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Effectiveness of three dimension demonstration methods for waste selection behavior children's of the Al-Qur'an mosque education park Jabal Nur in Pajangan, Bantul, Yogyakarta, Indonesia

Zulfa Nur Fadhila^{1,2}, Lucky Herawati^{1,2}, Bambang Suwerda^{1,2}, Desy Nuryunarsih³, Abubakar Yaro⁴

¹Indonesia Doctoral Forum of Health Polytechnic

²Department of Environmental Health, Politeknik Kesehatan Kemenkes Yogyakarta, Indonesia

³Department of Epidemiology and Public Health, University of Nottingham, Nottingham, UK

⁴Institute of Health Sciences & Research, AHRO Scientific Publishing, Glasgow, Scotland, UK

Corresponding author:

Zulfa Nur Fadhila (zulfafadhila0297@gmail.com)

Abstract:

Waste is the result of human activities that cannot be used anymore. Waste that is not managed properly can cause disease. The volume of waste in Bantul reached 2 190 t d⁻¹ and experienced an increase in 2016 amounting to 2 299.29 t d⁻¹. The Aims of this study to compare the method of demonstration of three-dimensional trash with conventional. Settings and Design of this study was a quasi-experimental design with a *non equivalent control group*. Methods and Material: as many as 30 respondents for each group. Data from the study were analyzed using the test *Mann-Whitney* with a confidence level of 95 %. The results of the study showed an increase in knowledge, attitudes and practices in the experimental group and there were differences in knowledge, practices between the experimental and control groups. Conclusions of the study, there are different demonstration methods using three trash bins with conventional trash cans to the meaningful knowledge and practice of sorting trash from the Al-Qur'an Mosque Education Park children, while those in attitudes are not meaningful. It is recommended that the management of the Al-Qur'an Mosque Education Park use a three-dimensional trash can as an intermediary so that the children of the Al-Qur'an Education Park get used to sorting and disposing of garbage in its place.

Keywords: Attitude, health promotion method, knowledge, practice, sorting of waste, trash can.

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Introduction

Household waste is rubbish that is generated from daily activities in the household, usually in the form of food waste, food boxes, plastic, cloth, leather, garden waste, wood, glass, iron, dust, and special waste (such as thick goods, goods electronics, white goods—large electronic items such as refrigerators—cleaning equipment), electronic waste (computers, telephones, televisions) ⁽¹⁾. The volume of waste in Bantul reached 2 190 t d⁻¹ and improvement in 2016 is 2 299.29 t d⁻¹. Law No. 18 of 2008 concerning improper waste segregation increases the cost of recycling programs because of the increased time and energy needed to sort waste ⁽²⁾. Waste Management states that the first activity of waste management is segregation of waste. Waste problems are caused by waste originating from settlements ⁽³⁾. The mosque is a place for community development through various facilities, infrastructure owned by the mosque, so the mosque needs to have sorting and waste management facilities because it is included in the facilities of public places. Amount one of the community developments in the mosque is TPA – *Tempat Pendidikan Al-Qur'an* (Al-Quran Education Center). TPA mosques are usually attended by children after school both from kindergarten to elementary school. The number of children in Indonesia on average 30 % of the total population in Indonesia and school age is the golden age ⁽⁴⁾. The age of 7 yr to 11 yr is also a child classified in the concrete operational stage, the use of adequate logic. This stage has understood logical operations with the help of concrete objects. Children at the concrete operational stage also have a high sense of curiosity in the surrounding environment. To provide education about sorting and managing waste at an early age it will be a

good and beneficial habit when it grows up. Based on the preliminary survey and interviews conducted on Monday, December 17, 2018, at the Jabal Nur Mosque and Baiturrahim Mosque with the Jabal Nur mosque manager, the reason the waste was not sorted and managed because it does not have a trash can, so waste is only thrown away carelessly. In addition to the absence of trash bins, the waste generated from the recitation, TPA, or other spiritual activities will be disposed of in the side ditches of the mosque and burned and also the *takmir* (mosque committee) usually tells them to bring their waste to go home while the Baiturrahim Mosque already has a trash can but it is not applied waste sorting. Waste management activities require participation from the surrounding community and the management of the management system to make a decision⁽⁵⁾. The management of organic and non-organic waste in the community is still not done well, because every house still does not care about the importance of good management, it can be seen from the residents who dispose of organic and non-organic waste in a place, causing unpleasant odors in the environment they live⁽⁴⁾. The impact caused by waste is air pollution on the spread of pollutants in the atmosphere⁽⁶⁾. The results of interviews with TPA children which content ten respondents obtained results that 60 % of waste has been disposed of in the trash and 40 % are still disposing of waste on the roadside and in the ditch, and 100 % have not been sorted out. Based on counseling with the demonstration method using posters, the results obtained 16 % improved in action and 38 % on knowledge included in the category of not good and not good^(7, 8). The researcher compares the effectiveness of the demonstration method using three-dimensional bins with demonstration methods using conventional bins so that the behavior of sorting garbage in TPA Mosque children in Bantul increases.

Materials and methods

The research is included quasi-experiments with the design of Non-Equivalent Control Group research. The population in this research were all children of the Jabal Nur Mosque Landfill and Baiturrahim Mosque are 60 people, with a sample in TPA are 30 children. This research was conducted in March to April 2019, and it was carried out at Jabal Nur Mosque as an experimental group and Baiturrahim Mosque as a control group. The activity was held three times a week is when there were landfill activities in the mosque on Monday, Wednesday and Friday. The location of this research was carried out at the Bumi Guwosari Indah Housing Project, Bantul Display, Yogyakarta, Indonesia. Data collection of the research was to use a test to measure knowledge and a checklist to measure attitudes and practices about sorting waste. The tools used in this study are: Test questions to measure knowledge, checklists to measure attitudes and practices, three-dimensional and conventional bins, examples of organic waste, paper and plastic.

The research implementation begins with a pre-test of knowledge and attitudes using multiple choice test questions for knowledge and checklist for attitudes filled by respondents and a checklist in practice but it filled by researchers. Furthermore, the implementation of the post-test was carried out after the treatment was given with the demonstration method of three-dimensional bins for the experimental group in Jabal Nur Mosque and conventional waste bins at the Baiturrahim Mosque by using pre-test questions which were repeated three times in the post-test. The data obtained were analyzed descriptive and analytic using Kolmogorov-Smirnov first. Data analysis used the Willcoxon test to improve knowledge, attitudes and practices in the experimental and control groups and the Mann-Whitney test to test the difference in knowledge, attitudes and practices in the experimental and control groups before and after treatment. The confidence level used uses SPSS 95 % ($\alpha = 0.05$).

Statistic analysis:

Data from the study were analyzed using the test *Mann-Whitney* with a confidence level of 95 %.

Results

Characteristics of respondents:

The minimum age of respondents is 10 yr and a maximum of 12 yr. Frequency distribution of respondent characteristics based on age and sex shows in table 1.

Table 1: Characteristics of age and gender of experimental groups and control groups.

Variable	Experiment group		Control group		p-value ^a	p-value ^b
	f	(%)	f	(%)		
Age (yr)						
10	16	26.7 %	17	53.3 %	1.000*	
11	5	8.3 %	7	16.7 %		
12	9	15 %	6	30 %		
Gender						
Male	14	23.3 %	15	25.0 %	0.715*	
Female	16	26.7 %	15	25.0 %		

f = frequency; a). Independent sample t test; b). Chi square ; * Level of significant 0.05

After testing of the equivalence, there is no significant difference in the age of respondents from the experimental group and the control group with p-value > 0.05 which is equal to 1.000. Gender between the experimental group and the control group had no difference or same sex in the experimental group and the control group with p-value > 0.05 which was equal to 1.000. Thus, there is harmony between the characteristics of the age and sex of the respondents in the experimental group and the control group before treatment.

Percentage improvement in pre-post knowledge average, attitudes and practices of experimental groups and control groups:

Knowledge measurement coincides with attitude measurement, while measurement practices are carried out separately because those who fill the practice checklist are researchers. The value of measuring knowledge, attitudes and practices can be seen in table 2.

Table 2: Percentage of increase in knowledge average, attitude and practice of experimental groups and control Groups

	Experiment group				Control Group			
	Avarage			%	Avarage			%
	Pre	Post	Difference		Pre	Post	Difference	
Pg	5	7	2	70 %	4	5	1	26 %
Sk	4	6	2	78 %	5	7	2	82 %
Pr	8	10	2	21 %	5	5	0	16 %

Pg = knowledge; Sk = attitude; Pr = practice

Table 2 shows that the average value of the pre-test and post-test in the experimental group and the control group was greater in the post-test value. The biggest difference in the experimental group is in the value of knowledge is the value of three and the smallest in practice is the value of one. The largest control group is attitude with a value of two while the smallest is in practice is zero, because there is no pre-test and post-test iimprovement. The percentage iimprovement in the largest experimental group of attitude value is 78 % and the largest control group of attitude is 82 %.

Improvement of knowledge, attitudes and practices before and after treatment of experimental groups and control groups:

Measurement of knowledge, attitudes and practices is carried out before and after the treatment is given. This is because to see whether there is an iimprovement in the value of knowledge, attitudes and practices of TPA children in sorting out waste. The frequency distribution of the value of increasing knowledge, attitudes and practices can be seen in table 3.

Table 3: Average improvement in knowledge value, attitudes and practices in the experiment and control group

	Experiment Group				Control Group			
	Pre		Post		Pre		Post	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Knowledge	4.9	2.0	7.4	1.4	4.2	1.1	5.0	0.9
Attitude	3.6	0.9	6.0	1.1	5.3	2.2	7.4	1.7
Practice	8.4	1.5	9.9	0.7	5.2	3.6	5.3	2.9
M = Mean; SD = Standard Deviation								

Table 3 shows that the average improvement in pre-test and post-test knowledge, attitudes and practices in the highest experimental group is in practice, with an average pre-test value of 8.43 and post-test at 9.90. The highest control group was also in the attitude with a pre-test value of 5.30 and post-test of 7.40.

Difference in knowledge values, attitudes and practices in the experiment group and the control group:

The differences of value is used to compare between experimental and control groups. In value, it can be seen whether there is influence before and after the treatment was given in each group. If the difference is greater, then there is influence before and after the treatment in the experimental and control groups. The frequency distribution of the difference in knowledge, attitudes and practices can be seen in table 4, while the results of the significance test can be seen in table 5 and table 6.

Table 4: difference in knowledge values, attitudes and practices of experimental groups and control groups

	Experiment Group		Control Group	
	Mean	SD	Mean	SD
Knowledge	2.53	1.074	0.83	0.913
Attitude	2.40	1.429	2.10	2.218
Practice	1.47	1.167	0.07	1.112
SD = Standard Deviation				

Table 4, the difference in knowledge, attitudes and practices of the experimental and control groups has improved in value of knowledge, attitudes and practices after treatment. The highest improvement in the average knowledge of the experimental group was 2.53 and in the control group the attitude was as big as.

Data normality test

The data normality test was carried out using the Kolmogorov Smirnov test, the value of pre-test and post-test improved of knowledge, attitudes and practices in the experimental and control groups with a 95 % confidence level ($\alpha = 0.05$) with a sample of 30 children for each group is experiment group at Jabal Nur Mosque Landfill and control groups at Baiturrahim Mosque. The pre-test data of knowledge and practice of the control group were abnormal distribution, whereas pre-test of attitude values in the control group were normal distribution. The post-test data control group was abnormal distribution. In the experimental group of pre-test and post-test of knowledge, attitudes and practices were abnormal distribution.

Table 5: Willcoxon test values improvement knowledge, attitudes and practices in the experimental and control groups.

		Significance-test			
		p-value a	Note	p-value a	Information
Pg	Pre Post	0,000*	There is differences	0.000*	There is differences
Sk	Pre Post	0,000*	There is differences	0.000*	There is differences
Pr	Pre Post	0,000*	There is differences	0.000*	There is differences

Pg = knowledge; Sk = attitude; Pr = practice; a) Willcoxon; * Level of significant 0.05

Based on Table 5, the results of the Willcoxon test on the value of pre-test and post-test knowledge, attitude and practice in the experimental group had a p-value < 0.05 is p-value knowledge, attitudes and practices of 0.000. The control group p-value < 0.05 is knowledge, attitudes and practices of 0.000. The value of p-value < 0.05, there is an improvement of value knowledge, attitudes and practices before and after giving treatment significantly in the experimental and control groups.

Table 6: Significant test of knowledge difference value, attitudes and practices in the experiment and control group

		P-value	Information
Knowledge	Experiment	0.000*	There is differences
	Control		
Attitude	Experiment	0.442*	There is no differences
	control		
Practice	Experiment	0.000*	There is differences
	control		

Mann Whitney ; * Level of significant 0,05

Based on table 6 the results of the Mann-Whitney test obtained p-value values for knowledge of 0.000, and practices of 0.000. Then the p-value < 0.05 means that there are different demonstration methods between three-dimensional bins with conventional bins before and after treatment. Based on Table 6 the results of the Mann-Whitney test obtained p-value values for knowledge of 0.000, and practices of 0.000. Then the p-value < 0.05 means that there are different demonstration methods between three-dimensional trash cans and conventional trash bins before and after waste treatment of TPA mosque children in Pajangan with meaningful knowledge and practice of sorting Bantul. Analysis of the data on attitude values obtained p-value of 0.442. Then the p-value > 0.05 means that there is no difference in the demonstration method using three-dimensional trash cans with conventional trash bins before and after the treatment of the attitude of sorting the garbage of the mosque's TPA children in Bantul Display.

Table 7: Data analysis recapitulation

	%		Analysis		Conclusion
			Test	p-value	
Experiment group	70 %	Pg	a	0.000	There is difference
	78 %	Sk	a	0.000	There is difference
	21 %	Pr	a	0.000	There is difference
Control group	26 %	Pg	a	0.000	There is difference
	82 %	Sk	a	0.000	There is difference
	16 %	Pr	a	0.000	There is difference

(continued on next page)

Table 7: Continued

	%		Analysis		Conclusion
			Test	p-value	
Differences of Experiment and Control Group	-	Pg	b	0.000	There is difference
	-	Sk	b	0.442	There is difference
	-	Pr	b	0.000	There is difference

Pg = knowledge; Sk = attitude; Pr = practice; a) Willcoxon test; b) Mann Whitney test

Based on table 7 the analysis used to analyze the improvement of knowledge, attitudes and practices in the experimental and control groups obtained a p -value < 0.05 , it means that there are significant differences in the improvement of knowledge, attitudes and practices before and after treatment in the experimental group and control group. In addition, the analysis used for the difference in knowledge, attitudes and practices between the experimental group and the knowledge and practice control group obtained a p -value < 0.05 , it means that there was a significant difference between the difference in knowledge and practice in the experimental and control groups. Attitude values get p -value > 0.05 is 0.442. It means that there is no significant difference between the difference in attitude in the experimental and control groups.

Discussion

Difference in value of knowledge before and after treatment in the experimental group and the control group:

The results of the analysis using the Mann-Whitney test were different in the difference in the value of TPA children's knowledge in sorting out the waste before and after the treatment in the experimental and control groups, so that this result had a significant change in the TPA children's knowledge differences about sorting out waste. Therefore, Molstad *et al.* formulated three important things to shape the behavior of sorting waste, namely policies, facilities, and community participation in sharing knowledge⁽⁹⁾. The researcher used a three-dimensional trajectory of the Jabal Nur Mosque landfill with a conventional trash can at TPA children Baiturrahim Mosque to compare the value of knowledge in sorting out garbage. It shows that the three-dimensional waste can make it easier for children to sort waste in place and the accuracy of sorting waste. The calculation of the differences are obtained from the value of knowledge in each experimental group and the control of pre-test and post-test if there is some improvement and not improvement in the value of pre-test and post-test, so the difference in the value of pre-test and post-test is called the difference in the value of knowledge. Knowledge is the most important domain in shaping a person's actions, so this knowledge domain has level. So the basic process of one's change is based on one's level of knowledge. It is related to the opinion of Purnomo, that there is a significant influence on the use of trash cans patterned on the behavior of trash in its place. The level of intelligence influences the behavior of disposing of waste precisely, because the level intelligence of children is different⁽¹⁰⁾. There are children who observe patterned and written waste before entering waste and it also there is no care about them. The demonstration method is a way of delivering material by demonstrating or showing students. Extension of demonstration methods using posters about waste management was able to improve knowledge and actions of dasawisma members experiencing a change in knowledge improvement was 38 %⁽⁷⁾ in not good category, while the improvement of three-dimensional bins was 70 % in the good category⁽⁸⁾.

Difference in attitude values before and after treatment in the experimental group and control group:

Attitude is a form of evaluation every reaction to an object, impartial which is a provision in terms of feelings (affection), thinking (cognition) and predisposing actions someone to an aspect in the environment. Attitudes affect the actions of a person who is initially determined by the knowledge and information that has been obtained⁽¹¹⁾. The results of this research were not significantly different from the demonstration method of three-dimensional trash bins and conventional trash bins before and after treatment in the experimental and control groups on the attitude of sorting waste of TPA mosque children in Bantul Pajangan, due to some improvement in attitude values before and after treatment in the experimental group was 78 % and the control group 82 %. Although there was an improvement in both groups but the improvement of attitude values was greater in the control group than the experimental group, so there was no difference using the demonstration method using three-dimensional bins with conventional bins. Another reason for the lack of some improvement of attitude in the experimental group was respondents in the experimental group paid less attention when given the treatment of the three-dimensional dumpster demonstration method. There are also respondents who are mutual cooperative when working on test questions so that when working on the value of the attitude the respondent does not work as he wishes.

Difference in practice values before and after treatment in the experimental group and the control group:

Measuring a practice can be done in a direct way by observing and interviewing respondents who will be assessed by attitude or indirectly by using a questionnaire about how they think about an object and whether the respondent does the behavior that has been exemplified. It is related to the opinion, there is the influence of the use of artificial objects on the modification of the trash can towards the practice of students throwing waste in its place in the Triharjo Pandak Bantul, state primary school that has meaningful. The using modified bins students will be more interested in disposing of trash to be exact. In Indonesia which has a culture of collectivism. In this culture, people want to adjust their behavior to the majority so that they feel part of the majority group. Communal communities make the behavior of most people a barometer of their behavior⁽¹²⁾. Modification of trash can improve one's interest because the modification is to bring up something new but using existing objects. Modifying can attract students' attention to dispose of waste in its place. The modification of the trash, it will be easier to implement waste disposal and to sort waste.

Conclusions

The TPA mosque are able to use the three-dimensional bins to improve the children's knowledge, attitudes and practice in sorting wastes. Afterward, they accustomed to throw the trash into the three-dimensional bins. On the other side, the TPA mosque administrator are also accustomed to sort garbages in their homes.

References

1. Hoornweg D and Bhada-Tata P. What a Waste: A global review of solid waste management. 2012; (15): 98 p. Washington: The World Bank.
2. Bohm RA, Folz DH, Kinnaman TC, and Podolsky MJ. The costs of municipal waste and recycling programs. *Resources, Conservation and Recycling*, 2010; 54(11): p. 864-871.
3. Furedy C and Pitot HA. Social factors in the treatment and reuse of organic wastes in developing countries. *Biotechnology - Vol .xiv. Encyclopedia of Life Support Systems (EOLSS)*. 2009; 14(4): p. 107-123.
4. Komakech AJ. Urban waste management and the environmental impact of organic waste treatment systems In Kampala, Uganda. [Thesis]. Swedish University of Agricultural Sciences, Uppsala and Makerere University, Kampala. *Acta Universitatis agriculturae Sueciae* 2014: 93 p.
5. Zarrabi A, Mohammadi J, and Ahangari S. An analysis of municipal solid waste management emphasizing on the recovering of waste (case study: Boukan). *Geography And Environmental Planning*. 2013; 48(4): p. 25-28.
6. Feszterovaa M and Jomova K. Character of innovations in environmental education. *Procedia - Social and Behavioral Sciences*. 2015; 197(2015): p. 1697-1702.
7. Appryllanda V. Penggunaan metode demonstrasi menggunakan poster pada penyuluhan pengelolaan sampah terhadap peningkatan pengetahuan dan tindakan anggota dasawisma Dusun VI Pleret Panjatan Kulon Progo [Clean living behavior and the use of demonstration methods using posters on the counseling of waste management to increase knowledge and actions of members of the Dasawisma Dusun VI Pleret Panjatan Kulon Progo]. [Undergraduated Thesis]. Kesehatan Lingkungan, Poltekkes Yogyakarta. 2018. [in Bahasa Indonesia].
8. Arikunto S. The procedure of research is a practical approach (Eds. Revision 2010). Jakarta: Rineka Cipta. 2010. 413 p.
9. Molstad E, Heyer KP, Marttin K, Sardi P, Bunnag A, and Wattanaburanon A. Reducing single-use plastic in a Thai school community: A sociocultural investigation in Bangkok, Thailand. Worcester Polytechnic Institute (Digital WPI). 2018. 75 p.
10. Purnomo R, Herawati L, and Amri C. Penggunaan tempat sampah bermotif terhadap perilaku buang sampah pada tempatnya di sekolah dasar negeri wilayah Argomulyo, Sedayu, Bantul [The use of trash can is motivated to the behavior of disposing garbage in its place in the state elementary school in Argomulyo, Sedayu, Bantul]. *Sanitasi Jurnal Kesehatan Lingkungan*. 2017; 8(3): p. 101-107. [in Bahasa Indonesia].
11. Yakob N, Esa N, and Yunus HM. Exploring secondary school students' belief and attitude about waste management in Northern Peninsular Malaysia. *IJGE: International Journal of Global Education*. 2012; 1(1): p. 35-46.
12. Hofstede G. Dimensionalizing cultures: The hofstede model in context. *International Association for Cross-Cultural Psychology*. 2011; 2(1): p. 1-26.