

FACTORS ASSOCIATED WITH WASTE MANAGEMENT IN THE COMMUNITY IN PAAL RED SUB-DISTRICT, JAMBI CITY

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ABSTRACT

Backgrounds: Garbage is produced by human activities which if not managed properly will have an impact on environmental hygiene. Paal Merah sub-district is a sub-district in Jambi City with a dense population. Based on data from the Jambi City Environmental Service, the amount of waste generated in the Paal Merah sub-district has increased from year to year.

Objective: The purpose of this study was to determine the factors related to the behavior of waste management in the community in Paal Merah District, Jambi City.

Methods: The study was conducted using a cross-sectional design with a sample size of 105 respondents.

Results: The results of this study are that there is a relationship between lack of knowledge (p-value 0.044 PR 2.01 95% CI 1.01-4.00), attitude (p-value 0.45 PR 1.63 95% CI 1.11-2.40), subjective norm (p-value 0.027 PR 1.65 95%CI 1.08-2.52), control of behavior (p-value 0.004 PR 1.92 95%CI 1.33-2.77) with poor waste management.

Conclusion: Suggestions for the government to provide facilities and infrastructure and increase socialization about waste management so as to increase control over community behavior in managing waste.

Keywords: waste management; public; Paal Merah sub-district

INTRODUCTION

The environment where all creatures live, the degree of health is affected by the level of cleanliness of the environment, therefore protecting the environment is everyone's responsibility. A clean environment is an environment that is free from dirt that can harm all aspects of life. Good waste management can have an impact on environmental cleanliness¹. Human activities every day that produce waste, poor waste management, no

temporary landfills (TPS) available and limited availability of land. In addition, public awareness is still low to manage waste.^{2,3}

According to Law No. 18 of 2008 concerning Waste Management, waste reduction is explained by reducing restrictions on waste generation, recycling waste and reusing waste.⁴One of the community's efforts to assist in overcoming the waste problem is by implementing waste management by means of 3R

(reduction, reuse, recycle). Apart from that, the community must also sort waste before it is disposed of in TPS, separate waste, namely organic waste and organic waste. Non-Organic⁵.

Waste is generated from production or consumption activities. Efforts to manage waste in production activities are mainly carried out in order to increase productivity, while on the consumption side, namely the contribution of consumers to waste generation will automatically increase with the increase in the number of people⁶. Waste generation will increase, not only in the amount of waste, but also in the type of waste, this is due to the increasing population. The type of waste produced is determined by consumption patterns and behavior of the population towards waste management^{7,8}.

According to the Ministry of Environment One of the problems in Indonesia is waste. As the population increases, the amount of waste increases. The amount of waste in Indonesia reaches 13,000 tons per day.⁹ In Indonesia, data from the world waste bank states that there is solid waste nationally reaching up to 151,921 tons per day. In Indonesia, data from the world waste bank states that there is solid waste nationally reaching up to 151,921 tons per day. Indonesia disposes of solid waste per day on average as much as 0.85 kg. The amount of solid waste in world cities will continue to increase by 70% this year until 2025, from 1.3 billion

tons per year to 2.2 billion tons per year.¹⁰

Based on health research data in 2018, it is known that the percentage of waste management methods by district/city In Jambi Province, waste management is still dominated by burning 59.1%, carried by officers 25.9%, buried in soil 1.8%, disposed of carelessly 3, 3%, dumped into ditches 9.7% and 0.2% for compost. In Jambi City, the volume of waste generated is 423,446.09 kg per day and only 316,175.92 kg of waste is transported to the TPA per day.^{11,12,13}

Paal Merah District is a sub-district in Jambi City with a dense population. Based on data from the Jambi City Environment Service, the amount of waste generation in the Paal Merah sub-district has increased from year to year¹⁴. From the results of the survey it was found that mixed organic and inorganic waste still accumulated in the TPS, this caused an unpleasant odor and could damage the aesthetics of the surrounding environment. There were 124 cases of DHF in Pal Merah District, 2 of them died and 2,190 cases of diarrhea. Therefore, it is necessary to manage waste properly based on the source so that waste problems can be handled and not have an impact on people's health and the environment. Based on the results of previous research, there are several factors that become a problem in waste management in society, namely knowledge, attitudes, subjective norms and control over behavior^{15,16}. Therefore,

researchers want to do research on what are the "Factors Associated with Waste Management Behavior in Communities in Paal Merah District, Jambi City".

METHOD

This research is an observational study using a quantitative approach with a cross sectional method. The dependent variable in this study is waste management in the community and the independent variables in this study are knowledge, attitudes, subjective norms, control over behavior. This research was conducted in Paal Merah District, Jambi City in August-November 2022. In this study, there was a population of 105,906 people in the Paalmerah district.

The number of samples drawn for each village were: Paalmerah Village with 14 respondents, Talang Bakung Village

with 26 respondents, Lingkar Selatan Village with 20 respondents, Eka Jaya Village with 31 respondents, Payo Selincah Village, with 15 respondents so that the total sample was 106 respondents. After being counted, the sample members were randomly selected from each stratum (random sample) and the data was collected using a questionnaire.

RESULTS

This study found that the average age of the respondents was 42.57 years with the youngest age being 17 years and the oldest being 73 years. The average number of respondents' family members is 4-5 people with the smallest number being 2 members and the highest number being 13 family members. The following is a frequency distribution table for an overview of the respondents. (Table.1.)

Table 1.General description based on age and number of family members (n=105)

<i>Variable</i>	<i>Means</i>	<i>Median</i>	<i>Min-Max</i>	<i>SD</i>
<i>Age</i>	<i>42.57</i>	<i>42.00</i>	<i>17-73</i>	<i>13.587</i>
<i>Number of Family Members</i>	<i>4.43</i>	<i>5.00</i>	<i>2-13</i>	<i>1.562</i>

The highest proportion of respondents was female (54.3%), married status (82.9%), Jambi Malay ethnicity (44.8%), graduated from high school/MA (53.3%), housewife occupation (41.0%), Islam religion (97.1%), income Rp. 2,000,000-5,000,000 as many as 35.2%,

live more than 1 year (94.3%), and own occupancy (81.0%). The following is a frequency distribution table of the waste management variables, knowledge, attitudes, subjective norms, and control over behavior based on the respondents' questionnaire answers (Table.2.)

Table 2. Frequency distribution general description of respondents (n=105)

<i>Variable</i>		<i>n</i>	<i>%</i>
<i>Gender</i>	<i>Man</i>	48	45.7
	<i>Woman</i>	57	54.3
<i>Marital status</i>	<i>Marry</i>	87	82.9
	<i>Not married yet</i>	13	12.4
	<i>Widow widower</i>	5	4.7
<i>Ethnic group</i>	<i>Jambi Malay</i>	47	44.8
	<i>Java</i>	28	26.7
	<i>Sunda</i>	5	4.8
	<i>Batak</i>	4	3.7
	<i>Other</i>	21	20.0
<i>Education</i>	<i>No school</i>	2	1.9
	<i>Did not finish SD / MI</i>	2	1.9
	<i>Graduated from SD/MI</i>	10	9.5
	<i>Graduated from Middle School/MTs</i>	15	14.4
	<i>Graduated from SMA/MA</i>	56	53.3
	<i>Graduated D1-D3/PT</i>	20	19.0
	<i>Work</i>	<i>PNS/TNI/POLRI/BUMN/BUMD</i>	2
<i>Private employees</i>		12	11.4
<i>Self-employed</i>		12	11.4
<i>Laborer</i>		4	3.8
<i>Farmer</i>		1	1.0
<i>IRT</i>		43	41.0
<i>Other</i>		30	28.5
<i>Doesn't work</i>		1	1.0
<i>Religion</i>	<i>Islam</i>	102	97.1
	<i>Protestant/Catholic Christian</i>	3	2.9
<i>Family Income</i>	<i><IDR 500,000</i>	3	2.9
	<i>Rp. 500,000-1,000,000</i>	12	11.4
	<i>Rp. 1,000,000-1,500,000</i>	12	11.4
	<i>Rp. 1,500,000-2,000,000</i>	30	28.6
	<i>Rp. 2,000,000-5,000,000</i>	37	35.2
	<i>Rp. 5,000,000-10,000,000</i>	10	9.5
	<i>>Rp. 10,000,000</i>	1	1.0
<i>Stayed over 1 year</i>	<i>Yes</i>	99	94.3
	<i>No</i>	6	5.7
<i>Occupancy Status</i>	<i>Family Owned</i>	10	9.5
	<i>One's own</i>	85	81.0
	<i>Rent</i>	10	9.5
Total		105	100.0

The largest proportion of respondents manages waste well, namely 53.3%, has good knowledge 66.7%, has a good attitude 77.1%, has a

positive subjective norm, namely 53.3% and controls behavior positive by 75.2% (Table.3.).

Table 3.Univariate Results (n=105)

Variable		N	%
<i>Waste management</i>	<i>Not good</i>	49	46.7
	<i>Good</i>	56	53.3
<i>Knowledge</i>	<i>Not good</i>	16	15.2
	<i>Currently</i>	19	18.1
	<i>Good</i>	70	66.7
<i>Attitude</i>	<i>Not good</i>	24	22.9
	<i>Good</i>	81	77.1
<i>Subjective Norm</i>	<i>Negative</i>	49	46.7
	<i>Positive</i>	56	53.3
<i>Control Over Behavior</i>	<i>Negative</i>	26	24.8
	<i>Positive</i>	79	75.2

Bivariate analysis was performed using the chi square test. The following is a table of the results of the bivariate

analysis between the independent variables and the dependent variable,

Table 4. Results of Bivariate Analysis (n=105)

Variable	Waste management				Total	PR	(95% CI)	P-Value
	Not good		Good					
	n	%	N	%				
<i>Knowledge</i>								
<i>Not good</i>	12	75.0	4	25.0	16	2.01	1.01-4.00	0.044
<i>Currently</i>	11	57.9	8	42.1	19	1.55	0.77-3.15	0.217
<i>Good</i>	26	37.1	44	62.9	70			
<i>Attitude</i>								
<i>Not good</i>	16	66.7	8	33.3	24	1.63	1.11-2.40	0.045
<i>Good</i>	33	40.7	48	59.3	81			
<i>Subjective Norm</i>								
<i>Negative</i>	29	59.2	20	40.8	49	1.65	1.08-2.52	0.027
<i>Positive</i>	20	35.7	36	64.3	56			
<i>Behavior</i>								
<i>Negative</i>	19	73.1	7	26.9	26	1.92	1.33-2.77	0.004
<i>Positive</i>	30	38.0	49	62.0	79			
Total	49		56		105			

Based on table 4 it can be seen on knowledge, it can be seen that the largest proportion of respondents who process waste is not good in respondents who have poor knowledge (75.0%) compared to respondents who have moderate and

good knowledge. The results of the bivariate analysis show that there is a significant relationship between poor knowledge and poor waste management with a p-value of 0.044, where poor knowledge has a 2.01 times risk of poor

waste management (95% CI 1.01-4.00) compared to respondents who have good knowledge. Meanwhile, there is no significant relationship between respondents who have a moderate level of knowledge and poor waste management (p-value 0.217 PR 1.55 95% CI 0.77-3.15).

In the attitude variable, the largest proportion of respondents who manage waste poorly is in respondents who have a bad attitude (66.7%) compared to a good attitude. Based on the results of bivariate analysis, it can be seen that there is a relationship between attitudes and waste management (p-value 0.045). The association value shows that respondents who have a bad attitude are at risk of 1.63 times not being good at managing waste compared to respondents who have a good attitude (PR 1.63 95% CI 1.11-2.40). In the subjective norm variable, the proportion Respondents who are not good at managing waste are mostly respondents who have negative subjective norms (59.2%). There is a significant relationship between subjective norms and waste management, where respondents who have negative

subjective norms are at risk of 1, 65 times less good at managing waste compared to respondents who have positive subjective norms. (p-value 0.027 PR 1.65 95%CI 1.08-2.52)

Based on the control over behavior, the proportion of respondents who manage waste poorly is the respondent who has control over negative behavior (73.1%). Based on bivariate analysis, it is known that there is a significant relationship between behavior control and waste management. The association value indicates that respondents who have control over negative behavior have a 1.92 times risk of poor waste management compared to respondents who have control over positive behavior. (p-value 0.004 PR 1.92 95% CI 1.33-2.77).

Multivariate analysis was carried out to determine the variables that most influence on poor waste management by connecting more than 1 independent variable with the dependent variable simultaneously. The following is a multivariate candidate table that has a p-value <0.25 based on the results of bivariate analysis.

Table 5. Multivariate Candidate

<i>Variable</i>	<i>p-values</i>	<i>Information</i>
<i>Knowledge</i>	<i>0.034</i>	<i>Multivariate Candidate</i>
<i>Attitude</i>	<i>0.045</i>	<i>Multivariate Candidate</i>
<i>Subjective Norm</i>	<i>0.027</i>	<i>Multivariate Candidate</i>
<i>Control Over Behavior</i>	<i>0.004</i>	<i>Multivariate Candidate</i>

Based on the table above, it is known that knowledge, attitudes, subjective norms and control over behavior are multivariate candidates. These variables are included in the first multivariate model. For the next model,

variables with p-values > 0.05 will be removed gradually until there are no variables with p-values > 0.05. The following is a table of the initial multivariate model and the final multivariate model.

Table 6. Early Models

<i>Variable</i>	<i>B</i>	<i>PR(95%CI)</i>	<i>p-values</i>
<i>Knowledge (1)</i>	0.461	1.58 (0.73-3.44)	0.244
<i>Knowledge (2)</i>	0.440	1.55 (0.75-3.18)	0.230
<i>Attitude</i>	0.243	1.27 (0.64-2.51)	0.483
<i>Subjective Norm</i>	0.251	1.28 (0.69-2.39)	0.429
<i>Control Over Behavior</i>	0.531	1.70 (0.91-3.18)	0.096

Table 7. Late Models

<i>Variable</i>	<i>B</i>	<i>PR(95%CI)</i>	<i>p-values</i>
<i>Control Over Behavior</i>	0.655	1.92 (1.08-3.41)	0.026

Based on table 6, the variables included in the final model are behavior control variables because they have a p-value <0.05. Therefore, it can be concluded that the variable that has the most influence on poor waste management is behavior control with PR 1.92 95% CI 1.08-3.41 after controlling for knowledge, attitudes and subjective norms.

DISCUSSION

Relationship between Knowledge and Waste Management

Based on the results of this study, there is a relationship between poor knowledge and poor waste management (p-value 0.044). Respondents who have poor knowledge about processing waste have the potential to manage waste 2.01

times less well than respondents who have good knowledge (PR 2.01 95% CI 1.01-4.00). These results are in line with the results of research conducted by Hidayah, et al regarding the causes of household waste management behavior in preventing DHF. Based on the results of his research, knowledge is significantly related to the behavior of managing household waste (p-value 0.000)¹⁷. Another line of research is research conducted by Dalimunthe and Nasution regarding the relationship of knowledge with the management of organic and inorganic waste in society. Based on his research, there is a significant relationship between knowledge and waste management (p-value 0.002)¹⁸.

The results of this study indicate that there is no significant relationship

between moderate knowledge of waste management and poor waste management (p-value 0.217 PR 1.55 95% CI 0.77-3.15). This is in line with the results of Gusti et al's research which showed that there was a positive correlation between knowledge and waste management with an estimate of 0.83. That is, the better the level of knowledge about waste management, the better the respondents manage their waste. Thus, respondents with a moderate level of knowledge about waste management are not associated with poor waste management¹⁹. Knowledge can be influenced by socio-culture, environment and one's experience which is known as perceived so that motivation arises, the intention to act

Relationship between Attitudes and Waste Management

Based on the results of the research that has been done, it can be seen that there is a significant relationship between attitudes and waste management (p-value 0.045), where respondents who have a poor attitude towards waste management are 1.63 times less good at managing waste than respondents who have good attitude (PR 1.63 95% CI 1.11-2.40). The results of this study are in line with the results of Gusti et al.'s research which states that there is a positive relationship and correlation between attitudes and sustainable waste

management (α 0.90). This means that the better the attitude towards waste management, the better a person is at managing waste. Conversely, the less good a person's attitude towards waste management is, the less good a person is at managing waste¹⁹. The results of this study are not in line with research conducted by Hidayah, et al who examined the relationship between attitudes and household waste management. Based on the results of his research, there is no significant relationship between attitudes and household waste management (p-value 0.201)¹⁷.

Relationship between Subjective Norms and Waste Management

The results of this study indicate that there is a significant relationship between subjective norms and waste management with a p-value of 0.027. Respondents who have negative subjective norms have 1.65 times the risk of poor waste management compared to respondents who have positive subjective norms (PR 1.65 95% CI 1.08-2.52). The results of this study are in line with Mahmud and Osman's research which examined the determinants of recycling behavior in school children. Mahmud and Osman's research applies planned behavior theory, where one of the elements of the theory is subjective norms. Based on his research, positive

subjective norms correlate positively with good waste recycling ($\beta=0.59$). The better the subjective norm, the more the waste recycling behavior will increase. It means, if the subjective norm is negative it will have an impact on bad waste recycling as well. This is in line with this research.²⁰

The results of this study are in line with the results of research conducted by Gusti, et al. They conducted research on the determinants of the behavior intention of sustainable waste management. The results of his research show that there is a positive relationship and contribution between subjective norms and waste management intentions¹⁹. The results of this study are also in line with the research conducted by Datu et al, in which he examined planned behavior theory with littering behavior. According to his research, subjective norms are directly related and positively correlated to a person's intention to dispose of trash with an estimate of 0.168. The higher the individual's subjective norm regarding littering behavior, the higher the individual's intention not to litter.²¹

The results of this study are not in line with research conducted by Wilma which examined recycling behavior in Africa. Based on his research, there is no strong correlation between social pressure or subjective norms and recycling behavior. Respondents who recycle well do not necessarily have good subjective norms either. According to him,

this happened due to the weakness of the questionnaire questions about the subjective norms that were carried out.²²

Social pressure or subjective norms are one of the factors that determine one's intention to take action. This attitude is a personal factor that refers to a person's assessment of his behavior.

Relationship between Control of Behavior and Waste Management

Based on the results of this study, it can be seen that there is a significant relationship between behavior control and waste management (p-value 0.004 PR 1.92 95% CI 1.33-2.77). Based on multivariate analysis, the control variable for behavior is the variable that has the most influence on waste management, where negative behavior control has the potential to manage waste 1.92 times less well compared to respondents who have control over positive behavior.

The results of this study are in line with the research conducted by Datu, et al who examined the Theory of Planned Behavior with Littering Behavior. Based on the results of his research, the effect of control on behavior (Perceiving Behavior Control) on littering behavior has a positive estimation value of 0.845, meaning that the higher the perceived control of individual behavior for littering, the higher the individual behavior for littering.²¹. The results of this study are also in line with the research conducted

by Mahmud and Osman. Based on the results of his research, there is a significant relationship between control of behavior (PBC) and recycling intentions with a positive estimated value of 0.687. That is, the higher the PBC, the higher the recycling behavior intention. The results of his research also state that PBC or control of behavior is the strongest predictor of recycling intention behavior.

Research conducted by Gusti, et al is also in line with the results of this study. Based on the results of his research, PBC relates and contributes positively to the intention to implement sustainable waste management behavior. So that it can also be concluded that if the control over negative behavior, the waste management will not be good.¹⁹ Control of behavior or PBC is a belief in one's ability to do something as well as an

indication of available resources and opportunities.

CONCLUSION

Based on the research conducted, it can be concluded that there is a significant relationship between poor knowledge, attitudes, subjective norms and behavior control with waste management. The variable that has the most influence on waste management is behavior control.

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