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The Effectiveness of Health-Community-Based Waste Management in Yogyakarta

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Abstract

The people's understanding of waste affects their attitudes and modes in waste management. The attitudes towards health-community-based waste management has their positive impact i.e. improving environmental and community health and in the end promoting community's economy. This research aimed at understanding the effectiveness of health-community-based waste management in Yogyakarta indicated by the residents' knowledge of waste, attitude, behavior, and the existence of desease vector and economical condition. This was a social action research, which applied a quantitative method. The research was conducted through implementing waste management based on community health perception. The data-collecting technique involved observation participant technique. There was a significant difference between people's knowledge on waste management before and after waste management counselling with p value 0.000 < 0.05. There was a significant difference between the people's attitude before and after waste management counselling with p value 0.021 < 0.05. There was a significant difference between the people's behavior before and after waste management counselling with 0.033 < 0.05. There was a significant difference between the density of fly population before and after waste management counselling with p value 0.013 < 0.05. The average of 30 participants' income earned from garbage is IDR 55.952.83 quarterly or IDR 18.650.61 (IDR 13.450.00 = 1 US$). The conclusion is knowledge, attitude, behavior indicators and vector density improved after the training of health-communicty based waste management.

Keywords: *knowledge; attitude; behavior; desease vector; waste management*

INTRODUCTION

Environmental health problems in Indonesia, especially in big cities involve urbanization, waste disposal, clean water supply, air pollution, disposal of industrial and household waste, natural disaster and refuge, and urban planning and government policy (Chandra, 2007). Waste is one of environmental health problems. The government policy on waste management needs community involvement. A good government policy should consider many aspecs such as culture, different social strata, economy, politic, education, and religion (Mawardi & Sumarto, 2003). Good infrastructure and system may actively improve community's involvement in waste disposal management (Slamet, 2004).

The people living around waste disposal place will experience aesthetical inconvenience and strong scent of air pollution. Poisonous waste spoils human body organs. The waste decomposition produces leachate and gas whose composition depends of the condition of the waste. Leachate pollutes ground water and reduces its quality, while gases emitted from the waste pullute air (Sucipto, 2012). These cases are reports

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of research, which says that the negative impact of bad waste management results in environmental pollution, and the spead of deseases, which endanger community's health (Suharjo, 2002). Community is a key factor in overcoming garbage problems because community itself produces it and it is also the community, which can manage the waste. Community, which is also the producer of waste, should be responsible for what it has produces. This idea is based on the reason that the continuous development of human culture into its complexity present different kinds and compositions of waste (Mulasari, 2010b).

The people's perception on waste affect one's behavior in managing waste. His knowledge on waste and maturity may influence his attitudes and behaviors in managing waste. Community's understanding on waste should be accompanied by a good attitude. The bad attitude toward waste management may affect the availabitlity of waste infrastructure (Mulasari, 2012).

The people's perception on waste management includes the idea of waste, its impact on environment, and its management. The concequence of the existence of different kinds and composition of waste is the need of advanced handing for it. The increasing waste volume certainly occupies more productive lands, which can be used for settlement and for productive purposes such as for farm, agriculture, and industry, to become waste disposal area. Garbage can cuase the spread of deseases for it is the good place for desease vectors such as rats, flies, fungi, bacteria, viruses, and other pathogent animals to breed (Mulasari, 2010b).

The researcher discussed the matter with a group of community Bina Lingkungan Kalurahan Bener on January 22nd, 2014 and concluded that acommunity empowerment program failed because the people found it difficult to manage the waste they produced. The people were not familiar with the problems related to health matters accompanying the waste handling. It proved that the community's perception on waste and their attitude towards waste were low. Because of these reasons, this research aims at knowing the effectiveness of implementing the health community-based waste management in Yogyakarta as viewed from the community's knowledge, attitude, behavior, the existence of desease vector, and economy.

RESEARCH METHODS

This research is a social action research (quantitative, inductive phenomenology), which employs a quantitative method. The research was carried out through implementing a waste management method based on community's health and its success was measured with controlled indicators. The instruments used to measure the community's perception on waste, attitude, behavior, the existence of desease vector, and economy were questionnaires and checklists. The location of the research was Bener subdictrict of Yogyakarta. The data collection technique was observational participative. The data analysis used a univariable analysis to describe the distribution, frequency, and the proportion of each indicator, and a bivariable analysis to know the difference of health condidtion (perception, attitude, behavior, the existence of desease vector, and the change in economy) before and after the treatment (the implementation of health community policy). The statistical test was carried out using t-pair t test signifancy level of 95%.

RESULTS AND DISCUSSION

Community's perception, attitude, behavior in household waste management can be seen in the following table 1. Based on the analysis, the participants'perception on waste before training as follows 17 persons (56%) was bad and 13 persons (43.3%) was good. This indicted that the participants' perception on waste management was relatively bad. The participants'perception on household waste management after training indicated that 21 participants' perception (70%) was good and 9 participants (30%) was bad. This indicated that the participants perception on household waste management improved after the training.

Based on the analysis, the partici-

Table 1. Frequency Distribution of community's perception toward household waste management based on community's health

Category	Before Training		After Training	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Good	13	43.3	21	70
Bad	17	56.7	9	30
Total	30	100	30	100

Table 2. Frequency Distribution of Community's attitude on household waste management based on community's health

Category	Before Training		After Training	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Good	15	50	16	53.3
Bad	15	50	14	46.7
Total	30	100	30	100

Tabel 3. Frequency distribution of behavior in handling household waste management based community's health.

Category	Before Training		After Training	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Good	16	53.3	20	66.67
Bad	14	46.7	10	33.3
Total	30	100	30	100

pants' attitude before the training showed 15 participants (50%) was good and 15 participants (50%) was bad. The participants' attitude on household waste management after training indicated that 16 participants' attitude (53.3%) was good and 14 participants (46.7%) was bad.This indicated that the participants' attitude on household waste management was relatively good. This indicated that the participants attitude on household waste management improved after the training.

Based on the analysis, the participants' behavior in handling household waste management based on community's health before training showed 16 participants (53.3%) was good and 14 participants (46,7%) was bad. This indicated that the participants' behavior in handling household waste based on community's health was relatively good. The participants' behavior on household waste management based on community's health after the training 20 participants (66,67%) was good and 10 participants (30%) was bad. This indicated that the participants' behavior on household waste management improved after the training.

From the analysis, it is known that the participants' perception on household waste management was good. The questions, which were not answered before the training by the respondents, could be answered correctly after the training. This indicated that the participants' degree of understanding the material was good (Preska, 2012). This research shows that the respondents' perception on household waste management improved. It means that the training on household waste management was effective in attracting respondents' attention on household waste and in improving their perception on it.

The training on household waste management was very important for the community as a means of waste management socialization so that they could take part

and then showed good behavior in handling waste properly. Through the training the people got new ideas in handling household waste well. The training was meant to improve community's perception on household waste maximally. The community's improvement in their perception on handling household waste indicated their understanding on the material i.e. hteir ability to interpret and to accept information from the trainers. The health training to stimulate the people's awareness on waste management and then to improve the community's knowledge on health care and health improvement for individuals, families and the whole community (Preska, 2012).

Improving community's knowledge on health care can be done through formal and informal education. The informal education is carried out through household waste management training, socialization, mass media health promotion in the forms of baliho and brochures (Notoadmojo, 2003).

Someone's perception on something results in his attitude. From his attitude he will be interested in it and the interest will affect his behavior. The degree of community's knowledge on household waste management is needed to know their understanding on how to handle waste especially handling household waste in relation with its selling potential so that it can be beneficial for both the environment and the people (Setyowati & Mulasari, 2013).

After the training most repsondets'perception on waste was better. This indicated that there was an improvement in community's knowledge in handling household waste management after the training. It can be said that the community's knowledge on waste influenced their ways of handling household waste in their daily life (Salawati et all, 2013). The community empowerment in handling waste began with socialization and the improvement of community's understanding on how to handle waste problems (Suartika, 2011). The socialization on how to handle household waste was done by giving information and making discussion among the groups, making a comparative study, reading leaflets and articles on how to handle household waste (Mohamad et all, 2012).

The improvement of participants' perception, attitude, and bevavior on household waste management can be seen in the following table

Table 4. The result of statistical analysis on the difference of participants' perception pre-test and post-test

Mean		T score	P *value*
Pre test	Post test	-5,267	0,000
11,07	14.00		

Based on the above table, the result of t-test using paired sample test showed the t-score was -5.267 and the p value was 0.000 < 0.05. This means that there was a significant difference of participants' perception on household waste management before and after the training. The negative value of t-score indicated that the average participants' perception before the training was 11.07 lower than the same average after the training i.e. 14.00 so that the training could improve the participants' perception on household waste management.

Table 5. The result of statistical analysis on the difference of participants' behavior pre-test and post-test

Mean		T score	P *value*
Pre test	*Post test*	-2,735	0,011
100.77	104,83		

Based on the above table, the result of t-test using paired sample test showed the t-score was -2.735 and the p value was 0.011 < 0.05. This means that there was a significant difference of participants' attitude on household waste management before and after the training. The negative value of t-score indicated that the average participants' attitude before the training was 100.77 lower than the same average after the training i.e. 104.83 so that the training could improve the participants' attitude on household waste management.

Tabel 6. The result of statistical analysis on the difference of participants' behavior pre-test and post-test

Mean		T score	P *value*
Pre test	*Post test*	-2,238	0,033
24,40	25,73		

Based on the above table, the result of t-test using paired sample test showed the t-score was -2.238 and the p value was 0.033 < 0.05. This means that there was a significant difference of participants' behavior on household waste management before and after the training. The negative value of t-score indicated that the average participants' behavior before the training was 99.07 lower than the same average after the training i.e. 104.83 so that the training could improve the participants' behavior on household waste management.

The participants' attitude on household waste management was good, but there was a significant difference in their attitude on it before and after the training. It means the training improved their attitudes on household waste management.

There were different attitudes because the respondents experienced three levels of acceptance such as accepting, responding, and appreciating responsibility. The respondents got the stimuli in the form of training on household waste management and the the respondents responded the materials of training by answering questions correctly and at the end the respondents appreciated and became responsible for waste problems. The questions on their attitude on household waste management, which formerly were not answered during pre-test, were correctly answered by the respondents after the training (Notoadmojo, 2003).

The individual's attitude will affect the community's attitude. By a good attitude this will rouse good behavior though it is not a must (Sudiharti & Solikhah, 2012). The factors, which influence attitudes, are personal experiences, which strongly remained in the memory, and other persons' influence, which are considered important (Wawan & Dewi, 2010). The community's knowledge on household waste management may also become the basis for the good attitude on waste handling, which means their perception on household waste management played an important role in forming good attitudes (Aryenti, 2011).

The participants' behavior in handing household waste was good and it improved after the training. There was a significant difference between the participants' behavior before and after the training.

The unresponsible behavior in household waste handling can cause environmental problem and devastation. Selfish behavior and far from environmatal and community consideration can affect the environment and can cause environmental devastation. Waste and other litter around us need to be seriously managed and need to be handled well. The training on household waste management is expected to be able to change and improve community's behavior in handling the waste so that it can be beneficial.

The knowledge and attitude are important factors for behavior so the training, supervision, encouragement and the provision of waste handling infrastructure are efforts to improve community's behavior in handling household waste. Behavior and structure components indicate community's tendency to behave on certain objects. The change of behavior in an individual can be identified through his perception and the perception may vary in facing the same case.

Someone's behavior is not formed by itself but it takes a certain process of learning. The behavior is formed when somenone has achieved certain knowledge and ability about something. The knowledge of environmental problems and the ways to solve them properly is one of the preconditions for environmentally responsible behavior. Acquiring knowledge and capacity is not enough. This should be completed with the desires to conduct good deeds.

Someone's desires to do something are determined by personal factors among others attitudes, self control and responsibility. An individual having knowledge, skills,

and positive attitudes is usually willing to actualize responsible behavior. Factors such as situation, economy, social pressure, and opportunities can hinder or enhance responsible behaviors towards waste. Responsible behaviors are result of internal and situational transaction (Wibowo, 2009). The factors affecting behavior includes age, sex, nationality, economy status, mood, personal characters and knowledge about something (Darmawan, 2014).

Desease vector indicator

Measurement results of desease vector indicator i.e. flies can be seen in the following table 7.

Table 7. The analysis result of fly density before and after the training of household waste management based on community'health.

Mean		T score	*P value*
Pre	*Post*	2,650	0,013
0,46	0,17		

Based on the above table, the result of t-test using paired sample test showed the t-score was 2.650 and the p value was 0.013 < 0.005. This means that there was a significant difference of fly density before and after the training. The value value of t-score indicated that the average fly density before the training was 0.17 lower than the same average after the training i.e. 0.46 so that the training did not improve the fly density in the environment.

Only one participant felt a rat's disturbance during the making of compost. The composting container was hollowed at the bottom and the rats consume compost material. The problem was solved by installing a sieve so that a rat could not enter the container. Other forms of disturbance were not found during the waste handing by the participants.

An indicator to see the least risk of household waste management is the existence of desease vector such as a fly. A fly plays an important role in spreading deseases such as dysentery, cholera, typhus, diarrhea, etc which are related to bad health (Depkes RI, 1992). Apart from mechanical vector, a fly causes uneasy feelings in the community (Kardinan, 2007). Because of these things it needs to controlled to prevent the spread of deseases (Depkes RI, 1992).

Ideally, a fly as a desease vector is not found around waste disposal. From the different score of fly detection before and after the training on household waste management can show that the waste management in the research area was done properly dan had prevented the presence of fly. From the result of t-test analysis using a paired sample test, the t score was 2.650. the p value 0.013 < 0.05 so that it means there was a significant difference between the fly density before and after the training on household waste management based on community health care. The positive score of t score indicated that the average fly density after the training was 0.17 lower than the density before the training of 0.46 so that the training did not increase the fly density in the area.

The making of compost is one of choices to the restriction of fly spreading, which is carried out in cities and countries with household waste problems (CIEH, 2008). The method of controlling fly density in the process of making compost needs to be realized properly so that composting and the fly control can result in reducing fly density maximally. The multilevel increase of temperature as a result of covering waste during composting is a good choice to prevent larvae from living in that temperature. Plastic was used to cover waste so that the temperature was maintained and larvae was killed (Stafford, 2008).

The rat disturbance case was found in one participant condition only during composting. The lower part of the container for composting was torn by rat. The solution to overcome the problem was done by covering the hole with a net so that a rat could not enter the composting container again. There was no cockroach disturbance during the handling of waste.

Waste is a good place for different flora and fauna including the desease vector. Waste is a good place for desease vectors.

Reptiles such as a snake and lizard can be found in waste. An animal such as rat, which can spread fever deseases is found in waste. Insects such as domestic flies, cockroaches, and mosquitoes breed and dwell in waste. The different vector can cause deseases such as malaria, cholera, typhoid and yellow fever as found in Kano, Metropolis, Nigeria (Butu, 2014).

Economy improment

The indicator of economy improvement is considered as an important indicator to improve the people's participation in waste management. The informants' economy from waste bank community was measured from the income the people obtained from waste collection. The time allocated for observing the income was three months inaccordance with the time of training intervention. The average income of 30 participants from waste management was IDR 55.952.83 for three months or IDR 18.650.61 per month. The kinds of garbage handled included plastic, white paper, cardboard, tin, glass bottle, iron, or mixed (paper or platic).

The indicator of economy improvement from the above mentioned analysis is considered as an important indicator in improving the participants' involvement in household waste management. This was due to the fact that undeniably economy was the main factor for human activity. All means are sacrified to get money. The financial interest in household waste management is expected to become one of factors for community empowerment.

Informants in household waste management were measure by their income from sending waste. The time for measuring the income was three months inaccordance with the beginning of the training. The 30 participants' income from sending waste was IDR 55.952.83 per 3 months or IDR 18.650.61 per month. The kinds of garbage sent included plastic, white paper, cardboard, tins, bottle, iron or mixed (paper and plastic).

The higher price of garbage, the less demand of household waste collector service. Community would not handle waste if there was no incentive for handling it (Kinnaman, 1999). It was said that waste had enough economical value for commerce or for further processes as economical commodity (Aryenti, 2011).

The poverty eradication can be pursued by waste management for increasing the household income. For example waste management is waste composting. The benefit of these activity will give impact in the life, neither individual nor household. If waste management training is applied will increasing income amount 35.000 IDR. This income derived from daily wages as administrator of waste management in the Semarang City (Banowati, 2014).

CONCLUSION

The knowledge, attitude, behavior, and the disease vector density indicators showed good improvement after the training on household waste management based on community health care. Organic waste was collected in waste collection posts and sold so that it could improved the community's income. The kinds of waste collected included plastic, white paper, cardboard, tins, bottle, iron, or mixed (paper and plastic).

The method of household waste management based on community's health care needs to be implemented so that the community will be more creative in handling the waste and keep taking care of their health from the risks of getting diseases from the waste.

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