

ORIGINAL ARTICLE

Health Promotion With Peer Education : Knowledge and Behavior Prevention of Dengue Hemorrhagic Fever (DHF) Among Adolescents in Indonesia

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ABSTRACT

Introduction: Dengue Hemorrhagic Fever (DHF) is still a significant health problem. During pandemics, there is a higher risk of co-infection alongside Covid-19 and Dengue. Similar early clinical manifestation and laboratory results make it healthcare professionals challenging to diagnose both diseases. In Indonesia, until July 2020 dengue cases reached up to 71,633. There is a need for health promotion strategy during the world-changing on era and peer education is one alternative method to increase DHF knowledge and prevention. Activities that occurred in group peers among adolescents will be easier to make interactive communication and information will be easier to understand This study aims to describe peer education's effectiveness toward the knowledge and behavior prevention related to DHF among adolescents in Indonesia. **Methods:** The research method is a Quasi Experiment with two groups pre-post test design. The intervention consists of training for peer educators, focus group discussion, and evaluation conducted in four days through virtual media. A total of 60 respondents were divided into an intervention and a control group. An instrument used in this study used a questionnaire of knowledge and practice of dengue (Self-Efficacy (Practice for Dengue Fever) total of 27 questions. Data analysis using paired t-test and ANCOVA. **Results:** A significant mean increase in DHF knowledge and prevention showed after a peer education intervention with $p < 0.05$. **Conclusion:** Peer education is one of the efforts to provide knowledge about health information and changing health behavior.

Keywords: Peer, Education, Dengue, Adolescent, Knowledge, Prevention

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INTRODUCTION

Dengue hemorrhagic fever (DHF) is a significant health problem now in several tropical countries and includes in the top ten list diseases that are a potential threat that can cause outbreaks or pandemics [1]. Based on the report, the incidence of DHF for the last two decades has increased eight times, from 505,430 in 2010 reached to 2.4 million in 2020, including in Indonesia with a total case up to 71,633 [2] The rise of dengue prevalence during the Covid-19 pandemic makes it a new phenomenon that allows someone can be both infected with SARS-COV 2 and DHF[3]. Similar clinical manifestation and laboratory results make healthcare

professionals challenging to diagnose between Arthropod-borne diseases and coronavirus [4,5] World Health Organization (WHO) reported in 2020 the dengue cases increase alongside with Covid-19 in several countries mostly in tropical countries including South America region and Asia [1] The total of 86% of dengue cases attack children aged 1-15 years with the highest occurred among early and late adolescent [5].

According to previous research [6,7], the lack of general knowledge and low perceptions related to DHF caused this disease is still a significant health problem and potential threat for outbreak and pandemic in the future. Breeding space of Aedes mosquitoes mostly placed in public places including school therefore many dengue cases occur in children and adolescent. Furthermore, in all levels of formal education, the students had limited DHF knowledge, and practice of prevention is still low, including adolescent high school [6].

There is a significant relationship between the level of knowledge and the behavior of preventing DHF [8]. To increase the level of knowledge by strategic innovation in health promotion is needed because knowledge impacts the behavior of dengue vector control. Factors in achieving the goals of health promotion are the methodology and one of the effective techniques by peer education. Peer education enables adolescents to make open discussions in the process of conversations and questions; therefore, the understanding process becomes easier [9]. Peer education increases the knowledge and attitudes of adolescents about HIV-AIDS prevention [10].

Research on peer education on DHF is still limited; thus, based on the described above, this study will describe the effectiveness of peer education is effective in increasing knowledge and behavior prevention-related to DHF among adolescents in Indonesia.

MATERIALS AND METHODS

This study is a quasi-experimental design with two groups consisting of control and intervention group with pre-posttest design. Convenience sampling method was used in this research in Mei 2021 for one month period.

A total of 60 respondents agreed to participate in this study and were divided into two groups at intervention and control. This study was conducted in one of the most prominent high schools in a rural area in West Java, Indonesia.

The research instrument consisted of demographic data, self-filled questionnaire about DHF knowledge,

and prevention behavior designed by [11] with a total of 27 questions. There are five domain variables: DHF and Aedes mosquitoes, DHF transmission, DHF prevention, DHF signs and symptoms, and treatment. The correct answer is given a score of 1, while the wrong and not know given score is 0. This instrument had good reliability with Cronbach’s alpha > 0.826. Data analyzed used SPSS Version 23 univariate and bivariate (Paired T-Test and ANCOVA). Normality test with Shapiro-Wilk described that data was normally distributed with p-value >0.005.

The process of peer-group by researchers provide training for four days to peer educators by delivering materials through Google Meet and WhatsApp Group. The information related to general information, etiology, clinical manifestation, transmission, prevention, and dengue treatment and management. After that, the leader group will explain to the students for 45 minutes, starting with the presentation of the material and watching the video. The last session is sharing discussions and the total of each session is up to 1- 1.5 hours. The standard operating procedure of the peer education intervention process implemented in this study has been validated by experts from a health background.

RESULTS

Based on table 1 it can be concluded that most of the respondents (n=44, 73%) are female, aged 17 year old (SD = 0.64), had heard of DHF (n=59, 98.3 %), and gained information sources from the internet (n=51.7%). There were significant differences in age and gender between the two groups.

Table 1 : General Characteristics of high school students (N=60)

Variables	Total n(%)	Intervention n(%)	Control n(%)	p-value
Age (Mean ± SD)	17.00 ± 0.64	16,70 ± 0.54	17,30 ± 0.56	0.001*
Sex				0.007
Male	16 (26.7)	3 (5,0)	13 (21,7)	
Female	44 (73,3)	27 (45,0)	17 (28,3)	
DHF information				0.313
Yes	59 (98.3)	29 (48,3)	30 (50,0)	
No	1 (1.7)	1 (1,7)	0 (0,0)	
Sources information				0,634
Friends	3 (5.0)	0 (0,0)	3 (5.0)	
Television	23 (38,3)	16 (26,7)	7 (11,7)	
Internet	31 (51.7)	14 (23,3)	17 (28,3)	
Healthcare professionals	3 (5.0)	0 (0,0)	3 (5,0)	

Table II : Knowledge and Practice Prevention of DHF among high school students (N=60)

DHF related	Intervention (N=30)		Control (N=30)	
Knowledge and Practice	Mean \pm SD	Min \pm max	Mean \pm SD	Min \pm max
Total score Knowledge				
Pre-test	15.43 \pm 3.491	6 \pm 22	14.87 \pm 3.246	4 \pm 20
Post-test	21.97 \pm 1.903	19 \pm 25	14.97 \pm 3.222	11 \pm 20
DHF and Aedes mosquitoes				
Pre-test	5.87 \pm 1.814	2 \pm 9	5.43 \pm 1.406	2 \pm 8
Post-test	9.60 \pm 0.894	8 \pm 11	5.50 \pm 1.456	2 \pm 8
DHF transmission				
Pre-test	0.17 \pm 0.379	0 \pm 1	0.20 \pm 0.407	0 \pm 1
Post-test	0.37 \pm 0.490	0 \pm 1	0.23 \pm 0.430	0 \pm 1
DHF prevention				
Pre-test	3.53 \pm 0.629	2 \pm 4	3.53 \pm 1.137	0 \pm 5
Post-test	4.17 \pm 0.592	3 \pm 5	3.57 \pm 1.073	0 \pm 5
DHF signs and symptoms				
Pre-test	4.83 \pm 1.802	0 \pm 7	4.83 \pm 1.802	1 \pm 7
Post-test	5.93 \pm 0.828	4 \pm 7	4.37 \pm 1.520	0 \pm 7
DHF treatment				
Pre-test	1.03 \pm 0.556	0 \pm 2	1.27 \pm 0.740	0 \pm 3
Post-test	1.90 \pm 0.885	1 \pm 3	1.30 \pm 0.750	0 \pm 3
Total score Prevention				
Pre-test	25.33 \pm 4.971	11 \pm 32	23.00 \pm 5.072	9 \pm 33
Post-test	29.90 \pm 2.833	22 \pm 34	22.97 \pm 5.089	9 \pm 33
Prevention of mosquito breeding				
Pre-test	10.33 \pm 2.695	5 \pm 15	9.77 \pm 2.944	3 \pm 15
Post-test	12.67 \pm 2.106	6 \pm 15	9.90 \pm 2.952	3 \pm 15
Cue to action				
Pre-test	5.57 \pm 0.898	2 \pm 6	5.23 \pm 1.331	0 \pm 6
Post-test	9.43 \pm 0.583	4 \pm 6	5.23 \pm 1.331	0 \pm 6
Prevention of mosquito bites				
Pre-test	9.43 \pm 2.635	3 \pm 14	7.87 \pm 1.987	5 \pm 12
Post-test	11.50 \pm 1.383	7 \pm 16	7.83 \pm 2.001	5 \pm 12

The results of this study showed that the average score of knowledge and prevention before the peer-group was lower in both intervention and control groups (Table II). A significant mean increase in DHF knowledge ($t=12.77$) and prevention ($t=4.54$) described after being given a peer education intervention (Table III). In subgroup analysis from knowledge variable, a domain that statistically significant

($p < 0.005$) are dengue etiology, transmission, clinical manifestation, and treatment (Table III) and in practice prevention variable, a domain that statistically significant ($p < 0.005$) are prevention from mosquito breeding and bites. There was a significant difference in DHF knowledge and prevention with ($F=75.05$, $p < 0.05$) (Table IV).

Table III : The analysis of DHF knowledge and practice prevention among high school students (N=60)

DHF related	Pre-test	Post-test	t	Mean difference	p-value
Knowledge and Practice	(Mean±SD)	(Mean±SD)			
Total Score Knowledge					
Intervention	15.43 ± 3.491	21.97 ± 1.903	12.777	6.533	0.000
Control	14.87 ± 3.246	14.97 ± 3.222	0.451	0.100	0.655
Domain Score					
DHF and Aedes mosquitoes					
Intervention	5.87 ± 1.814	9.60 ± 0.894	10.411	3.733	0.000
Control	5.43 ± 1.406	5.50 ± 1.456	0.528	-0.067	0.601
DHF transmission					
Intervention	0.17 ± 0.379	0.37 ± 0.490	1.795	0.200	0.083
Control	0.20 ± 0.407	0.23 ± 0.430	1.000	0.033	0.326
DHF transmission					
Intervention	3.53 ± 0.629	4.17 ± 0.592	3.739	0.633	0.001
Control	3.53 ± 1.137	3.57 ± 1.073	0.571	0.033	0.573
DHF signs and symptoms					
Intervention	4.83 ± 1.802	5.93 ± 0.828	4.235	1.100	0.000
Control	4.83 ± 1.802	4.37 ± 1.520	-0.626	-0.067	0.536
DHF treatment					
Intervention	1.03 ± 0.556	1.90 ± 0.885	4.069	0.867	0.000
Control	1.27 ± 0.740	1.30 ± 0.750	1.000	0.033	0.326
Total Score Prevention					
Intervention	25.33 ± 4.971	29.90 ± 2.833	4.542	4.567	0.000
Control	23.00 ± 5.072	22.97 ± 5.089	1.000	0.033	0.326
Domain Score					
Prevention of mosquito breeding					
Intervention	10.33 ± 2.695	12.67 ± 2.106	3.796	2.333	0.001
Control	9.77 ± 2.944	9.90 ± 2.952	1.682	0.133	0.103
Cue to action					
Intervention	5.57 ± 0.898	9.43 ± 0.583	0.841	0.167	0.407
Control	5.23 ± 1.331	5.23 ± 1.331	0.000	0.000	1.000
Prevention of mosquito bites					
Intervention	9.43 ± 2.635	11.50 ± 1.383	3.856	2.067	0.001
Control	7.87 ± 1.987	7.83 ± 2.001	1.000	0.033	0.326

DISCUSSION

DHF knowledge and prevention among adolescents

The possible cause of lower adolescent knowledge before peer education intervention because lack of education, and almost all respondents never received related DHF information (Table I). This was similar to previous research [12] and increased knowledge after the intervention because health information was given. One who has good knowledge will understand how to prevent DHF [13].

Increased DHF knowledge will impact DHF prevention to control dengue vectors and have a statistically significant relationship between both variables [14]. DHF prevention from external and internal actions, including cleaning water resources, closing the water reservoir, and pouring abate powder strongly related to DHF incidence. From this study, adolescents showed preventive behavior after peer education interventions. Similarly, with research by [15], peer education is related to adolescent girls with anemia.

Effectiveness of Peer Education on DHF Knowledge and Prevention

Improving strategies of health education are strongly needed during a pandemic crisis. Empowering adolescent engagement should be adapted in this vast shifting [16]. Through various implementations both in traditional and modern health promotion information will comprehend by the target population. Media online platforms are widely used for adolescents therefore peer-educator used this to teach this millennial generation are easier and well-communicated.

Peer education effectively increases adolescent knowledge because the process of delivering information is carried out repeatedly and insufficient time by peer educators [17]. Furthermore, peer groups with closer relationships used the same language and a simple method; thus, respondents are more comfortable discussing [18].

This research is in line with research conducted by [19,20], which proves that peer education can increase HIV/AIDS adolescent knowledge. The results of this study are also in line with research conducted by [20] which showed that peer education could increase knowledge of dengue in high school adolescents. Adolescents were able to understand DHF, clinical manifestation, transmission, and how to prevent DHF.

Peer education influences adolescent behavior through their role models who have reputable credibility and innovators in their group. Therefore, peer education is one of the efforts to provide knowledge about health information, changing health behavior [21,22].

Another study showed that the effectiveness of peer education on perineal hygiene behavior in adolescent girls [23,24]. The result from this study indicate health promotion are constantly changing and innovation was urgently developed using various technology approach with community empowerment [25].

CONCLUSION

Health promotion with peer education is one effective technique for adolescents to increase knowledge and change behaviour. DHF is a community disease therefore modification from environment is must needed with cooperation from all sectors. Health unit in school must used variation method to deliver information to youth and involved peers as mentor.

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