Health Education Program on Increasing Kindergarten Students' Knowledge of Insecticide Resistance: Education Through Music and Direct Practice of Making Ovitrap

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Abstract: Based on data from the 2020 Indonesia Health Profile, the incidence of dengue fever in Indonesia in 2020 reached 95,944 cases. According to data recorded until April 2024, the number of dengue cases in Indonesia reached 28,579 people, with 621 deaths. The Central Java Provincial Health Office reported that 5,814 dengue cases in 2023 have been recorded, with a Case Fatality Rate (CFR) of 362 cases. The Karanganyar Regency Health Office noted that the number of Dengue Hemorrhagic Fever (DHF) cases in Karanganyar Regency until the end of 2023 reached 294 cases. Based on data on the distribution of dengue cases in 2024 by age group in the last seven years, the age group of 5 to 14 years is the most vulnerable to dengue which leads to death. In addition, it is likely that insecticide resistance will occur due to the wrong use of insecticides to reduce the presence of mosquitoes. For this reason, health education programs in the community, especially children, in various ways must continue to be carried out as an effort to increase community awareness and role, increase the discovery of larvae and reduce dengue cases. At the same time, the use of insecticides must also be considered. The aim of this community service activity is to increase kindergarten students' knowledge of aedes breeding place, correct use of insecticide to avoid insecticide resistance, and how to make an ovitrap in order to reduce the Aedes mosquito population. This activity was attended by 12 kindergarten students and 12 companions from TK IT MTA Matesih Karanganyar. This implementation of health education was performed through several stages, starting from the giving of health education and counseling through music, identifying insecticide types and how to use it, followed by categorization games for students, and direct practice to make an ovitrap. The results showed an increase in knowledge of the kindergarten students and their companions. Health education through music and direct practice of making an ovitrap can increase kindergarten students' knowledge of dengue disease, especially aedes breeding place and correct use of insecticides to avoid insecticide resistance.

Keywords: Aedes Mosquito, Insecticide Resistance, Dengue Hemorrhagic Fever, Integrated Vector Management

INTRODUCTION

Dengue fever is an acute febrile disease caused by the dengue virus, which enters the human bloodstream through the bite of mosquitoes of the genus Aedes, such as Aedes aegypti and Aedes albopictus (Azzahra et al., 2016). Based on data from the 2020 Indonesia Health Profile,

the incidence of dengue fever in Indonesia in 2020 reached 95,944 cases. According to data recorded until April 2024, the number of dengue cases in Indonesia reached 28,579 people, with 621 deaths. Aedes aegypti is the most widely found vector as the cause of dengue fever and is the main vector of dengue disease in Indonesia (Azzahra et al., 2016)

The Central Java Provincial Health Office (Dinkes) reported that 5,814 dengue cases in 2023 have been recorded, with a Case Fatality Rate (CFR) of 362 cases. The Karanganyar Regency Health Office noted that the number of Dengue Hemorrhagic Fever (DHF) cases in Karanganyar Regency until the end of 2023 reached 294 cases. Matesih District is one of the areas located in Karanganyar Regency, Central Java. Matesih Village is located in an area that is still categorized as an endemic area for dengue fever. According to the 2023 Karanganyar Regency Health Office report, dengue cases are increasing every year and have increased by 30%.

Based on data on the distribution of dengue cases in 2024 by age group in the last seven years, the age group of 5 to 14 years is the most vulnerable to dengue which leads to death. Dengue in children is also more susceptible to more serious complications. Dengue complications in children can be serious complications such as plasma leakage which can cause shock and require intensive care, and dengue shock syndrome which is the most severe form of dengue and can be fatal.

Prevention and control of Dengue Hemorrhagic Fever (DHF) depends on controlling the mosquito vector, Aedes aegypti (Hasmiwati et al., 2018). Since the Second World War, chemical insecticides have been widely used for controlling vector populations and reducing disease transmission. Therefore, the use of insecticides is one of the effective ways to prevent dengue fever. Even so, this can also backfire if the use of insecticides is not in accordance with the dosage or method of use that has been determined. The use of inappropriate insecticides can cause resistance mechanisms developed by mosquitoes.

Based on this presentation, it is necessary to carry out health education to the community as an effort to increase knowledge and community participation in improving health status. The IVM (integrated vector management) program is carried out as a form of basic handling and prevention of zoonotic diseases. The program was carried out by involving the participation of community members from children and adults, and various stakeholders as a form of effort to increase knowledge to prevent insecticide resistance.

METHOD

RESEARCH DESIGN

This study uses a quantitative approach with the type of PTK (Class Action Research) experimental research. This research was conducted on students and teachers and focused on the application of learning strategies that are considered more efficient and effective to achieve certain educational goals (Kalangi, 2023), which in this case has been determined, namely increasing knowledge about insecticide resistance. Data analysis uses a quantitative descriptive analysis method where the author will describe the data in general to show the results of data improvement that refers to the success of the research.

TIME AND PLACE OF IMPLEMENTATION

The program is implemented in its entirety within eight months, and is carried out in stages starting from environmental observation steps, overall program planning, program implementation preparation, program implementation, and the last is the monitoring and evaluation stage. The implementation of the program was carried out precisely on May 18, 2024 at TK IT MTA Matesih, Matesih District, Karanganyar Regency, Central Java. The activity was attended by 15 kindergarten students along with their companions and 5 teachers from the school.

PROGRAM IMPLEMENTATION PROCEDURE

The implementation of the program began with the taking of a pre-test on the companion who was a participant in the adult age category. Furthermore, the speaker gave an introduction to vector-borne diseases, which then narrowed down to dengue fever. After that, it was continued with the provision of material to participants regarding insecticides, types of insecticides, use of insecticides, and insecticide resistance. In the implementation of education, the presenters used various props in the form of various types of insecticides that are commonly used by the surrounding community. In addition, education is carried out using the medium of simple songs that are easy for children to capture. The first song given contains an understanding of the life cycle of mosquitoes, while the second song contains an understanding of the types of insecticides and how to use them well, correctly, and safely. Education through interactive games with children is also carried out to create a fun educational environment for children. After the education through oral presentations was completed, the next activity was hands-on practice on how to make a simple ovitrap by using used bottles and several other equipment such as gauze and plaster. Participants

were divided into several small groups consisting of kindergarten students and companions. Each group will be guided and practiced directly to make ovitrap. After that, the products made by Ovitrap are placed in the mosquito breeding place area or an area that is widely liked by mosquitoes. The next step after health education is completed is to take a post-test to measure the level of knowledge in the participants.

DATA COLLECTION AND ANALYSIS TECHNIQUE

The data collection technique was carried out manually with questionnaire media in the form of a pre-post test. The questionnaire contained 10 multiple-choice questions that showed the level of knowledge of participants about dengue and insecticides. The data from filling out the questionnaire is then changed to digital form to make it easier to process. The data analysis technique is carried out using a simple data processing application that will produce data processing results. Furthermore, the results of the data that have been processed are interpreted in the form of a narrative that is easier to understand.

RESULTS

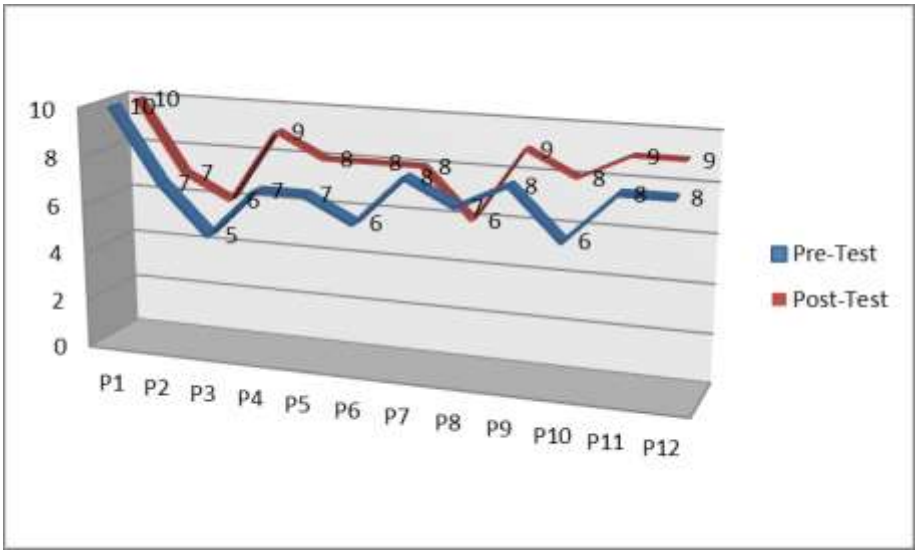
In the implementation of this program, all participants will be divided into 5 groups and will conduct an ovitrap creation experiment. An ovitrap is considered successful if the produced product (ovitrap) functions and is used as intended. Subsequently, each successful group will place their ovitrap in the designated location. The success of each group will then be recorded and described in the form of a group success status table.

Table 1. Group success status table

Group	Activities	Status
Group 1	Make an Ovitrap	Succeed
Group 2	Make an Ovitrap	Succeed
Group 3	Make an Ovitrap	Succeed
Group 4	Make an Ovitrap	Succeed
Group 5	Make an Ovitrap	Succeed

The table above shows the success status of ovitrap making activities carried out by each group. The results also showed that all participants in the program had the ability to make ovitrap.

Furthermore, the results of the pre-test and post-test data that have been processed show an increase in knowledge in the participants, which is then presented in the form of graphs to make it easier to understand.



Picture 1. Pre-test and post-test result of each participants

The graph illustrates an increase in scores on pre-test before intervention and post-test scores after intervention that have been carried out which shows an increase in knowledge after health education is carried out.

DISCUSSION

A health education program as a form of IMV (Integrated vector management) strategy carried out as an effort to prevent insecticide resistance. The program is carried out at TK IT MTA Matesih, where this area is located in an endemic area for dengue fever. The program involves community participation, especially kindergarten students and parents, and involves various parties and stakeholders.

The approach carried out is a cognitive approach, where this approach focuses on developing children's thinking and problem-solving skills. This method has been proven to be very suitable for children with high levels of intelligence, where learning is seen as a way to expand early childhood understanding. The use of techniques such as educational games and project-based activities can increase children's engagement and understanding (Astuti, 2023). Based on this, the researcher applied music and games as a learning medium and practiced making ovitrap directly as a form of project-type activity.

Health education as an intervention method was carried out by applying music and games as educational media to create a fun learning environment for children and materials that are easier for children to grasp and understand. The hands-on practice method in making Ovitrap and its use was also carried out as an effort to increase knowledge for participants.

Data collection is carried out before and after the implementation of health education. The data that has been collected is then analyzed so that it can produce a conclusion that health education through music and direct practice of making ovitrap can increase the knowledge of kindergarten students about insecticide resistance.

CONCLUSION

Health education through music and direct practice of making an ovitrap as a form of IMV (Integrated Vector Management) strategy, can increase kindergarten students' knowledge of dengue disease, causes, treatment and prevention, especially various kinds of insecticides and the correct use of insecticides to avoid insecticide resistance.

Conflict of Interest

The authors haven't any personal, commercial, political, academic, or financial interest in the subject matter or anything written in this research.

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