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AN OVERVIEW OF SOLID MEDICAL WASTE MANAGEMENT BY PRIVATE PRACTICE DOCTORS

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ABSTRACT

Every day, doctors who work in private practice produce hazardous amounts of medical waste that could put staff members in danger if not handled properly. It has been discovered that the management of medical solid waste in one of Yogyakarta's private medical practices has not been handled properly, and as a result, there is still the potential for risks. The objective of this study is to evaluate the strategies that are utilized by private practice doctors in Yogyakarta for the management of solid medical waste. An exploratory descriptive-qualitative technique was used for this study. The collection of solid medical waste requires the utilization of safety boxes and yellow plastic bags for storage. Utilize a leak-proof, airtight container, and then transfer the waste to the private practice doctor's temporary disposal location. Final management is carried out in collaboration with third parties. According to the findings of this study, private practice doctors have managed their solid medical waste in a manner that is compliant with Government Regulation No. 2 of the Minister of Health and Regulation No. 18 of 2020 pertaining to the management of medical waste in primary health care institutions. According to the findings of this study, the management of solid medical waste by private practice doctors needs to be improved in order to become even more effective. Specific areas for improvement include methods of waste reduction and classification, temporary storage, and processing by a third party.

Keywords: *Solid Medical Waste Management, Private Practice Doctors, Primary Care Management*

1. INTRODUCTION

Healthcare professionals (HCPs) must handle biomedical waste (BMW) properly to avoid risks to both human health and the environment (1). During the COVID-19 pandemic, healthcare professionals used more gloves, surgical masks, N-95 masks, air-purifying respirators, goggles, face shields, safety robes or suits, shoe covers, plastic syringes and needles, high-flow nasal cannulas, and breathing circuits than expected. They have greatly burdened waste management (1,2).

Every day, doctors who work in private practice produce hazardous amounts of medical waste that could put staff members in danger if not handled properly (3,4). Although 80 percent of all waste generated at health care facilities can be handled by normal domestic and urban waste management systems, an estimated billion pounds of solid medical waste (e.g., 16 billion injections) are administered annually, but not all of the solid medical waste (e.g., needles and syringes) are disposed of properly (4,5). The objective of this study is to evaluate the strategies that are utilized by private-practice doctors in Yogyakarta for the management of solid medical waste.

Notably, developing countries lacking waste management facilities, such as Indonesia (6–9). The increase in COVID-19 cases has also demonstrated the ineffectiveness of Indonesia's health care system poor managing medicinal waste(10). Prior to the epidemic,
improper disposal of medical waste was a significant environmental issue in

Indonesia (7,10). The amount of medical waste in Indonesia has significantly increased during the COVID-19 pandemic (7,11,12). The Indonesian Ministry of Environment noted that the volume of medical waste reached 382 tons per day, an increase of 30 percent from before the pandemic, which was 296 tons per day (11,12). The COVID-19 pandemic leads to increased waste generation of, on average, 102.2 percent in both private and public health care facilities(13). A COVID-19 patient with highly infected waste generated new issues that must be effectively managed by modifying routine procedures (13,14).

Although the amount of solid medical waste generated by private-practice doctors is small compared to hospital waste, it poses a threat to the environment and human health (15,16). Private-practice doctors have been facing a great challenge in the management of solid medical waste (17). The generation of solid medical waste from COVID-19 patient care, such as personal protective equipment (PPE) and other infectious waste, is on the rise. Personal protective equipment (PPE) used by healthcare professionals to treat COVID-19 patients, residual swabs, rapid test residues, syringe waste, and COVID-19 patients' cotton or tissue are examples of infectious medical waste (12). Private-practice doctors must discover alternative ways to safely dispose of solid medical waste once routine garbage collection services are disrupted because of a number of restrictions, such as lockdown and social isolation.

2. METHOD

An exploratory descriptive-qualitative technique was used for this study. This study is a qualitative investigation. Selection of research samples using sampling procedures known as purposive sampling Two private-practice doctors and three staff members were chosen as the sample. This study's informants are physicians employed as managers and officers at private practices in Yogyakarta. Chosen based on the criteria of adequacy and appropriateness (suitability). In-depth interviews guided by in-depth interview guides and tape recorders are utilized to collect data. Observational data collection is also conducted using instruments in the form of check lists. This study was also conducted using the descriptive observation research method, which is research that provides an overview of a situation or problem that is explored through observations that occur in the field. Descriptive observation allowed researchers to observe and analyze the current practices used in private practice doctor's offices in relation to their management of solid medical waste. Thematic analysis was used to analyze the data. Qualitative data also use analysis techniques using direct field observations. in-depth interview and observations started in December 2022 and continued until January 2024.

3. RESULT

Private practice doctors who are "social security agency of health" providers (BPJS Kesehatan (Badan Penyelenggara Jaminan Sosial Kesehatan)) and private practice doctors who are not BPJS providers, participated in the study. One man and as many as four women served as sources of information for the study. 20-to 32-year-old research informants The average tenure of those interviewed is approximately two years. The smallest term of employment is six months and the longest is four years.

Waste Category

During the COVID-19 pandemic, private doctors in Yogyakarta generated both medical and non-medical waste. Personal protective equipment (disposable gowns, gloves, and masks), cassette swabs, cotton swabs, syringes, ampoules, infusion bottles, gauze-

contaminated blood, alcohol swabs, lancet needles, rapid blood sugar check strips, uric acid, cholesterol, infusion sets, IV catheter needles, urinary catheters, urine bags, tissue waste from wound care, blood, and saliva are examples of medical waste. Paper, pharmaceutical boxes, food, beverages, and packaging constitute non-medical waste. Productive medical service activities that generate solid medical waste from infections from patients suspected or confirmed to have COVID-19 generate relatively significant amounts of waste.

Medical Waste Administration

The majority of medical waste managers are doctors who collaborate with third parties. The collection of solid medical waste requires the utilization of safety boxes and yellow plastic bags for storage. Utilize a leak-proof, airtight container, and then transfer the waste to the private practice doctor's temporary disposal location. Final management is carried out in collaboration with third parties.

Knowledge and Attitudes of Private-Practice Doctors and Their Staff

Five interviewees did not receive waste management lecture materials or educational resources. With trainings, appropriate agency pamphlets on medical waste management, involvement in the clinical accreditation process, and informal conversations with colleagues, one gains knowledge.

Private practice doctors do not know how to properly dispose of waste, despite their assertions to the contrary. The prerequisites for a proper garbage disposal site are well-known, but they have not been fully applied. During the observation, there was no lock on the temporary storage of solid medical waste. All interviewees understood the significance of medical waste management since it can harm the environment, spread disease, and be reused irresponsibly.

Figure.1 no lock on the temporary Storage of solid medical waste

Figure. 2 some of the used trash

Figure 3 Non Solid Medical Waste Bin

Availability of Infrastructure and Facilities

The syringe was placed within the safety box. Solid medical waste is thrown in a garbage can with a lid and a tread, although some private practice doctors utilize garbage bins without "treads".A plastic bag is covering the garbage container. Yellow is the color of all plastic bags used for solid medical waste. One private practice doctor labeled his waste bins "Medical" and "Non-Medical." Moreover, the safety box has a label with a biohazard symbol and text.

Policy, Monitoring, and Supervision

The policy holder is the district or city health office and/or the DIY provincial health office. In medical waste management, the policy encourages collaboration between private practice doctors and public primary health care or "puskesmas",

hospitals, or third parties. However, there is no detailed Standard Operating Procedure (SOP) explaining the things that must be done by private practice doctors related to the management of solid medical waste. The District/City Health Office conducts periodic monitoring of the management of solid medical waste in private practice doctors who are BPJS providers. This is done during the recredentialling process. Meanwhile, private practice doctors who are not BPJS providers are only surveyed at the start of their practice opening to arrange practice licenses and practice license extensions. According to the findings of this study, private practice doctors have managed their solid medical waste in a manner that is compliant with Government Regulation No. 2 of the Minister of Health and Regulation No. 18 of 2020 pertaining to the management of medical waste in primary health care institutions. Both regulations pertain to the management of medical waste in primary health institutions.

Segregating Medical Waste

During the observation, medical waste is placed separately from non-medical waste. In addition, medical waste has been type-sorted. One of the informants said that liquid medical waste enters household septic tanks. During the COVID-19 pandemic, sometimes there was accidental mixing of medical waste with non-medical waste, especially when patients were busy and the patient work was in a hurry and did not focus on sorting medical waste.

Packaging medical waste

Packaging is done by tying plastic bags as waste containers when the waste has filled about 2/3 of their capacity. Syringe waste is placed in a safety box and tightly closed. During the observation, the binding was carried out in the usual way, not with a “swan neck tie”.

Waste containers that have a sign in the form of horizontal lines are only safety boxes, while plastic waste containers do not have horizontal lines, so there is no exact measure of how much waste must be packaged, only estimates.

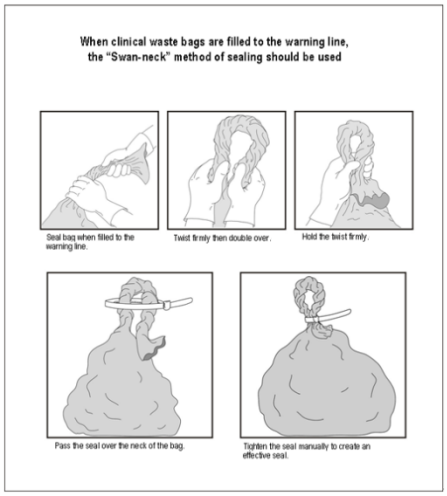

Figure 4 swan neck tie medical waste packages

Figure 5 safety boxes for sharp medical waste.

Storing solid medical waste

Most of the waste is stored in the practice room, and when it is full, it is transferred to a special room. Due to the small amount of waste, it is not easily accessible by anyone other than medical

waste managers. Waste is stored regularly for one month or depending on the number of patient visits, for example, during the peak of the COVID-19 pandemic wave. The informant stated that there had never been any problems, such as leakage of waste containers during temporary storage, because routine checks were carried out on these wastes. Third parties regularly provide special plastics for non-sharp solid medical waste and safety boxes for sharp medical waste.

Transporting medical waste

Medical waste is transported to health centers, hospitals, or third parties by special officers using special vehicles. The resource person directly cooperates with puskesmas, hospital, and third parties who already have incinerators by paying a levy per kilo of medical waste. The amount of payment is adjusted to the cooperation contract at the beginning and varies from 10,000 to 30,000 rupiah per kilo of medical waste. It was stated that there was a special officer who transported the medical waste.

Disposing of medical waste

The process of destroying medical waste is by burning the waste in a puskesmas, hospital incinerator, or by a third party. All informants stated that they had never seen the process of disposing of solid medical waste.

4. DISCUSSION

Type of waste

The waste generated in every private practice doctor activity during the COVID-19 pandemic is both medical waste and non-medical waste. Based on its form, the medical waste produced is in the form of solid waste and liquid waste. Most of the solid medical waste generated in the implementation of private practice doctor health services during the COVID-19 pandemic was infectious medical waste. This is relatively the same as a study conducted by Atanu Kumar Das (2021), which stated that all the clinics studied produced infectious waste (18). Private practice doctor health services that produce relatively large amounts of medical waste are for patients with complaints or suspicions leading to a diagnosis of COVID-19, such as antigen swab tests. This service requires quite a lot of equipment, so a lot of waste is generated. Based on data from the Indonesian Ministry of Environment, it was noted that the volume of medical waste reached 382 tons per day, an increase of 30 percent from before the pandemic (11). Since the COVID-19 Pandemic, the worldwide production of medical waste has risen, posing a significant hazard to human health and the environment (8).

Medical Waste Management

Private-practice doctors directly manage the initial generation of medical waste. There is no special officer who handles solid medical waste in private practice, like a special officer who handles medical waste and has a license. The absence of qualified health professionals also hinders the collection and disposal of biomedical waste in a scientific manner(19). However, most of the private practice doctors cooperate with parties that provide packaging services, labeling, and containers for medical waste so that medical waste management is safer (3). Emergency response services during the COVID-19 pandemic should include ensuring adequate waste disposal procedures (19). Less transmission risk will result from a switch to automated waste treatment systems. Fighting potential future pandemics may be aided by establishing localized, stable supply chains (19,20).

Knowledge and Attitude of a Private Practice Doctor and staff

Most of the private practice doctors said that they had not received lectures on waste management. It is possible that

there should be changes to the basic medical doctor education curriculum. This is related to the behavioral theory that Green presented (21). The private practice doctor's knowledge of medical waste management is a predisposing factor. Oversight from agencies is a reinforcing factor. If there is no supervision, even though they already have knowledge, the resource persons feel that they do not need to provide standardized facilities. Most private-practice doctors know and understand that medical waste management is very important because it can harm the environment and other people around them. As with research by Rume and Islam (2020), most persons dispose of such materials (such as face masks, hand gloves, etc.) in public areas and, in certain circumstances, with domestic waste due to a lack of knowledge about infectious waste management (8,22). Such improper handling of this waste restricts waterways and exacerbates environmental contamination (8). Training and capacity-building programs are required for all personnel working in medical waste management(23).

Availability of Facilities and Infrastructure

It is very dangerous to use a perishable container as a waste container for syringes, and it can cause injury to persons who come in contact with the container (24). The safety box must be used as a container for syringe waste (3). The housing is penetration- and leak-resistant (3,24). In addition, the safety box is labeled, and there is a horizontal line marking the maximum limit for filling in waste (25). Most of the trash cans already contain covers and treads to make it easier for private practice doctors and ensure that hands that are already sterile don't touch the waste receptacle anymore. Labeling each trash can makes it easier for private practice doctors to focus on putting medical waste in the right place when health services are taking place (26).

Heavy-duty plastic bags or thick plastic bags should be used to prevent leakage. Plastic bags of different colors are used to store different types of waste; for example, infectious waste is placed in yellow plastic bags while non-medical waste is placed in black plastic bags (27,28).

Policy, Monitoring, and Supervision

Local waste management authorities are now faced with a formidable task posed by the unexpected increase in hazardous garbage and its effective handling(8). Local waste management authorities in Yogyakarta provide policies but have not carried out strict and periodic supervision of the management of medical waste by private practice doctors. The policy will be a factor in strengthening the implementation of medical waste management. Policies will work effectively if they are accompanied by strict, periodic, and continuous supervision. The purpose of supervising is to prevent deviations that have an impact on not achieving a goal properly due to the inefficiency of the work being done. An important component of an effective and long-lasting health care waste management system is a national policy framework with rules and technical recommendations (19). There needs to be a greater introduction of circular economy (CE)-based waste management solutions(8,19). Using circular economy-based models would not only make it easier to divert collected waste from disposal sites to recycling facilities, but it would also contribute to lowering waste output in the first place. The CE models assist in keeping an increasing amount of resources in the cycle of production and consumption, which reduces the waste generated overall (19).

Medical Waste Segregating

Medical and non-medical waste are distinguished from one another. Various types of medical waste are sorted (25). In order to assist the identification of medical waste and the proper packaging of medical waste, this is designed. Researchers Saadun et al. (2022) discovered that participants in their study concurred that garbage should be divided into many groups (29).We advise keeping liquid medical waste separate from domestic sewage tanks and using a septic tank for storage instead (23). The microorganisms required for home garbage to degrade can be killed by liquid waste that contains chemicals. The groundwater may also get contaminated, and it may harm the soil in the area used for waste absorption.

Medical Waste Packaging

Waste is packed in plastic bags that are knotted together. On the garbage can, however, there is no horizontal line marker. The marker is required to ensure that the waste does not accumulate over the allowed amount. Plastic bags should be tied using the "swan neck tie" technique, which entails firmly twisting the plastic bag, bending it into two pieces, holding the rotated plastic bag, and then putting the cover on the "neck" plastic and tightening the cover so that the plastic bag is tightly closed (18).

Medical Waste Storage

It's necessary to choose a location for waste storage (30). Most often, practice spaces are used for temporary storage of medical waste (31). Depending on the number of patient visits, medical waste is kept on-site for an unlimited amount of time because more garbage is generated when there are many patients. It is preferable to avoid holding medical waste for an extended period of time to prevent issues such waste-related smells (32).

Transporting medical waste

Collectors or other parties have delivered waste directly to each private practice doctor, especially in Yogyakarta. This happens after a Memorandum of Understanding (MOU) between the two parties establishing the relationship has been signed.

Disposing of medical waste

Institutions with incinerators include hospitals, health centers, and other private businesses. By burning it and obliterating vast quantities of waste, incinerators can minimize the volume of waste. When there aren't precise and specific SOPs, medical waste management is less organized (19). Institutions with incinerators include hospitals, health centers, and other private businesses. The usage of incinerators can minimize the volume of waste by burning it and destroying significant volumes of waste (33). When there aren't precise and specific SOPs, medical waste management is less organized (19). This implies that facilities for handling medical waste are less secure. Disparities in the application of medical waste management are also brought on by a lack of strong and regular supervision. Private practice doctors treated more patients during the COVID-19 epidemic because of the high number of visits, rather than sifting medical trash. The management of medical waste is further hampered by facilities. Facilities play a key role in the handling of medical waste. A barrier is refusing to assist organizations in destroying medical waste. due to the lack of officers in charge of handling trash destruction.

Medical Waste Management guidance

The District/City Health Office of Yogyakarta's instruction to work with organizations that have incinerators for the destruction of waste is a motivating factor. Medical waste disposal is made safer by waste destruction in incinerators. Private-practice doctors

and their employees can manage medical waste because they are trained to do so through lectures and training sessions. This serves as another motivating factor in the management of medical waste. because one of the risk factors for controlling medical waste is the knowledge of private practice doctors and personnel.

This study has some limitations, including a lack of data regarding the efficacy of waste disposal techniques and an inability to identify all sources of medical waste. However, some of these issues can be resolved by becoming more knowledgeable about the function of knowledge in medical waste management. Additional study may examine the impact of education on the proper disposal of certain medical wastes, such as hazardous materials or pharmaceuticals. Ultimately, increasing public health and environmental awareness through better medical waste management methods and information can benefit both. It's also possible that the study did not take into account all the variables that influence medical waste management. These elements may include medical waste management social attitudes, legal needs, and healthcare policy. However, the study's findings can still offer useful suggestions for enhancing waste management procedures in private medical clinics.

5. CONCLUSION

According to the findings of this study, the management of solid medical waste by private practice doctors needs to be improved in order to become even more effective. Specific areas for improvement include methods of waste reduction and classification, temporary storage, and processing by a third party. Factors hindering medical waste management include the absence of SOPs regarding medical waste management, a lack of supervision from related agencies, a lack of focus on separating waste, inadequate facilities, and the absence of collaboration between several private practice doctors and agencies to destroy medical waste. Factors that encourage medical waste management include policies by the District/City Health Office in Yogyakarta and the knowledge possessed by private practice doctors regarding medical waste management.

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