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Analysis of Factors Influencing waste Management in The Dom Aleixo Administrative Post, Dili Municipality, in 2022

Cleofas da Costa Seixas
Universitas Padjadjaran, Indonesia
Email: cleofasseixas003@gmail.com

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ABSTRACT

Countries worldwide face complex challenges, with waste management remaining a major concern, particularly in rapidly growing urban areas of developing countries. Waste management involves waste reduction, reuse, processing, collection, and disposal activities. Effective waste management and disposal require the optimal utilization of available technologies to support sustainable practices and environmental protection. This study aimed to identify the factors influencing waste management in the Dom Aleixo Administrative Post, Dili Municipality, during 2022. It employed an analytical observational design with a cross-sectional approach. The results showed no significant relationship between community knowledge (X1) and waste management (Y) (RP = 0.954; 95% CI: 0.181–4.606). However, significant relationships were found between waste management (Y) and community attitudes (X2) (RP = 1.515; 95% CI: 1.019–4.066), local leader support (X3) (RP = 1.558; 95% CI: 1.293–3.762), political factors (X5) (RP = 2.043; 95% CI: 1.948–5.982), and facilities and infrastructure (X6) (RP = 1.572; 95% CI: 1.443–3.644). No significant relationship was identified between family support (X4) and waste management (RP = 1.225; 95% CI: 0.753–2.644). In conclusion, community knowledge (X1) and family support (X4) were not significantly associated with waste management, whereas community attitudes (X2), local leader support (X3), political factors (X5), and facilities and infrastructure (X6) demonstrated significant associations with waste management practices.

INTRODUCTION

Every country worldwide faces complex challenges, with waste management remaining a major issue, particularly in rapidly growing urban areas of developing nations (Okumus, 2021). Waste reduction involves activities such as minimizing waste generation, reusing materials, and processing waste for new purposes (Ayuningtyas, 2015; Azima Azwir, 2019; Bakry, 2010; Yulianto, 2018). Waste management processes include waste separation, collection, treatment, and final disposal. Efficient waste disposal can be achieved through the optimal utilization of available technologies to support sustainable management practices and environmental protection (Demirbas, 2011). Population mobility, increasing urbanization, and rising living standards driven by technological advancements have contributed to the growth in both the quantity and diversity of waste generated (Bari, 2012). Municipal waste management is a responsibility that must be carried out by the government. Effective waste recycling and reuse can create employment opportunities, support economic development, and reduce environmental pollution (Gundupali, 2016).

According to the World Health Organization (WHO), in 2006, approximately 24% of the global disease burden was associated with preventable environmental factors, contributing to more than 13 million deaths annually (Damanhuri, 2010; Darwanty et al., 2023; Dyah., 2018; Gunawan & Prasetija, 2023) . Diseases related to unhealthy environments include diarrhea, acute respiratory infections, dengue fever, various injuries, and malaria, among others. Data from the Indonesian Ministry of Health (Kementerian Kesehatan Republik Indonesia / Kemkes-RI) in 2020 indicated that malaria caused more than 200 million cases and associated deaths worldwide each year. As of January 13, 2022, epidemiological data from Timor-Leste recorded 370 dengue cases and 5 deaths. Most cases were identified in Dili Municipality (281 cases), followed by Manatuto (20), Covalima (16), Baucau (16), Manufahi (13), Ermera (13), Viqueque (4), Ainaro (3), and Aileu and Bobonaro (1 case each). These cases occurred between the first week of January and March 2022 (Sugiyono., 2022; Susanto, 2015) .

To address waste-related problems, a country must prioritize environmental protection and establish regulations and community schedules for proper waste disposal because inappropriate disposal practices can have serious negative impacts on environmental quality and public health. This principle aligns with Article 61 of the Constitution of the Democratic Republic of Timor-Leste (Constituição da República Democrática de Timor-Leste) regarding environmental protection (Maulina, 2024; McAllister, 2015; Septiani & Lestari, 2016) . Timor-Leste has also implemented Decree-Law No. 33/2009 concerning waste management in Dili. In 2014, a pilot program funded by the Ministry of State Administration was initiated to manage waste across 21 sucos (villages) in Dili Municipality. Each suco established a bank account to receive funding from the Ministry of Finance. The regulations stipulated that waste disposal activities should be conducted between 4:00 PM and 8:00 PM; however, community waste disposal practices often did not comply with these regulations (Ferronato & Torretta, 2019; Guerrero et al., 2013; Kaza et al., 2018) .

METHOD

This study employed an analytical observational design with a cross-sectional approach. The research was conducted in seven villages—Bairo-Pite, Komoro, Fatuhada, Kampung Alor, Bebonuk, Madohi, and Manleuana—located in the Dom Aleixo Subdistrict, Dili Municipality.

RESULTS AND DISCUSSION

Results

Univariate and bivariate analysis was conducted using 2×2 cross-tabulation for each independent variable against waste management, producing the number and percentage of respondents in each category, the p-value (chi-square test), the Prevalence Ratio (PR), and the 95% Confidence Interval (CI). Results for the six variables examined - Knowledge, Attitude, Leader Support, Family Support, Government Policy, and Facilities and Infrastructure - are summarized in Table 1 below.

Table 1. Univariate and Bivariate Analysis Results

Variable	Category	Waste Mgmt: Yes (n)	Yes (%)	Waste Mgmt: No (n)	No (%)	Total (n)	Total (%)	PR	95% CI	p-value
Knowledge	Good	126	47	138	51	264	98			
	Poor	3	1	3	1	6	2			
	Total	129	48	141	52	270	100	0.954	0.181-4.606	0.615 (> 0.05)
Attitude	Good	115	43	113	42	228	84			
	Poor	14	5	28	10	42	16			
	Total	129	48	141	52	270	100	1.515	1.019-4.066	0.030 (< 0.05)
Leader Support	Present	100	37	86	32	186	69			
	Absent	29	11	55	20	84	31			
	Total	129	48	141	52	270	100	1.558	1.293-3.762	0.002 (< 0.05)
Family Support	Present	109	40	112	42	221	82			
	Absent	20	7	29	11	49	18			
	Total	129	48	141	52	270	100	1.225	0.753-2.644	0.179 (> 0.05)
Government Policy	Present	106	39	81	30	187	69			
	Absent	23	9	60	22	83	31			
	Total	129	48	141	52	270	100	2.043	1.948-5.982	0.000 (< 0.05)
Facilities & Infrastructure	Present	82	30	60	22	142	53			
	Absent	47	17	81	30	128	47			
	Total	129	48	141	52	270	100	1.572	1.443-3.844	0.000 (< 0.05)

Source: Primary data, 2022

Based on Table 1, Attitude (PR = 1.515; 95% CI: 1.019-4.066; p = 0.030), Leader Support (PR = 1.558; 95% CI: 1.293-3.762; p = 0.002), Government Policy (PR = 2.043; 95% CI: 1.948-5.982; p = 0.000), and Facilities and Infrastructure (PR = 1.572; 95% CI: 1.443-3.844; p = 0.000) each show a statistically significant association with waste management ($p < 0.05$). In contrast, Knowledge (PR = 0.954; 95% CI: 0.181-4.606; p = 0.615) and Family Support (PR = 1.225; 95% CI: 0.753-2.644; p = 0.179) show no statistically significant association ($p > 0.05$).

Discussion

The discussion below addresses each independent variable - Knowledge (X1), Attitude (X2), Leader Support (X3), Family Support (X4), Government Policy (X5), and Facilities and

Infrastructure (X6) - in relation to the dependent variable, Waste Management (Y), at Posto Administrativo Dom Aleixo, Dili Municipality, for the 2022 academic year.

Knowledge (X1)

No association or risk relationship was found between community knowledge and waste management (PR = 0.954; 95% CI: 0.181-4.606; p = 0.615 > 0.05). This finding indicates that the community's knowledge of waste management is generally already good, such that variation in knowledge level does not translate into a measurable difference in waste management practice.

Attitude (X2)

An association was found between community attitude and waste management (PR = 1.515; 95% CI: 1.019-4.066; p = 0.030 < 0.05). This finding indicates that community attitudes toward waste management are not yet favorable, and that attitude is a factor associated with waste management outcomes in this area.

Leader Support (X3)

An association was found between leader support and waste management (PR = 1.558; 95% CI: 1.293-3.762; p = 0.002 < 0.05). This finding indicates that the support currently provided by community leaders has not been effective in motivating the community to keep the environment clean.

Family Support (X4)

No association or risk relationship was found between family support and waste management (PR = 1.225; 95% CI: 0.753-2.644; p = 0.179 > 0.05). This finding indicates that family members generally already support one another in maintaining environmental health, even though the habit of disposing of waste in improper locations persists among some community members.

Government Policy (X5)

An association was found between government policy and waste management (PR = 2.043; 95% CI: 1.948-5.982; p = 0.000 < 0.05). This finding indicates that government policy on waste management remains unclear, as reflected in the continued practice of disposing of organic and inorganic waste together in a single location without separation.

Facilities and Infrastructure (X6)

An association was found between facilities and infrastructure and waste management (PR = 1.572; 95% CI: 1.443-3.844; p = 0.000 < 0.05). This finding indicates that the waste management facilities and infrastructure currently provided have not been well developed and remain insufficiently effective, as the waste bins built across Dili City remain too small in capacity to accommodate the volume of waste disposed of by the community.

CONCLUSION

These findings indicate that improving waste management in Dom Aleixo requires an approach that focuses not only on increasing public knowledge but also on strengthening positive attitudes, local leadership, clear and actionable government policies, and the provision of adequate facilities and infrastructure. Given the cross-sectional design of the study, the findings should be interpreted as statistical associations rather than evidence of causal relationships. Future waste management improvement efforts should consider the integration

of community behavioral factors with the support provided by local waste management systems.

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