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Factors Relationship with Fly Density Level in Telanaipura Subdistrict Temporary Waste Storage

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Abstract: *Fly density is an indicator of environmental sanitation assessment. Fly density is influenced by waste management, the National Waste Management Information System (SIPSN) shows that waste generation in Jambi City reaches 159,688.01 tons/year. The aim of this research is to determine factors related to the level of fly density in Temporary Waste Storage Sites (TPSS) in Telanaipura District, Jambi City 2023. This research is a quantitative research with a cross sectional method research design. This research was conducted in the Telanaipura District community with a sample of 94 people. Data analysis was carried out using univariate and bivariate methods using correlation tests. The results of this study indicate that knowledge (p=0.027), action (p=0.029), monitoring (p=0.017), sorting (p=0.016), collection (p=0.027), and transportation (p=0.026) have relationship with the level of fly density, while attitude (p=0.245) had no relationship with the level of fly density. Knowledge, action, monitoring, sorting, collection and transportation are factors related to the level of fly density in temporary waste storage sites in Telanaipura District. It is hoped that the public will pay attention to managing household waste properly.*

Keywords *: Fly; Density, Temporary; Waste; Storage*

1. INTRODUCTION

Flies are insects belonging to the order diphtera with membrane-shaped wings and are a type of vector that affects the level of human health. This is because flies can transmit diseases such as diarrhea, cholera, and others.(Santi, 2015) Disease transmission by flies is done by landing on food and contaminating food with their saliva, feces, and vomit. Food contamination by flies is caused by the high density of flies in an environment.(Permenkes RI No. 50 Tahun 2017, 2017)

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Based on the initial survey conducted in five temporary waste storage, it was found that the density was high in four temporary waste storage and one semi-structured waste storage that had a low density of flies. The types of flies found in temporary waste storage consist of house flies, green flies and meat flies with a distance between temporary waste storage and settlements of ± 15 m. This allows flies to fly freely. This allows flies to fly freely into community settlements and have a negative impact on health. Based on the explanation that has been conveyed, researchers are interested in examining the factors that influence the level of fly density in temporary waste storage in Telanaipura District, Jambi City.

2. RESEARCH METHODOLOGY

This study uses quantitative methods with a cross-sectional approach with the aim of knowing the relationship between the dependent and independent variables at a single point in time using interviews with questionnaire instruments. This research was conducted in May 2023 - March 2024 with a sample size of 94 people in Telanaipura Subdistrict which was calculated using the Lemeshow formula. The sampling technique used was accidental sampling. Data analysis was performed using univariate and bivariate analysis, using the correlation test. This research has also gone through etichal clearance at the Poltekkes Kemenkes Jambi (on process).

3. RESEARCH RESULTS

The characteristics of respondents in this study consisted of gender and age of respondents. The following characteristics of respondents can be seen in the table below:

Table 1 Frequency Distribution of Respondent Characteristics

Variable	Total	Percentage(%)
Gender		
Men	36	38,3
Women	58	61,7
Age		
< 40 years old	40	42,6
≥ 40 years old	54	57,4

Source: Primary Data Processed, 2024

Based on table 1 above, it is known that the community who became respondents in this study were mostly women, namely 61.7% (58 people) and the age of the community who became respondents was mostly ≥ 40 years old, namely 57.4% (54 people).

Table 2 Frequency Distribution of Knowledge, Attitude, Action, Monitoring, Sorting, Collecting, Transporting

Variable	Total	Percentage (%)
Knowledge		
Good	60	63,8%
Not Enough	34	36,2%
Attitude		
Good	56	59,6
Not Enough	38	40,6
Action		
Good	52	55,3
Not Enough	42	44,7
Monitoring		
Good	48	51,1
Not Enough	46	48,9
Sorting		
Good	53	56,4
Not Enough	41	43,6
Collecting		
Good	55	58,5
Not Enough	39	41,5
Transporting		
Good	55	58,5
Not Enough	39	41,5

Table 3 Relationship Between Knowledge, Attitudes, Actions, Monitoring, Sorting, Collecting And Transporting With Fly Density Levels

Correlations

		Knowledge	Fly Density Levels
Knowledge	Pearson Correlation	1	-,365*
	Sig. (2-tailed)		,031
	N	94	35
Fly Density Levels	Pearson Correlation	-,365*	1
	Sig. (2-tailed)	,031	
	N	35	35

		Attitude	Fly Density Levels
Attitude	Pearson Correlation	1	,266*
	Sig. (2-tailed)		,123
	N	94	35

Fly Density Levels	Pearson Correlation	,266*	1
	Sig. (2-tailed)	,123	
	N	35	35
		Action	Fly Density Levels
Action	Pearson Correlation	1	,386*
	Sig. (2-tailed)		,022
	N	94	35
Fly Density Levels	Pearson Correlation	,386*	1
	Sig. (2-tailed)	,022	
	N	35	35
		Monitoring	Fly Density Levels
Monitoring	Pearson Correlation	1	,424*
	Sig. (2-tailed)		,011
	N	94	35
Fly Density Levels	Pearson Correlation	,424*	1
	Sig. (2-tailed)	,011	
	N	35	35
		Sorting	Fly Density Levels
Sorting	Pearson Correlation	1	,424*
	Sig. (2-tailed)		,011
	N	94	35
Fly Density Levels	Pearson Correlation	,424*	1
	Sig. (2-tailed)	,011	
	N	35	35
		Collecting	Fly Density Levels
Collecting	Pearson Correlation	1	,386*
	Sig. (2-tailed)		,022
	N	94	35
Fly Density Levels	Pearson Correlation	,386*	1
	Sig. (2-tailed)	,022	
	N	35	35
		Transporting	Fly Density Levels
Transporting	Pearson Correlation	1	,377*
	Sig. (2-tailed)		,026
	N	94	35
Fly Density Levels	Pearson Correlation	,377*	1
	Sig. (2-tailed)	,026	
	N	35	35

Based on table 2 above, it can be seen that the Telanaipura sub-district community who are respondents mostly have poor knowledge in managing waste, namely as many as 63.8% (60 people), people with poor attitudes in managing waste are known to still dominate with a total of 59.6% (56 people), respondents' actions in managing waste are known to be mostly still not good, namely as many as 55, 3% (52 people), monitoring of waste management is still mostly not good, namely as many as 51.1% (48 people), waste sorting carried out by respondents is still mostly not good, namely as many as 56.4% (53 people), waste collection carried out by respondents is still mostly not good, namely as many as 58.5% (55 people), and waste transportation is still mostly not good, namely as many as 58.5% (55 people).

Table 3 shows the correlation of the independent variables (knowledge, attitude, action, monitoring, sorting, collection and transportation) associated with the dependent variable (fly density rate) tested with the correlation test. Based on the results of statistical tests, the p-value = 0.031 means that there is a relationship between knowledge and the level of fly density. Correlation Coefficient value of -0.365 means that knowledge and fly density have sufficient strength of relationship.

The attitude of the community in managing waste does not have a significant relationship with the level of fly density, with a p-value = 0.123. The Correlation Coefficient value of 0, 266 indicates the relationship is very weak.

There is a significant correlation between community action in managing waste and the level of fly density, with a p-value = 0.022. The relationship between action and fly density is quite strong, indicated by the Correlation Coefficient value of 0.370.

There is a significant correlation between waste management monitoring and fly density, with a p-value = 0.011. The relationship between waste management monitoring and fly density is quite strong, indicated by the Correlation Coefficient value of 0.424.

There is a significant correlation between waste segregation by the community and the level of fly density, with a p-value = 0.011. The relationship between waste segregation by the community and the level of fly density is quite strong, with a Correlation Coefficient value of 0.424.

There is a significant correlation between waste collection by the community and the level of fly density, with a p-value of 0.022. The relationship between waste collection by the community and the level of fly density is quite strong, with a Correlation Coefficient value of 0.386.

There is a significant correlation between the waste transportation that has been carried out and the level of fly density, with a p-value = 0.026. The relationship between waste transportation that has been carried out and the level of fly density is quite strong, with a Correlation Coefficient value of 0.377.

4. DISCUSSION

Relationship Between Knowledge and Fly Density

Based on the results of data analysis, this study proves the hypothesis that there is a significant relationship between knowledge and fly density. The correlation test results obtained p-value = 0.027 means that there is a relationship between community knowledge in managing waste and the level of fly density in Telanaipura District, Jambi City. This study shows consistency with the findings conducted by Putu, et al (2020). In their study, the results of the analysis using the chi-square test showed a value of p = 0.000, which indicated a significant relationship between respondents' knowledge and the level of fly density. This indicates that the level of knowledge of respondents has a significant influence on the level of fly density.(putu mutiara ayu, I wayan sali, 2020) Haidina Ali's research (2021), the results of the analysis showed a value of p = 0.000 which indicated a significant relationship between the knowledge of hawker stall traders and waste management. Meanwhile, according to Notoatmodjo (2010) knowledge is divided into six levels; know, understand, application, analysis, synthesis, and evaluation. In this context, it is likely that traders only know information about waste management without deeply understanding or applying this knowledge in daily practice.(Notoatmodjo, 2011) Another study, namely Febry Talakua's research (2021), found that the p-value = 0.029 means that there is a relationship between knowledge and handling household waste.(Damayati et al., 2019)

The results of this study are not in line with research conducted by Nurul, et al (2021) the results of the analysis show a p-value = 0.84, which indicates that there is no significant relationship between the level of knowledge and waste management.(Ilma et al., 2021) There are several factors that influence the level of knowledge of housewives in waste management, among others; education, age, environment, information, and experience can play a role in shaping a person's level of knowledge about waste management is very important in designing effective educational programs or interventions. Education can provide access to formal knowledge about waste management, while experience and information from the surrounding environment also play a role in shaping understanding and attitudes towards sustainable waste management practices. Age can also affect the level of knowledge due to different life

experiences.(Ilma et al., 2021) Research by Agnes, et al (2020) is not in line with this study where there is no relationship between knowledge and waste management with a p-value = 1.000.(Widiyanto et al., 2020)

Relationship Between Attitude and Fly Density

Based on the results of statistical test calculations carried out using the correlation test, the results obtained p-value = 0.165 means that there is no relationship between community attitudes in managing waste and the level of fly density. This study is in line with the research of Nurul, et al (2021) which states that there is no relationship between attitudes and waste management with a p-value = 0.54.(Ilma et al., 2021) Research researched by Widya, et al (2019) states that there is no relationship between attitude and waste management with a p-value = 0.989.(Astuti et al., 2019)

The results of this study are inversely proportional to the research of Hengky, et al (2020) which states that there is an attitude relationship with waste management with a p-value = 0.000.(Oktarizal et al., 2021) According to Notoatmodjo (2023), attitude consists of several levels, namely: Receiving is a basic level where individuals accept and pay attention to stimuli provided by certain objects. For example, in the context of waste management, individuals may begin to pay attention to information about the importance of waste management after being given information or notifications about environmental problems, responding at this level, individuals provide answers or responses to stimuli received. For example, the individual may respond to questions about his knowledge related to waste management or start doing simple actions such as sorting waste at home, valuing this is the level where individuals invite others to discuss and work on the same problem. responsible is the highest level of attitude, where individuals take responsibility for their actions and commit to act in accordance with their values.

Relationship Between Actions and Fly Density

Based on the results of statistical tests used with the correlation test, the p-value = 0.029 was obtained, which means that there is a relationship between community action in managing waste and the level of fly density. The results of this study are in line with research conducted by Yunita and Rusni (2021) which found a p-value = 0.02 which shows a relationship between action and waste management.(Wulandari & Masnina, 2021) In the research of Despa, et al (2019), the results of the chi square test analysis were obtained with a p value = 0.039, which means that there is a relationship between action and waste management.(Wildawati & Hasnita, 2019) Another similar study is the research of Hengky, et

al (2020) obtained statistical test results with a p-value = 0.002 which shows the relationship between action and waste management.(Oktarizal et al., 2021) Knowledge and attitudes will lead to action (Soekidjo Notoatmodjo, 2003), in this case showing that knowledge and good attitudes have an influence on how individuals manage waste.(Oktarizal et al., 2021)

Unlike the case with Noni, et al (2022), the statistical test results were obtained with a p-value = 0.379 which showed that there was no relationship between action and waste disposal behavior. The lack of concern in maintaining environmental cleanliness and lack of knowledge in waste management causes a negative attitude and is a factor in the emergence of unfavorable actions.(Noni Sriwahyuni, Dian Fera, Darmawi, 2022)

Monitoring Relationship with Fly Density Level

Based on the results of statistical tests used with the correlation test, the p-value = 0.017 was obtained, indicating that there was a relationship between monitoring and the level of fly density in temporary waste shelters. This research is in line with the research of Aliefta, et al (2023) obtained statistical test results with a p-value = 0.029 indicating there is a relationship between monitoring and fly density levels. Improving the monitoring and evaluation system is very important to improve the waste management system. Waste management is a loop-forming cycle, so the evaluation and monitoring stages are crucial for assessing all steps that have been taken in order to obtain a better management model.(Aliefta Rochma Prajaningtyastiti, 2023) Similarly, research by Larasati and Laila (2020) states that improvements to the monitoring and evaluation system need to be carried out to improve a good waste management system.(Larasati & Laila, 2020)

The existence of illegal temporary waste storage can be influenced by several factors including; inadequate temporary waste storage facilities, knowledge, attitudes and actions of people who are still not good at waste management. The results of the study show that monitoring of waste management is needed to realize good waste management. Management is a continuous process that forms a cycle or circle, where the evaluation and monitoring stages are important steps to evaluate all steps taken to improve a better management model. Regular monitoring of each activity is necessary to ensure that policy implementation runs smoothly and effectively.

Relationship Between Sorting and Fly Density Level

Based on the results of data analysis with the correlation test, it proves the hypothesis that there is a relationship between waste sorting and fly density. Where the results of the correlation test obtained a p value = 0.016 indicates that there is a relationship between waste sorting and the level of fly density. This research is in line with the research of Cucu, et al

(2020) which states that there is a relationship between waste sorting and fly density with a p-value of 0.006.(Kristanti et al., 2021) Another study conducted by Andriani (2019) found that the p-value = 0.002 showed that there was a relationship between waste sorting and fly density.(Andriani, 2021) Another study, Olivia, et al (2023) obtained a p-value (0.000), meaning that there is a relationship between waste management and the level of fly density.

This research is inversely proportional to research conducted by Masyudi (2018) which states that there is no relationship between waste sorting and fly density with a p-value = 0.110.(Masyudi, 2018) The results of this study indicate that there are still many respondents who do not sort their waste before disposing of it in temporary landfills. This is shown from the results of the interview where most respondents (56.4%) did not sort their waste. Segregation is the initial stage in waste management, but there are several things that make the community still some who do not do waste segregation, among others; limited facilities, lack of knowledge in waste segregation, motivation and so on.

Collection Relationship with Fly Density Level

Based on the results of statistical tests using the correlation test, the p-value = 0.027 means that there is a relationship between garbage collection and the level of fly density. This research is in line with research conducted by Atang, et al (2022) obtained statistical test results using the Chi-Square test with a p-value = 0.002, meaning that there is a relationship between garbage collection and the fly population index. This is because there are still garbage containers that do not have a lid resulting in scattered garbage, no separation of waste according to its type and garbage containers that are not coated with plastic.(Saputra & Arvinanda, 2022) Another study, Chaca, et al (2019) stated that there was a relationship between garbage collection and fly density with a p-value = 0.003.(Ramadhani Chaca & Retno Hestiningsih, 2019) Another study conducted by Sulasmi and rita (2022) found a p-value = 0.006 which means that there is a relationship between waste management and fly density.(Sulasmi & Wahyuni, 2022)

According to the 2008 Indonesian Law on waste management, waste management activities include waste collection. In this context, waste collection includes the process of collecting and transferring waste from waste sources to temporary shelters or integrated temporary shelters. In the collection process at the waste collection point, waste must be collected in a temporary shelter.(2008, 2008) Based on research conducted by researchers, it is still found that much of the waste disposed of does not enter the collection storage but is scattered outside the collection storage.

This study is inversely proportional to research by Masyudi (2018) which states that there is no relationship between waste collection and fly density with a p-value = 0.110, which means that there is no relationship between waste management and fly density.(Masyudi, 2018) There are still many people who do not pay attention to garbage bins and dispose of garbage randomly even though temporary waste storage officers have done a good collection. So, this really needs to be considered and improved to create good waste management.(Kristanti et al., 2021)

Relationship Between Transportation and Fly Density

Based on the results of statistical tests using the correlation test, the p-value = 0.026 was obtained, which means that there is a relationship between waste transportation and the level of fly density. This research is in line with Wahyudi's research, (2023) obtained the results of statistical tests using the chi square test obtained a p-value = 0.000, meaning that there is a relationship between garbage transportation and the level of fly density.(Idris et al., 2023) Another study, namely Cucu, et al (2020), obtained statistical test results with a p-value = 0.003, meaning that there is a relationship between waste transportation and the level of fly density.(Kristanti et al., 2021) According to the Minister of Public Works Regulation No. 03 of 2013 concerning the implementation of waste infrastructure and facilities and the handling of household waste states that waste transportation cannot be mixed after sorting and collection.(Kristanti et al., 2021) Based on research conducted by researchers where during the transportation of waste, the condition of the waste is still mixed during transportation.(Fauziah & Suparmi, 2022)

This study is inversely proportional to research by Aliefta, et al (2023) obtained statistical test results with a p-value = 1.000, meaning that there is no relationship between waste transportation and the level of fly density.(Aliefta Rochma Prajaningtyastiti, 2023) Waste transportation does not have a relationship with fly density because almost all temporary waste storage sites have a transportation schedule and the implementation of transportation is in accordance with the predetermined schedule and waste transportation is carried out every day.(Aliefta Rochma Prajaningtyastiti, 2023) Each temporary waste collection site has a schedule for transporting waste from the temporary waste storage site to the designated landfill site. However, most of the temporary waste storage sites carry out the transportation inefficiently due to the large amount of waste left in the temporary waste storage sites that does not match the capacity of the available transport bins.

5. CONCLUTION

The results of this study indicate a correlation between knowledge, actions, monitoring, sorting, collecting and transporting waste with the level of fly density. While attitudes have no relationship with the level of fly density in temporary garbage dumps in Telanaipura District, Jambi City.

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