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Effect of Dengue Hemorrhagic Fever Health Education on Knowledge and Attitudes, in Elementary School Children in West Java, Indonesia

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***Abstract*---**Background: Flooding due to the Citarum river overflowing is a natural phenomenon that is almost common every year, especially for the area around Citarum Dayeuhkolot. Floods cause various health problems, such as Dengue Haemorogic Fever (DHF). The high incidence of environmental-based infectious diseases in flood-prone villages in Dayeuhkolot is caused by problems in the health determinant factor which is associated with the still low awareness of the community that supports clean and healthy lifestyle behaviors (PHBS). Objective: To determine the effect of DHF prevention education on elementary school students' knowledge and attitudes. Methods: Quasi-experimental research design with pre-test and post-test design. The study was conducted at Bojong Asih Elementary School, Pasawahan Elementary School, Cangkuang Elementary School, and Leuwi Bandung Elementary School in 2017. The samples in this study were all students in grades 4- 6 totaling 323 people. All students were given a questionnaire before the intervention and then given counseling about the prevention of DHF and given a questionnaire again to measure the level of knowledge and attitudes. Data analysis uses descriptive univariate analysis and bivariate t-test. The approach method in this research uses the Integrated UKS method. Results: The results showed that the average level of

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knowledge before intervention 292 (90.4%) of respondents had poor knowledge and after the intervention experienced a change in the level of knowledge to 163 (49.5%) of respondents had good knowledge about DHF prevention (p = 0.001). In the attitude variable, it showed that the average attitude before intervention 187 (57.9%) respondents did not support and after the intervention experienced changes in attitude 185 (57.3%) respondents became supportive of DHF prevention (p = 0.001). Conclusion: This study found that DHF education affects increasing the average knowledge and attitudes of students. Suggestion: The need for support from the local government both from the Health Office and the Education Office as well as the subdistrict apparatus, village heads, and school principals for the sustainability of the DHF program.

***Keywords*---**attitude, dengue hemorrhagic fever, elementary school children health education, knowledge.

Introduction

Dengue Hemorrhagic fever (DHF) represents a great task for global public health. DHF is a communicable disease spread generally by the bite of the female Ades Aegypti mosquito (Parks & Lloyd, 2004; Samuel & Tyagi, 2006). These mosquitoes usually nest in puddles of clean water. DHF has recently reappeared globally as an important viral infection (Dans et al., 2018). More than 50 million DHF cases happen globally every year, and children are the greatest public sufferers of this deadly disease (Samuel & Tyagi, 2006; Sure et al., 2004). The impact of DHF is to cause death. High mortality due to DHF ranges from 3% to 5%. DHF also causes severe damage to the economy (Centers for Disease Control and Prevention (CDC). (2013).

The dengue virus is found in many sub-tropical and tropic regions, one of which is in Indonesia. Indonesia is a tropical country that is suitable for the development of Indonesia's DHF disease (RI, 2018), especially in the rainy season (Arcari et al., 2007), which attacks people once in 4-5 years (Fever, 2007). Case Fatality Rate (CFR) due to DHF in Indonesia in 2017 more than 1% is categorized as high (RI, 2018). In 2016, 204,171 cases were found with a total of 1,598 people dying. The number of cases increased 129,650 cases compared to the year 2015.

West Java is one of the provinces in Indonesia which has experienced an increase in DHF. The Health office of West Java Province notes that DHF cases that occur in almost all cities and districts in West Java have increased, there are five regions with the highest cases in West Java, one of which is Bandung Regency (RES et al., 2019).

Bandung Regency was the second-highest population in West Java Province which was vulnerable to natural disasters such as floods (RES et al., 2019). Flooding has undesirable effects, one of which is increasing health problems such as Dengue Hemorrhagic Fever (DHF) disease spread by mosquitoes. Health problems do not seem to diminish as the flood recedes. Data showed that when

the flood started to recede, the number of people suffering from the disease will increase.

Lack of public exposure to health information causes low awareness of the community in efforts to prevent dengue. One of the factors causing the low achievement of health indicators is that health promotion efforts have not been optimal in the health sector. This can be seen from the low quality of the environment which can be a factor for mosquito nesting. The results of Riskesdas 2007 showed that the number of patients due to DHF was still high (Ministry of Health, 2008). The national prevalence of dengue fever was 0.62%. West Java was a province that has a DHF prevalence above the national prevalence (Ministry of Health, 2008).

The health determinant factor which is associated with the still low awareness of the community that supports the pattern of clean and healthy living behavior (PHBS) is one of the determinants of increasing DHF cases. Lack of knowledge and awareness of the prevention of DHF outbreaks causes DHF causes to increase. The DHF vectors, human knowledge, and behavior shows were vital roles in the spread of the disease (Ibrahim et al., 2009). One of the causes of mosquito breeding is not controlled is an unhealthy physical environment (Baequni & Adhiyanto, 2019).

A Health degree is determined by health services, behavioral and environmental factors. Behavioral and environmental factors are dominant factors. Household behavior is influenced by processes that occur in social settings, one of which is the structure of Educational institutions such as schools. Therefore health promotion in the prevention of DHF needs to be done in schools. Eradicating mosquito larvae is one indicator of Clean and Healthy Behavior (PHBS) in schools (Ong et al., 2007; Kurane, 2007; Lee et al., 2010).

DHF prevention programs at the elementary school level are very important, bearing in mind that children at this age are the next generation of the nation with a large enough community, the largest group of age groups of children applying compulsory education, but are a group prone to various diseases. If the child is sick, his learning achievement will be disrupted (Suwanbamrung et al., 2013; Guzman & Kouri, 2003).

School is an institution in a well-organized society, which has a container of human resources that can change children's behavior to be healthy. Health education through school children is effective in changing behaviors and healthy living habits including those related to DHF. Educational institutions are seen as a strategic place to promote school health, as well as an effective place to realize health education, where students can be taught about the intentions of healthy and unhealthy behaviors and their consequences (Adnani et al., 2018). DHF prevention behavior in children who are implanted in school will be brought to their homes so that it affects their family behavior.

Government policies which have so far been mostly curative rather than preventive measures in the DHF eradication program have not been able to reduce the severity of the disease (Baequni & Adhiyanto, 2019). Need to increase

socialization and promotion about the prevention of DHF in the community, both in the general public and the school community. WHO and the Centers for Disease Control and Prevention recommend and emphasize public education campaigns that highlight citizens' responsibilities in reducing the DHF vector (Michael et al., 2009; Priyadharshini et al., 2021).

Many people still lack knowledge and attitudes towards preventing DHF, including children. School children still have a low level of knowledge, perception, and preventative behavior (Charnchudhi Chanyasanha, 2013). To overcome and control the DHF problem requires knowledge and attitudes that support the prevention of DHF to increase supportive behavior from the community, including the school community. Regarding that, the epidemiology of DHF is related to human habits and lifestyles (Al-Dubai et al., 2013). Knowledge and attitude have a relationship with one's behavior (Bettinghaus, 1986).

Interventions conducted through health education programs play an important role in promoting behavior change (Sure et al., 2004), one of them is through school. Interventions conducted at school age are very important to improve the attitudes and behavioral activities of dengue prevention (Baequni & Adhiyanto, 2019), in managing DHF prevention, increasing knowledge, and attitudes (Usman et al., 2018). With students knowing side effects and prevention, students can actively participate in control strategies for the dengue virus in their schools, in the home, and their respective residential areas (Usman et al., 2018). Educational intervention methods in the prevention of DHF in children need to be adapted to the stage of growth and development of children at that age, such as educational methods of interactive question and answer lectures (CTJ), the use of educational videos, and posters.

Method

The design in this study was a quasi-experimental design with pre-test and post-test. The study was conducted at SDN Bojong Asih, SDN Pasawahan, SDN Cangkuang, SDN Leuwi Bandung, Dayehkolot District, Bandung Regency in November 2017. The population in this study were all students in grades 4-6 totaling 323 people in the four SDNs. The number of samples using total sampling. The approach method in this research uses the Integrated UKS method (Ministry of Health, 2007). Interventions were given using the interactive method of a two-way question and answer lecture (CTJ) accompanied by posters and educational videos about eradicating and preventing DHF.

All students were given a questionnaire before the intervention was then given education about eradicating mosquito larvae and prevention of DHF, then given a questionnaire again to measure the level of knowledge and attitudes related to DHF. Knowledge and attitude instruments were measured using a questionnaire with adequate validity and reliability ($\alpha = 0.65$, $\alpha = 0.74$). Measurement of the level of knowledge is divided into two categories, namely Good (76-100%) and Less (≤75%). Attitude measurement is divided into two categories, namely supporting and not supporting. Supports if a Median score ≥ 50 and Does not Support if a Median score is <50. Data analysis uses univariate analysis of frequency

distribution and bivariate t-test analysis (Dewi, 2019; Suwanbamrung et al., 2021; Shulga et al., 2021).

Results

Table 1
Frequency distribution of students' level of knowledge and attitudes about DHF prevention before and after the intervention in 2017 (n = 323).

Variable	Before Intervention		After Intervention	
	f	%	*f*	%
Level of knowledge				
Good	31	9.6	163	49.5
Poor	292	90.4	160	50.5
Attitudes				
Supporting	136	42.1	185	57.3
Not supporting	187	57.9	138	42.7
Total	323.	100	323	100

From table 1 it can be seen that the average level of knowledge before the intervention was that most respondents 292 (90.4%) have poor knowledge about DHF prevention. After the intervention experienced a change in the level of knowledge, the majority of respondents 163 (49.5%) had good knowledge about the prevention of DHF. On the attitude variable, it was known that the average attitude before the intervention most of the respondents 187 (57.9%) did not support the prevention of DHF. After the intervention experienced a change in attitude to the majority of respondents 185 (57.3%) had an attitude supporting the prevention of DHF

Table 2
Differences in average levels of knowledge and students before and after the intervention in 2017 (n = 323)

Variable	Before Intervention		After Intervention		z	p
	Mean	SD	Mean	SD		
Level of knowledge	1.55	0.701	2.50	.501	-16.534	0,001
Attitudes	2.77	1.113	3.51	.531	-15.855	0,001

Table 2. It showed that there were differences in the average level of knowledge before and after intervention in students (p = 0.001), and there were differences in attitude before and after intervention in students (p = 0.001)

Discussion

Based on the research results obtained that the level of knowledge and attitudes of students related to the prevention of DHF has increased. The results of the interventions carried out were significantly different between the pretest and post-test about knowledge and attitudes ($p < 0.05$). Education conducted comprehensively using multimedia such as interactive two-way questions and

answers, posters, and video media succeed in increasing the level of knowledge and attitudes of students. This happens because the education method used comprehensively through multimedia will mutually reinforce information received by students. Education using multimedia methods has proven to be effective in improving student attitudes (ömer Beydoğan & Hayran, 2015). Edukasi berbasis multimedia terbukti lebih efektif bagi anak-anak (De Gelder & Vroomen, 1997; Tabbers et al., 2001). This is because the education is interactive by the characteristics of school-age children. The media used must contain the right messages and cues by what the child wants to be informed. The media used must give the right cues to practice certain behaviors (Winch et al., 2002). The media can provide information about safe health practices as long as the contents of the message to be delivered to children are appropriate (Strasburger et al., 2010; Wartella, 2009). Multimedia contributes to perception, performance, memory, visual memory, visual attention, and motor skills (Stephenson, 2002) so that it can improve students' knowledge and attitudes.

Education delivered by two-way interactive CTJ will increase children's interest in asking and answering what they know and don't know. A two-way question and answer for a child will reveal what is in his mind. Children begin to be able to pay more attention to informative features such as dialogue and narration (Huston & Wright, 1983). Another interesting education is video. Video media is a good medium for conveying information to children because the information is conveyed in a fun way. Children may understand and learn more from real-life experiences from the videos they watch (Kirkorian et al., 2008). They learn by observing and imitating what they see on the screen (Bandura, 2001).

In addition to two-way interactive CTJ and educational video media, posters are also the preferred media for children because they contain short messages accompanied by interesting pictures according to the message content. The use of educational media through posters was successful in increasing knowledge related to DHF (Winch et al., 2002).

Through multimedia education, students can effectively interact with information conveyed based on images, sounds, and words designed in a predetermined sequence, they can analyze the stimuli received during the interaction (Sari, 1993). Education through the media was right for children because children spend more time with the media (Wartella, 2009). Thus, the use of multimedia in delivering health education messages to children related to the prevention of DHF is effective in increasing the level of knowledge and attitudes of children, which is expected to change their behavior related to DHF prevention efforts.

DHF prevention education interventions for students in schools are very important because in addition to increasing their knowledge and attitudes, they will also share the information they receive at school with their families at home. Children are significantly more likely to discuss dengue with their parents (Winch et al., 2002). So that, it will indirectly increase knowledge, attitudes, and family awareness of the prevention of DHF which will be applied in everyday life. Child involvement was aimed at introducing children to the concept of preventing dengue at an early age, as well as promoting changes in the behavior of their parents (Gubler & Clark, 1994; Passos et al., 1998; Madeira et al., 2002; Kay et

al., 2002). School-based dengue activities involving children are expected to change their parents' behavior through communicating dengue messages to their parents (Winch et al., 2002).
The community-based education program, including the school community established by the CDC Dengue Branch, in collaboration with Puerto Rico's Department of Health, showed a significant impact on children's knowledge and behavior related to DHF prevention (Winch et al., 2002). School-based community health education programs are important to be applied in all school institutions. The government must encourage the sustainability of the program, by encouraging education centers that hold health-related exhibitions directly

To achieve the success of the PHBS program at the School, coordination, and support from various parties are needed. The main parties are the puskesmas, elementary education UPTD, and village government. Things that need to be considered are support from the puskesmas in the form of knowledge and operational support, while from the village government in the form of policy and operational support (Manios et al., 1999; Humayoun et al., 2010).

Conclusion

Interactive education affects increasing the knowledge and attitudes of elementary school students about DHF.

Recommendation

The need for consolidation to bring together an understanding of information about DHF in schools, that DHF is part of health education in schools and not only in puskesmas, as well as the need for support from puskesmas, UPTD Elementary Education, and local village government for the sustainability of the program.

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