

EVALUATION OF MEDICAL WASTE MANAGEMENT BEFORE AND DURING THE COVID-19 PANDEMIC AT SENTRA MEDIKA HOSPITAL CIKARANG

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Abstract. One of important things in managing Coronavirus Disease 2019 (COVID-19) pandemic is managing medical waste production. Medical waste management start from waste sort until waste manage by licensed parties, both of patients' waste and health workers' waste. Sentra Medika Hospital Cikarang is one of the referral hospitals that handles COVID-19. This research is a descriptive analytic study. Researchers analyze hazardous and toxic waste management before and during a pandemic by conducting interviews with the nursing unit and using secondary data. Secondary data was obtained from the hospital environmental health unit. There is no significant differences medical waste before and during pandemic. This happens because there are decreasing of patients amount which come to hospital. Besides, health services waste is patients waste such as food or drink waste and personal protective equipment such as hazmat, masks, gloves and others. The weight of waste does produce is lighter. Medical waste at Sentra Medika Hospital has been managed in accordance with regulations.

Keywords: COVID-19, Medical Waste, Managing Medical, Hospital

Abstrak. Salah satu hal yang penting dalam penanganan pandemi corona virus disesse 2019 (COVID-19) adalah pengelolaan limbah medis yang dihasilkan, mulai dari pemilahan sampai dengan pengelolaan oleh pihak yang berijin baik dari limbah yang berasal dari pasien maupun limbah yang berasal dari tenaga kesehatan. RS Sentra Medika Cikarang merupakan salah satu rumah sakit rujukan yang menangani COVID-19. Penelitian ini merupakan penelitian deskriptif analitik yaitu serangkaian kegiatan dimana peneliti menganalisis pengelolaan limbah B3 saat sebelum pandemi dan saat ada pandemi dengan melakukan wawancara ke unit keperawatan dan data sekunder yang diperoleh dari unit kesehatan lingkungan rumah sakit. Limbah medis saat pendemi tidak berbeda jauh dengan limbah saat belum pandemi. Hal itu terjadi karena jumlah pasien yang berkunjung ke pelayanan kesehatan yang menurun pula, selain itu limbah yang dihasilkan dari pelayanan kesehatan adalah limbah yang berasal dari pasien seperti bekas makanan atau minuman pasien serta APD yang dipakai seperti hazmat, masker, sarung tangan. dan lain-lain yang secara berat memang menghasilkan berat yang jauh lebih ringan. Limbah medis di Rumah Sakit Sentra Medika sudah dilakukan pengelolaan sesuai dengan regulasi yang telah ditetapkan pemerintah

Kata Kunci : COVID-19, Limbah Medis, Pengolahan Limbah, Rumah Sakit

INTRODUCTION

Health is a basic need of every human being and the assets of every citizen and every nation in achieving its goals and achieving prosperity. A person cannot fulfill all the necessities of life if he has unhealthy condition. So, health is the assets of each individual to continue his life properly. Health care is one of the services which most needed by community. Health care facilities plays an important role in providing health services to the community such as hospital. Based on constitution number 44 of 2009 about hospitals, hospital is health care facility that

provides comprehensive individual health services including inpatient, outpatient and emergency services. Hospitals as health improvement efforts which giving health care, educational and research institutions for health workers, obviously have positive and negative impacts on the surrounding environment.

The impacts are production or use of hazardous and toxic materials, Findings of expired chemical waste which is increasing and spreading widely. If this is not managed properly, it can cause harm to human health, living things and the environment. The kind

of losses can be pollution of the air, land, water and sea. Therefore, it is necessary to make a hospital environmental health effort that aims to protect the public and hospital staff from the dangers of environmental pollution that comes from hospital waste (Sasmito, 2014).

In implementation, all elements in the hospital play a role as a producer of waste. The waste such as medical or non-medical waste. Hospital waste have a negative impact and cause pollution. Hospital waste have produced by an activity process. Negative impact can happen if the waste isn't managed properly.

Environmental monitoring activities towards compliance about waste management as a product of activities is regulated in constitution Number 32 of 2009 clause 71 verse one (1) concerning Environmental Protection and Management which states that "The Minister, Governors, Mayors / Regents in accordance with their respective powers are obliged to supervise the person in charge obedience and / or activities to the provisions defined in legislation and life management"

In accordance with clause one (1) verse (22) constitution Number 32 of 2009 concerning Life Protection and Management: Waste and Toxic Hazardous Materials, hereinafter referred as *B3*, is the residue of a business and / or activity containing *B3*". In addition, hazardous and toxic waste materials are also regulated in Government Regulation number 101 of 2014 concerning Hazardous and Toxic Waste Management. Hazardous and Toxic Wastes can be identified according to their sources and characteristics. Hazardous and toxic waste (*B3*) based on its source includes hazardous and Toxic waste (*B3*) from unspecified sources and specific sources. Hazardous and toxic waste (*B3*) is hazardous and toxic waste (*B3*) which generally does not come from the main process, but comes from equipment maintenance, washing, and corrosion prevention activities (corrosion inhibitors), crust dissolving, packaging, and others. Hazardous and toxic waste (*B3*) from specific sources is hazardous and toxic waste (*B3*) produce from an industrial process or activity that can be specifically determined. Hazardous and toxic waste (*B3*) from expired chemicals, spills, remaining packaging, or discarded products because they do not meet the specified requirement or cannot be reused. Because of that a product becomes hazardous and toxic waste (*B3*) which requires management such as other hazardous and toxic waste (*B3*) management. It can also apply to the remaining packages of hazardous and toxic waste (*B3*) and expired chemicals.

One of the hospitals that carries out activities and produces hazardous and toxic waste is Sentra Medika Hospital Cikarang. The hazardous waste produced is the product of medical service activities in the treatment room or surgical room that produces medical waste. The waste is considered a cause of environmental pollution which is higher than other wastes. For the waste management, strict supervision is needed and in accordance with existing regulations. Especially, when there is COVID-19 pandemic like this, further research is needed to find out how to manage hazardous and toxic waste (*B3*) before the pandemic and during pandemic.

Based on the background above, the authors interest to analyze "Hazardous and toxic (*B3*) waste management at Sentra Medika Hospital before and during the Pandemic".

METHOD

This research is a descriptive analytic study. A series of activities which is researchers analyze Hazardous and toxic (*B3*) waste management before the pandemic and during pandemic. Data were obtained by conducting interviews with the nursing unit and secondary data were obtained from the hospital environmental health unit. Waste differences data during the pandemic and before the pandemic were obtained by conducting interviews to nurses who handled COVID-19 patients. Based on interview, we get waste problems identification during and before COVID-19, then we find the root cause by conducting interviews using a structured questionnaire which distributed directly to nurses and unstructured interviews to public staff who handle covid waste management and interviews against cleaning workers who collect waste from the hospital and third parties as waste eliminator.

The method used is qualitative data analysis. Qualitative data collection and analysis stages as follows:

1. The first stage, the descriptive analysis stage is the stage where the researcher collects qualitative data using interview techniques, document review, and field studies to get an overview of the differences in waste during a pandemic and before a pandemic. The data was processed and analyzed to show the shapes and patterns differences of the waste.
2. The second stage, the analysis stage is the stage to find out differences in hazardous and toxic waste management.

RESULTS AND DISCUSSION

The results of the research are including observation data, in-depth interviews, document review, and field studies were combined. The problems in every hazardous and toxic waste management processes can be seen. The results of the study are as follows:

Observation of waste management

1. Sorting

The waste is sorted by type, the waste was separated into hazardous and toxic waste or domestic waste. If the waste is medical waste then it is put in yellow plastic which is collected in infectious waste container. Infectious waste (medical waste) produce from health workers who treat COVID-19 patients such as bandages, syringes, masks, plastic / paper used for food and beverages, tissues and personal protective equipment. Before the COVID-19 pandemic occurred, medical waste was waste which produce from nursing activity who care of patients, without any waste produce from patient activity such as eating or drinking waste. Medical waste which has been filled $\frac{3}{4}$ is transported by cleaners who have special job to transport waste. Waste is transported

twice from the room every day. Based on interviews which conducted to nurses, to reduce covid waste isto destroy the infusion plabots after used before they throw away to the yellow plastic. The filled waste bag then wrapped in a box for rapping to differentiate between covid and non-covid patient waste.

2. Transporting

After the waste bag is three-quarter fully filled, the waste bag is transported to a licensed special hazardous waste temporary dumpsite by using a sulo (special cart). Waste route have a different route with food delivery or clean linen. Waste is transported twice a day by staff using complete PPE in accordance with government regulation number 101 of 2014 concerning the hazardous and toxic waste management. During pandemic, the transportation of medical waste, especially for medical waste from the treatment room which handled COVID-19 patients, there was increasing medical waste. The weight of waste obtained in Jasmine room increase during this COVID-19, even though the beds decrease from 48 to 32 beds.

From the logbook and manifest obtained, it showed that there is increasing waste producing at Sentra Medika Hospital.

Table 1. Medical Waste Producing as Sentra Medika Cikarang Hospital in 2019

No	Month	Weight (kg)
1	January	3.819
2	February	3.796
3	March	3.639
4	April	3.842
5	May	3.153
6	June	3.442
7	July	3.817
8	August	4.636
9	September	4.262
10	October	4.701
11	November	4.406
12	December	4.391

Total Waste**47.904**

Base on Table 1, it can be seen that the heaviest waste is in August as 4701 kg, the lightest waste is in May as 3153 kg. Meanwhile, when compared

to 2020 or during pandemic, we know significant differences, the waste had increased compared to 2019.

Table 2. Medical Waste Producing at Sentra Medika Cikarang Hospital in January - June 2020

No	Month	Weight (kg)
1	January	3.818
2	February	3.922
3	March	4.200
4	April	4.230
5	May	3.256
6	June	3.927
Total Waste		23.353

Data were obtained from the environmental health unit at Sentra Medika Hospital. Data shows that the

pandemic does not have significant effect on waste increasing. It was due to a decrease in the number of non COVID-19 patients.

Table 3. Bed Occupation Rate at Sentra Medika Cikarang Hospital in 2019

No	Month	Percentage (%)
1	January	68,8%
2	February	96,2%
3	March	109,5%
4	April	98,0%
5	May	72,8%
6	June	64,1%
7	July	65,8%

8	August	63,5%
9	September	56,8%
10	October	60,6%
11	November	65,4%
12	December	69,7%
Mean		74,25%

Base on Table 3, it can be concluded that the BOR spread in hospitals in March was 109.5%, while the lowest BOR was in September was 56.8%.

Meanwhile, in 2020 there was a decline trend in the BOR number in the first semester. This data can be seen in Table 4.

Table 4. Bed Occupation Rate at Sentra Medika Cikarang Hospital in January – June 2020

No	Month	Percentage (%)
1	January	65,8%
2	February	63,5%
3	March	56,8%
4	April	60,6%
5	May	65,4%
6	June	69,7%
Mean		63,63%

3. Weighting

Before the waste is stored in the temporary hazardous dumpsite according to its type, the medical waste is weighed and recorded in a logbook. Waste is recorded according to the type and according where it is produce (room). The waste is weighed by a cleaning officer (rubbish) who is accompanied by the environmental health staff. Waste is recorded in the logbook, how much waste to throw and how much the waste leaves temporary hazardous dumpsite to be processed by a third party.

4. Storage

After the waste is stored in temporary hazardous dumpsite, the waste will be stored based on the type of waste (solid, needle, liquid). The waste is stored at the temporary hazardous dumpsite which has a license from DPMPSTSP Bekasi district. Waste will be transported by a third party every 2 days in accordance with the regulations in the Ministry of Environment and Forestry Regulation number 56 of 2015 concerning Procedures and Technical Requirements for Hazardous and Toxic Waste management in Health Care Facilities. It show

that waste stored in rooms with temperatures $>0^{\circ}\text{C}$ must be transported once every 2 days.

5. Third Party Managing

The waste that has been stored in the temporary hazardous dumpsite will be transported by a third party in accordance with agreement. The waste is transported by staff who used the specified PPE. The waste transported to the designated waste management site and according to procedures.

Based on interviews were conducted to hazardous and toxic waste transporters, the transported waste during the pandemic looks like increasing, but in the waste weightless. It causes of the transported waste is PPE from nurses and food waste from the patient.

6. Hazardous and Toxic Waste Management Capacity

Based on circular letter No. SE.2 / MENLHK / PS LB3 / 2020 concerning the management infectious waste (hazardous waste) and household waste from the treatment COVID-19 (KLHK RI, 2020), Hazardous waste must be managed specifically and treated in a hospital waste incinerator facility at a minimum temperature is 800°C .

CONCLUSIONS AND RECOMMENDATION

Conclusion

1. Medical waste at Sentra Medika Hospital has been managed in accordance with regulations.
2. In accordance with the regulations, the infectious medical waste disposing is carried out by a medical waste eliminator that has a permit from the government.

Recommendation

1. Eliminating infectious waste from COVID-19 patient must be priority task
2. Waste separation is very important to reduce the waste weight.
3. Infectious medical waste which produce from COVID-19 patients needs to be disinfected first by spraying disinfectants. This is an effort to prevent transmission, including for staff who are responsible for collecting and transporting waste.

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