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# ATTITUDE AND PREVENTIVE BEHAVIOR OF DENGUE HEMORRHAGIC FEVER AMONG ELEMENTARY SCHOOL STUDENTS IN JAKARTA, INDONESIA

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Abstract – Indonesia is an endemic area of Dengue Hemorrhagic Fever (DHF). The disease has spread to all provinces in Indonesia and Jakarta is one of the provinces that has high number of DHF cases. One of the vulnerable group to suffer from the disease is school children. Instead of the treatment, it needs preventive action such as providing health education message to the children. Thus, the objective of this study was to assess the attitude and preventive behavior of DHF among elementary school students in Jakarta Indonesia. This study was carried out using a quasi-experimental study. The 5th and 6th grade students of 21 elementary schools in Jakarta were selected as the study participants. Among twenty-one elementary schools, seven school received poster intervention and other seven school with flipchart intervention. Meanwhile seven schools were determined as the control. There were 632 students involved in the study, which were 211 included in each intervention groups and 210 as the control group. The results showed that attitude of the students toward the prevention of DHF was good even before the intervention. The students strongly agree that cleaning mosquito nests is a pleasant thing. For the preventive behavior, students who received poster intervention (95% confidence interval: 1.189 – 2.866) more active in cleaning their school to combat mosquito nests than those who got flipchart intervention (95% confidence interval: 1.327-3.177) compared to the control group. Providing health education such as poster and flipchart to the elementary school students were effective in triggering the behavior of combating and preventing DHF.

## INTRODUCTION

Indonesia is an endemic area of Dengue Hemorrhagic Fever (DHF) that attacks the people once in 4-5 years (Lestari, 2007). As an archipelago and tropical country, Indonesia is very suitable for breeding various types of mosquitoes, especially in the rainy season (Arcari *et al.*, 2007). The plain truth: that malaria, dengue hemorrhagic fever, chikungunya, and filariasis spread by *Aedes aegypti* become endemic and it could not be controllable with current technologies of the country.

Unmanageable physical environments, especially in urban areas, is one of the causes of uncontrolled mosquito breeding. This situation has directed to an increase of DHF incidence. Actually, DHF was first reported in 1968, since then DHF has spread to all provinces in Indonesia (Setiati *et al.*, 2006). There were 204,171 cases with the number of deaths as many as 1,598 people in 2016 in the country. The number of cases increased 129,650 cases compared to year, 2015 (Ministry of Health Republic of Indonesia 2017). According to Data from Minister of Health Indonesia in the year 2014, Incidence rate due to the disease reached 83.34 people per 100.000 in The Capital city of Jakarta (Ministry of Health Republic of Indonesia 2015). The DHF outbreak in 2004 in Jakarta was categorized by the transmission of multiple virus serotypes, with DEN-3 was the largest spread among the people (Suwandono *et al.*, 2006).

Government policies which is curative than preventive actions in dengue eradication programs have not been able to reduce the severity of the disease. On the contrary, since 1995 the world's dengue eradication program have been focusing on coordinate National efforts for prevention and control activities (WHO 2001). The Strategy consists

of five main elements, i.e.; (1) selective, integrated mosquito control with community and inter-sectoral participation, (2) active disease surveillance based on strong health information systems, (3) emergency preparedness, (4) capacity building and trainingand (5) vector control research (Parks and Lloyd, 2004). In Indonesia, out of the four factors of which cause of dengue prevention program was communication, resources, disposition, and bureaucratic structure, there was found only one weakness in resources with the form of limited authority, budget, and equipment (Respitowati, 2012).

The highest incidence rate of DHF patients is schoolchildren, who were aged 5 to 14 years up to 1998 (Karyanti *et al.,* 2014). However, they were having low level of knowledge, perception, and preventive behavior (Charnchudhi Chanyasanha 2013). The intervention that carried out at this age is essential with the aim of advancing attitude as well as behavior activities of DHF prevention.

## MATERIALS AND METHODS

The population of this study was the 5$^{th}$ and 6$^{th}$ grade of elementary schools in five regions of Jakarta. Among twenty-one elementary schools, fourteen schools received interventions while seven schools were determined as the control. There were 632 students involved in the study, which was 211 included in intervention and 210 as the control.

This was a quasi-experimental study. There were three groups of the respondent, which was seven elementary schools followed flipchart intervention, seven elementary schools received poster intervention and the other seven school without intervention.

We showed and explained the contents of the flipchart as well as the poster to students in each intervention group. Students had access to view flipcharts and posters whenever they want within one month. Both flipcharts and posters contain information about DHF infection and prevention.

The data from Respondents' attitude was collected using questionnaires at pre and post-tests. The questionnaire included nine questions about the attitude of DHF. In the questionnaire, we provided options to answer the attitude according to the Likert scale. Responses to questions scored as follows: 1. strongly disagree; 2. disagree; 3. neither agree nor disagree; 4. agree; 5. strongly agree

Field research teams who had a public health background were educated for using the questioner and collected the data to minimize the bias. The attitude from the flipchart intervention group, poster intervention group, and control group was analyzed using statistical software. Average answers from respondents in pre and post-test were calculated to see the differences.

The effect of intervention on behavior of the respondents were studied by using multinomial logistic regression to show the effect of flipchart and poster intervention in increasing behavior among respondents.

## RESULTS

Table 1 showed that the pre and post attitude scores almost the same, some attitude scores were high than pre-test, such as; (1) Eradication of mosquito nets is pleasant thing, (2) The students eradicate the mosquito in school and house (3), Teachers regularly remain student to eradicate mosquito. The average respondent's attitude generally good (average total score 4.1 for pre-test and 4.2 for post-test) so why the respondent approves or agrees the things that were very necessary for preventing the development of mosquitoes. Counseling through flipchart interventions and posters may strengthen some of the positive attitude.

Table 2 presented whether the respondent had ever received lessons or counseling of DHF from the teachers during the intervention. The table showed that the group of respondents who were followed flip chart intervention OR 2.19 (95% confidence interval: 1.43 – 3.37) likely more getting counseling of DHF than those who were followed poster intervention OR 1.87 (95% confidence interval: 1.23 – 2.88). On the other word, the teachers from the flipchart intervention group were more active to do counseling and it could also said that flipchart was more effective in motivating teachers to participate in DHF counseling to students. However, these two types of interventions could motivate teachers to participate in DHF counseling programs to elementary school students

Table 3 showed the activity of cleaning school by respondents. The respondents who followed poster intervention OR 2.05 (95% confidence interval: 1.33-3.18) more active in cleaning their school than those who followed flipchart intervention OR 1.85 (95% confidence interval: 1.19 – 2.87).

Table 4 displayed the activity of respondents to clean their own living place with family. The respondents who followed flipchart intervention OR

Table 1. Attitude on DHF at Pre and Post-test among respondents

| NO | Attitude on DHF | Flipchart Inte rvention Group | | Poster Intervention Group | | Control Group | | Avarage Total | | Subtracti on |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre (n=211) | Post (n=210) | Pre (n=211) | Post (n=210) | Pre (n=211) | Post (n=210) | Pre (n=632) | Post (n=630) | Post-Pre |
| 1 | Eradication of mosquito in school and house | 4.0 | 4.2 | 4.2 | 4.3 | 4.2 | 4.2 | 4.1 | 4.2 | 0.10 |
| 2 | Eradication of mosquito nests to prevent DHF | 4.2 | 4.2 | 4.1 | 4.2 | 4.2 | 4.2 | 4.1 | 4.2 | 0.06 |
| 3 | Eradication of Mosquito Nests is a pleasant thing | 3.6 | 4.0 | 3.6 | 3.8 | 3.7 | 3.8 | 3.6 | 3.9 | 0.27 |
| 4 | Warning fam iles to eradication of m osquito | 4.2 | 4.3 | 4.2 | 4.2 | 4.2 | 4.3 | 4.2 | 4.3 | 0.08 |
| 5 | Teachers regularly remain student to eradicate mosquito | 4.3 | 4.3 | 4.3 | 4.3 | 4.2 | 4.3 | 4.2 | 4.3 | 0.00 |
| 6 | Clean m osquito nests im mediately | 4.1 | 4.2 | 4.2 | 4.3 | 4.3 | 4.1 | 4.2 | 4.2 | (0.02) |
| 7 | Regularly, warning friends | 4.5 | 4.3 | 4.5 | 4.3 | 4.5 | 4.3 | 4.4 | 4.3 | (0.14) |
| 8 | Always do cleaning activities to prevent Mosquito | 4.3 | 4.2 | 4.3 | 4.3 | 4.3 | 4.2 | 4.3 | 4.2 | (0.09) |
| 9 | Talk to Friends about mosquito eradication | 4.1 | 4.2 | 4.0 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 0.04 |

Table 2. Effect of the intervention on motivating teacher to do couseling DHF programs for the respondents

| Variable | B | SE | P value | Odds Ratio (OR) | 95% Confidence Interval for OR |
|---|---|---|---|---|---|
| Flipcart Intervention | 0.78 | 0.23 | 0.001 | 2.17 | 1.43-3.37 |
| Poster Intervention | 0.62 | 0.21 | 0.003 | 1.87 | 1.23-2.84 |

Table 3. Effect of the intervention to respondents activity on cleaning school for Eradication Mosquito Nest

| Variable | B | SE | P value | Odds Ratio (OR) | 95% Confidence Interval for OR |
|---|---|---|---|---|---|
| Flipcart Intervention | 0.61 | 0.22 | 0.006 | 1.85 | 1.19-2.87 |
| Poster Intervention | 0.72 | 0.22 | 0.001 | 2.05 | 1.33-3.18 |

Table 4. Effect of the intervention to respondents activity on cleaning home with their family for eradication mosquito nest

| Variable | B | SE | P value | Odds Ratio (OR) | 95% Confidence Interval for OR |
|---|---|---|---|---|---|
| Flipcart Intervention | 0.46 | 0.22 | 0.037 | 1.59 | 1.03-2.46 |
| Poster Intervention | 0.44 | 0.22 | 0.049 | 1.55 | 1.00-2.34 |

1.59 (95% confidence interval: 1.03 – 2.46) more active in cleaning their home than those who followed poster intervention OR 1.55 (95% confidence interval: 1.00-2.34).

## DISCUSSION

The study showed that the pre-post intervention of flipchart and poster attitude score almost the same. The average attitude of the respondents were generally good toward activities of DHF preventing.

The study revealed that there were some effects of the intervention on teacher's behavior to do counseling program, respondent's activities on cleaning the school and their living places. DHF counselling is effective in increasing knowledge teacher about dengue first aid (Saleha Sungkar 2013). Teachers played important role in facilitating

health promotion among students (Lennon, 2004; Siriwardana, and Samarasinghe, 2018) and their education to elementary school program resulted a high level of awareness, and some behavior change (Winch *et al.,* 2002).

The intervention program to reduce DHF incidence rate through school-age children is a new breakthrough in overcoming DHF epidemic. However, many studies confirm that there was a possibility of this idea could be implemented seriously. Our study also showed that the respondents did cleaning activity in school as well as at home with their parents and this is an evidence that school-age children could use as "agent of change" in triggering community to do DHF prevention. The study from Srilanka showed that education sector might play as important partner in DHF prevention (Jayawardene *et al.,* 2011).

In a study of prevention of DHF among urban community showed that more than 90% of the participants knew that Aedes and designated water jars and water retention in the houses as the common breeding places transmit the disease (Swaddiwudhipong *et al.,* 1992). Another study in semi-urban community concluded about half of the respondents (50.5%) had misconceptions that Aedes could be breed in dirty water and they said that preferred biting time is dusk or sunset (45.6%) (Naing *et al.,* 2011). The people in urban areas like Jakarta knows about DHF program and prevention even some of them have misunderstanding about the breeding place of Aedes Mosquito. May be this is the reason why our respondents have positive attitude with DHF activities and programs.

Until this day, Jakarta has still haunted by repeated outbreaks of dengue fever. The failure of the DHF programs are caused by the busy life of the capital's citizens in carrying out their daily activities as well as the condition of the structure of urban residential buildings that affected the difficulty to reach in the implementation of the DHF programs (Dwiposuwignyo, 2011). The idea of using school-age children as "agent of change" to combat DHF should be considered with conducting cross-sectoral cooperation between the ministry of health and ministry of education.

One of the most interesting findings was the attitude of the respondents that showed cleaning mosquito nests as a very pleasant thing for the respondents. The education of DHF prevention to the school-age children may be done in the various way. The research on the effectiveness of counseling methods for grade 6$^{th}$ elementary school students was found that extension methods with pictorial games were more effective than lecture methods in increasing knowledge about DHF (Qimamayah *et al.,* 2012) as well as the utility of a board game (Lennon and Coombs, 2007). In the extension study with the comic method to the children concluded that this method had an influence on the prevention behavior of DHF (Hadi *et al.,* 2012). With the effective and amusing education ways, the school-age children could be as a potential hope for the future combating and preventing DHF in the country.

## CONCLUSION

Providing health education such as poster and flipchart to the elementary school students were effective in triggering the behavior of combating and preventing DHF such as cleaning the school and home environment. Both poster and flipchart were effective to use as a tool to educating the respondents. The possibility to use school-age children as "agent of change" to combat DHF should be something to consider. This study highlighted that education through elementary school was effective especially in triggering positive behavior on preventing DHF and motivate the teachers as well as the parents to do cleaning activities in their school and home.

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