



Communication for Behavioral Impact (Combi) Strategy; Does it Improve Knowledge, Attitude and Practice on Dengue Control?

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Abstract

Indonesian government has elaborated the policy to controlled dengue fever through the program called *3M-Plus* which targeting in cleaning all the potential breeding places of mosquito. One of community empowerment method in dengue vector control is Communication for Behavioural Impact (COMBI). This strategy emphasizes strengthening information to the community in the concept of prevention and eradication of mosquito breeding. This study aims to assess the increasing of health behaviour in school setting after the implementation of COMBI strategy. This research using quasi experimental two group pre test-post test inferential causal design. The subjects are 108 of school teachers whose responsible in managing health care school unit, they divided into four groups of intervention.

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The data were analyzed using Wilcoxon and Kruskal Wallis. Results showed that the knowledge, attitude and behavior of school teacher in their efforts to eradicate dengue fever changed dramatically into positive behaviour. was very high in group 1 compared to the other groups. The increase of knowledge, attitude, and behavior in COMBI intervention group are higher than the other three comparison group. By this result, the influence of giving information with with COMBI approach will intensify the behavior changed of community in school setting to controlled and eradicate mosquito nest . Therefore this study recommend to all of health care unit in school setting adapt this strategy completely to enforced the activity in breaking the cycle of mosquito vector controlled in particular the breeding process of *Ae. Aegypti*.

Keywords: COMBI; DHF; Behavior; Nest Controlled; *Ae. Aegypti*.

1. Introduction

Dengue Haemorrhagic Fever (DHF) is one of the infectious diseases which is still a priority health problem since it often cause an outbreak and end up with death [1]. This disease caused by dengue virus spread by *Aedes aegypti* mosquito as the main vector [2]. The absence of dengue vaccine [3] and the number of cases spreading area is increasing in line with the increasing of mobility and population density [4]. This spreading area infected among all of tropical and sub-tropical region [5,6]. The clinical manifestations range from mild acute to life-threatening disease followed by a plasma leak syndrome resulting in hypovolemic shock and hemorrhage [7,8]. The increasing number of cases and due to the increasing number of immigration, elevated the existence of new settlements, traditional water storage that is still maintained by the community and their poor behavior in exterminate the mosquito nests [9-11]. The study found that lower community knowledge towards prevention of DHF influences on attitudes and behavior [12]. Rosdiana in his research also proved that there is a relationship between level of knowledge and behavior in eradication of *Ae. Aegypti* mosquito breeding [13].

Bone regency in South Sulawesi, Indonesia conducted as one of the nine epidemic outbreaks area in 2016. Patients are generally derived from villagers majority of school-aged children. The number of people affected by DHF symptoms at the beginning 2016 are 120 cases and 6 of it died, most of the cases attacked the villagers and children [14]. Conducting epidemiological observation through vector observation and eradication potentially decline. *Ae. Aegypti* mosquito control strategy performed to decrease morbidity and mortality rate by locating the breeding place and break the chain of transmission on it's life cycle [15]. This problematics can be eliminated by trying to apply an educational health communication approach. The Communication for behavioral Impact (COMBI) strategy emphasizes changes in societal behavior related to socio-culture, and based on target group segmentation, to solve problems especially on disease eradication and it has been proven in India, Kenya, SriLanka and Zanzibar [12,16-18]. Teachers as educators played a role in disseminating information in controlling DHF in school. A teacher needs to have knowledge and positive attitude in controlling DHF [19]. Their proper knowledge will affect their health behavior. Based on Health Ministerial Decree No.1457/2003 on Minimum Services Standards in the health sector in municipalities, each school has the obligation to conducted unit care for health in the school environment in efforts undertaken to improve the health of school-aged children through the School Health Unit. The World Health Organization also recommend the Health Promoting School integrating the school curriculum with health topic and education in effort to

improving the healthy behavior among all its component including students, teachers, parents, society, environment [17]. Therefore the students' awareness needed to maintain the health of the school community, especially the younger children who are vulnerable to disease. Development of school health care unit is important links in improving the quality of life among the school population. Despite the severity of DHF, it needs to held a comprehensive eradication strategy of the disease, it required the participation of all levels of society, especially in schools. The inactivity of monitoring mosquito breeding place in school by health care school unit consequences of uncontrolled nest. Therefore, such participation needs to be further enhanced through a more facilitative, bottom-up, partnership strategy where communities including non-governmental organizations including private and others have a larger, focused role, more optimizing cross-sectoral cooperation, supported by data, especially data social culture and the programming of nest controlled widely in provinces, districts, municipalities and primary health care [5]. This study aims to assess the influence of COMBI strategy to increase knowledge, attitude, behavior of DHF vector control on health care school unit among teachers in Bone regency.

2. Method

The study design using a quasi experiments with two group pretest and post test designs. Amount 108 school teacher divided into four groups: group one; given a training of COMBI strategy and modification module, group two; given training of conventional module, group three; using only modification module, and group four; using conventional module without training. The data collection using a self administered questionnaire before and after the intervention program. Data were analyzed by wilcoxon and kruskall wallis test.

3. Result

Knowledge is the result of knowing, and this happens after people have sensed a particular object. Sensing occurs through the human senses. Knowledge or cognition is a very important domain in shaping one's actions (overt behavior). The results of this study are shown in the form of graphs and tables as follows:

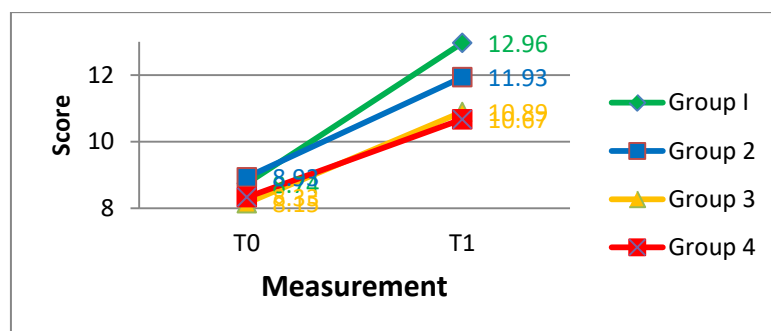


Figure 1: Knowledge score difference before and after intervention

Figure 1 shows that at the beginning of the measurement, the average score of knowledge of subject are highest in group 2 (8.93%) and lowest in group 3 (8.15%). At the end of the measurement the highest knowledge score in group 1 (12,96%), then group 2 (11,93%) and lowest in group 4 (10,67%). Form of behavior first occur

because of process of maturity and interaction with the environment . The second way is the greatest influence on human behavior. Formation and change of knowledge because the process of interaction between individuals with this environment through a process, called it the process of learning. Therefore, behavioral changes and learning process is very closely related. Attitude is the readiness or willingness to act, and not the implementation of certain motives [18]. In other words, the function of attitude is overt respond to situation. Attitude is not an action or activity, but is predisposing action of certain behavior.

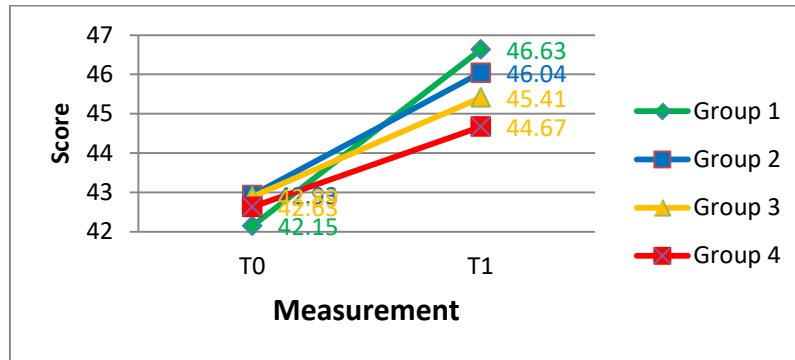


Figure 2: Attitude score difference before and after intervention

Figure 2 shows that at the beginning of measurement, the average score of respondents attitude is highest in group 2 (42.93%) and lowest in group 1 (42.15%). At the end of measurement, the highest attitude score in group 1 (46.63%), and lower group 4 (44.67%). The attitude is a closed reaction or response from a person towards a stimulus or object. It can be concluded that the manifestation of the attitude can not be directly seen, but can only be interpreted first. A theory explained that attitude has the main components of: belief, ideas and concepts of an object. Emotional life or evaluation of an object, tendency to act or to behave (Newcomb;1998). One social psychologist stated that attitude is a readiness or willingness to act, and not an exercise of a particular motive. In other words, the function of attitude is open reaction or activity, but is predisposing behavior (action) or closed reaction. How to change the attitude into an action or practice required supporting factors or a condition that allows, such as facilities and infrastructure [20]. Knowing the stimulus of health object, making an assessment or opinion of what it's known, then next process is expected to implement a certain behavior.

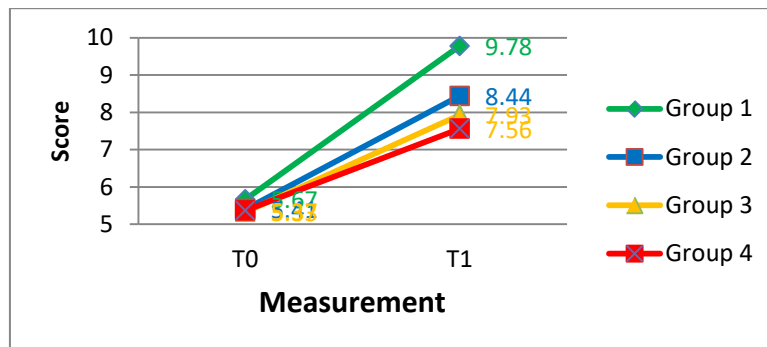


Figure 3: Practice score difference before and after intervention

Figure 3. shows that at the beginning of the measurement, the average score of respondents highest practice in the group 1 (5.67%) and the lowest in group 3 (5.33%). At the end of measurement, the highest knowledge score in group 1 (9.78%), and the lowest in group 4 (7.56%) .The measurement of practice or action is influenced by several factors coming from inside and outside the individual. Health behavior can be formed from stimulation such as: knowledge, intelligence, perception and motivation, while from outside that is influenced by external environment. Both physical and non-physical such as, climate, human, social economy, culture and custom [7]. The final result of measurement attitude score is higher in the first group (table 1). It is highly related to the tendency of taking some action against a favored object after the training experiment provided on the basic problems found in the school [13]. The training was conducted during 12 meetings with discussing the controls and completion.

Table 1: Knowledge, Attitude and Practice Score Measurement and Value Before and After Intervention

Variabel	Measurement		P value*	Score	P value**
	T0	T1			
Knowledge					
Group 1	8.74	12.96	0.001	4.22	
Group 2	8.93	11.93	0.001	3.00	
Group 3	8.15	10.89	0.001	2.74	0.001
Group 4	8.33	10.67	0.001	2.33	
Attitude					
Group 1	42.15	46.63	0.001	4.48	
Group 2	42.93	46.04	0.001	3.11	
Group 3	42.89	45.41	0.001	2.52	0.001
Group 4	42.63	44.67	0.001	2.04	
Practice					
Group 1	5.67	9.78	0.001	4.11	
Group 2	5.41	8.44	0.001	3.04	
Group 3	5.33	7.93	0.001	2.59	0.001
Group 4	5.37	7.56	0.001	2.19	

* Wilcoxon, **Kruskal Wallis

Improvement of knowledge, attitude, and practice in eradication of DHF was obtained. Wilcoxon test results showed that knowledge, attitudes, and practice of DHF experienced a significant change in all groups. Based on the Kruskal Wallis test results indicated that there are differences in the score changes of knowledge, attitude, practice of eradicating DHF. Based on the values, it was highest in group 1, group 2, group 3 and group 4.

Training was given in group 1 with modification module while group 2 with training using conventional module with smaller value of results was obtained compared to first group. Group 3 training without modification module was higher than the score obtained from group 4 with conventional modules without training. This means that modification module has higher effectiveness than conventional module in changing DHF eradication practice because based on analysis of local culture situation that exist in the area.

This study noted that there are influence of COMBI startegy to knowledge, attitude, practice of DHF controlled in school. Increased knowledge, attitude, practice of eradicating DHF was higher among respondents who received training than those who did not receive training. The use of modified modules has a higher value than the existing conventional modules. The results of this study support panel the intervention by providing training to teacher who responsible in school health care unit. There is an increase in knowledge, attitude and behavior before and after intervention. Knowledge is the result of knowing that occurs through sensory processes, especially the eyes and ears of a particular object. In this research, the improvement of knowledge, attitude, and practice occurs because of the provision of training through demonstration methods and frequently asked questions by involving entomologists and the educational expert [20]. This is consistently stated that knowledge is very important domain for the formation of overt behavior [20]. Knowledge are affected by information and experience through demonstration methods. By obtaining new knowledge about dengue eradication and experience an empirical practice after training, the school teachers able to applied this new behavior in everyday life particularly in eradicating DHF at the school level. As it known today the number of school children is estimated 30% among the total population in Indonesia or around 73 million people. With this amount, the school-aged children facing multiple health problem including DHF. Teachers as educators can play a role in disseminating information in controlling DHF. In addition, a character has a great influence in moving students and their families, because the general public is more easy to accept what is described by role models. In order to realize the condition, a teacher needs to have positive knowledge and attitude in controlling DHF. Knowledge will affect behavior as intermediate impact and health behavior will influence the increase of public health indicator as health education outcome.

4. Conclusion

There is an effect of information sharing with COMBI approach to change of knowledge, attitude, and behavior of DHF vector control. The highest effectiveness of knowledge, attitude, and behavior improvement in group that received training and modification module compared to training with conventional module. This study recomend that all school teacher are priority subject which must be included in sustainable COMBI training program so have a tremendous impact in eliminating DHF transmission.

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References

- [1]. WHO. Prevention and Control of Dengue and Dengue Haemorrhagic Fever. Terjemahan dari WHO Regional Publication SEARO. 2004. No. 29, New Delhi. <http://www.who.int/tdr/publications/documents/dengue-diagnosis.pdf>. 2004.
- [2]. Organization WH. Prevention and control of dengue and dengue haemorrhagic fever: comprehensive guidelines. Prevention and control of dengue and dengue haemorrhagic fever: comprehensive guidelines. 1999.
- [3]. Arsin AA. Epidemiologi Demam Berdarah Dengue (DBD) di Indonesia. MASAGENA PRESS; 2013.
- [4]. Vargas WP, Kawa H, Sabroza PC, Soares VB, Honório NA, de Almeida AS. Association among house infestation index, dengue incidence, and sociodemographic indicators: surveillance using geographic information system. *BMC public health*. 2015;15.
- [5]. Saifur RGM, Dieng H, Hassan AA, et al. Changing Domesticity of *Aedes aegypti* in Northern Peninsular Malaysia: Reproductive Consequences and Potential Epidemiological Implications. *PLoS One*. 2012;7(2).
- [6]. Kemenkes. Modul pengendalian demam berdarah dengue. http://www.pppl.depkes.go.id/_asset/_download/manajemen%20DBD_all.pdf. 2011.
- [7]. Sarfraz MS, Tripathi NK, Tipdecho T, Thongbu T, Kerdthong P, Souris M. Analyzing the spatio-temporal relationship between dengue vector larval density and land-use using factor analysis and spatial ring mapping. *BMC public health*. 2012;12:853.
- [8]. Depkes. Penemuan dan Tatalaksana Penderita Demam Berdarah Dengue, Jakarta. <https://silahuddinm.files.wordpress.com/2013/02/bk2007-g4.pdf>. 2010.
- [9]. Troyo A, Fuller DO, Calderón-Arguedas O, Solano ME, Beier JC. Urban structure and dengue fever in Puntarenas, Costa Rica. *Singapore journal of tropical geography*. Jul 1 2009;30(2):265-282.
- [10]. Getachew D, Tekie H, Gebre-Michael T, Balkew M. Breeding Sites of *Aedes aegypti*: Potential Dengue Vectors in Dire Dawa, East Ethiopia. *International Scholarly Research Notices*. 2015;2015.
- [11]. Neng W, Shusen W, Guangxin H, Rongman X, Guangkun T, Chen Q. Control of *Aedes aegypti* larvae in household water containers by Chinese cat fish. *Bulletin of the World Health Organization*. 1987;65(4):503-506.
- [12]. Wiwik d. Pengembangan metode pemberdayaan masyarakat dalam pengendalian vektor demam berdarah dengue di kota Semarang provinsi jawa tengah. . <http://model.pemberdayaan.PMPV.COMBI.pdf>. ; 2015.
- [13]. Jacobs N, Clays E, De Bacquer D, et al. Effect of a tailored behavior change program on a composite lifestyle change score: a randomized controlled trial. *Health education research*. 2011;26(5):886-895.
- [14]. Bone D. Profil kabupaten Bone ,2016
- [15]. Correction: use of insecticide-treated school uniforms for prevention of dengue in schoolchildren: a cost-effectiveness analysis. *PLoS One*. 2015;10(2):e0118038.
- [16]. Rizzo N, Gramajo R, Escobar MC, et al. Dengue vector management using insecticide treated materials and targeted interventions on productive breeding-sites in Guatemala. *BMC public health*. 2012;12:931.

- [17]. WHO. European Network of Health Promoting Schools dikutip dalam Thurston,. 2006.
- [18]. Suhaili MR, Hosein E, Mokhtar Z, Ali N, Palmer K, Isa MM. Applying communication-for-behavioural-impact (COMBI) in the prevention and control of dengue in Johor Bahru, Johore, Malaysia. *Dengue Bulletin*. 2004;28:39.
- [19]. Kabir MI, Rahman MB, Smith W, Lusha MAF, Milton AH. Child Centred Approach to Climate Change and Health Adaptation through Schools in Bangladesh: A Cluster Randomised Intervention Trial. *PLoS One*. 2015;10(8).
- [20]. Glanz K, Rimer BK, Viswanath K. *Health behavior and health education; theory, research, and practice*; Jossey-Bass; 2015