

## Effect of Education and Knowledge on Domestic Waste Management for Housewives in Medan City in 2022

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### Abstract

*The purpose of this study is to analyze effect of education and knowledge on domestic waste management for housewives in Medan City in 2022. This type of research is an analytic survey using a cross sectional and quantitative research design. The population in this study are housewives who live in 7 Sub-Districts (Region-III) in Medan City. The sample in this study is obtained from 4 Sub-Districts in Region-III Medan City. The sampling method used in this study was purposive sampling. The selected Sub-Districts are Medan Tembung District, Medan Marelan District, Medan Deli District, and Medan Labuhan District. The distribution of samples is distributed proportionally with 25 samples in each Sub-Districts. The statistical test used in this study is logistics regression multivariate analysis. The results show that education has effect on action of domestic waste management for housewives in Medan City in 2022. Knowledge has effect on action of domestic waste management for housewives in Medan City in 2022.*

### Keywords

education; knowledge; action; domestic waste management; housewives



## I. Introduction

The total amount of world waste is increasing every year. There has been an increase in the amount of waste by one ton per year from 2019 to 2021 (Kementerian Lingkungan Hidup dan Kehutanan, 2021). Various efforts have been made to reduce the amount of waste, but the condition of waste in the world has not been fully controlled. When viewed from waste-producing countries, Indonesia is ranked in the top 10 dirtiest countries by ranking 9th in the world with a total volume of 66 million tons of waste in 2021. The Ministry of Environment did not announce monitoring and verification of Adipura activities to the public throughout 2020 and 2021 due to the COVID-19 pandemic, so the ranking of the cleanest and dirtiest cities in the last two years is unknown because the government prioritizes handling the pandemic case. In 2019, before the pandemic, the Ministry of Environment and Forestry announced that Medan City was ranked first as the worst city in handling waste.

Medan City is the third largest city and the most densely populated of major cities in Indonesia, thus proving that Medan City is still a city that has not been able to handle waste properly. Every corner of the city can still be found piles of garbage until the garbage scattered on the roadside is a witness to the poor people in Medan City in preserving their territory from garbage. Several areas in the city of Medan are densely populated areas that

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contribute the most waste in the northern area of Medan City which is generally referred to as Region III (Badan Pusat Statistik Kota Medan, 2021).

The city of Medan has an area of 265.10 km<sup>2</sup> with a recorded population in 2020 of 2,435,252 people. The area in Medan City is divided into three, namely Region I, II, and III. Region-III Medan City is an area located in the northern part of Medan City with the widest area of 127.42 km<sup>2</sup> and has the largest population with a total of 981,926 people consisting of seven sub-districts including East Medan District, Medan Labuhan, Medan Belawan, Medan Marelan, Medan Deli, Medan Tembung, and Medan Struggle. This area also consists of urban areas and coastal areas (Badan Pusat Statistik Kota Medan, 2021).

Medan City is a big city which also produces 0.7 kg of waste per person per day (Ilmi, 2013). In line with the fact that Region-III Medan City produces the most waste, namely 659.42 tons per day in 2017 and 667.22 tons per day in 2018 (Badan Pusat Statistik Kota Medan, 2021). The results of the survey using secondary data obtained data on the number of residents in Region-III Medan City 981,926 people (Badan Pusat Statistik Kota Medan, 2021). So that it can be obtained the amount of waste produced by residents in Region-III Medan City as much as 687,348 tons per day. This shows an increase in waste generation every year. The amount of waste that continues to increase if not managed will cause environmental problems so that waste management needs to be carried out with the principle of reuse, reduce, and recycle.

The problems caused by waste are not small and can harm various aspects of life. Floods, environmental diseases, climate change, and global warming are problems that arise due to the generation of waste that cannot be handled properly. The Medan City experiences floods when the rainfall is quite intense. Respiratory diseases, digestive problems such as diarrhea, eye and skin irritation are environmental diseases that are always included in the list of diseases caused by waste generation. The climate change of Medan City is also increasingly felt every year. This is evidenced by the increase in the temperature of Medan City since 2019 until now with the highest temperature being at 36oC, followed by the fact that the results of measurements by the Medan Sampali Climatology Station stated that Region III of Medan City in 2019 was above 30oC (Badan Pusat Statistik Kota Medan, 2021).

Global warming events have also been felt throughout the world, this is caused by several factors originating from human activities including those from the forestry, agriculture, household waste, industrial production processes and energy sectors. Household waste comes from piles of inorganic and organic waste that undergo weathering processes and then produce harmful gases, namely methane compounds (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) that diffuse into the air. This is expected to occur continuously every year (Kementerian Lingkungan Hidup dan Kehutanan, 2017). Both of these harmful gases have the property of absorbing heat which makes a major contribution to increasing the state of the earth's temperature (NCAR, 2021).

The risks and impacts of global warming caused by climate change in the future can be reduced by mitigating climate change. Indonesia has a responsibility as one of the participating countries of the United Nations Framework Convention in establishing national policies as a strategy to regulate and strive to reduce the impact of climate change. Indonesia carries out mitigation efforts in five sectors, namely the forestry, agriculture, household waste, industrial, and energy sectors. Mitigation efforts in the household waste sector can be carried out by reducing waste generation with the principle of reuse, reduce, and recycle (Kementerian Lingkungan Hidup dan Kehutanan, 2017).

Reuse, reduce, and recycle is a concept in managing waste properly. Waste management with 3Rs in managing and handling waste is still the best way. Everyone can

carry out waste management by reuse, reduce, and recycle in their daily activities. Reduce explains how to reduce the use of products such as electronic goods, furniture, paper products (books, magazines, and newspapers), sanitary kits/personal hygiene equipment, clothing, baby and toddler equipment, pet supplies, leaving no food behind, and make-up equipment. up/skincare. Reuse can be defined as the use of a product more than once for the same or other functions so as to reduce waste generation including, using drink bottles for refills, using reusable cups, and reusing plastic bags for waste collection. Waste management system that is not in accordance with the technical standards is due to the system of waste management that has not functioned optimally and the lack of concern of residents in waste management is one of the causes of the system has not run well (Tobing, 2021). The waste was significantly influenced by the socio-demographic characteristics of the households such as gender, age, income and residency (Huho, 2020). Recycle is a way to recycle used goods into useful new items. Paper, plastic, metal and glass are used materials that can be recycled. Research shows that the application of reuse, reduce, and recycle has a positive impact on solving environmental problems (Ahmadi, 2017).

This is in line with the Medan Mayor Regulation Number 26 of 2019 which contains policies and strategies for the Medan city area in managing household waste and waste similar to household waste. The emergence of these regulations is based on Law Number 18 of 2008 concerning waste management, which is followed by Government Regulation Number 82 of 2012 which explains the management of household waste and waste similar to household waste. The success of the program is of course still related to regional officials who have the right to autonomy in developing their territory, for that Presidential Regulation Number 97 of 2017 concerning National Policies and Strategies for Household Waste Management which is then in line with the Regulation of the Minister of Environment and Forestry Number P.10/MENLHK/ SETJEN/PLB.0/4/2018 which contains the Guidelines for the Preparation of Regional Policies and Strategies for the Management of Household Waste and Types of Household Waste. Waste management is also regulated in Medan City Regional Regulation Number 6 of 2015. The application of reuse, reduce, and recycle principles in household management is needed to control waste generation.

The Medan City Government has made efforts to control waste generation by issuing regulations and fines that apply to the public and companies that violate these regulations. The fine given is not small, namely as much as 10,000,000 rupiah which has been stipulated in the 2015 Medan City Regional Regulation Article 35 Paragraph 1 The Mayor of Medan is also aware of the losses caused by waste so that it requires parties who are responsible for supervising the community not to litter by issuing Medan Mayor Regulation Number 18 of 2021 has stated that one of the tasks of the Medan City Cleanliness and Parks Service is to collaborate with the sub-district head as the executor of waste socialization and counseling, but the socialization and counseling has not been conveyed evenly to all communities in Medan City.

The implementation of reuse, reduce, and recycle in the community is influenced by knowledge and attitudes (Edison and Dana, 2017). Occupational education, age, knowledge, and attitudes are also influencing factors (Lidia, 2020). In addition, it is also influenced by income in implementing the principles of reuse, reduce, and recycle (Isabella, 2020). This application has been carried out in several states in Malaysia by providing counseling with the aim of educating, raising awareness and encouraging the public to use products that minimize waste, for example the use of recycled bags to replace single-use plastic bags and aluminum straws to replace plastic straws (Ahmadi, 2017).

The purpose of this study is to analyze effect of education and knowledge on domestic waste management for housewives in Medan City in 2022.

## II. Research Method

This type of research is an analytic survey using a cross sectional and quantitative research design. Cross sectional research is research that studies the relationship between risk factors and effects, by approach, observation or data collection all at once (Octiva et al., 2018; Pandiangan, 2018). This study also uses a quantitative analysis approach. Quantitative analysis is a method used when conducting research related to numerical data (Asyraini et al., 2022; Octiva, 2018; Pandiangan, 2015). This type of method requires large amounts of numerical data and can be calculated using statistical formulas.

Population is a group or collection of objects or objects that will be generalized from the results of research (Jibril et al., 2022; Pandiangan et al., 2018; Pandiangan, 2022). The population in this study are housewives who live in 7 Sub-Districts (Region-III) in Medan City. The sample in this study are housewives who lived permanently in Region-III Medan City. The sample in this study is obtained from 4 Sub-Districts in Region-III Medan City. The sampling method used in this study was purposive sampling. Purposive sampling (also known as judgment, selective or subjective sampling) is a sampling technique in which researcher on his or her own judgment when choosing members of the population to participate in the study (Octiva et al., 2021; Pandiangan et al., 2021; Pandia et al., 2018). Taking 4 Sub-Districts based on the largest and most densely populated area and consisting of urban and coastal areas. Then the sample size is distributed proportionally to the 4 selected Sub-Districts. The selected Sub-Districts are Medan Tembung District, Medan Marelan District, Medan Deli District, and Medan Labuhan District. The distribution of samples is distributed proportionally with 25 samples in each Sub-Districts.

The statistical test used in this study is logistics regression multivariate analysis. Logistics regression multivariate analysis is a formula used to predict the relationships between dependent and independent variables. It calculates the probability of something happening depending on multiple sets of variables. This is a common classification algorithm used in data science and machine learning (Pandiangan et al., 2022; Tobing et al., 2018).

## III. Discussion

### 3.1 Research Overview

One of the Regencies/Cities in North Sumatra Province is Medan City. Medan city is the capital of North Sumatra Province and the third largest city in Indonesia. The area owned by Medan City is 26,510 hectares (265.10 km<sup>2</sup>) or 3.6% of the total area of North Sumatra Province. Based on the geographical location, Medan City is located at 3°30' - 3°43' North Latitude and 98°35' - 98°44' East Longitude. The topography of Medan City tends to tilt to the north and is located at an altitude of 2.5 – 37.5 meters above sea level.

Administratively, Medan City is directly adjacent to Deli Serdang Regency in the north, south, west and east. Most of the area of Medan City is a lowland which is the meeting place of two important rivers, namely the Babura River and the Deli River. Medan city is crossed by nine rivers, namely Belawan River, Badera River, Sikambing River, White River, Babura River, Deli River, Sulang-Saling River, Kera River, and Tuntungan River. Medan City has a wet tropical rain climate with an unclear dry season. Medan City has a tropical climate with a minimum temperature according to the BMKG Region I station in 2020, which is 22.9°C and a maximum temperature of 36°C.

### 3.2 Logistics Regression Multivariate Analysis Results

**Table 1.** Logistics Regression Multivariate Analysis Results

Independent Variable	B Value	P Value	Exp (B)	95% C.I for Exp (B)	
				Lower	Upper
Education	1.399	0.020	4.052	1.246	13.169
Knowledge	1.605	0.007	4.978	1.537	16.123

The results show that education has effect on action of domestic waste management for housewives in Medan City in 2022. Knowledge has effect on action of domestic waste management for housewives in Medan City in 2022.

## IV. Conclusion

### 4.1 Conclusion

The results show that education has effect on action of domestic waste management for housewives in Medan City in 2022. Knowledge has effect on action of domestic waste management for housewives in Medan City in 2022.

### 4.2 Suggestions

Suggestions for this research are:

1. The Sub-District is expected to cooperate with the Medan City Health Office and the Community Health Center involving sanitarian workers to provide health information media (posters, leaflets, etc.) especially regarding regional regulations and fines related to waste management with the principle of reuse, reduce, and recycle in the city of Medan which is applied in public places such as markets, stalls, minimarkets, schools which are often visited by housewives.
2. The sub-district organizes counseling related to waste management with the principles of reuse, reduce, and recycle by involving the Family Welfare Empowerment Mother, recitation associations, partangian associations to raise awareness about the problem of waste generated by each household, especially regarding activities to increase creativity in processing waste into reusable items.
3. The Sub-District in collaboration with the environmental service facilitates reuse, reduce, and recycle activities that are integrated with the Medan Mayor's Program related to Zero Waste 2025 by giving awards to regions that are able to preserve the environment, for example by implementing the climate village program.

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