

# The Effect of Knowledge About Waste Management and Gender on Environmental Sanitation Behavior

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## Abstract

The objective of this research was to find out whether knowledge about waste management and gender on environmental sanitation behavior. The method used in this study was an Ex Post Facto research with 2 x 2 factorial design with a random sample technique of 60 citizens at Muara Angke, North Jakarta, Indonesia. Data were analyzed by applying two way ANOVA and Tukey test. The research results were: 1) there was significant differences on environmental sanitation behavior between knowledge about waste management who were the high and those who were the low; 2) there was significant differences on environmental sanitation behavior between those who have an male and an female; 3) for female, environmental sanitation behavior were more positive with the high knowledge about waste management compared to the low knowledge about waste management; 4) for male environmental sanitation behavior were more positive with low knowledge about waste management compared to the high knowledge about waste management; 5) there was significant interaction effect between knowledge about waste management and gender on environmental sanitation behavior. To improve the environmental sanitation behavior, there was a need to consider the knowledge about waste management and gender factors.

**Keywords:** knowledge about waste management; Gender; Environmental sanitation behavior.



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## 1. Introduction

A proper sanitation system has become an indicator of development in a country, including Indonesia. However, the sanitation facilities that exist in Indonesia nowadays is not adequate to fulfill the needs of its citizen, which keep growing in number every second. As a result, diseases caused by virus and bacteria spread around easily in Indonesia. In short, it can be stated that poor sanitation system will give negative effect to people's health condition. Thus, in order to avoid those negative effects, it is necessary to keep the sanitation system adequate.

Nowadays, basic sanitation has become a minimum requirement for every family in Indonesia in order to fulfill their needs in daily life. The sanitation meant here including clean water, household toilets, wastewater disposal facilities and waste management facilities. The fulfillment of these needs may prevent environment based-diseases.

However, there are some problems faced by Indonesian government in regard to environment sanitation management. The number of facilities available for use cannot match the needs of people that keep growing rapidly in number. Also, there are many people in Indonesia that still do unhealthy habits, such as defecating in rivers or fields, wash their clothes in river with dirty water, and so on.

In Indonesia, there are some factors that suspected as the cause of rapid spread of disease in many areas. One of them that often researched on is the environment factor, which include clean water facilities, toilets, wastewater disposal system, bacteriological quality of water, and the condition of houses

There are some factors that, either directly or not, can become the factors that increase the chance of disease spreading around. The first factor is related to the habit of people. There are many people in Indonesia that do unhealthy habits, such as littering, not wash their hands with soap and water, and so on. The second factor is related to the unavailability of clean water facilities and healthy toilets. If those factors happened in an area for some time, then diseases will easily spread around (Indonesia D. K. R., 2005).

Other factors that are suspected to be related to the environment sanitation is the citizen's knowledge about garbage management and gender. The knowledge of garbage management can be defined as everything that someone know in relation to the management of garbage which are learned through several dimensions, namely knowledge of specifics, knowledge of way and means of dealing with specifics and knowledge of universal and abstraction in a field.

Gender itself can be defined as a way to differentiate people based on their sexual types into two categories; man and woman. Sexual types itself may be defined as a condition of an individual which is obtained biologically since their birth. This condition may be used to give them characteristic in their social life in a population.

Muara Angke is located in Kelurahan Kapuk Muara, Kecamatan Penjaringan, Kotamadya Jakarta Utara. According to a survey conducted by Puskesmas Muara Angke, the behavior of its people related to healthy life is not good and its sanitation is still inadequate (Jakarta, 2016). Based on the writer's initial observation, the management of wastewater is inadequate; construction of toilets and septic tanks which are dangerously close to water pumps; the unsanitary habit of locals (such as did not wash their hand with water and soap before and after eating; defecating on rivers, fields or ponds and littering around) and the low rate of availability of household clean water facilities.

A research by Saleh (2014) showed that dangerous bacteria can grow easily in toilets. As a result, it is important to keep the toilets clean. An unclean toilet can become the source of disease spread around households. Another thing that is important is to increase people's knowledge related to wastewater disposal. This is caused by its influence towards people's daily life, particularly related to health. In short, clean water facilities, toilets and wastewater disposal system should be maintained so that it will be available at all times.

According Dardak (2005) stated that the growth of cities in Indonesia had already reach its saturation point, and it will be hard to fix it up. Due to this condition, there are several problems related to social, economic and ecology problem that already occurred (such as the decrease of supporting capabilities of cities in Indonesia and the inefficiency of resources usage in Indonesia) which caused the level of life of Indonesian people to be low in general.

A research by Turnbull Loverock (2010) which focused on pro-environment behaviors which are done in workplace by its employees, showed that those behaviors (such as flushing toilets after use, wash hands with soap and water, etc.) were influenced by the behaviors of those people in their homes.

Based on the researches mentioned earlier, the novelties of this research are the knowledge about garbage management, gender and environment sanitation behavior which include clean water facilities, household toilets, wastewater disposal facilities and garbage management facilities. Because of that, the researcher was interested to conduct a research to investigate the influence of knowledge about garbage management and gender to the environment sanitation behavior of people of Muara Angke, Kelurahan Kapuk Muara, Kecamatan Penjaringan, Kotamadya Jakarta Utara.

The research questions of this research are: a) Is there any difference in environment sanitation behavior between people who have sufficient level of knowledge related to garbage management and those who have not?; b) Is there any difference in environment sanitation behavior between men and women in gender perspective?; c) For women, is there any positive influence towards their environment sanitation behavior if they have sufficient level of knowledge about garbage management?; d) For men, is there any negative influence towards their environment sanitation behavior if they have low level of knowledge about garbage management?; and e) Is there any influence of interaction between knowledge about garbage management and gender towards environment sanitation? The aim of this research is to obtain information about the influence of interaction between knowledge about garbage management and gender towards environment sanitation behavior.

## 2. Literature Review

### 2.1. Environment Sanitation Behavior

Environment sanitation may be defined as the health status of an environment which include houses, waste disposal system, clean water providing system and so on Notoatmodjo (2003). Another definition of environment sanitation was proposed by WHO (Winarsih, 2008) which stated that environment sanitation is the efforts to control every factor of human physical environment which may cause harm to physical development, health and quality of life of human.

Environment sanitation behavior may be defined as the preventive behavior of an individual or group of people in terms of preventing spread of disease through environment management. Another definition of environment sanitation behavior that is who stated that environment sanitation behavior as activities which aim to improve the standard of basic environment condition which influence human welfare, such as clean water availability, waste disposal system, clean air and clean houses. In short, it may be stated that environment sanitation behavior not only affecting human health, but also important to keep the balance of ecosystem, socio-economy and aesthetic state of a housing complex (Notoatmodjo, 2007).

A research conducted by Inah Inah *et al.* (2017) showed that good sanitation system may prevent the spread of diseases in an environment. The research also showed that environment sanitation is closely related to age, gender, education level and income of an individual. One factor that may influence the sustainable growth in a society is the environment sanitation, which is closely related to economy growth, social development and the society's level of health. In short, it may be stated that sustainable growth of a society is highly influenced by its environment sanitation (Prahlaad, 2015).

Based on several definitions that has been mentioned above, environment sanitation may be defined as the activities of members in a society which are based on knowledge, behavior and preventive actions in improving basic standards of environment condition which include clean water facilities, household toilets, wastewater disposal facilities and garbage management facilities.

### 2.2. Knowledge

Knowledge may be divided into four types of knowledge; factual (based on actual facts), conceptual (related to concepts), procedural (related to application of knowledge) and metacognitive Anderson *et al.* (2001). The characteristic of factual knowledge including parts of knowledge which must be acquired by people to solve problems including: a) terminology knowledge (related to terms) and b) more specific and basic knowledge. On the other hand, conceptual knowledge is the type of knowledge which is more complex and organized, including: a) knowledge about category and classification, b) knowledge related to generalization, and c) knowledge of theory, model and structure. Procedural knowledge is more related to knowledge about steps to do or finish things, including a) knowledge about specific skills and algorithm and b) basic knowledge about techniques and methods. Metacognitive knowledge is more related to the general cognitive about one's self, including strategic knowledge. In

short, it may be stated that knowledge can be defined as everything that an individual knows in relation to terms, specification, classification, principles, generalization, theory, structures, specific knowledge methodology and criteria of something.

### 2.3. Garbage and Garbage Management

According to Slamet in (Pratama and Soleh, 2008) garbage is defined as everything which is not wanted by its owner and is solid. Another definition of garbage can be found in the draft of Indonesian Garbage Act, which stated that garbage is solid or semi-solid leftovers of an activity which can be either organic or an organic which are considered useless and thrown away to the environment. In other words, garbage is a solid thing which can be either organic or an organic which exist as a result of human activities which thrown away to the environment and then managed so that it will not cause any harm to the environment.

Garbage management is the efforts to maintain cleanliness of an environment by processing garbage which are done by people and its government or a management (Amos, 2008), while according to Alex Alex (2012) garbage management can be defined as activities which include gathering, transporting, processing, recycling or disposing garbage material. In other words, there are five steps of garbage management, including gathering, transporting, processing, recycling or disposing garbage material.

Garbage management can be defined as every activity which is done in the process of managing garbage since it first exists until its disposal. In general, activities in this process including garbage control, garbage gathering, transporting and disposal (Kartikawan, 2007). Garbage management can be defined as a systematic and continuous activity which include garbage reduction and management. Garbage management can also be done in order to restore natural resources. Garbage management may also involve solid, liquid, gas or even radioactive material in order to reach its goal (Indonesia K. L. H. R., 2008).

In short, it may be stated that garbage management may be defined as activities which is done by someone in order to control the number of garbage which include dividing, gathering, transporting and processing.

Based on the literature above, it may be concluded that knowledge about garbage management can be defined as everything that an individual knows in relation to terms, specification, classification, principles, generalization, theory, structures, specific knowledge methodology and criteria related to controlling the number of garbage through dividing, gathering, transporting and processing.

### 2.4. Gender

Epistemologically, the word “gender” has its roots from Latin word “*genus*” which mean “type”. There are several substances of gender which are easy to understand. First, gender to differentiate role and rights and obligation between man and woman in a society. Gender rule is not fixed, rather it may change according to customs of the society. Second, gender can be understood as an analytical tool used to see cases in order to obtain more understanding related to cause-effect relationship which may create a new reality which related to man and woman (Andersen and Taylor, 2007).

Gender is a social or cultural construction in an individual who was born either as a man or a woman. As a result, gender is different with sexual types which obtain biologically. “Gender” is not universal since it is obtained from the society and its characteristics may change due to the cultural and social traits of a society (Ferrante, 2012). Gender role is influenced by age, social class, ethnicity, religion, economy, geography and politic factors in a society. For this reason, an individual always internalize the conventional gender role and stereotypes, regardless of sexual types, and develop gender in themselves (Johnson and Repta, 2012).

The concept of gender can be defined as a social perception which sticks to man and woman which constructed both socially and culturally. An individual, regardless to his/her sexual type, consist of feelings, behaviors and attitudes which related to himself/herself (Brym and Lie, 2012). An individual can be considered to act according to his/her gender if his/her appearance, behavior, attitudes, interest and value match the characteristic of his/her gender group, since the society will find it easier to understand him/her through his/her gender.

Based on the literature mentioned above, it may be concluded that gender can be defined as division of role, status and duty between man and woman which established based on traits of man and woman, which itself established based on norms, customs, religions and habits.

## 3. Method

This research was conducted with quantitative approach through survey method and ex post facto technique, with 2x2 design. In this research, there were three variables which are tested, including environment sanitation behavior as the dependent variable (Y). There were several independent variables, including (1) knowledge about garbage management (A), which consist of higher level (A1) and lower level (A2); gender, which consist of woman (B1) and man (B2) (Sekaran and Bougie, 2016). The design of this research is illustrated in Table 1.

Table-1. Research Design

		Knowledge about Garbage Management(A)	
		High (A <sub>1</sub> )	Low (A <sub>2</sub> )
Gender (B)	Women (B <sub>1</sub> )	B <sub>1</sub> A <sub>1</sub>	B <sub>2</sub> A <sub>1</sub>
	Men (B <sub>2</sub> )	B <sub>1</sub> A <sub>2</sub>	B <sub>2</sub> A <sub>2</sub>

Note:

- A : Knowledge about garbage management  
 A<sub>1</sub> : Locals which have high level of knowledge about garbage management  
 A<sub>2</sub> : Locals which have low level of knowledge about garbage management  
 B : Gender  
 B<sub>1</sub> : Women  
 B<sub>2</sub> : Men  
 B<sub>1</sub>A<sub>1</sub> : Women which have high level of knowledge about garbage management  
 B<sub>1</sub>A<sub>2</sub> : Women which have low level of knowledge about garbage management  
 B<sub>2</sub>A<sub>1</sub> : Men which have high level of knowledge about garbage management  
 B<sub>2</sub>A<sub>2</sub> : Men which have low level of knowledge about garbage management.

The sampling was done through simple random sampling. The amount of sample is 110, which considered adequate to represent the total population. The sample consisted of 55 women and 55 men. The researcher spread questionnaire which was related to the knowledge about garbage management. The results were arranged in ranking system. Next, based on the scores, two groups were established; upper and lower level.

On the next step, a sampling process was conducted in order to determine groups based on its members' knowledge about garbage management. The results showed that there are 27% of the sample which belong to the group with high level of knowledge related to garbage management and 27% of the sample which belong to the group with low level of knowledge about garbage management.

Based on those proportion, the locals were then given test about environment sanitation behavior. With the proportion of 27%, 15 women were picked and considered as the women group with high level of knowledge about garbage management (B<sub>1</sub>A<sub>1</sub>), and 15 other women were picked and considered as the women group with low level of knowledge about garbage management (B<sub>1</sub>A<sub>2</sub>). For men, there were 15 of them which were chosen and considered as men group with high level of knowledge about garbage management (B<sub>2</sub>A<sub>1</sub>), and 15 others which were chosen and considered as as men group with low level of knowledge about garbage management (B<sub>2</sub>A<sub>2</sub>).

The data was analyzed using descriptive statistics and inference. Regression analysis was also conducted. Before the analysis stage, there were some test that conducted, which are variant homogeneity and normality test. The hypotheses were tested using Two-way Anova 2x2 and Tukey test.

#### 4. Results and Discussion

The requirements for hypotheses test were related to the basic assumptions in using parameter statistics. The normality test of the data was conducted based on the data of the sample which was measured using every research variable. The hypotheses which were tested including:

H<sub>0</sub> : Data was distributed normally

H<sub>1</sub> : Data was not distributed normally

The data can be considered as normal if the value of L<sub>count</sub> was smaller compared to L<sub>table</sub> in  $\alpha = 0,05$ . The normality test of the data was conducted using Microsoft Excel. The results of normality test can be summarized in Table 2.

Table-2. Summary of the Results of Normality Test of A<sub>1</sub>, A<sub>2</sub>, B<sub>1</sub> and B<sub>2</sub>

Sample	L <sub>count</sub>	L <sub>table</sub>	Conclusion
A <sub>1</sub>	0,079	0,162	Normally Distributed
A <sub>2</sub>	0,078	0,162	
B <sub>1</sub>	0,123	0,162	
B <sub>2</sub>	0,064	0,162	

Based on the calculation, it may be concluded that the value of A<sub>1</sub> = 0.079; A<sub>2</sub> = 0.078; B<sub>1</sub> = 0.123 and B<sub>2</sub> = 0.064. As a result, it may be concluded that the group A<sub>1</sub>, A<sub>2</sub>, B<sub>1</sub> and B<sub>2</sub> which was tested can be considered as data that distributed normally. This can be observed from the value of L<sub>count</sub> which was smaller compared to L<sub>table</sub> for every group of data.

On the next step, it was important to find out the significance value of B<sub>1</sub>A<sub>1</sub>, B<sub>1</sub>A<sub>2</sub>, B<sub>2</sub>A<sub>1</sub> and B<sub>2</sub>A<sub>2</sub> data using Liliefors test. The results of the test are summarized in Table 3.

**Table-3.** Summary of Normality Test Results on B<sub>1</sub>A<sub>1</sub>, B<sub>1</sub>A<sub>2</sub>, B<sub>2</sub>A<sub>1</sub> and B<sub>2</sub>A<sub>2</sub>

Sample	L <sub>count</sub>	L <sub>table</sub>	Summary
B <sub>1</sub> A <sub>1</sub>	0,103	0,229	Normally distributed
B <sub>1</sub> A <sub>2</sub>	0,091	0,229	
B <sub>2</sub> A <sub>1</sub>	0,112	0,229	
B <sub>2</sub> A <sub>2</sub>	0,096	0,229	

Based on the calculation, it may be concluded that the value of B<sub>1</sub>A<sub>1</sub> = 0,103; B<sub>1</sub>A<sub>2</sub> = 0,091; B<sub>2</sub>A<sub>1</sub> = 0,112; and B<sub>2</sub>A<sub>2</sub> = 0,096. As a result, it may be concluded that the value of B<sub>1</sub>A<sub>1</sub>, B<sub>1</sub>A<sub>2</sub>, B<sub>2</sub>A<sub>1</sub> and B<sub>2</sub>A<sub>2</sub> which were tested can be concluded as data that distributed normally. Thus, it can be concluded that the normality test of every group of data came from population that distributed normally.

Variance homogeneity test of the sample data which was measured based on every research variable was conducted in several stages. The hypotheses which were tested are:

H<sub>0</sub> : variance in every group is homogenous

H<sub>1</sub> : variance in every group is heterogenous

The homogeneity test was conducted using Bartlett test. The results showed that the value of Z<sub>count</sub> = 4.403, while the value of Z<sub>table</sub> = 7.815 with  $\alpha = 0.05$ . Since Z<sub>count</sub> < Z<sub>table</sub>, it may be concluded that the variance is homogenous.

Referring to those two tests, it may be concluded that to use finish every hypotheses test, the method that would be used is Two-way Anova for the first, second and fifth hypotheses, while for the third and fourth hypotheses would be tested using Tukey test. The results of the research are summarized in Table 4.

**Table-4.** Research Result

Y	A <sub>1</sub>	A <sub>2</sub>
B <sub>1</sub>	n <sub>(1,1)</sub> = 15	n <sub>(1,2)</sub> = 15
	$\sum Y_{(1,1)}$ = 1732	$\sum Y_{(1,2)}$ = 1517
	$\bar{Y}_{(1,1)}$ = 115,47	$\bar{Y}_{(1,2)}$ = 101,13
	$\sigma_{(1,1)}^2$ = 4,580	$\sigma_{(1,2)}^2$ = 5,181
	$\sigma_{(1,1)}^2$ = 20,98	$\sigma_{(1,2)}^2$ = 26,84
	$\sum Y_{(1,1)}^2$ = 200.282	$\sum Y_{(1,2)}^2$ = 153.795
B <sub>2</sub>	n <sub>(2,1)</sub> = 15	n <sub>(2,2)</sub> = 15
	$\sum Y_{(2,1)}$ = 1564	$\sum Y_{(2,2)}$ = 1629
	$\bar{Y}_{(2,1)}$ = 104,27	$\bar{Y}_{(2,2)}$ = 108,61
	$\sigma_{(2,1)}^2$ = 5,763	$\sigma_{(2,2)}^2$ = 6,080
	$\sigma_{(2,1)}^2$ = 33,210	$\sigma_{(2,2)}^2$ = 36,971
	$\sum Y_{(2,1)}^2$ = 163.538	$\sum Y_{(2,2)}^2$ = 177.427

The results of the test of influence of knowledge about garbage and gender towards environment sanitation behavior which was conducted using Two-way Anova can be seen in Table 5.

**Table-5.** Two-way ANOVA

Source Variance	dk	JK	RJK	F <sub>count</sub>	F <sub>table</sub> in $\alpha$	
					0,05	0,01
Inter-group	3	1.734,03	578,01	19,6**	2,77	4,15
Intra-group	56	1.651,9	29,49			
Effect of Knowledge (A)	1	1.306,66	1.306,66	44,3**	4,00	7,08
Effect of Gender (B)	1	266,95	266,95	9,05**		
Interaction AXB	1	166,64	166,64	5,65*		
Total	59	3.591,65				

\*  $p < 0,05$ ; \*\*  $p < 0,01$

Based on the test on first hypotheses, it may be concluded that H<sub>0</sub> "there is a difference of environment sanitation behavior between locals who have high level of knowledge about garbage management compared to those who do not" can be rejected. This is based on the results of the calculation which showed that the value of F<sub>count</sub> = 44.3 while the value of F<sub>table</sub> = 4.00 in  $\alpha = 0.05$  (if F<sub>count</sub> is higher than F<sub>table</sub>, the hypotheses should be rejected). The rejection means that there is a significant difference in environment sanitation behavior between locals who have high level of knowledge about garbage management compared to those who do not.

This matches the results of research conducted by Duru *et al.* (2017) which showed that environment sanitation is the basic process which becomes the key of health intervention of the society, which is important. Although the awareness level of environment sanitation among participants is high (95.0%), the level of knowledge about environment sanitation (22.9%), attitudes (38.6%) and practice of environment sanitation (20.8%) is still low.

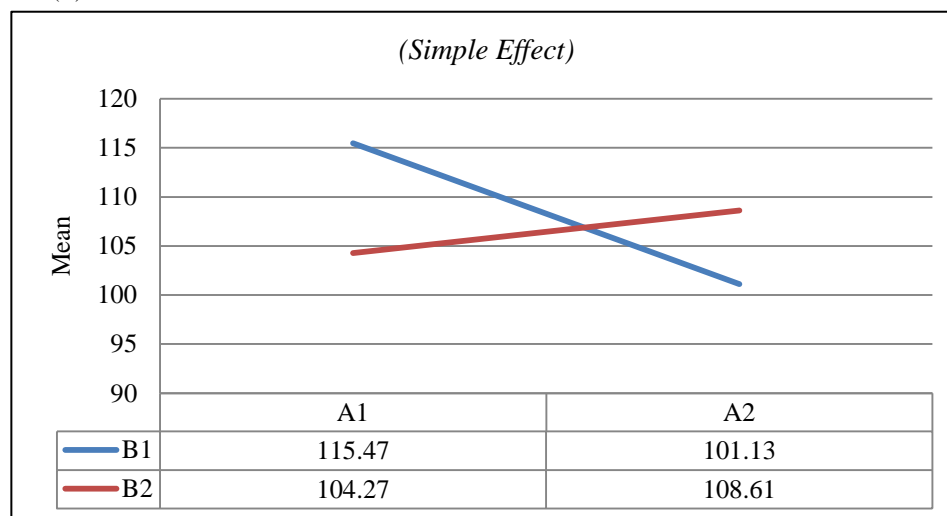


The result of Desa, showed that knowledge, attitudes, awareness level and behavior of students related to solid waste management can be considered as average. As a result, it is important to encourage and raise awareness about the importance of garbage management on campus among students in order to promote sustainable environment [Desa et al. \(2011\)](#).

The result of the test on second hypotheses showed that the  $H_0$  "there is a difference in environment sanitation between men and women". With the value of  $F_{\text{count}} = 9.05$ , while the value of  $F_{\text{table}} = 4.00$  with  $\alpha = 0.05$ . (If  $F_{\text{count}}$  is higher than  $F_{\text{table}}$ , the hypotheses should be rejected). It means that there is a significant difference in environment sanitation behavior between men and women. The results of research showed that inadequate urban sanitation may lead to low level of woman health in slums. The negative effects including contagious diseases, violence, malnutrition and poverty ([Corburn and Hildebrand, 2015](#)).

The fifth hypotheses which was tested in this research was: "there are some influence of interaction between garbage management and gender towards environment sanitation management". The value of  $\rho_{\text{count}} = 5.65$ , while the value of  $\rho_{\text{table}} = 4.00$ . If the value of  $\rho_{\text{count}}$  is higher than the value of  $\rho_{\text{table}}$ , the hypotheses should be rejected. It means that there are some onfluence of interaction between knowledge about garbage management and gender towards environment sanitation management.

**Figure-1.** Simple Effect Chart of Interaction Between Knowledge about Garbage Management (A) and Gender (B) towards Environment Sanitation Behavior (Y)



This condition matched the results of O'Reilly's research ([O'Reilly, 2016](#)), which showed that gender analysis is very important in order to get more understanding about the sanitation needs of the safety condition of toilets for women and children. Also, gender analysis may varied depend on geography, custom, social level, workplace, religion and ethnicity.

The results of a research conducted by Lawrence that sanitation behavior could be encouraged by hierarchy in social life and opinion of children [Lawrence et al. \(2016\)](#). The bad condition of land often be considered as an obstacle in toilet construction. Taboos, including prohibition for different gender to share the same toilet may become another obstacle. Community-led total sanitation (CLTS) has become a solution that may help to encourage construction of toilets and building habit to wash hands, particularly in Zambia where the research was conducted.

Moreover, the results of Tiwari et al.'s research showed that public defecation which was done by billions of people around the world may lead to negative consequences such as spreading diseases and hamper the growth of children. Zambia put CLTS in practice as an intervention to reduce public defecation, particularly in rural areas. In order to support CLTS and achieve zero public defecation, regulators are encouraged to contribute by become an agent of change to improve household sanitation [Tiwari et al. \(2017\)](#).

The third hypotheses which was tested in this research was "for women who have high level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts". The test was conducted using Tukey test, with the rejection criteria being "if the value of  $Q_{\text{count}} > Q_{\text{table}}$ , the hypotheses should be rejected". The analysis result showed that the value of  $Q_{\text{count}} = 14.47$ , while the value of  $Q_{\text{table}} = 3.86$ . As a result, it may be stated that for woman who have high level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts.

This condition matched the results of research conducted by Caruso et al., which showed that women in the village of Odisha, India has several problems of urination, defecation and menstruation which related to several factors, including the availability of toilet and time. In this research, there were several domains which can be considered as closely related to those problems, including sociocultural, physical and social environment and private problems [Caruso et al. \(2017\)](#).

The fourth hypotheses which was tested in this research was "for men who have low level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts". The test was conducted using Tukey test, with the rejection criteria being "if the value of  $Q_{\text{count}} > Q_{\text{table}}$ , the hypotheses should be rejected". The analysis result showed that the value of  $Q_{\text{count}} = 4.32$ , while the value of

$Q_{table} = 3.86$ . As a result, it may be stated that for men who have low level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts.

This condition matched the results of research conducted by Igwe et al., which showed that there were inadequate practices of environment sanitation in schools. There were several solutions which were offered, including increasing awareness about environment among male students, increasing the number of garbage can in classes and inclusion of material about environment in schools' curriculum (Igwe et al., 2017).

## 5. Conclusion and Recommendation

### 5.1. Conclusion

Based on the results of this research, it may be concluded that for women, if they have high level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts. On the other hand, for men, if they have low level of knowledge about garbage management, their environment sanitation behavior will become more positive compared to their counterparts. Also, environment sanitation behavior is not only determined by the level of knowledge about garbage management, but also gender.

### 5.2. Recommendation

There are several other factors that may influence the environment sanitation behavior beside knowledge about garbage management and gender, such as personality, ability, trust, justice and so on. Those factors may still be researched on. Also, there are several methods and approaches that may be used to analyze the data, such as correlational, path analyses, factor analysis and structural equation modelling.

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