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Research Article

Waste Management at the Bahteramas Regional General Hospital in Southeast Sulawesi Province During the COVID-19 Pandemic

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Abstract.
Hospitals produce large amounts of wastewater and biomedical waste, which contain various contaminants and, if not treated, negatively impact the environment. Over the last two years, the COVID-19 outbreak increased hospital waste stockpiles because treating patients needed more medical equipment. Bahteramas Regional General Hospital generated 9,923 kg of medical waste in 2020 and 9,577 kg in 2021. From this data, it was possible to see that the amount of waste decreased from 2020 to 2021. This study aimed to determine how medical waste was processed at the Bahteramas Regional General Hospital in Southeast Sulawesi Province during the COVID-19 pandemic. This survey was conducted at the Bahteramas Regional General Hospital in Southeast Sulawesi, using report data on medical waste and Covid-19 waste. According to the findings of this study, medical hazardous and toxic waste management was carried out, including separation, labeling, transportation, storage, disposal/destruction, and the use of third parties in final disposal. Meanwhile, sampling was used to determine the feasibility of processing liquid waste before it was distributed to the Water Agency.

Keywords: Hospital, Medical Waste, Covid-19

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1. Introduction

With the COVID-19 virus outbreak. WHO has declared Coronavirus Disease 2019 (COVID-19) a pandemic, and Indonesia has declared COVID-19 a non-natural disaster in the form of a disease outbreak that must be mitigated in order to prevent an increase in cases. Guidelines for the community to follow in order to prevent the spread of COVID-19, both for themselves and those around them, including their families, are required [1].

Personal Protective Equipment (PPE) is required when dealing with COVID-19, which spreads quickly and easily. PPE consists of masks, gloves, gowns, and head coverings that are mostly made of plastic and have a single use period. This significantly

increases the generation of used PPE medical waste. COVID-19 medical waste can also include specimens, used pharmaceutical materials, used medical devices, and used food/beverage packaging for COVID-19 patients [2].

According to the World Health Organization (WHO), health service facilities (Fasyankes) generate 75-90% of domestic waste, also known as non-hazardous waste, from administrative rooms, kitchens, and households. The remaining 10-25% is hazardous and toxic waste (B3) and radioactive waste, both of which have the potential to harm health and the environment [3].

Hospitals generate large amounts of sewage and biomedical waste, both of which contain a variety of contaminants, if left untreated, can be harmful to your community. Over the last two years, the COVID-19 outbreak has resulted in an increase in hospital waste generation. Under these conditions, reference studies are conducted concurrently to uncover the negative consequences hospital waste that hasn't been treated and describe appropriate solutions. The pushback protection method alone removes 50%-70% of the emerging contaminants in wastewater [4].

Hospitals use a variety of materials and facilities or equipment that may contain hazardous or toxic materials in order to carry out their functions (B3). Hospital interactions with humans and the environment can result in environmental health issues, as evidenced by indicators of decreasing quality of environmental health media in hospitals [5]. Hospital liquid waste is generated as a byproduct of hospital operations. Hospital activities are associated with the process of healing patients suffering from communicable and noncommunicable diseases. In terms of environmental health, wastewater with a quality below the environmental quality standard will have an impact on the aquatic ecosystem and cause public health issues [6].

In general, medical waste management in Indonesia continues to face challenges ranging from regulatory aspects to processing capacity, local government role, institutional coordination, human resources, infrastructure, licensing, private sector role, and financing. In terms of quantity and uneven distribution, medical waste processing capacity is insufficient. There are currently only 120 licensed waste treatment facilities or incinerators out of 2,880 hospitals, and only 5 hospitals have autoclaves. The transportation issue is also complicated by the fact that only 165 licensed transportation services exist. This condition prevents transportation from reaching all healthcare facilities in Indonesia, particularly those in eastern Indonesia, remote areas, and islands [7].

Based on research [8], one of the issues in the midst of a pandemic is the handling of Corona virus waste. This waste is classified as hazardous and toxic medical waste. Masks, gloves, used bandages, tissues, used syringes, used infusion sets, used personal protective equipment (PPE), and leftover patient food are among the waste items. According to the Minister of Environment and Forestry, the volume of infectious medical supplies distributed throughout Indonesia until June 8, 2020 has exceeded 1,100 tonnes, with a medical output of 14.3 kg/day.

The purpose of this study is to provide an overview of wastewater management, domestic solid waste management, and medical hazardous and toxic waste management based on Indonesian Ministry of Health guidelines for waste management of referral hospitals dealing with Covid-19 patients.

2. Methods

In 2020-2021, this survey was conducted at the bahteramas regional general hospital in southeast sulawesi, using report data on medical waste and covid-19 waste. the data was numerical in nature. the research data was presented graphically and then

3. Results and Discussion

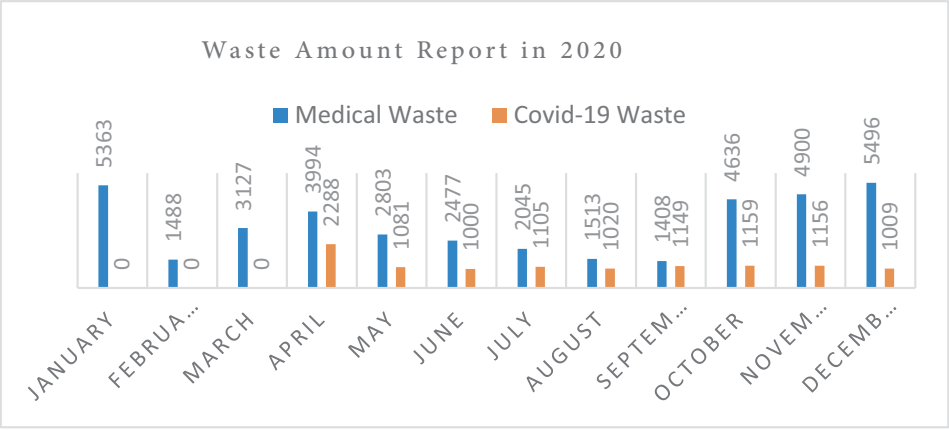

Figure 1: Medical waste volume and Covid-19 in 2020.

Figure 1 shows medical waste volume and Covid-19 every month in 2020 at Bahteramas Regional General Hospital, Southeast Sulawesi Province.

Figure 2 shows medical waste volume and Covid-19 every month in 2021 at Bahteramas Regional General Hospital, Southeast Sulawesi Province.

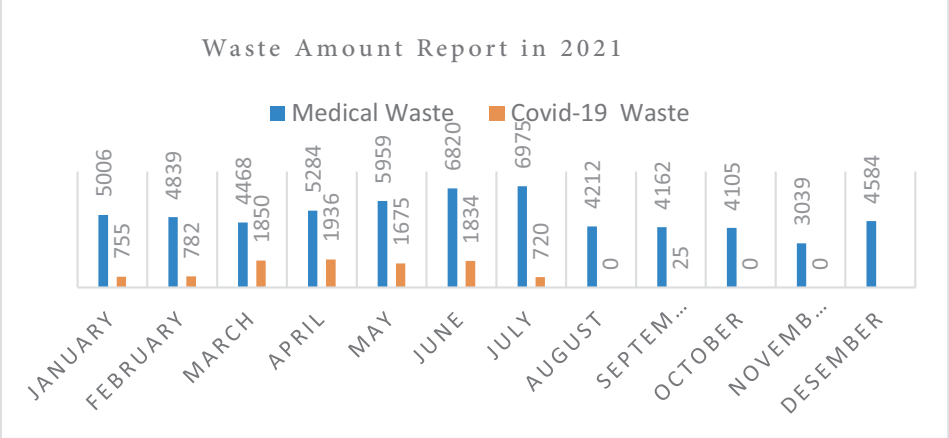

Figure 2: Medical waste volume and Covid-19 in 2021.

The Covid-19 waste in 2020 was 10,967 Kg, according to data from the Sanitation Installation division at the Bahteramas Regional General Hospital in Southeast Sulawesi Province, with the highest number of 2288 Kg in April and the lowest number in June and December. Then, in 2021, there were 10,527 Kg, with the highest numbers being 1850 Kg in April, 1936 Kg in May, and 1934 Kg in July. Furthermore, the lowest number occurred in October, at 25 Kg, despite the absence of Covid-19 waste in November and December. This data also shows that the amount of waste produced decreases from 2020 to 2021 [8].

Solid medical B3 waste is defined as leftover goods or materials that have the potential to be contaminated with infectious substances or have come into contact with COVID-19 patients/staff. Patient food leftovers, used infusions, used contaminated food and drink paper/plastic, used gloves, used bandages, used masks, PPE used by workers handling COVID-19 patients, and used syringes are examples of waste [9].

The disposal of solid medical B3 waste in hospitals is a structured and organized system to ensure that individuals' health is not jeopardized, groups, or the surrounding environment if not properly managed. An SOP (Standard Operating Procedure) for the handling of solid medical B3 waste must be developed as a reference guideline for parties involved in the management of solid medical B3 waste, beginning with identification, separation, labeling, transportation, storage, and ending with disposal/destruction. A dam cleaning service that has been trained The officers involved work in accordance with the SOP, so that a person works in a predetermined field and PPE is used based on the risk of work [10].

The waste water for the Covid-19 case that must be treated is all waste water including feces, originating from the activities of handling Covid-19 patients which may contain microorganisms, especially the Corona Virus, toxic chemicals, blood and other body fluids, as well as liquids used in the isolation of patient activities. includes fluids from the mouth and/or nose or patient's mouthwash and water for washing work tools, cutlery and patient drinking utensils and/or laundry linens that are hazardous to health sourced from Covid-19 isolation patients, treatment rooms, examination rooms, laboratory rooms, tool and linen washing room [1].

The sources of waste generation at the Bahteramas Regional General Hospital are outpatient rooms, inpatient rooms, emergency rooms, delivery rooms, operating rooms, ICU, laboratories, radiology, pharmacy rooms, laundry, kitchens, and offices. For waste from the kitchen and laundry rooms, grease traps are provided to prevent blockages due to food debris and detergents. Waste originating from the laboratory in the control basin is first neutralized by giving anion and cation powder because it contains many toxic chemicals from the rest of the examination samples (blood, urine, feces, sputum, and other body fluids) and reagents used for examination.

Based on the results of this study, the Bahteramas Regional General Hospital is one of the referral healthcare facilities for handling Covid-19 patients in Southeast Sulawesi. Thus, the handling of solid and liquid medical hazardous and toxic waste must have a Standard Operating Procedure (SOP) as a reference guideline for parties involved in waste management, such as identification, separation, labeling, transportation, storage, and disposal/extermination through cooperation with third parties, namely PT. Artama Sentosa Indonesia. In order not to damage the surrounding environment, liquid waste processing is carried out by taking samples to determine its feasibility. The involved officers or health workers work based on the SOPs so that they are in accordance with the specified fields, and the use of PPE is based on the risk of their work.

According to the findings of research and observations, the Bahteramas Regional General Hospital in Southeast Sulawesi Province provides adequate equipment and PPE to facilitate solid medical hazardous and toxic waste management activities, including trash cans lined with colored plastic bags, trolleys, TPS, and incinerators. Meanwhile, before distributing liquid waste to the Water Agency, a sample test is performed to ensure that it does not harm the environment or surrounding communities. Based on the findings of interviews and observations, officers or health workers followed SOP to

handle solid medical waste and liquid waste during the pandemic, which is one of the issues in the Covid-19 pandemic era.

4. Conclusions

The Covid-19 Medical Waste in Bahteramas General Hospital in Southeast Sulawesi Province shows that it already has SOPs for solid medical waste and liquid waste management in accordance with the waste management guidelines of referral hospitals treating patients with Covid-19 in Bahteramas General Hospital in Southeast Sulawesi Province will be involved in the sorting, containerization, assembly, transportation and destruction processes in collaboration with a third party PT. Artama Sentosa Indonesia.

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