



THE EFFECT OF EDUCATION ON MAKING ECO LIGHT TRAP USING THE DEMONSTRATION METHOD AS AN EFFORT TO IMPROVE DHF PREVENTION SKILLS

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ABSTRACT

Dengue Hemorrhagic Fever (DHF) is a viral disease transmitted by the *Aedes Aegypti* mosquito. DHF is transmitted through the bite of the *Aedes Aegypti* mosquito and contains the dengue virus. This study was to determine the effect of education on making eco light traps using the demonstration method as an effort to improve DHF prevention skills in Wedi Village, Kapas District, Bojonegoro Regency. The method used in this research is quantitative with a pre-experimental approach. The population in this study was 538 adults in Wedi Village. The sample in this study was taken using purposive sampling of 36 respondents. Data were collected through pre- and post-observation of respondents' skills after being given education, demonstrations, question and answer sessions, and independent practice of making eco light traps, then the data were analyzed using the Wilcoxon rank sum test. Based on the results of the respondent observation sheet before (pre-test) the demonstration of making Eco Light Trap, it was found that 1 respondent (2.8%) had good skills, 14 respondents (38.9%) were included in sufficient skills, and 21 respondents (58.3%) had poor skills. And after (post-test) the demonstration of making Eco Light Trap, it was found that 31 respondents (86.1%) had good skills. 5 respondents (13.9%) were included in sufficient skills, and none had poor skills. Based on the Wilcoxon analysis test, the p-value was 0.000, which means the significance value is <0.05 . This study shows that eco-light trap education as a Dengue Hemorrhagic Fever (DHF) prevention effort can improve community knowledge, attitudes, and behavior in controlling the *Aedes aegypti* mosquito vector. The application of eco-light traps has proven effective as a simple, environmentally friendly technology that is easy to apply at the household level to reduce mosquito populations.

Keywords: community; demonstration; DHF; eco light trap; education; method

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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a viral disease transmitted by the *Aedes Aegypti* mosquito. DHF is transmitted through the bite of the *Aedes Aegypti* mosquito, which breeds in residential areas with poor sanitation. Dengue Hemorrhagic Fever (DHF) is an endemic disease in several regions of Indonesia that often causes extraordinary events (KLB). Environmental factors, community behavior, and low awareness in carrying out prevention are the causes of the still high risk of transmission. Therefore, DHF requires serious attention, especially through community empowerment in prevention efforts (Mils & Febrianti, 2024). According to World Health Organization (WHO) data in 2024, the increase in the number of dengue fever cases reached 14 million cases, with 10,576 deaths (WHO, 2024). Based on data from the Ministry of Health (Kemenkes), the cumulative number of dengue fever cases in Indonesia was recorded at 13,776 as of February 20, 2022. Meanwhile, the number of deaths due to dengue fever was 145 cases (Kemenkes RI, 2022). Based on data from the East Java Provincial Health Office, from January 1-27, 2022, there were 1,220 dengue fever cases in East Java, with 21 deaths (CFR = 1.7%), predominantly in the 5-14 age group. This figure is an increase compared to January 2021, when 668 dengue fever cases were recorded in East Java, with 5 deaths. The Bojonegoro Regency Government is seriously concerned about the DHF case. Meanwhile, data from the Health Office shows that since January 2022, there have been 112 DHF cases and 2 deaths (Affan, 2022).

The impact of dengue fever is not only related to high morbidity and mortality rates, but also causes social and economic losses for the community. Dengue fever sufferers require intensive care in hospitals, resulting in increased family healthcare costs. Furthermore, if optimal prevention is not implemented, the potential for outbreaks at the village level can disrupt community activities, reduce productivity, and increase the burden on local governments in disease management (Dawe et al., 2020). The increase in dengue fever cases is influenced by several factors, including increased mobility, population density, and climate change. In addition, behavioral factors and low public knowledge regarding simple technological innovations in vector control are among the causes of the ineffectiveness of dengue fever prevention at the village level. Weak dengue fever control program efforts are also a factor in the increase in dengue fever cases, so dengue fever control program efforts need to receive more attention, especially at the district/city level and in the working areas of community health centers through mosquito nest eradication (MNE) activities carried out periodically by the community with the core message of 3M plus (Utama, 2020).

Dengue fever prevention can be done by mosquito nests eradicating (MNE) and is carried out with 3M Plus activities. This activity consists of 3M, namely draining water reservoirs, such as bathtubs/toilets, drums and so at least once a week, tightly closing water reservoirs such as water jars/jars and others, reusing used items that can hold water and have the potential to become breeding grounds for dengue-transmitting mosquitoes. The main activities for dengue fever control are dengue surveillance, focused control, intensive vector eradication, public education, and periodic monitoring of mosquito larvae (Kurniawati et al., 2020). The chain of transmission of *Aedes aegypti*, the cause of dengue fever, can be broken, but the number of cases remains largely uncontrolled. This necessitates education and prevention efforts related to dengue fever. Another method that can be developed to eradicate dengue fever is the eco-light trap method. This innovation can significantly improve dengue prevention. Innovation in dengue control, in the form of innovative mosquito traps. The Eco-light Trap is a tool used to break the mosquito development cycle. Eco-light trap components can be made from recycled materials. Using recycled materials can reduce waste that could potentially become breeding sites for dengue vectors. The use of environmentally friendly and safe consumables for the community. The application of eco-light traps can reduce the dengue population, thereby achieving prevention of dengue cases (Sukendra et al., 2020).

Research conducted by Sukendra et al (2020), on the application of Eco-Light Trap in Innovative Community-Centered Dengue Ecosystem Management to reduce the Dengue Vector Population, the results of entomological surveys were conducted before and after the application of eco-light traps. From the analysis of the data obtained, it was found that there was an increase in the number of free larvae after the application of eco-light traps. The calculation of the number of free larvae before the application of eco-light traps was 75% and after the application of 89%, there was an increase of 17%. A preliminary study conducted by researchers in Wedi Village, Kapas District, Bojonegoro Regency, out of 10 respondents, 3 respondents said they had carried out dengue fever prevention with 3M, 2 respondents had done it but rarely did it every day, while 5 respondents had not carried out dengue fever prevention with 3M due to lack of education regarding dengue fever prevention. Wedi Village is a tourist village that has a snake fruit garden, from this condition the large number of snake fruit gardens in Wedi Village is a trigger for the rapid development of mosquitoes, therefore prevention against mosquito development must be stopped. Based on the description above, the researcher is interested in knowing the skills before and after making eco light traps and analyzing the influence of education on making eco light traps using the demonstration method as an effort to improve DHF prevention skills.

METHOD

This research is a quantitative research using a Pre-experimental approach. Pre-experimental design, because this design is not yet a real experiment. namely to determine the effect of education

on making eco light traps with a demonstration method as an effort to improve prevention skills (DHF) by comparing DHF prevention with 3M with prevention with eco light traps. This research was conducted in May-June 2024 in Wedi Village, Kapas District, Bojonegoro with a population of 538 respondents (adults) and a sample of 36 respondents (the entire community of RW 01 in Wedi Village). The sampling method used is non-probability sampling with Purposive Sampling technique. The instrument used for the independent variable of the eco light trap demonstration method is the extension program unit (SOP). While the instrument for the dependent variable, namely the skills of making eco light traps, is an observation sheet. Data were collected through pre and post observation of respondents' skills after education, demonstrations, question and answer sessions, and independent practice in making eco light traps. Observations were conducted by the researcher and three colleagues. The analysis test uses SPSS with the Wilcoxon statistical test.

RESULT

Table 1.
Frequency Distribution of Respondents Based on Age, Gender, Education

Characteristics	f	%
Age		
17-30 age	11	30.6
31-45 age	23	63.9
46-59 age	2	5.5
<60 age	0	0
Gender		
Man	8	22.2
Woman	28	77.8
Education		
No school	12	33.3
Elementary	17	47.2
Junior High School	5	13.9
Senior High School	2	5.6

The characteristics of the respondents in this study were that most of the respondents were aged 31-45 years, namely 23 (63.9%). Most of the respondents were female, namely 28 respondents (77.8%). Some respondents had an elementary school education, namely 17 (47.2%).

Table 2.
Distribution of frequency of Eco Light Trap Making Skills before (PRE) and after (POST) the demonstration of making Eco Light Traps was given

Skills	Before		After	
	f	%	f	%
Good	1	2.8	31	86.1
Enough	14	38.9	5	13.9
Not enough	21	58.3	0	0

Based on table 2 above, the frequency distribution of respondents' skill levels before being given an eco light trap demonstration was that more than half of the respondents had poor skills, as many as 21 (58.3%) respondents, and after being given an eco light trap demonstration, it can be seen that most of the respondents had good skills, as many as 31 (86.1%) respondents.

Table 3.
The effect of making Eco Light Traps using the demonstration method as an effort to improve DHF prevention skills

Skills	Before		After	
	Σ	%	Σ	%
Good	1	2.8	31	86.1
Enough	14	38.9	5	13.9
Not enough	21	58.3	0	0

Test Wilcoxon p value = 0,000 (α =0.05)

Table 3 shows that the results of the SPSS calculation on the Wilcoxon test can be seen that the significance value obtained for the Effect of making Eco Light Trap with the demonstration method as an effort to improve DHF prevention skills is 0.000. With a significance level of 5% $0.000 < 0.05$ so that H1 is accepted. So it can be concluded that there is an influence of education on making Eco Light Trap with the demonstration method as an effort to improve DHF prevention skills in Wedi Village, Kapas District, Bojonegoro Regency.

DISCUSSION

From the results of the respondent observation sheet before (pre-test) the demonstration of making Eco Light Trap, it was found that 1 respondent (2.8%) had good skills, 14 respondents (38.9%) were included in sufficient skills, and 21 respondents (58.3%) had poor skills. Skills based on Dunnett's in Lian (2013:17) quoted by Suhartini & Maharani (2023), skills are the capacity needed to carry out a series of tasks that develop from the results of training and experience. A person's expertise is reflected in how well a person carries out a specific activity, such as operating equipment or communicating effectively. This is in line with Sukendra et al (2020) with a total sample of 35 respondents, the majority of respondents had poor skills, namely 21 respondents (62.9%) before the eco light trap demonstration. Demonstration is a teaching method by demonstrating objects, events, rules or sequences of activities, either directly or through the use of teaching media that are relevant to the subject matter or material being taught (Sumirah et al., 2022). The eco light trap making skills provided in this study used the demonstration method, this method has several advantages compared to other methods, namely clearer delivery, more interesting and participants are more active in each step of the process (Sukendra et al., 2020).

The results of the pre-test observation can be concluded that all respondents have a low level of practice in eco light trap making skills. According to researchers, this is caused by several factors that can influence the practice of eco light trap demonstrations on respondents, including internal factors, namely the level of knowledge and ability and capturing information, while external factors are the influence of the environment, education. Based on the results of the study on 36 respondents, it was found that the highest level of education of respondents was elementary school, namely 17 respondents. The level of education and knowledge are factors related to skills. The results of this study are in accordance with Ramadhana & Meitasari (2023), stating that people who have higher education can also influence someone compared to people who have low education. Education is important for daily life in carrying out activities or interactions with the community. In this study, respondents had a majority of elementary school education, education can also influence the skills of making eco light trap tools, respondents lacked understanding when making tools, and the majority of respondents had less skills, knowledge can affect work or ongoing activities.

From the results of the respondent observation sheet after the (post-test) demonstration of making Eco Light Trap, it was found that respondents had good skills, namely 31 respondents (86.1%). A total of 5 respondents (13.9%) were included in sufficient skills, and none had poor skills. This finding confirms that the demonstration method is effective in improving the practical skills of the community, especially in making simple, inexpensive, and applicable Dengue Hemorrhagic Fever (DHF) prevention tools. According to researchers, demonstrations can explain the benefits, objectives and steps of making eco light traps, then the community made eco light traps, practicing making eco light traps according to the steps taught by researchers. Most people can make eco light traps well, this is because the majority of people are adults. This is in line with theory Fadli et al (2023), middle adulthood is a time to expand responsibilities at work, life in society, and at home to play an active role, middle adulthood needs to expand intellectual abilities including accumulation of knowledge, speaking skills, speed of analyzing information, reasoning, problem prevention, and their respective skills. Based on the characteristics of the age of respondents are divided into four age groups, namely 17-30 years old with a percentage of 30.6%, 31-45 years old with a percentage of 63.9% and 46-59 years old with a percentage of 5.5%. The majority of respondents aged 41 years and above have good skills. Where a good level of skills is more common among respondents in the

middle adulthood stage. According to researchers, it can be concluded that the demonstration method is more effective in improving Eco Light Trap making skills. This skill improvement shows that the demonstration method is able to provide practical understanding through a direct learning process, where respondents not only receive theoretical information, but also observe, imitate, and practice the steps in real life. Thus, respondents find it easier to master the skills taught compared to conventional extension methods such as lectures.

The results of the Wilcoxon test using the SPSS 16.0 program showed that the pre-test and post-test on respondents showed that $p = 0.000$, so $p > \alpha = (0.05)$ so that H1 was accepted. So it can be concluded that there is an influence of making Eco Light Trap with the demonstration method as an effort to improve DHF prevention skills in Wedi Village, Kapas District, Bojonegoro Regency. Skills before being given an eco light trap demonstration there is a very big difference with the skill value obtained results that as many as 21 respondents (58.3%) have less skills, As many as 14 respondents (38.9%) in sufficient skills, as many as 1 respondent (2.8%) has good skills. And after being given an eco light trap demonstration there is a very significant decrease from the results of 21 respondents (58.3%) to none for less skills, while for respondents with good skills there is also a significant difference where before the eco light trap demonstration there was 1 respondent (2.8%) who had good skill values and after the eco light trap demonstration there was a very significant value where almost all respondents' skills increased to 31 (86.1%) respondents, and for sufficient skills there was a difference from as many as 14 respondents (38.9%) to 5 (13.9%) sufficient skills.

Skills are also the abilities or skills that a person has to do a job and are only acquired through practice, either training or experience, so that the training carried out can influence a person's skills. Skills are the ability to manage, organize, and record information about the implementation and results achieved as well as the obstacles experienced and the ability to follow procedures (Basir et al., 2024). The demonstration method is a teaching technique by showing how to carry out a procedure. The target of health education can try the procedure. The target of health education can try the procedure that has been shown by the presenter. The demonstration method is very effective in finding solutions to do something and in carrying it out. The purpose of the demonstration method is to help participants practice skills to apply the theory presented and develop interpersonal interaction skills.

According to researchers, the influence of Eco Light Trap making skills using the demonstration method in Wedi Village showed significant results, where there was an increase in the community's ability to understand and practice how to make the tool independently. The demonstration method proved effective because it provided a direct learning experience, so that respondents not only gained theoretical knowledge, but were also able to master the steps of making it through repeated practice. This was evident from the difference in skills between before and after the demonstration, where the majority of respondents who initially had poor skills then improved to good skills after participating in the activity. With the increase in community skills, it is hoped that the manufacture of Eco Light Traps can be implemented sustainably as one of the community empowerment efforts in preventing Dengue Hemorrhagic Fever (DHF). This demonstrates that the use of demonstration methods in environmental health education can be a crucial strategy for community empowerment. The community not only understands the importance of dengue fever prevention but is also able to implement concrete actions through the skills of independently making Eco Light Traps. This is expected to support mosquito breeding eradication programs and contribute to reducing dengue fever incidence in the region.

CONCLUSION

Based on the results of research conducted in Wedi Village with 36 respondents, it can be concluded that the demonstration of making Eco Light Traps has proven effective in improving community skills in preventing Dengue Hemorrhagic Fever (DHF). Before the demonstration, most respondents still had inadequate skills (58.3%), and only a few had good skills (2.8%). However,

after the demonstration, there was a significant increase, where the majority of respondents had good skills (86.1%), and none were included in the poor skills category. The statistical test using the Wilcoxon method showed a significant value of $\rho = 0.000$ (<0.05), which means there is a significant difference between the pre-test and post-test results. This study shows that eco-light trap education as a Dengue Hemorrhagic Fever (DHF) prevention effort can improve community knowledge, attitudes, and behavior in controlling the *Aedes aegypti* mosquito vector. The application of eco-light traps has proven effective as a simple, environmentally friendly technology that is easy to apply at the household level to reduce mosquito populations. Thus, eco-light trap education can be a potential community empowerment strategy to support environmental-based and community-participatory DHF control programs.

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