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Investigation on Waste Management Training Effectiveness on Community Behavior in Household Waste to Reduce the Waste Number Into the River in Penawar Village, Kerinci Regency

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ABSTRACT

Poor waste management can result in chemical exposure and health issues. With a %age of 42.63 %, Kerinci district is the district in Jambi province with the largest number of river trash disposals, while Penawar Village is the village with the highest number of river waste disposals. This study aims to investigate waste management training effectiveness on community behaviour in household waste to reduce the waste number into the river in Penawar village, Kerinci Regency. This research is a quasi-experimental study employing a pretest-posttest design group with a research sample of 46 houses and simple random sampling. The results showed that before the intervention, the majority of housewives' knowledge was lacking (34.8%), the majority attitude was negative (69.6%) and the majority action was poor (71.7%). After the implementation of the Household Waste Management Training, the majority of housewives' knowledge was good (89.1%), positive attitude (100%) and majority action was good (73.9%). Compared before intervention. The application of the training proved to be effective in increasing household waste management behavior with (p) < 0.05. Waste management training effectively enhances the knowledge, attitudes, and behaviors of housewives in managing home trash to lower the rate of garbage disposal into the river in Penawar Village, Kerinci Regency.
Keywords: Training, Waste Management, Knowledge, Attitude, Action.

Introduction

Garbage is a worldwide concern since it may create environmental damage and community health issues. According to the World Health Organization (WHO), waste is either a worthless object that cannot be utilized or an object that is typically discarded and no longer beneficial to human existence (WHO, 2018). This issue arises due to the high pace of garbage production, and many individuals continue to litter (Nabawiyati and Makiyah, 2020). Careless trash disposal in the environment can wreak havoc on the ecosystem, causing natural disasters such as floods (Suwerda, 2020).

Household trash is one of the sources of waste that contributes significantly to the accumulation of garbage in an environment and environmental contamination (Mulasari, Bayu, and Inaz, 2020). 70 % of household trash consists of organic materials such as food waste, plants, animals, and paper, while the remaining 25 % consists of inorganic substances such as plastic, glass, fabric, and metal (Rasida Ayu, Ade Dita Puteri, 2021).

According to research by the World Bank titled "What a Waste: A Global Review of Solid Waste Management," the waste quantity in the world will rise by 70 % from this year until 2025, from 1.3 billion. Tons per year to 2.2 billion. Tons per year (World Bank, 2012). In addition, the World Bank projects that by 2050, the quantity of garbage created worldwide will reach 3,4 billion tons. This landfill will more than treble global population growth by 2050. (World Bank, 2021). Most of these increases happened in underdeveloped nations

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(Windasari, Hamid, and Juliatmi, 2020).
Indonesia is one country with problematic waste management (Syarfaini, Amansyah, and Khairunnisa, 2020). Indonesia is one of the developing nations with the fourth-largest population in the world; the amount of waste produced daily is 178,885 tons, and the amount of waste accumulated in 2020 will be 33,320,745 tons, with 39.76 % of waste coming from households, 17.16 % from markets, 13.48 % from the property, 8.02 % from commerce, 4.78 % from public facilities, 3.52 % from offices, and 13.28 % from other sources.
According to statistics from the Ministry of Environment and Forestry (KLHK), in 2020, handled garbage in Indonesia amounted to 19,709,918 tons, or approximately 59 %, of which 63,2 % of residential waste management was improperly managed by burning and dumping it wherever, even in rivers.
Jambi Province is one of the provinces where home trash management is improperly managed (Health Ministry, 2018). The province of Jambi will generate 522,732 tons of waste in 2020, or 1,432 tons daily. 30 % of the waste consists of home and market waste, 4.54 % of commercial waste, 3.19 % of waste from public facilities, 2.35 % of waste from workplaces, 2.11 % of waste from regions, and 21.96 % of other waste kinds.
According to Health Research statistics from Jambi Province in 2018, Kerinci Regency is a district/city with the worst management of improperly managed household garbage, particularly by dumping it into rivers or rivers, with a proportion of 42.63 %, the most in Jambi province. 69.36 % of residential garbage is improperly handled (Health Research of Jambi Province, 2018).
Based on data from the Department of Environment (DLH) of Kerinci Regency in 2020 regarding waste that is not appropriately managed, 18,269 tons or 40% is thrown into the river. Based on data from Riskesdas Jambi Province in 2018, rural areas are places to live with poor waste management, namely 88.59% of waste is not managed correctly (Riskesdas Jambi Province, 2018).
The population of Penawar will be 1,428 people in 2020 (BPS Kabupaten Kerinci, 2021), producing 14.28 tons of waste with a daily waste generation of 7.14 tons per day. Waste not appropriately managed amounts to 5.71 tons, which is thrown into the river and any place. Villages with a poor level of waste management with a high number of river waste disposal are bidder villages. Based on the observations, the high number of river waste disposal in the bidder occurs because of the community's habit of throwing garbage into rivers and sewers. There are no regulations from the local government regarding dumping river waste and the unavailability of temporary disposal sites (TPS) so that people make rivers a final disposal site for waste. There are various types of waste in the river, such as plastic waste, used sanitary napkins, baby diapers, and cooking waste. Garbage mixed and scattered can impact the flow of river water as river water is sometimes clogged and disrupts the surrounding environment.

Method
This study uses a quasi-experimental study using a one-group pretest-posttest design. The sampling technique used is simple random sampling. The population is 456 families with a total sample of 46 housewives. The inclusion criteria are housewives who live and are registered as residents in Penawar Village aged 15-64 years and are willing to become respondents. In contrast, the exclusion criteria are housewives who stay but are not registered as residents in Penawar Village. This research was conducted in March 2022. Then the research data were analyzed using Univariate Analysis, Bivariate Analysis, and paired t-test.

Results
Table 1. Distribution of Respondents' Characteristics by Age, Education Degree and Occupation

No	Respondents' Characteristics	Total (n)	Percentage (%)
1	Age		
	≤ 24 years	1	2.2
	25 - 44 years	21	45.7
	45 - 59 years	22	47.8
	≥ 60 years	2	4.3
Total		46	100
2	Education Degree		
	Elementary School	6	13,0
	Junior High School	4	8,7
	Senior High School	20	43,5
	Associate Degree	3	6,5
	Undergraduate Degree	13	28,3

Total		46	100
3	Occupation		
	Housewife	15	32,6
	Farmer	18	39,1
	Honorary Employee	9	19,6
	Civil Servant	4	8,7
Total		46	100

Based on table 1, it is known that the characteristics of respondents according to the average age are in the age range, namely in the range of 45-59 years as many as 22 people (47.8%), according to the majority of education, namely senior high school degree as many as 20 people (34.5%) and according to the majority of occupation, namely farmer as many as 18 people (39.1%).

Frequency Distribution of Respondents' Waste Management Behavior Based on Respondents' Knowledge in The Situation Before and After Intervention with Waste Management Training

Table 2. Knowledge of Respondents Before Intervention with Waste Management Training

No	Knowledge	Total (n)	Percentage (%)
1	Less	16	34,8
2	Enough	15	32,6
3	Good	15	32,6
Total		46	100

Based on table 2, it is known that the knowledge of the respondents before the intervention with the waste management training activities, the majority had less knowledge, namely 16 people (34.8%), while 15 people had enough knowledge (32.6%) and 15 people had good knowledge (32 ,6%).

Table 3. Knowledge of Respondents After Intervention with Waste Management Training

No	Knowledge	Total (n)	Percentage (%)
1	Less	0	0
2	Enough	5	10,9
3	Good	41	89,1
Total		46	100

Based on table 3, it is known that the knowledge of respondents after the intervention with waste management training activities, the majority of them have good knowledge, namely 41 people (89.1%), while 5 people have enough knowledge (10.9%).

Table 4. Distribution of Knowledge Differences in Respondents in the Situation Before and After Intervention with Waste Management Training

Knowlwdge	Household Waste Management Training			
	Mean	*Elementary Degree*	*Mean Diff*	*P Value*
Sebelum	13,41	4,495	-5,05	0,000
After	18,46	1,722		

Based on table 4, it is known that there is a difference in the knowledge of the respondents before the intervention, namely the mean value of 13.41 and after the intervention with the Waste Management Training it became 18.46. Respondents' knowledge has increased after the intervention with Waste Management Training with an average difference (mean difference) of 5.05 and a p value of 0.000. This means that there is a statistically significant difference ($p<0.05$) between knowledge before and immediately after intervention with Waste Management Training.

Frequency Distribution of Respondents' Waste Management Behavior Based on Respondents' Attitudes in the Situation Before and After Intervention with Waste Management Training

Table 5. Attitudes of Respondents Before Intervention with Waste Management Training

No	Attitude	Total (n)	Percentage (%)
1	Negative	32	69,6
2	Positive	14	30,4
Total		46	100

Based on table 5, it is known that the attitude of respondents before the intervention with waste management training activities, the majority were negative as many as 32 people (69.6%), while being positive as many as 14 people (30.4%).

Table 6. Respondents' Attitudes After Intervention with Waste Management Training

No	Attitude	Total (n)	Percentage (%)
1	Negative	-	-
2	Positive	46	100,0
Total		46	100

Based on table 6, it is known that the attitude of the respondents before the intervention with the waste management training activities, all of them were positive as many as 46 people (100.0%).

Table 7. Distribution of Differences in Respondents' Attitudes Before and After Intervention with Waste Management Training

Attitude	Household Waste Management Training			
	Mean	*Elementary*	*Mean Diff*	*P Value*
Before	25,48	6,541	-17,41	0,000
After	42,89	3,945		

Based on table 7, it is known that there are differences in the attitudes of respondents before the intervention, namely the mean value of 25.48 and after the intervention with the Waste Management Training it becomes 42.89. The attitude of the respondents increased after the intervention with the Waste Management Training with an average difference (mean difference) of 17.41 and a p value of 0.000. This means that there is a statistically significant difference ($p<0.05$) between attitudes before and immediately after the intervention with the Waste Management Training.

Frequency Distribution of Respondents' Waste Management Behavior Based on Respondents' Actions in The Situation Before and After Intervention with Waste Management Training

Table 8. Respondents' Actions in The Situation Before Intervention with Waste Management Training

No	Action	Total (n)	Percentage (%)
1	Bad	33	71,7
2	Good	13	28,3
Total		46	100

Based on table 8, it is known that the respondent's actions before the intervention with waste management training activities, the majority of the actions were bad, namely 33 people (71.7%), while the actions were good as many as 13 people (28.3%).

Table 9. Respondents' Actions Before Intervention with Waste Management Training

No	Action	Total (n)	Percentage (%)
1	Bad	12	26,1
2	Good	34	73,9
Total		46	100

Based on table 9, it is known that the respondent's actions before the intervention with waste management training activities, the majority of the actions were good, namely 34 people (73.9%), while the actions were bad as many as 12 people (26.1%).

Table 10. Distribution of Differences in Respondents' Actions in the Situation Before and After Intervention with

Action	Household Waste Management Training			
	Mean	*Elementary*	*Mean Diff*	*P Value*
Before	5,11	1,935	-3,54	0,000
After	8,65	2,479		

Based on table 10, it is known that there are differences in the respondent's actions before the intervention, namely the mean value of 5.11 and after the intervention with the Waste Management Training to 8.65. Respondents' actions increased after the intervention with Waste Management Training with a mean difference of 3.543 and a p value of 0.000. This means that there is a statistically significant difference ($p<0.05$) between the Actions before and immediately after the intervention with the Waste Management Training.

Discussion

The Effectiveness of Waste Management Training on Respondents' Knowledge in Managing household waste

Based on statistical analysis using paired-sample t-test there is a significant difference of 5.05 between the knowledge of housewives before the intervention (mean 13.41) and the knowledge of housewives after the intervention (mean 18.46) with waste management training in improving knowledge of housewives about waste management behavior. This difference can be seen from the difference in the mean knowledge of housewives before and after the intervention.

The results of statistical tests with paired-sample t-test before and after intervention with waste management training showed that the value of tcount = -10,083 < ttable = -2,016. These results indicate that there is an effect of waste management training with the knowledge of housewives. This means that this method is effective in improving the behavior of housewives in managing household waste.

On the basis of the analysis of the data and the discussion of the study, it can be stated that there is a considerable difference between the knowledge of housewives before and after waste management training intervention. There is a trend for waste management training to raise housewives' understanding of waste management behavior so as to develop interest or desire to modify behavior in a positive manner.

The Effectiveness of Waste Management Training on Respondents' Attitudes in Managing Household Waste

Based on statistical analysis using paired-sample t test, there is a significant difference of 17.41 between the attitudes of housewives before the intervention (mean 25.48) and the attitudes of housewives after the intervention (mean 42.89) with waste management training in improving attitudes. housewives about household waste management behavior.

This difference can be seen from the difference in mean attitudes of housewives before and after the intervention.

The results of statistical tests with paired-sample t test before and after intervention with waste management training showed that the value of tcount = -19,628 < ttable = -2,016. These results indicate that there is a significant difference between the attitudes of housewives to waste management behavior before and after the intervention.

On the basis of the analysis of the results and the discussion of the research, it can be concluded that there is a significant difference between the attitudes of housewives before and after the intervention with waste management training, indicating that waste management training is effective in enhancing the attitudes of housewives toward waste management.

The Effectiveness of Waste Management Training on Respondents' Actions in Managing Household Waste

Based on statistical analysis using paired-sample t test, there is a significant difference of 3.54 between the actions of housewives before the intervention (mean 5.11) and the attitude of housewives after the intervention (mean 8.65) with waste management training in improving the actions of housewives. housewives about household waste management behavior.

This difference can be seen from the difference in the mean of the action before and after the intervention due to the respondents' motivation towards waste management properly and correctly. The results of statistical tests with paired-sample t test before and after intervention with waste management training are known to have tcount = -15.274 < ttable = -2.016. These results indicate that there is a significant difference between the actions of housewives before and after the intervention.

On the basis of the analysis of the data and the discussion of the study, it can be concluded that there is a substantial difference between the actions of housewives before and after waste management training intervention.

Conclusion

The behavior of housewives disposing of waste prior to the implementation of household waste management training for housewives in Penawar Village, Kerinci Regency includes the majority of knowledge categorized as Less (34.8%); the majority attitude is categorized as negative (69.6%); and the majority of actions are categorized as Bad (71.7%). The behavior of household waste management after the implementation of household waste management training for housewives in Penawar Village, Kerinci Regency includes the majority knowledge categorized as good (89.1%), attitudes categorized as Positive (100%) and the majority of actions categorized as good (73, 9%). The application of household waste management training has proven to be effective in increasing the behavior of disposing of waste among housewives in Penawar Village, Kerinci Regency, as evidenced by the significance value (p) < 0.05 so that it has a more significant positive impact when compared to before the intervention. It is hoped that the Kerinci Regency Environmental Service will empower its workforce to carry out counseling and training activities as well as empowerment in villages, especially to improve community behavior in waste management and the Penawar Village Government is expected to provide and improve the quality of waste facilities and infrastructure in order to support in improving the implementation of good and correct waste management.

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