International Journal of Science and Healthcare Research
Vol.6; Issue: 1; Jan.-March 2021
Website: ijshr.com
Research Paper *ISSN: 2455-7587*

The Relationship of Working Period and Personal Protective Equipment with Health Complaints to Scavengers at the Landfill Terjun, Marelan, Medan City, 2019

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ABSTRACT

The landfill (TPA) of Terjun in Marelan waste is a landfill in Medan City. The scavengers usually take the trash in the trash. In waste management, TPA Terjun raises hydrogen sulfide gas levels which can endanger scavengers in the TPA if they exceed the quality standard threshold of 0.002 ppm. Hydrogen sulfide gas levels that exceed the quality standard threshold can cause foul odor and cause health complaints for those who are exposed. The study aims to determine the relationship between working Period and personal protective equipment with health complaints to scavengers at TPA Terjun, Marelan, Medan City, in 2019. This type of research is an analytical survey with a cross-sectional research design with a total sample of 75 people taken by purposive sampling. The research was conducted in November 2019 at TPA Terjun Marelan. The study used bivariate analysis with the chi square test. The results showed bivariate with the chi square test that working period (p=0.033) and personal protective equipment (p=0.003) were associated with health complaints to scavengers at TPA Terjun, Marelan, Medan City, 2019.

Keywords: Working Period, Personal Protective Equipment, Health Complaints

INTRODUCTION

Garbage is the result of the remains of living things and inanimate objects that are no longer used which can cause health and environmental disturbance activities. There is waste that is easily broken down by nature and difficult to decompose by nature so it takes a long time for the environment to accept it (Notoadmodjo, 2007). Even though there are many methods and ways to reduce the amount and volume of waste in Medan City, the waste problem is still a problem that must be faced by the cleanliness manager of Medan City and the community.

The factors that influence the increase in waste each year are population size and population density. So the increasing population and human activities, the more waste increases in proportion to the level of people's daily consumption. Before there were many industries and the population was still small, residents could still handle waste by throwing garbage far away to places that were not inhabited by residents, and nature could still handle waste by means of self-purification or nature could still decompose waste. But now there are no more places for people to dispose of their waste because the place is already fully occupied by humans and when there was an industrial revolution, there were chemicals that were difficult to decompose by nature so that waste began to have problems (Ginting, 2007).

According to the Pemerintah Kota Medan (2013), the amount of waste piles reached up to 387,412 kg/m3 or 1,937,059 liters/m3 per year. The waste consists of 48% organic waste and the remaining 52%

is inorganic waste. As a result of population growth which increases by 4% each year, it is estimated that the amount of waste will also increase.

The final process in handling waste is usually located at the final waste disposal site (TPA). Usually, the processing carried out at the TPA is landfill and open dumping. But what is mostly done is through the open dumping process which causes many environmental problems such as air pollution, odors, gases, and dust. Landfills are landfills that are collected from various temporary landfills which aim to reduce the capacity of waste in the community. But after the waste has been transported to the TPA, a new problem will arise for the people living in the vicinity of the landfill because it can cause various diseases and spread it.

TPA Terjun is the final disposal site for waste transported from landfills in Medan. TPA Waterfall is located in the Subdistrict of Terjun, Medan Marelan District, which has been operating since 1993 and is only 9 km from downtown Medan. The area of TPA Terjun is 14 hectares with a capacity of 500,000 m3.

TPA Waterfall, Marelan is a garbage dump in Medan City. The scavengers usually take the trash in the trash.

With the increase in the amount of waste, there are some groups or people who increase their income by collecting waste to be recycled, and there are those who resell waste such as plastic bottles. Community groups often call them scavengers. Scavengers make a living in trash cans, in the trash cans, streets, temporary garbage disposal, to landfills. They seek and utilize used items such as used cardboard, plastic bottles, metal, etc. which can be sold back to entrepreneurs so that they can be recycled and produce new goods (Marpaung, 2012).

In waste management, TPA Terjun raises hydrogen sulfide gas levels which can endanger scavengers in the TPA if they exceed the quality standard threshold of 0.002 ppm. Hydrogen sulfide gas levels that exceed the quality standard threshold can cause foul odor and cause health complaints for those who are exposed.

One of the air pollutants originating from the waste sector is hydrogen sulfide. The gas comes from the waste decomposition process. If H2S gas spreads into the air, it will reduce air quality in the surrounding environment (Slamet, 2002). Hydrogen sulfide is poisonous to the body and also has a foul odor and is aesthetically unacceptable, so hydrogen sulfide can cause adverse effects on human health, especially if exposed to air. The lungs can quickly absorb this hydrogen sulfide gas. Therefore, the respiratory system is the most sensitive organ when exposed to this gas.

The results of a study conducted by Sianipar (2009), on an analysis of the environmental health risks of exposure to hydrogen sulfide gas in the community around TPA Waterfall show that exposure to the gas in the long term, although still in low concentrations, can cause permanent effects such as headaches, coughs. chronic, and disorders of the respiratory tract. The results of his research showed that the average concentration of hydrogen sulfide gas was 0.0290.

The results of Ludrya (2018) research regarding hydrogen sulfide levels and respiratory complaints among officers at the Super Debo Sutorejo waste processing unit found that the measurement of hydrogen sulfide levels was still below the quality standard, namely 0.6 μg/m3-1.4 μg/m. Although the levels of hydrogen sulfide gas are still below the quality standard of the Governor of East Java Number 10 of 2009, namely 42 μg/m3, 16 of the 21 officers experience complaints of health problems in the form of coughing, shortness of breath and itching throat.

Research conducted by Simbolon (2018), regarding the effect of exposure to hydrogen sulfide gas on respiratory complaints in scavengers at the Ganet final disposal site, Tanjungpinang City, found that the H2S levels at the sorting and unloading points had exceeded the quality standards, namely 0.08 and 0, 09.

Scavengers experience many complaints of respiratory problems in the form of coughs, sore throats, fever, headaches, colds and shortness of breath.

Research on risk factors for exposure to Ammonia and Hydrogen Sulfide Gas for complaints of health problems among scavengers at TPA Jatibarang Semarang City conducted by Hartini (2015), stated that women scavengers often experience complaints of health problems in the form of chest pain, sore eyes, dry throat, hot throat, headache, coughing, and shortness of breath. Even though the measurement results obtained at the Jatibarang TPA are still below the quality standard, namely in Zone I the measurement results are 0.001 ppm and zone II the measurement results are <0.001. This shows that even though hydrogen sulfide gas levels are still below quality standards, it can cause complaints of health problems.

Based on a preliminary survey conducted by researchers as well, it is known from the head of the scavenger coordination, namely Mr. Sutimin, who is usually called Pak Sutimin Grondong, and the coordinating secretary for the scavenger coordination Mr. Iwan, who is usually called Mr. Iwan Brewok, that the number of scavengers is decreasing every year because now the scavengers are already looking for work someone else and someone is already working as a scavenger at another dumping site so they don't work at TPA Terjun anymore. From 2017 to 2018, the number of scavengers still numbered more than 500, but since 2019 the number of scavengers has decreased so that in May there were only 300 people. The origin of the scavengers who make a living at TPA Waterfall also come from various remote areas, some even from Deli Serdang moved to TPA Waterfall because the Namo Bintang TPA which is in Pancur Batu has been closed.

The study aims to determine the relationship between working Period and personal protective equipment with health complaints to scavengers at TPA Terjun, Marelan, Medan City, in 2019.

RESEARCH METHODS

This type of research is an analytic survey with a cross sectional research design.

The population of this study is the total number of scavengers who live in TPA Terjun Medan Marelan District. The total number of scavengers working at TPA Terjun is 300 people. The number of samples of 75 people was taken by purposive sampling. Sampling using purposive sampling technique Sugiyono (2010), using inclusion and exclusion criteria. This technique determines the sample with certain considerations making it easier for researchers to research. The research was conducted in November 2019 at TPA Terjun Marelan.

The study used bivariate analysis with the chi square test.

RESULT

Description of Research Location

General Description

TPA Terjun is located in Terjun Village, Medan Marelan District, Medan City, North Sumatra Province. Medan Marelan Subdistrict has an area of ±44.47 Km2 where the Waterfall Village has the largest area, namely 16.05 Km2. Medan Marelan sub-district consists of five sub-districts, namely Labuhan Deli Village, Paya Pasir Village, Rengas Pulau Village, Tanah Six Ratus Village, and Waterfall Village. Medan Marelan sub-district consists of five with the following boundaries:

1. North side is bordered by Medan Belawan District
2. South side is bordered by Medan Helvetia District
3. To the west is bordered by Deli Serdang District
4. East side is bordered by Medan Labuhan District

The Terjun landfill began operating on January 7, 1993, and has a location area of 13.75 hectares and is often rounded to 14

hectares. Waste processing at TPA Terjun uses an open dumping system. This landfill is located between the flow of Paluh Nibung and Paluhatuh which is about 6 km from the coastline. The distance to this landfill is also relatively close to residential areas because it is only 500 m away.

Schedule and Piling of Waste at TPA Terjun

TPA Terjun has an Inactive Zone, where this Inactive Zone is no longer used for waste exposure activities or operations. In other words, the Inactive Zone has been overfilled with soil. Hoarding at TPA Waterfall is done manually twice a year by using the excavator heavy equipment in the TPA. The land used for landfilling is land originating from the landfill of TPA Terjun. Landfilling is carried out to reduce foul odors and fire hazards that can occur due to the formation of methane gas (CH4) and carbon dioxide (CO2) from the waste decomposition process.

The landfill also functions to control the humidity of the waste, prevent the spread of garbage, and prevent the growth of animals/disease vectors. In order to reduce the potential for environmental disturbances that may arise, then periodically waste must be piled with soil with a minimum soil thickness of 20-30 cm. In 2014, the landfill of the Waterfall TPA (TPA) had landfilled as much as 2200 m3, which was carried out in September and November 2014. In September the TPA Waterfall was stockpiled with 200 m3 of land and 2000 m3 in November. Meanwhile, in 2015 the landfilling was 742 m3 with implementation in April 2015 as much as 371 m3 and in October 2015 as much as 371 m3.

Bivariate Analysis

Bivariate analysis was carried out to determine the relationship between the independent variables, namely individual characteristics (working period and personal protective equipment) with health complaints from scavengers (shortness of breath, coughing, chest pain, sore eyes, watery eyes, itchy eyes, swollen eyes, nose. itching, runny nose, sore throat, dry throat, hot throat, and headache).

Based on Table 1, it is known by using the chi square test that the variables related to health complaints are years of service and use of personal protective equipment.

Table 1. The Relationship of Working Period and Personal Protective Equipment (APD) with Health Complaints to Scavengers at the Landfill Terjun, Marelan, Medan City, 2019

Variable		Health Complaints				p value
		Yes		No		
		N	%	N	%	
Working Period	> 10 Year	54	72.0	2	2.7	0.033
	≤ 10 Year	15	20.0	4	5.3	
	Total	69	92.0	6	8.0	
APD	Good	13	17.3	5	6.7	0.003
	Less	56	74.7	1	1.3	
	Total	69	92.0	6	8.0	

The results of the analysis of the relationship between working period and health complaints using the chi square test obtained p value=0.033 (p<0.05) so that it is known that there is a relationship between working period and health complaints.

The results of the analysis of the relationship between the use of personal protective equipment (APD) while working at the Marelan TPA Terjun with health complaints using the chi square test obtained a value of p=0.003 (p<0.05) so that it can be seen that there is a relationship between the use of personal protective equipment while working at the Marelan TPA health complaints.

CONCLUSION AND SUGGESTION

The study used bivariate analysis with the chi square test. The results showed bivariate with the chi square test that working period (p=0.033) and personal protective equipment (p=0.003) were associated with health complaints to scavengers at TPA Terjun, Marelan, Medan City, 2019.

To the Medan City Government, it is advisable to provide information to the public about how to sort waste before it is disposed of in the trash and how to recycle waste that can still be used so that it can

reduce the amount of waste. The Medan City Government should also provide counseling to scavengers about the dangers of garbage and suggest wearing complete personal protective equipment in order to reduce the risk of health problems due to garbage disposal.

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How to cite this article: Sihotang E, Marsaulina I, Hasan W. The relationship of working period and personal protective equipment with health complaints to scavengers at the Landfill Terjun, Marelan, Medan City, 2019. *International Journal of Science & Healthcare Research.* 2021; 6(1): 201-205.

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