowledge (n=27)

Question	Pre-test Correct Answers (%)	Post-test Correct Answers (%)
Definition of Dengue Hemorrhagic Fever	96.3	100.0
Intermediaries of dengue transmission	85.2	100.0
Causes of Dengue Hemorrhagic Fever	85.2	100.0
Type of dengue-infecting mosquito	88.9	100.0
When the dengue mosquito bites	88.9	100.0
Dengue mosquito body color	92.6	92.6
Characteristics of dengue mosquitoes	33.3	70.4
Source of patients with Dengue Hemorrhagic Fever	81.5	85.2
Symptoms of Dengue Hemorrhagic Fever	77.8	100.0
Early rescue efforts through drinking a lot	66.7	100.0
DHF sufferers must be immediately taken to the hospital	92.6	100.0
Definition of fever	81.5	96.3
Characteristics of fever in Dengue Hemorrhagic Fever	66.7	74.1
Body temperature checkpoint	92.6	96.3
Giving cold compresses to reduce body temperature	48.1	48.1
Techniques for administering fever medication	66.7	77.8
The need for early treatment efforts	96.3	96.3
Absence of drugs/vaccines that can cure DHF	37.0	100.0
Efforts to report DHF cases in the village	100.0	100.0
Dengue prevention efforts	88.9	100.0
Activity of closing water containers	92.6	100.0
Act of cleaning the bathtub	81.5	100.0
Sowing larvicide powder in a water reservoir	22.2	92.6
Cleaning the home environment and community cooperation	96.3	100.0
Spraying/fogging by health workers	92.6	88.9
Responsibility for eradicating mosquitoes and dengue larvae	92.6	92.6
Eradicate mosquitoes by raising betta fish	66.7	96.3
Characteristics of Aedes Aegypti mosquito larvae	77.8	85.2
Type of water preferred by dengue mosquitoes	77.8	88.9
Dengue-infectious mosquitoes live in:		
a. used tires	81.5	92.6
b. gutters	88.9	92.6
c. water dispenser reservoirs	88.9	100.0
d. flower vases	85.2	100.0
e. water vessels	88.9	100.0
f. sewers	29.6	85.2

g. rivers	63.0	88.9
h. pools	70.4	55.6

Note: *The percentages represent the proportion of respondents who answered each question correctly during the pre-test and post-test*.

The pre-test results indicated that there were five items with correct response rates below 50%. Notably, only 22.2% of respondents correctly answered the question about "Sowing larvicide powder in a water reservoir," and 29.6% correctly identified that "Dengue mosquitoes do not dwell in rivers." Post-intervention, only one item remained below 50% correct responses: "Giving cold compresses to reduce body temperature," which was correctly answered by 48.1% of respondents. This indicates a significant improvement in the participants' knowledge following the training intervention.

Differences in Mean DHF Knowledge Scores Before and After Intervention

The following table presents the average distribution of respondents' knowledge values before and after the Dengue Hemorrhagic Fever (DHF) Basic Concept training intervention.

Table 2. Distribution of Average Respondents' Knowledge Value Before and After the Dengue Hemorrhagic Fever Basic Concept Training (n=27)

Intervention	Mean	SD	SE	N	p-value
Before	27.70	4.842	0.932	27	.003
After	33.96	1.951	0.375		

Paired Differences	Mean	SD	SE Mean	95% CI of the Difference		Sig. (2-tailed)
				Lower	Upper	
Before-After	6.254	4.110	.791	-7.885	-4.633	.000

Table 2 presents the mean knowledge scores of respondents before and after the DHF training. The average pre-intervention score was 27.70 with a standard deviation of 4.842. Post-intervention, the average score rose to 33.96, with a standard deviation of 1.951 (p=0.003). This increase in the mean score by 6.254 points indicates a statistically significant improvement in knowledge following the intervention (p=0.000).

The training for women health cadres in the working area of the Public Health Center in Jaya Baru Sub-district, Banda Aceh, has been highly effective in enhancing their knowledge. This approach is a key method in controlling DHF at its source, particularly by targeting patients who may be potential transmission sources, implementing environmental vector control, and conducting community outreach. This aligns with the findings of Achmadi et al. (2013a), who identified environmental management, larva eradication, health promotion, and patient management as key strategies for DHF prevention.

These findings are consistent with the results of an action research conducted in the Banda Raya and Kutaraja Sub-districts, which demonstrated that counseling effectively increased the knowledge of Jumantik cadres and

elementary school students about DHF and environmental management of Aedes aegypti mosquito breeding sites (Achmadi et al., 2013b). Additionally, Ramadhani et al. (2022) found that community awareness of DHF significantly increased following educational activities. The pre and post-test interventions positively impacted outreach efforts, including the distribution of mosquito repellents (Abate and lotion) and fostering community cooperation.

The training model, which utilized lectures, Q&A sessions, simulations, and demonstrations, was guided by knowledgeable facilitators and successfully increased the knowledge scores of the participants by 81%. This success can be attributed to various components, such as the quality of the material presented, the facilitators' expertise, and the effectiveness of the methods used (Notoatmodjo, 2010).

Additionally, factors such as education level, occupation, age, and experience of the respondents also played a role in the improvement of knowledge (Notoatmodjo, 2010). The study showed that 55.6% of women health cadres had a high school education, which generally facilitates better information assimilation and increased knowledge. Additionally, 70.4% of respondents were housewives, a role associated with managing household health issues and caring for family members. The average age of respondents was 37.2 years, ranging from 18 to 61, and as individuals age, their cognitive and psychological maturity tends to improve. Furthermore, 96.3% of respondents had never previously attended DHF training, yet 81.5% were married, reflecting a natural propensity for caregiving. Effendy (2003) highlights that positive experiences, particularly those involving successful outcomes, can have a lasting impact and foster a constructive attitude.

To further enhance public awareness and knowledge about DHF, Aziz et al. (2014) recommend increasing public awareness to prevent and control DHF cases, educating people to disrupt the mosquito life cycle by eliminating breeding sites such as ponds and water reservoirs, ensuring effective communication and collaboration between agencies, and enhancing public self-awareness through continuous health education programs. They also suggest regularly conducting education programs at various levels to stress the importance of environmental sanitation, assessing and improving the community's knowledge, attitudes, and practices (KAP) regarding DHF and its vectors, and encouraging active public participation in health education initiatives organized by authorities and government agencies.

Furthermore, Sayono et al. (2019) found that the community in Semarang Municipality had positive perceptions and high satisfaction with the capabilities and impact of Dengue Surveillance Workers (DSWs). Community members believe that DSWs significantly contribute to increasing public awareness and participation in DHF control measures, reducing dengue vector density in residential areas, and ultimately decreasing the incidence of DHF cases.

Despite the pivotal role women play in family and community-based DHF prevention, a recent study by Baldwin (2022) revealed that women's

participation in DHF prevention was neither gender-equal nor gender-responsive. Corrective measures are necessary to change harmful gender norms and empower women to assume leadership and decision-making roles. Recognizing the benefits, enablers, and barriers to women's participation in formal and informal disease prevention efforts can help enhance their role and contribute to reducing disease incidence.

According to Kusiawati (2017), community empowerment can be achieved through various programs aimed at disease prevention. Increased community knowledge facilitates a better understanding of DHF and its prevention (Zahra et al., 2022). Health education is a crucial step in any vector control program, as it sustains efficient information and scientific knowledge about transmitted diseases and their vectors. Educating the public about vector life cycles, ecology, and biology is essential for fostering healthy living conditions and eliminating vector breeding sites (Aziz et al., 2014).

The training activities positively impacted the women health cadres by enhancing their knowledge, skills, and experience in DHF prevention, enabling them to care for themselves, their families, and disseminate this knowledge to others in the community. Women health cadres who have received education on mosquito larvae eradication are expected to monitor larvae within their home environments, thereby fostering hygienic and healthy living behaviors and increasing early awareness of dengue outbreaks in their surroundings.

To effectively combat Dengue Hemorrhagic Fever (DHF), it is crucial to continue regular training for health cadres and the public to keep knowledge up-to-date. Empowering women in leadership roles can enhance community health initiatives, as they play a key role in prevention efforts. Strengthening cross-sector collaboration among healthcare, education, and local government will create a more integrated approach to DHF control. Active community participation in mosquito eradication and prevention should be encouraged to ensure a unified effort. Additionally, implementing local, tailored programs focused on early detection, prevention, and management will address specific needs and improve overall DHF control.

CONCLUSION

The training for women's health cadres has proven effective in enhancing the knowledge of the cadres in controlling DHF. It significantly enhanced their understanding of DHF's basic concepts, environmental-based vector control and community outreach initiatives. This improvement was supported by effective training methods, such as lectures, Q&A sessions, simulations, and demonstrations, led by competent facilitators. Factors like educational background, occupation, age, and previous experience of the health cadres also contributed to the success of this training.

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