

Factors Associated With Public Behavior In Reducing Household Waste In Sungai Penuh City

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Abstract – Sungai Penuh City's waste is dominated by household waste at 40.76% with the largest composition of food waste at 44.76%. Based on Law No. 18/2008, one of the main focuses in waste management is reduction, but the practice of waste reduction in Sungai Penuh City has not been maximized. The study aims to analyze factors related to public behavior in waste reduction in Sungai Penuh City. The approach used was quantitative with survey techniques using questionnaires, which were carried out August-December 2023. The research subjects were 79 samples of people in Sungai Penuh City. The Chi Square test was used to determine the relationship of behavior to age, education, occupation, income, knowledge and attitude. The results of the Chi Square test show that there is a significant relationship between education and waste reduction behavior (P Value = 0.03), there is a significant relationship between employment and public behavior in waste reduction (P Value = 0.027), there is a significant relationship between knowledge and public behavior in waste reduction (P Value = 0.004), and there is a significant relationship between attitudes and public behavior in waste reduction in Sungai Penuh City (P Value = 0.000). while age has no significant relationship with public behavior in waste reduction (P Value = 0.581) and income has no significant relationship with public behavior in waste reduction in Sungai Penuh City.

Keywords – Public Behavior, Waste, Reduction.

I. INTRODUCTION

Waste problems are often seen as simple and easy to overcome. But it turns out that the waste problem is a problem that needs special handling. This is because waste is related to all human, animal, plant and natural activities. The main focus of waste management is waste reduction and waste management. The final management phase includes reducing the amount of waste, recycling, and/or reusing it [1].

Waste generation in Indonesia in 2022 reached 35.803 million tons/year with a reduction rate of 14.98% and handling of 47.64%, while managed waste reached 62.62% and unmanaged 37.38%. National waste sources are dominated by household waste (38.40%). Meanwhile, based on its composition, waste is dominated by food waste (40.80%), followed by plastic (18%), wood (13%), paper / cardboard (11.30%), metal (3.31%), cloth (2.76%), rubber / leather (1.98%), glass (2.28%) and others (7.1%). When compared with the waste data in Sungai City, the amount of waste generated by Sungai Penuh City as a small city is 50.124 tons/day. The waste comes from various sources, including waste from household waste [2]. The composition of organic food waste is 35.262 tons/day or 70.350%. Population growth, changes in people's consumption patterns, economic growth, income changes, urbanization, and industrialization cause a high amount of waste generation and produce waste of various types [3].

Since 2014 until now, Sungai Penuh City has experienced problems related to the absence of a definitive landfill site. Residents have resisted every attempt by the government to plan a new landfill site. The main obstacle is the limited land that can

be used as a location for public facilities, including landfills. This also plays a role in exacerbating the waste problem in Sungai Penuh City. Currently, the government has rented land from residents to be used as a temporary landfill located in Renah Pandan Tinggi Village with an area of 1.6 hectares. In the absence of a definitive landfill, the government is required to find innovations and appropriate solutions in waste management in Sungai Penuh City.

Regarding the way waste is disposed of in Sungai Penuh City, about 46% is transported by the cleaning fleet to the landfill, 25% of waste is disposed of by dumping or burning, 15% of waste is processed into compost and 14% of waste is thrown into the river. Full public participation is needed in waste reduction and handling efforts. Communities have an important role as waste producers and have a better understanding of the waste management conditions around them. The public will also feel the impact directly if waste is not managed properly. Waste reduction from the source, especially household and similar waste, will not be successful without the active involvement of the public. Similarly, in waste management, the contribution of the public is very influential on the sustainability of waste management. Active public participation is the key to successful waste management [4].

The obstacle in waste reduction is that people are not accustomed to reducing the consumption of products that will become waste (reduce) or reusing their waste (reuse). But some people are already familiar with recycling (recycle) for waste such as plastic bottles, paper, and so on. Although the term recycling is actually not only used for the utilization of inorganic waste, but also for organic waste, namely by composting. Like other developing countries, the informal sector plays an important role in recycling activities in Indonesia [5].

People's behavior in handling waste also affects waste generation in Sungai Penuh City. Some people also tend to throw garbage outside the container, causing garbage to be scattered. In addition, the activities of the people of Sungai Penuh City who do not dispose of garbage at the designated place and time often cause environmental pollution and accumulation of garbage outside of waste collection hours by janitors. Not all people in Sungai Penuh City have an understanding of the importance of not littering and the negative impacts that will arise from this behavior such as environmental pollution, the spread of disease, and ecosystem degradation.

Any sustainable behavior comes from within the individual, indicating the importance of improving public behavior to contribute to the reduction of household waste production [6]. Identification of key factors is necessary to achieve such behavior. This is because human behavior can be changed and improved if the key factors that formulate behavior have been identified. By finding the right factors, the government, public and related parties can develop strategies and programs that will lead to waste reduction behavior. Therefore, it is interesting to examine the factors associated with public behavior in waste reduction in Sungai Penuh City.

II. RESEARCH METHODOLOGY

This research was conducted in Sungai Penuh City, Jambi Province from September to December 2023. The survey method with a quantitative approach was used in this study to collect and analyze data on factors related to public behavior related to waste reduction. The data analysis used is the Chi Square Test, a statistical method functioned as a hypothesis test when the research sample has two or more classes where the data is nominal and the sample size is large. [7]. Data collection was conducted using primary and secondary data. Primary data were obtained through field observations, documentation, and questionnaires. The population in this study were all selected family heads in Sungai Penuh City using the multi-stage random sampling method, namely 385 family heads. The sample in this study was 79 heads of families with the Slovin formula as follows [8]:

$$n = \frac{N}{1 + N (d^2)}$$

Description:

N = Population Size

n = Sample Size

d = Trust level

$$n = \frac{385}{1 + 385 (0,1)^2}$$

$n = 79$ Sample

III. RESULTS AND DISCUSSION

The Frequency Distribution of Family Head Characteristics in Sungai Penuh City can be seen in table 1 below :

Table 1. Frequency Distribution of Family Head Characteristics

No	Characteristics	Frequency	%
Age			
1	Young (≤ 47)	39	49,4
2	Old (> 47)	40	50,6
Education			
1	Low Education (Elementary School, Junior High School)	13	16,5
2	High Education (Senior High School, College)	66	83,5
Employment			
1	Others (Farmers, Housewives, Retirees, and Private Employees)	41	51,9
2	Entrepreneur	18	22,8
3	Government employees	20	25,3
Income			
1	Low Income (\leq Rp. 2.000.000 IDR)	22	27,8
2	High Income ($>$ Rp 2.000.000 IDR)	57	72,2
Knowledge			
1	Low Knowledge	15	19,0
2	High Knowledge	64	81,0
Attitude			
1	Negative	37	46,8
2	Positive	42	53,2
Action			
1	Poorly	32	40,5
2	Good	47	59,5

Source: Data Processing Results Using the SPSS Application, 2023

Based on table 1 above, it shows that the age of the head of the family respondents is mostly Old (> 47) years old 50,6%, the education of the head of the family is mostly higher education (College and High School) 83,5%, the occupation of the head of the family is mostly Others (Farmers, Housewives, Retirees, and Private Employees) 51,9%, the income of the head of the family is mostly high income ($>$ Rp. 2.000.000 IDR) 72,2%, the knowledge of the head of the family is mostly high 81,0%, the attitude of the head of the family tends to be positive 53,2% and the actions of the head of the family are mostly good 59,5%.

Table 2: Chi Square Test of Age with Waste Reduction Behavior

No	Age (Year)	Public Behavior				Total		<i>P Value</i>
		Poorly		Good				
		n	%	n	%	n	%	
1	Young (≤47)	17	21,5	22	27,8	39	49,4	0,581
2	Old (>47)	15	19,0	25	31,6	40	50,6	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 2, good public behavior in reducing household waste is found more in the older age (> 47 years) with a percentage of 31,6% than in the younger age (≤ 47 years) with a percentage of 27,8%. Meanwhile, poor public behavior in waste reduction is found more in young family heads (≤ 47 years old) with a percentage of 21,5%. Based on the Chi Square test results, there is no significant relationship between age and public behavior in reducing household waste in Sungai Penuh City ($P \text{ Value} = 0,581 > \alpha = 0,05$).

Table 3. Chi Square Test of Education with Waste Reduction Behavior

No	Education	Public Behavior				Total		P Value
		Poorly		Good		n	%	
		n	%	n	%			
1	Low Education (Elementary School, Junior High School)	10	12,7	3	3,8	13	16,5	0,003
2	High Education (Senior High School, College)	22	27,8	44	55,7	66	83,5	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 3, good public behavior in reducing household waste is more common among household heads with a high level of education (high school and university) with a percentage of 55,7% than those with a low level of education (elementary school, and junior high school) with a percentage of 3,8%. Meanwhile, poor public behavior in waste reduction was found more among household heads with a high level of education (high school and college) with a percentage of 27,8%. Based on the Chi Square test results, there is a significant relationship between education and public behavior in reducing household waste in Sungai Penuh City ($P \text{ Value} = 0,003 < \alpha = 0,05$).

Table 4. Chi Square Test of Employment with Waste Reduction Behavior

No	Profession	Public Behavior				Total		P Value
		Poorly		Good		n	%	
		n	%	n	%			
1	Lainya (Tani, Ibu Rumah Tangga, Pensiunan, dan Pegawai Swasta)	20	25,3	21	26,6	41	51,9	0,027
2	Wiraswasta	9	11,4	9	11,4	18	22,8	
3	PNS	3	3,8	17	21,5	20	25,3	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 19, good public behavior in reducing household waste is found more among heads of households with other employment (Farmers, Housewives, Retirees, and Private Employees) with a percentage of 26.6% compared to heads of households who work as self-employed with a percentage of 11.4%. Meanwhile, poor public behavior in waste reduction was found more among heads of families with other employment (Farmers, Housewives, Retirees, and Private Employees) with a percentage of 25.3%. Based on the Chi Square test results, there is a significant relationship between education and public behavior in reducing household waste in Sungai Penuh City ($P \text{ Value} = 0.027 < \alpha = 0.05$).

Table 5. Chi Square Test of Income with Waste Reduction Behavior

		Public Behavior				Total		<i>P Value</i>
No	Income	Poorly		Good				
		n	%	n	%	n	%	
1	Low Income (\leq Rp. 2.000.000 IDR)	9	11,4	13	16,5	22	27,8	0,964
2	High Income ($>$ Rp 2.000.000 IDR)	23	29,1	34	43,0	57	72,2	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 5, good public behavior in reducing household waste was found more among heads of households with income $>$ Rp.2,000,000 (High) with a percentage of 43.0% compared to heads of households with income \leq Rp.2,000,000 (Low) with a percentage of 16.5%. Meanwhile, poor public behavior in waste reduction was found more among family heads with income $>$ Rp.2,000,000 (High) with a percentage of 29.1%. Based on the Chi Square test results, there is no significant relationship between education and public behavior in reducing household waste in Sungai Penuh City ($P \text{ Value} = 0.964 > \alpha = 0.05$).

Table 6. Chi Square Test of Knowledge with Waste Reduction Behavior

No	Knowledge	Public Behavior				Total		P Value
		Poorly		Good		n	%	
		n	%	n	%			
1	Low Knowledge	11	13,9	4	5,1	15	19,0	0,004
2	High Knowledge	21	26,6	43	54,4	64	81,0	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 6 above, good public behavior in reducing household waste was found more among household heads who had a high level of knowledge (54.4%) than among household heads who had a low level of knowledge (5.1%). Meanwhile, poor public behavior in reducing household waste was found more among family heads who had a high level of knowledge (26.6%). Based on the results of the chi square test, there is a significant relationship between knowledge and public behavior in reducing household waste ($P \text{ Value} = 0.004 < \alpha = 0.05$).

Table 7. Chi Square Test of Attitude with Waste Reduction Behavior

Public Behavior								
No	Attitude					Total		P Value
		Poorly		Good				
		n	%	n	%	n	%	
1	Negatif	25	31,6	12	15,2	37	46,8	0,000
2	Positive	7	8,9	35	44,3	42	53,2	
Total		32	40,5	47	59,5	79	100	

Source: Data Processing Results Using the SPSS Application, 2023

Based on Table 24 above, good public behavior in reducing household waste is more common among household heads who belong to the positive attitude group (44.3%) compared to household heads who belong to the negative attitude group (15.2%). Meanwhile, poor public behavior in reducing household waste was found more among household heads who belonged to the negative attitude group (31.6%). Based on the results of the chi square test, there is a significant relationship between attitude and public behavior in reducing household waste ($P \text{ Value} = 0.000 < \alpha = 0.05$).

The poor waste management behavior seen in the younger age group is due to a lack of understanding about waste management and a lack of motivation to carry out waste management. Knowledge improvement needs to be done especially in the young age group who still have a limited understanding of waste management. The delivery of educational materials in educational institutions such as schools or colleges, as well as the implementation of advertisements aimed at the younger generation, can be an effective strategy to increase awareness about waste management among the younger age group [9]. As people age, their experience and awareness of the importance of protecting and improving the environment for the better increases. The opportunity for older age groups to manage waste is higher than younger age groups. Therefore, age has an impact on the level of awareness and importance of household waste management.

In general, the level of education affects attitudes and behaviors, where a low level of education can lead to unhealthy attitudes and behaviors. Successful education includes increased knowledge, so with a high level of education it is expected that knowledge about waste management will also increase. This is expected to change attitudes and behaviors to be more positive towards waste management. There is a positive correlation between education level and public participation in waste management. Public education is related to how much public participation in managing waste. The higher the knowledge the public has about waste management, the higher the level of participation in waste management because their awareness of the importance of keeping the environment clean is increasing [10].

The employment variable has a significant positive impact on waste management. Therefore, it can be concluded that individuals who are employed have fairly good skills in waste management. Although those who work may have limited time at home, they have higher understanding, reasoning, and awareness about waste management. In addition, they are also more informed about good household waste management practices. Employment status has an impact on the level of public participation in the waste bank program, which is one form of waste management that involves the public directly. The observation shows that in Denpasar City, people who are employed have a higher tendency to participate in the waste bank program. People who work tend to have the awareness to be involved in waste management because they interact more with the surrounding environment compared to those who do not work [11].

Poverty results in a lack of concern for the environment. People who live in poverty, feel hunger, and are faced with various needs such as family, education, and so on, find it difficult to think about caring for the environment. For example, they may not be able to provide containers or trash bins at home due to economic limitations. This is not in line with the theory that family income level has a significant impact on waste handling activities. Individuals with higher incomes tend to implement waste management more effectively. For example, they may provide waste containers inside and outside the house, and also pay others to take care of the waste generated [12].

The knowledge variable has an important and positive impact on waste management. This shows that lack of knowledge can affect behavior in managing waste. Knowledge about waste management is crucial in everyday life. Adequate knowledge will shape attitudes and behavioral desires that are beneficial in waste management. Knowledge gained from environmental awareness will encourage public participation in waste reduction efforts and overall improvement in waste management. The knowledge variable has a significant impact on waste management [13]. This is due to the important role of knowledge in determining the quality of effective waste management. People's knowledge about the specific type of waste is very meaningful, because it is crucial in efforts to overcome household waste problems and encourage positive behavior in reducing waste in daily life [14].

The attitude variable has a significant influence on behavior in waste management. A positive attitude towards waste management is supported by a good level of environmental knowledge. Waste management measures that can influence people's attitudes towards reducing and managing waste include monitoring and reinforcing when inappropriate attitudes occur, as well as appointing individuals to carry out checks to prevent waste accumulation. An individual's attitude will affect the behavior of the public as a whole, and with a positive attitude, it is expected that it will encourage good behavior, although this is not always the case [15].

IV. CONCLUSIONS

Based on the results of the study there are several factors associated with public behavior in reducing household waste in Sungai Penuh City including education (P Value = 0.003), occupation (P Value = 0.027), knowledge (P Value = 0.004) and attitude (P Value = 0.004). While factors that have no relationship with public behavior in reducing household waste are age (P Value=0.581) and income (P Value=0.964).

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