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Medical And Non-Medical Solid Waste Management System at The Regional General Hospital of Kediri Regency

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ABSTRACT
The development of hospitals in Indonesia has been increasing rapidly in recent years. Along with the increasing number of hospitals each year, the amount of medical waste produced also rises. If medical waste is not managed properly, this condition will increase the potential for hospital waste to pollute the environment, spread diseases, and cause occupational accident. The solid waste management process at RSKK includes sorting and containment, transportation, storage, and management. This study aims to identify the solid waste management system, both medical and non-medical, at Kediri General Hospital. The methods used are the fishbone diagram, Urgency, Seriousness, Growth (USG) method, and analyzed by Strength, Weakness, Opportunity, Threat (SWOT). Based on the assessment results, the problem determination related to the medical and non-medical solid waste management system at Kediri General Hospital was obtained. Proposed solutions to address these issues include maximizing storage in the non-medical waste Temporary Storage Site (TPS) to be stored or contained separately according to the type, as well as the need for a waste bank for non-medical solid waste management, providing training for management officers and operators to obtain a competency certificate for hazardous and toxic waste management, and increasing human resources for hospital waste management. This research specifically examines strategies for medical and non-medical solid waste management systems and identifies solutions to these problems.

KEYWORDS : Management System, Medical Solid Waste, Non-Medical Solid Waste.

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INTRODUCTION

Managing garbage from hospitals and other healthcare facilities will be one of the greatest issues in the contemporary world. Incorrect handling of hospital waste can threaten the population's health and the surrounding environment (Rimantho & Putri, 2022). Hospital as a means of health, a place for patients or health people, may be the vulnerable place to spread disease, and to contaminate the environment and health problems. Environmental Health Management is recently considered not as a consumptive part, but a set of stages and strategies

of hospital management to develop its capacity in managing hospital environment to give direct or indirect benefits to the service quality in a whole. Hospital waste management means "the management of waste produced by hospitals using techniques that will check the spread of diseases through hospital waste" (Mehta, 2008) Environmental Health Management has complicated problems in (Maulana et al., 2016). Waste generated in the community as an inherent part of human life is one of the most serious issues affecting public health and the environment.The World Health Organization (WHO) categorizes the quantity of infectious waste generated in hospitals within developing nations ranging 10–25 % of the total hospital solid waste (Hosseinpoor et al., 2024). 'Medical waste' refers to materials generated as a result of patient diagnosis, treatment, or the im- immunization of human beings or animals. 'Infectious waste' refers to the portion of medical waste that could transmit an infectious disease (Manyele S.V., 2018). Both medical and non-medical waste are produced by hospital operations and other supporting activities; solid and liquid waste are not given enough attention in waste management. Meanwhile, these all result in illness and poisoning from the environment (Kaban et al., 2025). Medical Waste (MW) is classified as hazardous waste because of its poisonous and pathogenic components, which include pathological, pharmacological, chemical, and radioactive substances (Azami-Aghdash et al., 2023).Health Development is directed at increasing the will, awareness and ability to live healthily for all levels of society so that it is hoped that the level of health can be increased as high as possible. The degree of health has a big impact on the quality of human resources. Healthy human resources will increase life productivity. Public knowledge and concern for health causes the need for quality hospital services to increase from year to year. This has resulted in the development of hospitals in Indonesia increasing rapidly recently. As the number of hospitals increases every year in Indonesia, the amount of medical waste produced increases. A hospital is an institution that provides health services, including care, treatment and medical testing(Khairil et al., 2024). If medical waste is not managed properly, this condition will increase the potential for hospital waste to pollute the environment and transmit disease and can also result in work accidents (Purwanti, 2018). the stages of solid medical waste management in hospitals start from reducing and sorting, storing, transporting, processing, burial, and stockpiling.(Hutajulu et al., 2022). Knowledge about waste segregation is important for all health care workers as lack of knowledge about waste segregation may jeopardize infection control in the health facilities (Ugwu & Onoh, 2022) systematic training can be effective in segregation, total and medical waste reduction, and improvement in the health, economic, and environmental condition(Alighardashi et al., 2024)

In accordance with Law Number 17 of 2023, it is explained that a hospital is a health service facility that provides complete individual health services through promotive, preventive, curative, rehabilitative and/or palliative health services by providing inpatient, outpatient and emergency services. Hospitals provide a positive impact as a means of improving the level of public health, while the negative impacts include medical and non-medical rubbish and waste which can cause disease and pollution which requires special attention. Solid medical waste contains pathogens that cause disease in humans and carriers for the spread of infectious diseases, including typhoid fever, cholera, dysentery, and hepatitis (Israr et al., 2024). Therefore, it is necessary to make efforts to clean the hospital environment which aims to protect the public and employees from the dangers of environmental pollution originating from rubbish and hospital waste. Garbage or hospital waste can be dangerous because it can be toxic, infectious and also radioactive (Andriza et al., 2023). Poor management of solid medical waste in hospitals can endanger the health and the environment. This can cause all hospital workers, medical waste handlers, and the public to be exposed to infection, toxic effects, and injury(Hasiany et al., 2023).

Due to the activities or nature of the services provided, hospitals become depots for all kinds of diseases in society, and can even be a source of disease distribution because they are always inhabited, used and visited by people who are vulnerable and weak to disease. In this place, transmission can occur either directly (cross infection), through contamination of objects or through insects (vector Borne Infection) so that it can threaten the health of the general public.(Valonda & Hermawati, 2022) And the solid waste management process at RSKK starts from sorting and containerization, transportation, storage and management whether or not it is in accordance with the Minister of Environment and Forestry Regulation P.56/Menlhk-Setjen/2015 (Ministry of Environment and forestry, 2015)concerning procedures and technical requirements for managing hazardous waste and toxic from health care facilities. Solid medical waste management is very important because it aims to reduce or eliminate risks to patients, staff, and the environment (Himayati et al., 2021).

METHODS

This research aims to find out and identify the medical and non-medical solid waste management system at the Kediri Regency Regional General Hospital. In this research, variables were identified which are strengths, weaknesses, opportunities and threats. This identification becomes the basis for determining intervention planning strategies as a solution to overcome these problems.

Preliminary research was conducted at the Kediri District General Hospital in June 2024. The intervention was implemented in early July 2024. The intervention method used was to provide advice and input for hospital management. Preliminary data was obtained from the 2023 final report and general data from the Kediri Regency Regional General Hospital. Data were analyzed through several stages, namely 1) Problem assessment stage carried out using Fishbone diagrams; 2) The stage of determining problem priorities which is carried out using the USG method (Urgency, Seriousness, Growth); 3) The stage of determining the intervention strategy as a solution to the problem is carried out using a SWOT analysis (Strength, Weakness, Opportunities, Threats)

RESULTS

The problem assessment carried out in this research is by using a fishbone diagram which examines problems according to the categories Man, Method, Measurement, Material and Environment.

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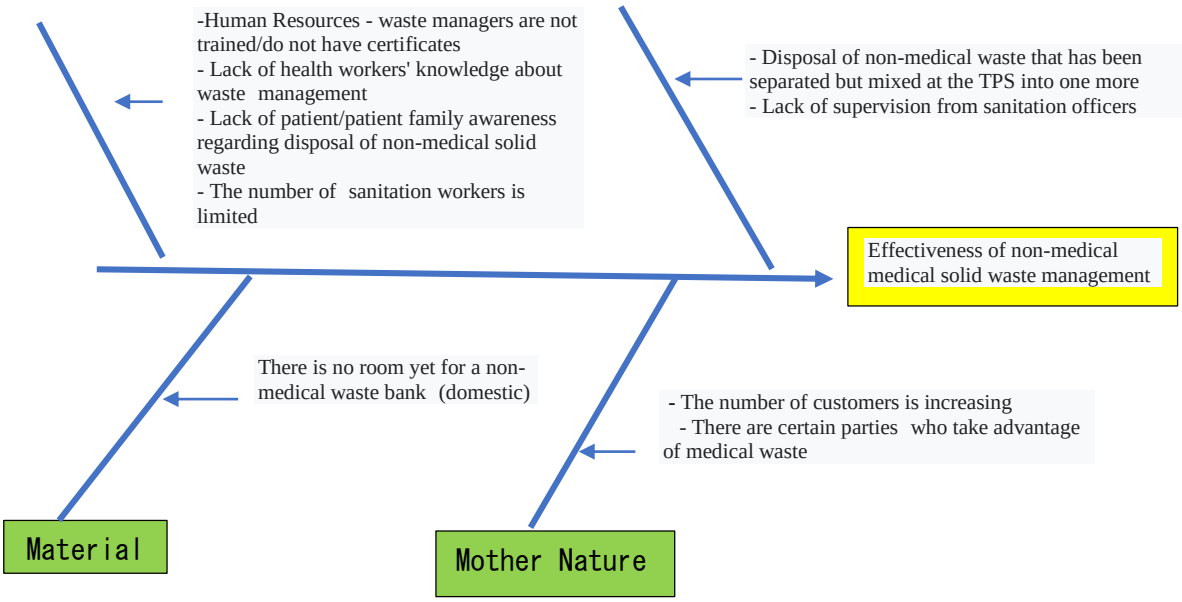

Results were obtained: (1) Man: Human resources for waste managers are not trained/do not have certificates, lack of knowledge of health workers about medical waste management, lack of awareness of patients/patients' families about solid waste disposal. non-medical, the number of sanitation personnel is limited (2) Method: disposal of non-medical waste which is already separate but mixed into one more landfill at the TPS, lack of supervision from sanitation officers (3) Material: there is no space for a non-medical (domestic) waste bank (4) Mother Nature: The number of customers is increasing, there are certain parties who take advantage of medical waste.

Problem solving strategies from the problem assessment carried out using the Fishbone diagram, the following. Based on the problem priorities that have been determined using the USG method, an analysis is then carried out using the SWOT method (Strengths, Weaknesses, Opportunities, Threats). This analysis is used to determine problem solving strategy solutions that can be implemented to overcome priority problems. The results of the SWOT analysis show that the intervention planning strategy used to support the resolution of priority problems is a strategy that combines the relationship between weaknesses and threats from the results of the SWOT analysis. The SO (Strength Opportunities) strategy for overcoming priority problems includes implementing regulations as a basis for achieving waste management goals that meet standards in terms of facilities and infrastructure.

DISCUSSION

The degree of health has a big impact on the quality of human resources. Healthy human resources will increase life productivity. Public knowledge and concern for health causes the need for quality hospital services to increase from year to year. This has resulted in the development of hospitals in Indonesia increasing rapidly recently. As the number of hospitals increases every year in Indonesia, the amount of medical waste produced increases. If medical waste is not managed properly, this condition will increase the potential for hospital waste to pollute the environment and transmit disease and can also result in work accidents (Purwanti, 2018). Hospital needs to maximize its waste management by procuring medical waste

processing equipment internally in the form of an incinerator, which needs to be supported by the Environmental Service and the relevant Health Service to prevent environmental pollution from medical activities (Palita et al., 2024). The process of transporting solid medical waste in government hospitals has been carried out based on Permenkes RI No. 7 of 2019, although it has not been fully carried out (Fiqra & Antomi, 2023).The transportation and final processing processes are appropriate. Therefore, it is recommended that hospitals further increase the capacity of human resources, especially waste management officers, as well as add and update facilities and infrastructure that support a better waste management system.(Nurlina et al., 2025)

In this research, based on the results of the Urgency, Seriousness, Growth (USG), fishbone diagram and SWOT analysis carried out, the strategic solutions implemented by the researchers were in overcoming problems related to the medical and non-medical solid waste management system at the District General Hospital. Kediri is an intervention in implementing regulations as a basis for achieving the goal of managing medical and non-medical solid waste that meets standards in fulfilling facilities and infrastructure (S1,2, O2). Waste management policies in hospitals are available in the form of sanitation guidelines, sanitation organization guidelines, B3 waste management guidelines, B3 waste management SOPs, B3 waste transportation SOPs and B3 waste storage SOPs. Hospitals must comply with the regulations of the Minister of Environment and Forestry No. 56/Setjenklhk/2015, Minister of Environment and Forestry Regulation No. 6 of 2021,(Ministry of Environment and forestry, 2021) hospital waste management guidelines and SOPs that have been created and monitoring their implementation on a regular basis, Providing education and training to medical and non-medical solid waste management officers in hospitals. (W1,2,3, O3). Minister of Environment and Forestry Regulation Number 6 of 2021 states that it is the obligation of technical approval holders in the field of waste management, especially B3 medical waste, for the collection, processing and utilization of B3 waste, to have workers who have a competency certificate in the field of B3 waste management. The hospital provides education and training for management officers and operators to obtain competency certificates for managing B3 waste, implementing SOPs and regulations regarding waste management (S2, T1,2). By having SOPs for managing medical and non-medical solid waste in hospitals, every officer in carrying out waste management can become a reference or guide in carrying out their duties and complying with the regulations/guidelines that have been made by the hospital.(Nasrul et al., 2024). the availability of solid medical waste management reporting activities, permits related to temporary storage for medical waste ownership, and colla- boratian with licensed external parties that officially have government permits to manage solid medical waste indicate that all hospitals adhere to the regulatory standards(Khansa et al., 2023).

CONCLUSION

Based on research on problems related to the condition of the medical and non-medical solid waste management system at the Kediri District General Hospital which was carried out using the Fishbone, Urgency, Seriousness, Growth (USG) and SWOT diagram methods, the following conclusions can be drawn. From the fishbone diagram, existing problems will be determined and will be studied regarding medical and non-medical solid waste management systems. From the ultrasound method, priority problems are determined to be addressed with solutions to be proposed, namely problems related to medical and non-medical solid waste management systems. From the SWOT method, a priority problem solving planning strategy is determined, namely the implementation of regulations as a basis for achieving the goal of managing medical and non-medical solid waste that meets standards in fulfilling facilities and infrastructure (S1,2, O2). Waste management policies in hospitals are available in the form of

sanitation guidelines, sanitation organization guidelines, B3 waste management guidelines, B3 waste management SOPs, B3 waste transportation SOPs and B3 waste storage SOPs. Hospitals must comply with the regulations of the Minister of Environment and Forestry No. 56/Setjenklhk/2015, Minister of Environment and Forestry Regulation No. 6 of 2021, hospital waste management guidelines and SOPs that have been created and monitoring their implementation regularly.

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