



IMPLEMENTATION OF GREEN HOSPITAL CONCEPT IN SOLID MEDICAL WASTE MANAGEMENT

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ABSTRACT

Hospitals are one of the institutions that use considerable energy and contribute the largest amount of waste. To reduce the impact, initiatives have emerged in the form of greening hospitals for effective use of resources. Green Hospital is a hospital concept that is designed by empowering the potential of nature as the main resource so that it is friendly to the environment and saves energy expenditure. The existence of Green Hospital is needed to overcome climate change that can cause human health problems and the environment, because hospitals are one of the contributors to pollution. In Indonesia, Green Hospital is still a concept that emphasizes effective and efficient use of water and electrical energy, as well as environmentally sound waste management. The purpose of this study is to analyze solid medical waste management in Saraswati Dental and Oral Hospital Denpasar in realizing the Green Hospital concept. This research is qualitative. Data were collected by in-depth interviews with 1 staff at the Environmental Health Installation and 3 staff of cleaning service, observation, and document review. Data were analyzed by data reduction, data presentation, and conclusion. Data validity used source triangulation and method triangulation. Medical waste management in Saraswati Dental & Oral Hospital Denpasar is generally in accordance with the Indonesian health regulation No. 1204/2004, but does not yet have a policy or direction to realise Green Hospital. To achieve Green Hospital, hospitals can start by making policies to implement non-medical waste minimization and increasing the number of personnel in the field of medical and non-medical waste management.

Keywords: green hospital; management; medical waste

How to cite (in APA style)

Apriyanthi, D. P. R. V., Widayanti, N. P., & Laksmita, A. S. (2024). Implementation of Green Hospital Concept in Solid Medical Waste Management. *Indonesian Journal of Global Health Research*, 7(1), 399-406. <https://doi.org/10.37287/ijghr.v7i1.4384>.

INTRODUCTION

The number of hospitals in Indonesia is increasing, making the existence of each hospital in a single ecosystem amidst the issues of climate change and global warming and environmental degradation deemed necessary to be responsible for sustainable development in order to maintain environmental quality and the use of natural resources. Hospital resources based on nature and the environment such as clean water, energy, paper and other materials which are daily necessities for hospital operations, the use of which also needs to be based on the principle of eco-efficiency, while products produced by hospitals such as liquid, solid and gas waste need to be processed so that the target is not only to meet waste quality standards, but also to meet the principles of reduce, reuse, recycle and recovery.

Hospital waste is one of the serious environmental problems because this waste contains hazardous materials and can have negative impacts on human health and the environment if not managed properly. Some problems with hospital waste include improper management, health hazards, increasing waste volume, lack of resources and technological limitations. In the activities in the hospital every day produces waste, both in solid, liquid and gas forms which are divided into medical and non-medical waste. Developing countries produce 0.8 to 6

kg per person per year (Chandra, 2012). Kuwait Hospital produces waste per day varying between 3.87 kg/bed/day to 7.44 kg/bed/day. The waste consists of non-medical waste of 71.44% and infectious waste of 27.8% and 0.76% sharp waste (Alhumoud, 2007). The results of a study on hospital waste management in Indonesia show that only 53.4% of hospitals implement liquid waste management. Waste quality checks were only carried out by 57.5% of hospitals and of the hospitals that carried out these checks, 63% had met the standard quality requirements (Adisasmito, 2014).

The Green Hospital concept is expected to overcome climate change and the sustainability of natural resources which are increasingly worrying. Based on the instructions of the Minister of Home Affairs No. 14 of 1988, it is stated that Green Hospital provides benefits, namely freshness, comfort, beauty and a clean and healthy environment. To realize an environmentally friendly hospital, there are criteria that must be met by the hospital. However, there are no standard criteria that apply worldwide. The implementation of Green Hospital is based on the conditions of each country related to local needs and environmental actions and primary prevention practices that are actively involved in efforts to improve public environmental health, health equity, and a green economy (Balifokus, 2010). Adisasmito (2014) emphasized that several benefits obtained if the hospital implements an environmental management system are environmental protection, cost reduction or savings, and improving the image of the hospital. In addition, several recent studies and reports state that the implementation of eco-efficiency can improve environmental performance and generate economic benefits (Five Winds International, 2021). In addition to the Environmental Management System, good environmental management is closely related to PROPER (Company Performance Rating Assessment Program in Environmental Management) which is one of the KLH's efforts to encourage corporate governance in environmental management through information instruments. In addition to concerning corporate image, the PROPER ranking is also related to business and investment (Purwanto, 2017). Some of these approaches are environmentally friendly production approaches, most of which are carried out by minimizing the use of raw materials, water, and energy to increase the efficiency of activities which also have an impact on reducing the impact of environmental pollution.

The existence of efficiency in the activity process is expected to reduce the potential impact on the environment which is also part of the Green Hospital concept. A hospital waste management system is needed because service activities in hospitals produce clinical or infectious waste that can cause health problems and environmental pollution if not handled properly. By considering the risks that may occur, hospitals are therefore influenced by several government regulations by requiring everyone to maintain the sustainability of environmental functions and prevent and overcome environmental pollution and destruction. (Kepmenkes RI. 2004). The purpose of this research is to analyze solid medical waste management in Saraswati Dental and Oral Hospital Denpasar in realizing the Green Hospital concept.

METHOD

The type of approach in this study is a qualitative approach. Informants in this study were selected based on purposive sampling techniques. In relation to the purpose of the study in knowing and analyzing the management of solid medical waste, informants were selected who worked in the waste processing and management section in each hospital, with a minimum of 1 year of work experience. Primary data comes from direct observations of the research object using observation and interview guidelines. While secondary data is obtained

from document review. Data analysis in this study was carried out with the stages of data reduction, data presentation, drawing conclusions. After that the data was validated by means of source triangulation and method triangulation.

RESULT

The components studied in this study are input, process and output components. Input components consist of policies, implementing personnel, financing, facilities and infrastructure. Process components consist of sorting, collection, transportation, final processing and supervision. Output components are the suitability of the Green Hospital concept based on the Decree of the Minister of Health of the Republic of Indonesia Number 1204/MENKES/SK/X/2004 and the Green Hospital standard by the Ministry of Health of the Republic of Indonesia for the implementation of the medical waste management system at the Saraswati Denpasar Dental and Oral Hospital. The policy on solid medical waste management in the form of SOPs has been socialized to all workers at the Dental and Oral Hospital who are directly related to solid medical waste. Socialization is very necessary so that solid medical waste management activities are carried out properly and sustainably. In an effort to reduce the risk of health problems for hospital workers, the community around the hospital, and the environment. It was found that Saraswati Denpasar Dental and Oral Hospital has had a SOP for solid medical waste management based on the Decree of the Minister of Health Number 1204 of 2004 concerning Hospital Environmental Health Requirements. The hospital's Environmental Health Installation is responsible for implementing solid medical waste management.

The average weight of solid medical waste produced by the hospital over the past three months ranges from 2 - 9 kg per day. Waste is weighed in the morning (at 10.00 WITA) to measure the weight of waste produced from hospital activities from afternoon to morning. Various activities carried out in the hospital produce hazardous and toxic waste that can be dangerous and cause health problems for visitors and officers, so waste management is needed (Widiarti, Simanjuntak, & Sitorus, 2019). The source of funds used in medical waste management comes from the hospital. Most of these funds are used for the final processing of solid medical waste, because the hospital must pay as much as IDR 30,000 / kg of medical waste to be processed by PT. Triata. Table 1 is the result of triangulation from the results of interviews, document reviews and field observations related to the management of solid medical waste that has been carried out.

Table 1.
Triangulation matrix at Saraswati Dental and Oral Hospital, Denpasar

Aspect	In-depth interview	Document review	Conclusion
Policy	GM Hospital has an SOP for solid medical waste management based on the Decree of the Minister of Health No. 1204 of 2004.	GM Saraswati Hospital Denpasar has an SOP for managing solid medical waste from hospitals based on the Minister of Health Decree No. 1204 of 2004 which was updated in 2022.	GM Saraswati Denpasar Hospital has an SOP for solid medical waste management based on the Minister of Health Decree No. 1204 of 2004 concerning Hospital Environmental Health Requirements
Implementing Staff	The implementing staff at the Environmental Health Installation consists of 1 person and also serves in the CSSD (Central Sterile Supply Department) field.	Implementing staff at Health Installations The GM Saraswati Denpasar Hospital environment has a decree	The Environmental Health Installation of GM Saraswati Hospital Denpasar is inadequate, but assisted by 6 CS personnel, this number is sufficient. Training on medical waste management has been provided.

Aspect	In-depth interview	Document review	Conclusion
	In collecting medical waste, the environmental health installation implementing staff are assisted by 6 cleaning service (CS) personnel who have been given training related to medical waste management.	CS staff have training certificates on medical waste management.	
Financing	The funds provided for solid medical waste management are considered sufficient.	There are budget details related to solid medical waste management, namely details of financing for transportation and destruction of medical waste by third parties.	The source of funds for waste management and processing comes from the Hospital and is sufficient.
Facilities and infrastructure	Infrastructure in the implementation of solid medical waste management is sufficient, but not yet up to standard.	Availability of waste places separate solid medical and non-medical waste in each health service room.	The infrastructure is adequate
Sorting	Solid medical waste sorting has been carried out for infectious waste, sharp objects, pharmaceuticals, and cytotoxics in each waste-producing room. Each waste container is labeled and colored differently according to its nature.	Sorting has been done in each room, namely by differentiating Place based its nature. Waste sorting consists of infectious waste, sharp objects, cytotoxic, pharmaceutical, and non-infectious.	Sorting has been done based on the nature and type of waste.
Collection	Solid medical waste is transported from each waste-producing room by CS officers wearing complete PPE.	Collection is carried out by CS officers on duty in each room. Collection uses a closed trolley and separates medical and non-medical waste. Medical waste is collected at TPS B3	Collection is carried out by CS officers on duty in each room. Collection is carried out if the waste bin is 2/3 full and then transported by CS transporters to the medical waste TPS.
Transportation	On-site transportation using a closed trolley is carried out by CS officers and then taken to the TPS. Off-site transportation uses a container truck with a danger/infectious symbol on the truck.	Transport of solid medical waste using separate transport equipment/trolleys from solid non-medical waste and off-site transport using special medical waste transport trucks that are closed and have a symbol. danger to containers	On-site transportation uses closed trolleys and separates medical and non-medical waste. Off-site transportation uses trucks that have a hazard symbol on the truck container. On site transport officer not yet using complete PPE, but off-site transport officers are already using complete PPE
Final Processing	RS GM Saraswati Denpasar collaborates with PT. Triata for final processing. The party has an operational permit from KLH.	GM Saraswati Denpasar Hospital has an MoU with PT. Triata. PT. Triata provides documentation of the final waste processing results to RS GM Saraswati Denpasar.	RS GM Saraswati Denpasar in collaboration with PT. Triata final processing. Final processing using an incinerator

DISCUSSION

Hospitals are one of the health service facilities that are required to manage B3 waste, which includes reducing and sorting B3 waste, storing B3 waste, transporting B3 waste, processing B3 waste, burying B3 waste, and/or stockpiling B3 waste. B3 waste management in hospitals is very necessary because if B3 waste is not managed properly, it can cause impacts including: causing injury, environmental pollution, and causing nosocomial diseases. Good management of B3 waste in hospitals is expected to minimize the impacts caused (Ministry of Environment and Forestry, 2015).

Facilities and infrastructure owned by the hospital in implementing solid medical waste management include trash bins for medical waste, safety boxes or using jerry cans for sharp waste, yellow plastic wrap for medical and pharmaceutical waste, and purple for cytotoxic, PPE in the form of masks, gloves, boots, and work clothes for waste collectors, medical waste trolleys, and TPS for medical waste. The availability of facilities and infrastructure related to solid medical waste management in hospitals is considered sufficient. Sorting of solid medical waste based on its type at the source level is an essential stage of solid medical waste management. Good sorting of solid medical waste can improve work safety, as well as reduce the risk of officers handling waste from disease transmission. Waste containing toxic and hazardous materials (B3) that is not managed will endanger public health and the environment (Ministry of Environment and Forestry, 2018). Non-medical hospital waste and domestic waste if contaminated with medical waste must be managed as medical waste, so early efforts to prevent contamination of medical waste through sorting waste from the beginning of its production must be prioritized (Ministry of Environment and Forestry, 2014).

Based on Table 1, there has been no direction or policy from the hospital for waste minimization or independent waste processing even for non-medical waste. This may be due to the lack of personnel in the environmental health installation which only consists of 1 person and also serves in the CSSD (Central Sterile Supply Department) field. Human resources are an important element in organizing an organization so that it can survive in the future. In the management of medical waste, the availability of qualified and experienced management personnel is very much needed for the implementation of solid medical waste management activities (Adisasmito, 2014). Sorting should be carried out not only to reduce the cost of medical waste processing, but also to prevent contamination of general waste by infectious waste that has the potential to cause infectious diseases for workers who handle general waste. In addition, realizing the implementation of solid medical waste minimization at the source can reduce the amount of waste generated by the Hospital. Waste from each room that has been collected is left lying on the floor. Waste that is left lying on the hospital floor can cause problems, such as lack of aesthetics, causing odor, and leaving traces of waste. This can affect the comfort of Hospital visitors.

According to the Green Hospital Guidelines in Indonesia, there are 3 benefits that will be felt by the community around the hospital, including hospitals, namely health benefits, economic benefits, social benefits, economic, social, and environmental benefits (Widodo et al., 2022). The concepts related to "green health" and "green hospital" are rapidly changing and varying their scope towards a broader perspective. Environmental health considers the natural environment, the built environment and the social environment, implying a better understanding of how they impact health, and accepting that the built environment plays an important role in it. On the one hand, the impact of building design, construction, operation and management of hospitals on the environment and health is now accepted. On the other hand, hospitals are complex systems, where change is neither quick nor easy. To achieve an

environmentally friendly healthcare system, a deep knowledge of its strengths and weaknesses, as well as its internal dynamics, is required. Various aspects such as location and its environment, better access, efficient management of resources (especially water and energy), waste reduction, use of renewable and low-emission materials, as well as all factors in the design that can improve the health of users (Chías and Abad, 2017).

In Indonesia, the hospital industry has grown significantly. However, only five hospitals in Indonesia have implemented the concept of an environmentally friendly hospital, namely: Ciputra Hospital, Persahabatan Hospital, Prof. Dr. Soerojo General Hospital, Buruh General Hospital, and Siloam Hospital. The implementation of green hospitals and green marketing itself still does not meet the needs of the community, the price of services is unaffordable, information technology is poor, there is a lack of investors who care about the environment and the preference of the Indonesian people for green hospitals abroad is still high. To fulfill the concept of a green hospital, planning is needed from the start. Planning starts from the hospital strategy, the concept of the building to be carried out, the person in charge of operations, the funds needed, and so on. The implementation of a Green hospital will affect the quality of the hospital (Lestari, Sari and Arso, 2023). Green hospitals are also a hospital commitment to continue to improve public health by reducing environmental impacts and ultimately reducing the burden of disease (Azmal et al., 2014).

The criteria for Green Hospital in solid waste management based on the Indonesian Ministry of Health are having a solid waste management SOP, having a B3 waste logbook, B3 waste balance, B3 waste manifest, TPS meets the requirements (in accordance with the Decree of the Minister of Health of the Republic of Indonesia number 1204 of 2004), having its own incinerator or collaborating with a third party in the destruction of solid medical waste, and making efforts to minimize or recycle domestic or non-B3 waste (Herman and Nopriadi, 2020). The realization of Green Hospital in Indonesia is also the target of the Directorate General of Health Efforts that by 2020 all hospitals in Indonesia have implemented the Green Hospital concept. This is supported by the existence of a program from the Ministry of Health which holds an annual Green Hospital competition which has started since 2016. Based on the program, Hospitals that have been accredited class A and B are prioritized to be able to participate in the Green Hospital competition, but it does not rule out the possibility for class C and D hospitals to apply the Green Hospital concept (Risnawati, Purwanto and Setiani, 2015) The environmental management system directs hospitals towards this concept so that they have no or minimal environmental impact. In this case, they encourage hospitals to consider the use of sustainable building materials that are free of mercury, latex, and PVC, save energy and water, purchase environmentally friendly resources and equipment, reduce and recycle waste, and utilize nutritious and sustainable food.

CONCLUSION

Saraswati Denpasar Dental & Oral Hospital does not yet have a policy or direction to realize a Green Hospital. To achieve a Green Hospital, the hospital can start by creating a policy in implementing the minimization of non-medical waste and increasing the number of personnel in the field of medical and non-medical waste management.

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