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Evaluation Of Medical Waste Management Strategies In First Level Health Facilities: A Review From An Environmental Health Perspective

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ABSTRACT

Public health centers as one of the institutions that produce medical waste have an obligation to maintain the environment and health in their working areas. Sumbersari Health Center has problems in handling solid medical waste at the stage of transportation and temporary storage. The purpose of this study is to determine how solid medical waste is handled at the stages of reduction, sorting, packaging, transportation, temporary storage, facilities and infrastructure as well as the knowledge and behavior of health workers and janitors. This study used descriptive method with purposive sampling technique. The sample size of Respondents amounted to 12 people and environmental samples amounted to 5 rooms that produce solid medical waste. The results of this study, obtained an average medical waste generation of 0.64 kg/day. Handling of medical waste at the reduction stage 75% meets the requirements, the sorting and packaging stage 100% meets the requirements, the transportation stage 20% meets the requirements, the temporary storage stage 87.5% meets the requirements, in facilities and infrastructure 75% meets the requirements. Aspects of knowledge and behavior of health workers are categorized as good 100%. The knowledge aspect of janitors is categorized as good 50% and sufficient 50%.The aspect of the behavior of janitors is categorized as 100% sufficient.It is advised that the health center add infrastructure for managing medical waste, such as trolleys for waste transportation, cold storage for waste kept longer than two days, scales, and instructions for cleaning staff on how to handle solid medical waste.

INTRODUCTION

Health service facilities are places where sick people, service providers, visitors, and the surrounding environment gather or meet. If human interaction is not created by a hygienic and conducive environment, disease can spread 1 . The Central Statistics Agency (BPS) noted that the number of community health centers (puskesmas) in Indonesia was 10,374 units in 2022. According to the region, the most puskesmas were in West Java in 2022, namely 1,100 units 2 . Based on the 2022 Bandung Regency Health Profile, the number of puskesmas in Bandung Regency in 2022 was recorded at 62. Consisting of 57 puskesmas without treatment and 5 puskesmas with treatment (DTP). Meanwhile, the waste generated from health service facilities, especially hospitals and health centers, is 296.86 tons/hr (October 2018), but on the other hand, the processing capacity owned by third parties is only 151.6 tons/day 3. As one of the health institutions that produces waste, public health service centers have an obligation to maintain the environment and public health and have special responsibilities for the waste produced. The obligations in question include the obligation to ensure that the handling, processing, and disposal of waste do not have a negative impact on health and the environment 4. Untreated medical waste can endanger human health and the environment. The consequences of improper handling of medical waste can include injuries from sharp objects, respiratory or skin diseases due to exposure to chemicals, outbreaks of disease if wastewater disposal is not managed properly. Officers who are most at risk of exposure or injury due to inadequate waste handling are those who work in the health or hygiene industry 5. The decline in environmental quality that causes discomfort and aesthetic disturbance is one of the impacts of medical waste because of the negative impression caused by improper handling of medical waste, visitors can experience psychological impacts on their views of the Health Center. Based on the researcher's initial survey, Sumbersari Health Center has problems in handling solid medical waste, namely at the stage of storing medical waste because the temporary storage place for medical waste is integrated with the warehouse for storing goods, does not provide a temperature controller for medical waste that is more than 1x24 hours, transportation of solid medical waste at Sumbersari Health Center is carried out by a third party once a month. This can result in the accumulation of medical waste produced every day, so that it can become a risk of environmental pollution and the spread of diseases due to the waste.

RESEARCH METHODS

This type of research is descriptive research. The method used is the survey method with the aim of knowing or describing the handling of solid medical waste starting from the stages of reduction, sorting, containerization, transportation, temporary storage, facilities and infrastructure, as well as the knowledge and behavior of health workers and cleaning staff at the Sumbersari Health Center, Bandung Regency. This research was conducted at the Sumbersari Health Center in May 2024. The population in this study were health workers and cleaning staff who were directly involved in handling solid medical waste, totaling 12 people and all rooms that produce solid medical waste, namely 5 rooms. The sampling technique in this study was purposive sampling. The instruments used were observation sheets for observing the handling of solid medical waste and questionnaire sheets for interviews with health workers and cleaning staff. The data was analyzed univariately, namely when the data had been collected, then processed and analyzed descriptively and presented in the form of a frequency distribution with the results obtained a value of 1 if it meets the requirements, while 0 if it does not meet the requirements, for knowledge and behavior, an assessment was carried out with the categorization Good: score ≥ 76 - 100%, Sufficient: score 60-75%, and Less: score ≤ 60%.

RESULTS

Solid medical waste at Sumbersari Health Center is generated from the Emergency Room, dental and oral health room, KIA room, general examination room and laboratory. The waste generated is in the form of syringes, gloves, masks, cotton, used bandages, cotton sticks and others. The amount of solid medical waste generated by Sumbersari Health Center is relatively less, because Sumbersari Health Center does not perform many procedures on patients and is a non-inpatient health center.

Based on the results of measuring the generation of solid medical waste carried out for 8 consecutive days, the results were 5.17 kg with an average of 0.64 kg/day. While the results in the form of volume for 8 consecutive days in 5 rooms were 0.0085 L with an average of 0.0010 L/day. Outpatient health centers have a lower generation rate when compared to inpatient health centers. In Arifah Wulansari's study, it showed a significant difference between the rate of solid medical waste generation in inpatient and outpatient health centers. However, there was a difference in the rate of generation in this study, in addition to being influenced by the number of patient visits according to the referral, this could be due to the size and type of health center and the activity of sorting medical waste and the type of medical services. Based on the research that has been conducted at the reduction stage, the results obtained from 5 rooms still do not meet the requirements because the health center has not reduced medical equipment such as bottles or glass packaging. This reduction is an effort made to reduce the amount of medical waste generated by the health center and is very important to maintain environmental health and minimize negative impacts on human health.

DISCUSSION

at the sorting stage at the Sumbersari Health Center, separation has been carried out at the source of waste in each room, waste has been separated between infectious and non-infectious waste and there is a safety box in each room for sharp waste. Sorting solid medical waste at the Health Center is an important step in effective medical waste management. With proper sorting, health risks can be minimized, the waste processing process becomes more efficient, and negative impacts on the environment can be minimized. This study is in line with Nasrita et al., (2023) that health centers must provide a place for sorting medical waste that is in accordance with its characteristics and placed in each room and for sharp objects are put into safety box 6. At the sorting stage, the separation system is carried out based on medical and non-medical waste. For medical waste, a safety box is provided for used syringes, while non-medical waste uses plastic trash bins. This sorting process aims to categorize the waste produced by the Health Center, making it easier for management officers to proceed to the next stage. at the stage of storage at the Sumbersari Health Center, each room already has a place to store solid medical waste according to its characteristics, the place is also lined with a colored plastic bag according to the characteristics of the waste, there is also a symbol on the waste container, the place is strong, watertight and closed and to close or open it using a foothold that can reduce contact between officers so that the risk of contamination by germs in the waste is smaller. Medical waste must be stored in packaging with clear symbols and labels. Except for sharp waste and liquid waste, medical waste from health care facility activities is generally stored in plastic packaging, containers that have been given plastic waste, or packaging with certain

standards such as leak-proof. Each type of waste must be separated based on its type 7. In line with Siti Nurinda's research at the container stage at the Gunung Putri Health Center, it already has a waste container that is in accordance with its characteristics, the place is strong, waterproof, rust-resistant, closed and sharp waste is stored in a safety box, the waste container must also be stored or placed in an area that is easily visible and accessible to health workers, for the container it must be easy to open and close, it would be better if using 8 steps. When compared to PermenLHK No. 56 of 2015, in the solid medical waste container stage at the Sumbersari Health Center, it has met the requirements according to the regulations.

Transportation of solid medical waste is carried out from the room that produces solid medical waste to the TPS. At the Sumbersari Health Center, every time medical waste is transported, it does not use a trolley or strong container but rather uses a plastic bag and is carried by hand and the plastic waste that is transported is not tied so that there is potential for waste to be scattered when it is transported or moved to the TPS, in addition, the Sumbersari Health Center does not yet have a special route used for transportation, but rather uses a service route. The transportation process is carried out by cleaning staff every day to be taken to a temporary shelter. This activity is carried out manually without using tools on the grounds that the amount of waste transported is not large and does not have tools such as trolleys. Transportation is carried out in the afternoon when service activities are complete. In line with the research of Mirawati et al., (2019) that in the process of transporting medical waste at the Pangi Health Center, waste transportation tools such as containers or waste trolleys have not been provided. Temporary storage of solid medical waste is an activity carried out to temporarily store solid medical waste that has been produced from each room that produces solid medical waste before the waste is transported by a third party. Based on observations made at the TPS at Sumbersari Health Center, it still does not meet the requirements because the storage of solid medical waste is stored for more than 2 days without chemical disinfection or using a refrigerator to store and eliminate microbes in the medical waste. It is known that temporary storage at the Sumbersari Health Center has a special place as a temporary storage place for solid medical waste, but the storage place is integrated with the storage warehouse for used goods such as cans, cardboard, boards, and others. In line with the research of Khusna et al., (2023) that in their research, they mentioned the stages of temporary storage of solid medical waste at the Pasar Panas, Tamiang Layang, and Ampah Health Centers that most dominantly can cause problems is the length of storage time, due to waste transportation by a third party which is only carried out once a month. Meanwhile, none of the temporary storage rooms are equipped with refrigerators or coolers at a temperature of 0° (zero degrees Celsius) or lower 10.

The temporary storage process that is too long will result in the storage area being messy, damaged, irregular, and more dangerously can cause infection. Infectious waste can contain various types of pathogenic microorganisms. Facilities and infrastructure at the sorting and storage stage have met the requirements according to regulations, namely that there are separate solid medical waste bins for medical and non-medical waste. At the storage stage, it is appropriate because the waste bin has been coated with plastic according to the characteristics of the waste, there is also a symbol and a safety box for sharp waste. For facilities and infrastructure at the transportation stage, it does not meet the requirements because it does not use a means of transportation/trolley to transport waste from the source to the TPS but uses plastic from medical waste containers and there is no special route for transporting medical waste. In Tri Wulandari's study, each room has carried out medical waste transportation from each room that produces waste, transportation is carried out by cleaning staff in a simple way, namely plastic bags of medical waste are carried by hand, this can be influenced by the lack of availability of facilities and infrastructure provided by the health center 11. Facilities and infrastructure for temporary storage at the Sumbersari Health Center already have a special room for storing medical waste but are integrated with a warehouse for used goods. TPS should be used specifically to store solid medical waste, items such as cans, cardboard, boards, wood, iron are not allowed and must not be stored in TPS 12. The storage place is not equipped with SOPs regarding waste handling, there are no scales and there is no occupational health and safety equipment, such as PPE, APAR and warning signs. Facilities or means are everything that facilitates the smooth running of work. The completeness of facilities greatly affects the workload in carrying out a person's duties and responsibilities. If the tools or facilities available are in accordance with the work being done, they will utilize the tools or facilities, especially if they can provide benefits for workers. The existence of facilities that comply with solid medical waste handling procedures is very important in preventing the spread of disease, contamination, and reducing the risk of accidents and fires. The provision of facilities is certainly the responsibility of the health facility so that attention and

supervision from the management is needed, especially in handling medical waste Aspects of health workers' knowledge of handling solid medical waste at the Sumbersari Health Center, Bandung Regency by conducting interviews with 10 health workers obtained results for health workers having a good category with a percentage of 100%.

CONCLUSIONS AND RECOMMENDATIONS

The generation of medical waste generated from 5 rooms at the Sumbersari Health Center, Bandung Regency for 8 consecutive days was 5.17 kg with an average of 0.64 kg/day. While the results in the form of volume for 8 consecutive days in 5 rooms were 0.0085 L with an average of 0.0010 L/day. Handling of solid medical waste at the sorting and container stages met the requirements for the reduction, transportation, temporary storage stages, facilities and infrastructure did not meet the requirements. The aspects of health workers' knowledge and behavior were in the good category. The knowledge aspect of cleaning staff was in the good and sufficient category, while the behavior aspect of cleaning staff was in the sufficient category.

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