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Knowledge and waste management based on local wisdom on environmental health complaints

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Abstract

Objective: This study explores environmental health issues related to waste management, focusing on the local wisdom that makes biopore holes to accommodate organic waste with *Budaya Gawe Jugangan Sampah Organik* as known as ”BYGJUSO”, to understand the relationship between knowledge and waste management based on local wisdom and public health complaints. **Methods:** The study used a cross-sectional approach. It was conducted in October 2024 in Sorogenen Village, RT 34, RW 09, Sorosutan, Umbulharjo, Yogyakarta City. The sample consisted of 30 family Empowerment and Welfare (PKK) members, selected through purposive sampling. The data were analyzed using univariate analysis, including cross-tabulation, and bivariate analysis with Fisher’s exact test. **Results:** The statistical analysis revealed a p-value of 0.037 for the association between the edge and environmental health complaints, indicating a significant relationship. In contrast, the p-value for the association between waste management and environmental health complaints was 0.491, indicating no statistically significant relationship. **Conclusion:** These results suggest that enhancing environmental knowledge may play a crucial role in addressing public health concerns, whereas waste management practices alone may not have a direct influence on health complaints.

Keywords: biopore; environmental health; local wisdom; waste management

INTRODUCTION

One of the problems Indonesia faces is waste management. This problem cannot be denied because waste will always exist as long as life activities continue [1]. Garbage or waste originates from various human activities, including household activities, industry, trade, agriculture, offices, and development projects. However, the activity that contributes the most waste is household activity [2].

The amount of waste generated in Yogyakarta City from 2012 to 2023 remains relatively high. The latest data indicate that the estimated amount of waste generated in Yogyakarta City in 2023 averaged 331,764 tons/day. Limited facilities and infrastructure in the waste transportation process have resulted in not all waste being transported to the landfill (Final Processing Site). The percentage of waste that can be managed is approximately 60.70%, and the estimated rate of waste reduction is around 18.53%. Meanwhile, unmanaged waste is estimated to be approximately 20.77%. Unmanaged waste can impact the environment by entering the watershed or scattering and piling up in unauthorized waste dumps, resulting in environmental pollution [3].

Waste management can employ several methods tailored to the unique characteristics of a specific area. This study aims to determine the relationship between

knowledge-based and local wisdom-based waste management and environmental health complaints in Kampung Sorogenen RW 09, Sorosutan Village, Umbulharjo District, Yogyakarta City.

METHODS

This quantitative research explores the relationship or influence between two or more variables by estimating how health phenomena can occur. The approach is cross-sectional, meaning that cause-and-effect relationships in the study are collected simultaneously [4]. In this study, variable data were collected simultaneously using a questionnaire and then analyzed to determine the relationship between knowledge and local wisdom-based waste management (BYGJUSO) with community complaints.

This research was conducted from September to October 2024, with data collection taking place on October 13, 2024. The study's participants were members of the Family Empowerment and Welfare (PKK) in Sorogenen Village, RT 34, RW 09, Sorosutan, Umbulharjo District, Yogyakarta City.

The hypothesis in this study is that there is a relationship between knowledge and local wisdom-based waste management (BYGJUSO) and community complaints in Sorosutan Village, Sorogenen Umbulharjo, Yogyakarta City. The null hypothesis is rejected if the p-value <0.05, which means the statistical test results show a relationship.

The sampling technique used in this study was purposive sampling. Purposive sampling is a sampling technique with specific considerations. The reason for using this purposive sampling technique is that it is suitable for use in quantitative research or research that does not generalize [4]. The inclusion criteria for this study were PKK mothers residing in Sorogenen Village, RT 34, RW 09, Sorosutan, Umbulharjo District, Yogyakarta City. PKK mothers were purposely selected because they are actively involved in community activities and are often the leading agents in supporting health and welfare programs at the village level. One of their programs is waste management. Therefore, their participation is expected to provide relevant data for achieving the research objectives. Meanwhile, the exclusion criteria were PKK mothers who were unwilling to fill out the questionnaire that had been given.

This study has dependent and independent variables. The dependent variable is knowledge and waste management, while the independent variable is community complaints. Data processing and analysis were performed using a computer with SPSS for Windows. Data analysis consisted of both univariate and bivariate analyses. Univariate analysis using cross-tabulation describes the characteristics of the independent and dependent variables. Bivariate analysis aims to find the relationship between the dependent and independent variables using Fisher's Exact test.

RESULTS

General description

Sorosutan Village is an area in Umbulharjo District, Yogyakarta City (Figure 1), where local wisdom is applied in waste management. One of the areas in Sorosutan Village, specifically Sorogenen RT 34 RW 09, with approximately 30 households, has implemented household waste management using a method known as Gawe Jugangan Sampah Organik (BYGJUSO (Figure 2). "BYGJUSO" waste management is making “jugangan” in biopore in the yards and alleys of residents' houses. The application of "BYGJUSO" uses the *dasawisma* principle, which means one biopore hole or “jugangan” to collect waste from 10 households. Waste that is processed using "BYGJUSO" is solid organic waste. Meanwhile, inorganic waste is managed with a waste bank system.

The sample size for this study consisted of 30 respondents. The researcher briefly explained the purpose and objectives of the study and then distributed questionnaires containing informed consent and research questions. After collecting the questionnaire answers, the researcher processed and analyzed the data. Then, conclusions will be drawn from the research results.

Univariate analysis presents a frequency distribution that provides an overview of respondents' characteristics. Furthermore, bivariate analysis was used to determine the relationship between knowledge, local wisdom-based waste management (BYGJUSO), and community complaints in Sorogenen Village, Sorosutan, Umbulharjo, and Yogyakarta City. The results of univariate and bivariate analyses are presented in the following table.

Age is typically classified into two categories: young age, defined as 25-44 years old, and middle age, defined as 45-60 years old. Education level is classified into four categories: elementary school, junior high school, high school, and university. Employment is classified into two categories: not working and working. Knowledge level was classified into two categories based on the median score: low (final score < 7) and high (final score

≥ 7). Waste management was classified into two categories based on the median value, poor (final score < 8) and good (final score ≥ 8). Environmental health complaints were classified into two categories based on the median value: no complaints (final score < 9) and complaints (final score ≥ 9).

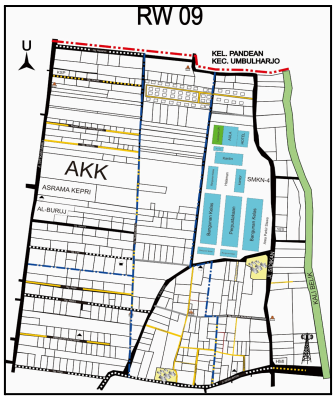

Figure 1. Map of Sorosutan Village

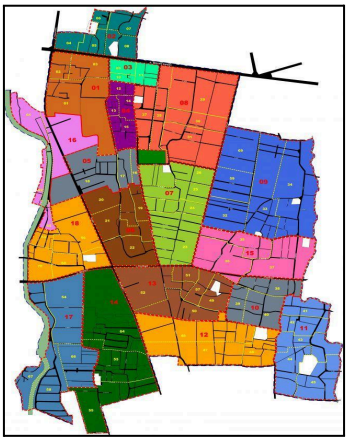

Figure 2. Map of BYGJUSO distribution in RW 09 Sorogenen Village, Sorosutan Urban Village

Based on Table 1, most respondents belong to the young age category (53.3%). Most respondents had a high school education (53.3%) and were employed (53.3%). Most respondents had low knowledge of waste management (86.7%) and poor waste management (56.7%). Additionally, most respondents also reported experiencing environmental health complaints (53.3%).

Table 2 shows that most respondents (53.3%) have little knowledge of waste management and experience environmental health complaints. In addition, most respondents (33.3%) perform poor waste management and experience environmental health complaints.

In addition, the p-value obtained for the comparison between knowledge and environmental health complaints is 0.037 or less than 0.05. This suggests a relationship between knowledge of waste management and environmental health complaints. In contrast, the p-value for the comparison between waste management and environmental health complaints is 0.491. It means there is no relationship between waste management and environmental health complaints.

Table 1. Frequency distribution (n=30)

Variable	%
Age	
Young age	53.3
Middle age	46.7
Education level	
Elementary school	6.7
Junior high school	16.7
High school	53.3
College	23.3
Employment	
Not employed	53.3
Employed	46.7
Knowledge	
Low	86.7
High	13.3
Waste management	
Poor	56.7
Good	43.3
Environmental health complaints	
No complaints	46.7
Complaints	53.3

Table 2. Cross tabulation between knowledge and waste management with environmental health complaints (n=30)

Variable	Environmental health complaints				p-value
	No complaints		Complaints		
	n	%	n	%	
Knowledge					
Low	10	3.3	16	53.3	0.037
High	4	1.3	0	0	
Waste management					
Poor	7	23.3	10	33.3	0.491
Good	7	23.3	6	20.0	

DISCUSSION

Respondent characteristics

The majority of respondents in this study are young. In this age group, respondents can still understand the issue of environmental pollution and how to treat waste to reduce it. As Muis states in Samosir et al., the older a person gets, the slower their mental development process becomes, which is slower than during their teenage years. The ability to accept or remember knowledge decreases at specific ages or with advancing age [5].

Most respondents have a history of high school education. Educational level can influence an individual's approach to waste management. Individuals with higher levels of education are generally more likely to engage in proper waste management practices, possibly due to greater environmental awareness or better knowledge of appropriate waste handling methods [6].

About 53.3% of respondents in this study had a job. Employment is one of the key factors that can significantly influence a person's ability to manage waste effectively. When people can fulfill their needs, they can adequately manage waste [7].

Relationship between knowledge and environmental health complaints

The p-value obtained for the comparison between knowledge and environmental health complaints is 0.037. It indicates a relationship between knowledge related to waste management and environmental health complaints. This result aligns with research conducted by Said et al., which suggests that knowledge about environmental sanitation has a positive and significant impact on the quality of environmental health within the house [8]. However, there is a slight difference in this study; the variable measured is environmental health complaints. Annisa and Susilawati stated that a healthy environment can have a significant impact on public health. Maintaining environmental health is equivalent to maintaining the health of oneself and one's family [9].

Based on research by Wiyarno and Widyastuti, knowledge also has a positive relationship with community behavior in littering. To develop good behavior in waste management, particularly in reducing waste littering, it is necessary to provide information and counseling activities on a regular and widespread basis [10]. Within increased public awareness, littering behavior is expected to improve. This will contribute to creating a clean, beautiful, and healthy environment. The environment will improve if knowledge is enhanced [11]

Relationship between waste management and environmental health complaints

The p-value comparing waste management and environmental health complaints is 0.491. It means there is no relationship between waste management and environmental health complaints. The absence of environmental health complaints may be attributed to the favorable environmental conditions at the time of data collection. Moreover, the cross-sectional study design captures exposure and outcomes at a single point in time, thus reflecting only the current conditions and limiting the ability to assess past exposures [12].

This research is constrained by time and cost limitations regarding the relationship between local wisdom-based waste management, “BYGJUSO,” and environmental health complaints. The research period was two months, so observation and data collection were limited to selected samples due to the time constraints. The source of funding for this research is entirely from the researcher. Hence, the research aims to determine the direct relationship between variables and has not been followed up in subsequent experimental studies or by the “JAGA DIRI” program, which is recommended by researchers for waste management and increasing knowledge about local wisdom.

In future research, the preparation and implementation of the research schedule are expected to adjust to the research design and the program being implemented. Additionally, the waste management program can be implemented with regional funding as a form of community program support, particularly for residents of Sorogenen Village, Sorosutan Village, and Umbulharjo District. Thus, the long-term effects of “BYGJUSO” waste management, combined with the “JAGA DIRI” program, on reducing environmental health complaints can be observed.

CONCLUSION

This study highlights a significant relationship between knowledge of waste management and environmental health complaints. However, waste management based on local wisdom has a clear association with environmental health complaints.

Researchers recommend that the residents of RW 09 Sorogenen Village, Sorosutan Village, continue to be committed to and directly involved in the BYGJUSO program. To maintain environmental health, they should innovate and collaborate in sustainable waste management in the surrounding area. The Yogyakarta City Government should provide moral and material support for local wisdom-based waste management to optimize waste management in the Yogyakarta City area. Additionally, as a positive reference for further investigations that develop local wisdom-based approaches, address broader populations, and explore more complex environmental health issues.

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