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The Effect of Lecture and Small Group Discussion Methods in Health Education Towards Dengue Hemorrhagic Fever Vector Larva Free Proportion in Gunungkidul Regency

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ABSTRACT

Background: Dengue Hemorrhagic Fever (DHF) is a community health problem in Gunungkidul Regency, Yogyakarta. In the last five years, the case number and its spread have been increasing. Many efforts have been conducted to overcome the case increase, and the most important is community participation in Mosquito Nest Eradication/*Pemberantasan Sarang Nyamuk* (PSN). Health education through radio broadcast, leaflet, and lecture is still failing in changing community behavior to conduct PSN continuously because the number of larva free areas is still low and the spreading keeps increasing. Previous studies found that Small Group Discussion (SGD) was more effective in changing community behavior. Therefore, further study is needed to find out the effectiveness of the SGD and lecture methods towards community behavior in PSN, which can be measured using larva free proportion in the households.

Objectives: The objective of the study was to find out the effect of health education using Small Group Discussion (SGD) and lecture methods towards DHF vector larva free proportion in the household. **Methods:** The study was a quasi-experiment with control time series design. Research was conducted in Wonosari district, Karangmojo district, and Playen district in Gunungkidul Regency. The subject of the study was 412 households divided into three groups: lecture intervention group, SGD intervention group, and control group. Data analysis used paired sample t-test and Mann-Whitney test. **Results:** There was an effect in health education using SGD method towards DHF vector larva free proportion with p -value $< \alpha$ (0.05). There was a difference in DHF vector larva free proportion using lecture method but it was not statistically significant, p -value $> \alpha$ (0.05). There were differences between SGD with lecture method and control group in increasing DHF vector larva free proportion with p -value $< \alpha$ (0.05). **Conclusion:** There was a difference in the effect in health education using the SGD method and lecture method towards DHF vector larva free proportion in the household. Health education using the SGD method is more effective than lecture method to increase DHF vector larva free proportion in the household.

Keywords: *lecture, SGD, DHF larva free, Gunungkidul Regency, Indonesia*

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is still one of the significant health problems in the world. In the last few years, its incidence and spread have been increasing globally. About 2.5 billion people in the world live in DHF endemic areas, including Indonesia¹. For 45 years, DHF

incidence and spread have been increasing rapidly through 34 provinces and 446 regencies/cities in Indonesia².

In Indonesia, the Special Region of Yogyakarta (DIY) has the fourth highest incidence of DHF after Bali province, East Kalimantan, and Jakarta³. All regencies/cities in DIY

are DHF endemic areas, including Gunungkidul Regency. In the last five years, the incidence, spread, and endemics of DHF have been increasing. In 2016, DHF case reporting has spread in all Gunungkidul districts. Sixteen of them were already DHF endemics⁴.

One of the efforts to lower the risk of the DHF disease transmission is using vector control, i.e. Mosquito Nest Eradication (PSN). Vector control can be enhanced by community participation in PSN^{5,6}. Meaningful empowerment can prepare the community or individuals with resources, chances, expertise, and knowledge to increase the community capacity participation in vector control⁷. Enhancement and empowerment of community participation in PSN are some of the basic principles of health promotion⁸. Health promotions through radio broadcast, leaflet, and lecture are still failing in changing community behavior to conduct PSN continuously because the number of larva free areas is still low. The number of larvae free households shows the spread of the disease and the risk of transmission⁹.

Previous studies said that Small Group Discussion (SGD) was more effective in changing community behavior^{10,11,12}. This research studied the effect of health education with SGD and lecture methods in changing community behavior to conduct PSN in Gunungkidul Regency, which was measured by household larva survey.

Lecture method in health education is one way to orally explain an idea, or message to the targeted group in conveying health information. Group discussion method uses constructed and prepared talks about a topic among 5-20 participants (objectives) with one appointed group discussion leader¹³.

The objective of the study is to find out the difference in the effect of health education using Small Group Discussion (SGD) and lecture methods towards DHF vector larva free proportion in the household and to determine which one is more effective.

RESEARCH METHODS

The research was a quasi-experiment using control time series design¹⁴. It was conducted in Wonosari district, Karangmojo district, and Playen district in Gunungkidul Regency using Cluster Random Sampling as the sampling method. Samples were divided into three groups: lecture intervention group, SGD intervention group, and control group¹⁵.

Univariate analysis provides distribution table and narration in each variable to find out the characteristics of the research subjects, e.g. age, gender, education, job, and the existence of DHF's exposed in a family member in the last one year. Larva survey results in pre-intervention and post-intervention from each group were analyzed using paired sample t-test with significant level $p < 0.05$. The difference in results from pre-intervention and post-intervention in the treatment and control groups was analyzed using the Mann-Whitney test with significant level $p < 0.05$ ¹⁶.

Intervention Method with Small Group Discussion (SGD)

Small Group Discussions (SGD) were conducted once in each group for 90-120 minutes. The group with SGD intervention was divided into small groups which consisted of 8-10 persons. The discussion was using Bahasa Indonesia and Bahasa Jawa, as local languages. Flip chart, board marker, speaker, slide projector and laptop were used as media of discussion¹⁷.

Each group was accompanied by the facilitator that consisted of health workers with a health education background who have extensive knowledge in the DHF topic. A facilitator led the discussion process, facilitated the discussion for smoothness and became the resource person of discussed topic¹⁸. Beside the facilitator, there was also a secretary who typed all responses from participants and a presenter that presented the group discussion result.

SGD data which were processed included opinion exploration and experiences from all participants about DHF and scientific material presentation from each small group in larger group forum¹⁹. SGD was expected to produce consensus to become a group norm in DHF prevention.

Intervention Method with Lecture

The lecture was conducted once for each group with 60-80 participants for 90-120 minutes. The lecturer was a health worker with a health education background, having knowledge of DHF countermeasures and prevention and experienced in lecturing. Speaker, laptop and slide projector were used as support media.

The lecture was conducted with participants seated in their seats or on the floor, adjusted with the local conditions, and all facing in the same direction. The lecturer was standing or seated in front of participants, adjusted with local habits and conditions. It included a scientific material presentation from the lecturer, Q&A session and participants' responses.

Larva Survey Implementation

Larva survey was held to measure PSN changing behavior before and after intervention²⁰. Pre-intervention larva survey was conducted once before the implementation of lecture in intervention group or at the beginning of the study in the control group. Meanwhile, the post-intervention survey was conducted serially every week for a month in the intervention group and control group.

Larva survey process included examination in water reservoirs and other potential places for mosquitos to breed in and out of the house. Every larva discovery in the household area was marked as larva existence (t), without considering its quantity or its place of origin²¹.

RESULTS

Respondent Characteristics

Gender, age, education, job and the existence of DHF's exposed in a family member in Gunungkidul, DIY as respondents' characteristics are displayed in Table 1. Table 1 shows that most of the respondents in the control and

SGD groups were females, while the lecture group was male. Most of the respondents in the lecture, SGD, and control groups were 41–50 years old. Most respondents in control and lecture groups were elementary school/equal graduates, while respondents in the SGD group were junior high school/equal graduates. Most of the respondents in

all groups were farmers. DHF's exposed family member existence in the last one year in all three groups was the same, between 2% - 7%.

The Results of DHF Vector Larva Free Proportion Measurement in Control Group

To see the difference between the start of the study and

Table 1. Respondent Distribution based on Gender in Control Group and Intervention Group (n = 412)

No	Respondent Characteristic	Description	Control		Intervention		Total		
			F	%	f	%		f	%
1	Gender	Male	49	33.6	70	51.9	17	13	136
		Female	97	66.4	65	48.1	114	87	276
2	Age	20-30 years	12	8.2	5	3.7	15	11.5	32
		31-40 years	24	16.4	28	20.7	28	21.4	80
		41-50 years	42	28.8	39	28.9	38	29	119
		51-60 years	33	22.6	30	22.2	33	25.2	96
		61-70 years	17	11.6	22	16.3	16	12.2	55
		71-80 years	15	10.3	11	8.2	0	0	26
		81-90 years	3	2.1	0	0	1	0.7	4
3	Education	Not graduating from elementary school	25	17.1	17	12.6	29	22.1	71
		Elementary school	45	30.8	45	33.3	36	27.5	126
		Junior high school	40	27.4	44	32.6	39	29.8	123
		Senior high school	31	21.2	25	18.5	25	19.1	81
		D. I - D.III	1	0.7	1	0.7	2	1.5	4
		D.IV - S1	4	2.8	3	2.3	0	0	7
4	Job	Civil/Military/Police Servants	5	3.4	4	3	4	3.1	13
		Employees of BUMN/BUMD	0	0	2	1.5	3	2.3	5
		Private employees	7	4.7	3	2.2	0	0	10
		Village government officials	1	0.7	4	3	1	0.8	6
		Farmer	69	47.3	81	60	68	51.8	218
		Labor	6	4.1	19	14.1	14	10.7	39
		Entrepreneur	15	10.3	16	11.8	14	10.7	45
		Others (Housewife, Retired)	43	29.5	6	4.4	27	20.6	76
5	DHF's Exposed Family Member Status	DHF's exposed family member existence	7	4.8	3	2.2	10	7.6	20
		DHF's exposed family member absence	139	95.2	132	97.8	121	92.4	392

the first week to the fourth week in the control group, the authors were able to present the larva-free proportions in Table 2. Table 2 shows that the proportion of larvae at the beginning of the study control group compared to the end of observation experienced a significant increase of 44.5%

at the start of the study to 58.9% at the end of the study, with p -value > α (0.05). This result means that there is a significant difference in the proportion of larvae at the start of the study with the end of the study in the control group.

Table 2. Pre-test and Post-test of Larva Free Proportion Distribution in Control Group

Larva Free Proportion	Pre-test Control		Post-test Control Group							
			1st Week		Week-2		Week-3		Week-4	
	f	%	f	%	f	%	f	%	f	%
Exist	81	55.5	65	44.5	78	53.4	69	47.3	60	41.1
Absence	65	44.5	81	55.5	68	46.6	77	52.7	86	58.9
Total	146	100	146	100	146	100	146	100	146	100
<i>p</i> -value			0.000		0.258		0.028		0.000	

The Results of DHF Vector Larva Free Proportion Measurement in Lecture Group

To see the difference between pre and post-intervention in the lecture group data are presented in Table 3 below. Table 3 shows that the proportion of larvae in the lecture group before the intervention was 54.8%, and there was

an increase at the end of the study to 62.2% (Mg-4). The results of statistical calculations using the paired sample t-test obtained p -value > α (0.05), meaning there was no significant difference in the proportion of free DHF vector larvae between before and after giving counseling using the lecture method.

Table 3. Pre-Intervention and Post Intervention Larva Free Proportion Distribution in Lecture Group

Larva Free Proportion	Pre-test Lecture		Post-test Lecture Group							
			1st Week		2nd Week		2rd Week		4th Week	
	f	%	f	%	f	%	f	%	f	%
Exist	61	45.2	65	48.1	58	43	53	39.3	51	37.8
Absence	74	54.8	70	51.9	77	57	82	60.7	84	62.2
Total	135	100	135	100	135	100	135	100	135	100
<i>p-value</i>			0.588		0.693		0.311		0.227	

The Results of DHF Vector Larva Free Proportion Measurement in SGD Group

To see the difference between pre and post interventions in the DHF group data are presented in Table 4 below. Table 4 shows that the proportion of free pre-intervention larvae in the DKK group was 49.6%. The free proportion of post-intervention larvae increased since the first week and was

consistent until the fourth week to 86.3% (Mg-1), 95.4% (Mg-2), 96.2% (Mg-3), and 96.9% (Mg-4). The results of statistical calculations using the paired sample t-test obtained *p*-value in the first week to the fourth week of $0.000 < a (0.05)$, which means that there was a significant difference in the proportion of free DHF vector larvae before and after counseling using the DKK method.

Table 4. Pre-Intervention and Post Intervention Larva Free Proportion Distribution in SGD Group

Larva Free Proportion	Pre-test SGD		Post-test SGD							
			1st Week		2nd Week		2rd Week		4th Week	
	f	%	f	%	f	%	f	%	f	%
Exist	66	50.4	18	13.7	6	4.6	5	3.8	4	3.1
Absence	65	49.6	113	86.3	125	95.4	126	96.2	127	96.9
Total	131	100	131	100	131	100	131	100	131	100
<i>p-value</i>			0.000		0.000		0.000		0.000	

The Results of DHF Vector Larva Free Proportion Measurement in Intervention and Control Group

Comparison of the proportion of free DHF vector larvae in the intervention group with the control group was using the Mann Whitney test. The results are presented in Table 5 which shows the results of the comparison of changes in the proportion of free DHF vector larvae in the SGD group

with the lecture and control groups that obtained *p*-value $0.000 < a (0.05)$, meaning there are significant differences between the intervention group and the lecture group and control. Since the mean rank of the SGD group was higher than the other groups, then the education with the SGD method was more effective than the lecture method.

Table 5. Results of Mann-Whitney Comparison Test for DHF Vector Larva Free Proportion between the Intervention and Control Group

Group	Mean Rank			
	1st Weeks	2nd Weeks	3rd Weeks	4th Weeks
Lecture	110.96	108.36	110.29	110.76
SGD	156.73	159.41	157.42	156.94
Control	145.77	151.05	147.13	146.18
Z	-6.044	-7.308	-6.986	-6.978
<i>p-value</i>	0.000	0.000	0.000	0.000

The time series of larva-free proportions in the lecture intervention group, SGD intervention, and control groups are shown in the graph below. At the beginning of the study and pre-intervention, the proportion of free larvae in the lecture group, the SGD group, and the control group had similar values of 54.8% (lecture group), 49.6% (SGD group), and 44.5% (control group).

Larva free proportion in the SGD group has increased significantly after the intervention and stay stable until the end of the study. From 49.6% in pre-intervention, increased to 86.3% (w-1), 95.4% (w-2), 96.2% (w-3), and 96.6% (w-4). The serial larva free proportion number in the lecture and control groups was equal. Larva free proportion in the lecture group was 54.8% in pre-intervention and then

decreasing in week one of post-intervention to 51.9%. It began increasing after week 2 with 57%, week 3 with 60.7% and week 4 with 62.2%. Meanwhile, in the control group, the proportions of larva free from pre-intervention up to week 4 were as follows, 44.5%, 55.5%, 45.6%, 52.7%, and 58.9%.

The graphic shows that there was an effect of the SGD method in health education towards larva free proportion, compared to the lecture method and control. Meanwhile, there was no difference between the lecture method and control in health education.

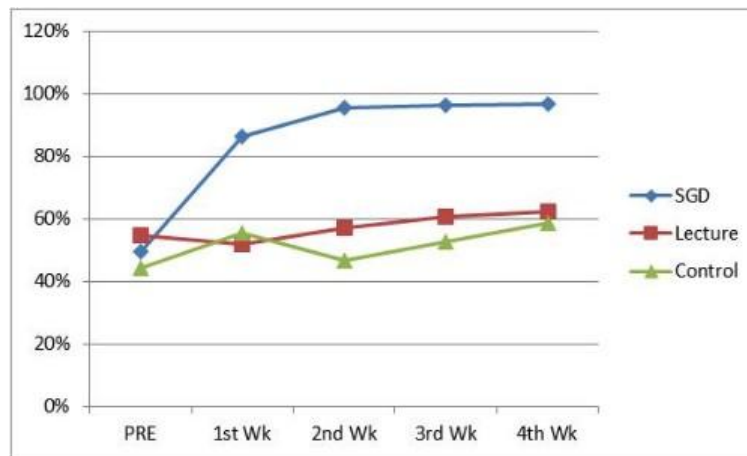


Figure 1. The Difference between Pre-Intervention and Post Intervention of Health Education in SGD, Lecture and Control Group

DISCUSSION

We need a special strategy to change people's behavior. The strategy can use enforcement, regulation, and education. Changing people's behavior through education is more effective than enforcement and regulation⁸. Education can be applied by giving valid and accurate information to increase knowledge in the community. Therefore, they will act and talk in accordance with their education. The right education method needs to be chosen in order to change community behavior.

This study was conducted in order to find out the effect of health education using Small Group Discussion (SGD) and lecture methods towards community behavior in mosquito nest eradication (PSN), measured by DHF vector larva free proportion in the household. Hypothetically, SGD intervention was more effective to increase DHF vector larva free proportion in the household.

The Effect of Health Education Using Lecture Method towards DHF Vector Larva Free Proportion in Gunungkidul

Measurement test in pre-intervention and post-intervention showed that the proportion of larva free was increasing by using the lecture method. However, it wasn't statistically significant (Tables 4 and 8). This finding meant that there was no significant difference in larva free proportion between pre-intervention and post-intervention in health education using the lecture method.

This result was different from the previous study by Lubis *et al.* which stated that there was a significant effect in health education using lecture method to increase community knowledge and behavior for a healthy and clean lifestyle (PHBS)²². It was because the changing of knowledge and behavior in the community can be observed sooner than

the initial behavior like PSN.

The study by Santoso also found the same result, that the lecture intervention was more effective to improve the use of drugs in therapy and decrease the non-rehydrate drugs in acute diarrhea. The differences between Santoso's research and this study were on the terms of the study and the lecture method. Santoso's study was conducted for three months, while this study was only a month. The lecture method in this study was less effective in changing community behavior due to a weaker stimulant that was received by the targets or respondent perceptions on PSN behavior.

The Effect of Health Education Using SGD Method towards DHF Vector Larva Free Proportion in Gunungkidul

Measurement test in pre-intervention and post-intervention showed that the proportion of larva free was increasing by using the SGD method. There was a significant effect from the SGD method in increasing the DHF vector larva free proportion in the household. This result was in accordance with the study by Hadiyono *et al.*, which said that behavior intervention using group interaction discussion was significantly decreasing the use of unnecessary injection and absorbed drug quantity. Santoso's study also said that face to face intervention in a small group was more effective in increasing the knowledge and the right medication for diarrhea patients¹².

The larva free proportion in the SGD method was significantly increased after the intervention. It was probably caused by several factors, e.g. the relaxed and informal situation during discussion so the participants felt more comfortable and actively shared their opinions and experiences in controlling the DHF, the presentation

of the facilitator that made the discussion run smoothly and focused and there was also a consensus the participation of community in conducting the PSN.

DHF Vector Larva Free Proportion Differences between Health Education Intervention Group using SGD and Lecture Method and Control Group

The test was conducted by using Mann-Whitney in order to find out the difference of larva free proportion between SGD and lecture groups in Gunungkidul Regency. Results showed that the education using the SGD method was more effective than the lecture method in increasing the larva free proportion.

This result can be explained, as follows, 1) education using lecture method was mostly affected by lecturer's ability to attract the audiences. In the SGD method, all participants were being active while the lecturer acted as facilitator, 2) the participants in both methods were adults. SGD method was more appropriate to teach adults due to communicative atmosphere, which was absent in the lecture method, and 3) SGD method produced a consensus that made all group members feel obligated to conduct PSN, while the lecture method only transferred the knowledge from the lecturer to the participants who probably could have gotten the same knowledge from other sources.

Study Limitations

Time limitation made the post-intervention observation was only conducted in a month, and the study only used two methods, i.e. lecture and small group discussion (SGD) methods, while there are many other effective and efficient methods that can be applied in community education programs, and there exist many external factors such as mass media as information source, that cannot be controlled by researcher.

CONCLUSIONS

Based on the study results and discussion that has been explained by the researcher, the conclusions are as follows: 1) health education using SGD method was more effective than lecture method in increasing the DHF larva free in household, 2) there was significant effect in health education using SGD method in increasing the DHF larva free proportion in household, and 3) there was no significant difference in DHF larva free proportion between pre-intervention and post-intervention in health education using lecture method, and probably this was caused by too short of an observation time.

SGD method was shown to be more effective in changing community behavior to increase DHF larva free proportion in Gunungkidul, so it can be used as the basis of policy for prevention and countermeasures of DHF in Gunungkidul Regency Public Health Division. For the future research, further study needs to be done as the comparison and the observation time need to be extended for at least three months.

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Ethical Approval and Informed Consent

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Availability of Data and Material

Data and material can be accessed via corresponding author.

Conflict of Interest

None.

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