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Evaluation of Waste Management in Dental and Oral Health Services at Mitra Sejati Hospital Medan

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ABSTRACT

The amount of medical waste continues to increase as healthcare facilities, including dental health services, increase. If not managed properly, medical waste can have a negative impact from the collection stage to final disposal. This study aims to evaluate waste management in dental and oral health services at RSU Mitra Sejati Medan with a qualitative descriptive approach. The informants totaled six people, consisting of leaders, management, K3 officers, and nurses. Data analysis is carried out with the help of NVivo software through data reduction, coding, inductive and deductive analysis, and conclusion drawn. The results of the study show that waste management has gone well. Human resources are considered adequate, comply with SOPs, and have competencies according to their duties. The infrastructure facilities are complete and up to standard, although there are still minor mistakes by the new officers. The budget is available and sufficient, but it has not been allocated specifically for the dental and oral unit, although the needs are still met. The level of conformity of waste management with the Regulation of the Minister of Environment and Forestry No. 56 of 2015 reached 98.6%, which is included in the category according to the provisions. This reflects the hospital's commitment to safe and sustainable waste management. In conclusion, waste management at the dental and oral service unit of Mitra Sejati Hospital Medan is considered good. It is recommended that the recording of the budget per unit be improved, the supervision system is strengthened, and the means of waste collection and destruction are updated regularly.

Keywords: *Waste Management, Dental and Oral Health Services, Human Resources, Facilities and Infrastructure, Budget, Environmental Health*

INTRODUCTION

A hospital is a health service institution that provides individual health services in a complete manner that provides inpatient, outpatient, and emergency services (Permenkes RI, 2020). The services provided by the hospital in addition to having a positive impact also have a negative impact. The positive impact is to improve the degree of public health, while the negative impact resulting from health services is waste from hospitals that can cause diseases and environmental pollution if disposed of without first treatment (Zuhriyani, 2019). The rapid growth of the health service industry in Indonesia has made a significant contribution to generating waste, generally activities in hospitals produce two large groups of waste, namely medical waste and non-medical waste, which can be solid or liquid (Fitri, 2023).

The hospital is a meeting place for groups of people with diseases, service providers, visitors and the surrounding environment. The interaction in it allows the spread of disease if it is not supported by good and clean hospital environmental conditions. Activities in hospitals

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will produce a number of solid, liquid, and gaseous waste containing pathogenic germs, chemical substances and medical devices that are generally dangerous and toxic. Medical waste is an infectious and dangerous material that must be managed properly, so as not to become a source of new infection for the community around the health facility and for health workers in the health facility itself. Medical waste is waste consisting of infectious waste, pathological waste, sharp object waste, pharmaceutical waste, chemical waste, and waste with a high content of heavy metals whose amount is estimated to increase every year. The reason is the growing number of medical centers, as well as medical laboratories (Meli, 2022).

The increase in the number of dental and oral clinics in Indonesia is directly proportional to the amount of medical waste produced. Waste from dental and oral care activities produces medical and non-medical waste. Medical waste is waste derived from medical service activities such as used bandages, body tissue remains, used syringes, blood bags and others that are categorized as infectious Hazardous and Toxic Materials (B3) waste that should not be mixed with other B3 medical waste, because they have different ways of management and storage limits. While non-medical waste is domestic waste generated from health service facilities such as paper, plastic, plastic bottles, cans, food scraps, leaves, organic and other inorganic materials, for non-medical waste some of it can be recycled or directly disposed of at the final processing site (TPA) (Resta, 2018).

The amount of medical waste continues to increase as the number of health care facilities increases, as well as the waste of dental health facilities. Based on research in Mumbai, the average dental clinic waste generated is around 0.5-1.0 kg per day. Every year dentist practices in the world generate 4.8 million *lead foils*, 2.8 million liters *fixer x ray* toxic, 3.7 tons of mercury waste, 1.7 million sterilizing materials, 680 million *chair barrier*, *ligh handle covers* and *patient bibs* (Oktavia, 2019). In some developing countries such as Indonesia, medical waste has not received enough attention, most medical waste is still handled and disposed of together with non-medical waste or by using incinerators on a small scale to handle medical waste. The management of medical B3 waste from health services such as hospitals, health centers, medical centers, and medical laboratories in Indonesia is still below professional standards (Resta, 2018).

In Indonesia, with a total of 2,889 hospitals, only 110 have licensed incinerators. This condition resulted in a limited capacity of medical B3 waste processing which only reached 53.12 tons/day. Coupled with the capacity of processing services by third parties of 187.90 tons/day, while the amount of medical B3 waste is predicted to reach 294.66 tons/day (Prasetiawan, 2020). The results of the supervision (MoEF) found several problems in the management of medical B3 waste, including the accumulation of infectious waste, temporary storage that does not meet standards, has not carried out B3 waste management procedures correctly, the use of incinerators that are not in accordance with standards (emitting black smoke and pollutant emissions), limitations of B3 waste processing services and others. The Ministry of Health of the Republic of Indonesia in 2020 calculated nationally that the percentage of hospitals that carried out waste management according to standards in 2019 only reached 42.64% (Ahmad, 2022).

According to the Ministry of Health (2006), waste management is one of the efforts to prevent infection control activities in hospitals or health care facilities. Waste from hospitals or other health services can be contaminated (potentially very dangerous) or uncontaminated. About 85% of the general waste generated from hospitals or other health facilities is not contaminated and is not dangerous to the officers who handle it, but

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nevertheless the handling of this waste must be managed properly and correctly. All uncontaminated waste such as paper, boxes, bottles, plastic containers and food scraps can be disposed of normally or sent to the local waste disposal service or public waste disposal site (Elpizon, 2020).

The policy of medical waste management is based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number: P.56/MenLHK-Setjen/2015 concerning Procedures and Technical Requirements for the Management of Hazardous and Toxic Waste from Health Service Facilities, it is explained that the management of medical waste from health service facilities includes stages: reduction, sorting, storage, transportation, processing, burial and stockpiling each health facility has a permit according to applicable regulations. Puskesmas waste must be separated according to infectious waste, pathology, pharmaceutical, sharp objects, cytotoxicity to facilitate the next process. Sharp objects should be accommodated using *a safety box* or made of strong materials so that sharp objects cannot penetrate to the outside.

Research conducted by Rurie (2016) entitled "Analysis of Waste Management for Dental Health Services (Case Study at Hospital X, Pancoran Health Center, West Pejaten Health Center, and TADC Dental Clinic). The focus of this study is to evaluate the suitability of medical waste management with the correct principles of medical waste management, especially the management of amalgam waste (containing mercury) as one of the dental fillings. The basis of the regulation referred to is *Environmental Regulations and Dental Office of Ohio Environmental Protection Agency* and KEPMENKES 1204/MENKES/SK/2004 concerning hospital environmental health requirements. The results of qualitative research that have been carried out show that the waste management of dental health services in health facilities that have been studied has not been in accordance with applicable regulations. So far, medical waste treatment has only reached solid waste sorting and is subsequently managed by a third party. Meanwhile, the management of infectious liquid waste and amalgam has not yet been carried out. Infectious liquid waste management has not been carried out because not all respondents have wastewater management plants (WWTP).

In the health facility environment, medical waste can be a source of cross-infection and cause work accidents and work-related diseases (Pascalin, 2021). From the results of the pre-survey conducted by the researcher to RSU Mitra Sejati Medan by conducting observations, the results were obtained that RSU Mitra Sejati Medan had carried out waste treatment procedures in accordance with the provisions but there were still several obstacles, namely the mixing between the placement of liquid waste and solid waste.

From the results of the background description above, the researcher is interested in conducting a research entitled "Evaluation of Waste Management in Dental and Oral Health Services at Mitra Sejati Medan Hospital".

METHODS

This type of researcher is qualitative descriptive research. According to Moleong (2018) Descriptive is a formulation of a problem that guides research to explore or photograph social situations that will be studied comprehensively, broadly and deeply. This research was conducted at Mitra Sejati Medan Hospital which is located at Jl. Jenderal Besar A.H Nasution No.7, Pangkalan Masyhur, Kec. Medan Johor, Medan City, North Sumatra 20219. This research has been carried out since the author conducted a preliminary survey in June 2024 followed by the making of a research proposal to data collection followed by a seminar

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on results. In qualitative research, the research subject is referred to as an informant, which is a person who is used to provide information about the situation and conditions of the research background and is a person who really knows the problem to be researched (Moleong, 2018).
The informants in this study are as follows.

Table 1. Research Informant

Yes	Report	Method	Sum
1	Leader of Mitra Sejati Hospital Medan	Interview	1 Person
2	Management of Mitra Sejati Medan Hospital	Interview	1 Person
3	K3 Employee of RSU Mitra Sejati Medan	Interview	2 People
4	Nurse of Mitra Sejati Hospital Medan	Interview	2 People
	Total		**6 People**

The object of this study is waste management in dental and oral health services at Mitra Sejati Hospital Medan. In this study, there are 2 types of data used, namely primary data and secondary data. The researcher uses the results of interviews and observations obtained from informants about the research topic as primary data, and in this study the secondary data sources are books, journals, articles related to what is directly related to the research topic with other reference sources. In this study, the researcher collected data using observation, interview and documentation techniques. The instruments used in this study are interview guidelines and field observation guidelines.
Qualitative data analysis is inductive, which is an analysis based on the data obtained, then developed into an answer to the problem formulation, then the data is searched again repeatedly so that it can be concluded whether the problem formulation and the purpose of the research have been achieved. Qualitative research is exploratory, so the data to be processed is in the form of a collection of words arranged into sentences, not data in the form of numbers that can be arranged into categories or classifications. The approach used in data analysis consists of content analysis and refinement of the research model. The focus of content analysis in qualitative research is aimed at identifying categories or themes to summarize the content found in the data set in the form of sentences (Drisko, 2016).
The stages carried out in content analysis use two analysis steps, namely inductive analysis and deductive analysis. The content analysis process is also supported by the Miles et al (2018) that the analysis activity consists of 3 (three) activities, namely: data reduction, data display and conclusion drawn. The data analysis technique in this study uses *Computer Assisted Qualitative* Data *Annalysis Software* (CAQDSAS) is with NVivo software version 11.0.

RESULTS

Overview of Research Informants

The following is an overview of the informants in this study which includes the age, gender, and length of work of the informants at RSU Mitra Sejati Medan.

Table 2. Overview of Research Informants

They do not report	Age	Gender	Long Time Working

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1 reported	45 Years	Woman	2 Years
2 reported	75 Years	Man	15 Years
3 reported	22 Years	Woman	1 Year
4 reported	26 Years	Man	1 Year
5 reported	42 Years	Woman	18 Years
6 reported	40 Years	Woman	13 Years

Table 2 describes the results of the general overview of the informants in this study. While the informants in this study were at least 22 years old and the maximum age was 75 years, the informants in this study were dominated by female informants. The informants who have a working period at RSU Mitra Sejati Medan are 18 tofu and the informant with the lowest working period is 1 year.

Results of Human Resource Evaluation on Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

The following are the results of the research by conducting interviews with informants to find out the evaluation of human resources on waste management in dental and oral health services at Mitra Sejati Medan Hospital.

Table 3. Results of the NVivo Table Evaluation of Human Resources in Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

Yes	Question	Report	Kutipan NVivo	Open Coding	Category
1	Is waste management in accordance with SOPs?	1 reported	"It has been done according to the SOP."	Compliance with SOPs	SOP Implementation
		2 reported	"Already, waste management in our dental and oral service unit is carried out in accordance with standard procedures..."	Implementation according to hospital procedures	SOP Implementation
		3 reported	"The implementation has followed the SOPs, both in terms of sorting, packaging, and disposal."	Sorting, packaging, disposal	SOP Implementation
		4 reported	"It has been carried out consistently according to the SOP that has been determined by the hospital."	SOP consistency	SOP Implementation
		5 reported	"We have carried out waste management in accordance with the applicable SOP guidelines."	Operational implementation according to SOP	SOP Implementation

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
		6 reported	"It has been managed according to the SOP rules."	Procedural compliance	SOP Implementation
2	How important is waste management?	1 reported	"It is very important because if it is not implemented properly, waste can endanger the operator or the environment."	Health and environmental impacts	Management Urgency
		2 reported	"It is very important, because improper handling of medical waste can endanger health workers and the surrounding community."	Risks to medical personnel & the public	Management Urgency
		3 reported	"If managed carelessly, it can cause infection hazards and pollute the environment."	Risk of infection & contamination	Management Urgency
		4 reported	"Medical waste has the potential for biological and chemical hazards..."	Potential biological/chemical hazards	Management Urgency
		5 reported	"... can have a negative impact on patients, staff, and the hospital environment."	Multifaceted hazards	Management Urgency
		6 reported	"... The impact can be very widespread, including the spread of disease and environmental damage..."	Spread of disease and environmental damage	Management Urgency
3	What is the role of human resources in supporting waste management?	1 reported	"It has been fulfilled and supports waste management well."	HR supports operations	Quality HR & Support
		2 reported	"Our human resources have been prepared and sufficient... and actively	Human resources are sufficient and active	Quality HR & Support

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
			engaged..."		
		3 reported	"The existing human resources are quite competent and active..."	Human resource competence & participation	Quality HR & Support
		4 reported	"All officers have understood their respective roles..."	Understanding roles	Quality HR & Support
		5 reported	"All colleagues are already involved and aware of the importance of waste management..."	Team participation	Quality HR & Support
		6 reported	"Personnel... already have a good understanding of waste management."	Adequate knowledge	Quality HR & Support
4	Is there any training for HR?	1 reported	"Each new staff will be trained to ensure that the staff is in accordance with the SOP..."	Initial on-the-job training	HR Training & Orientation
		2 reported	"We routinely provide special training to new workers..."	Regular training	HR Training & Orientation
		3 reported	"The new personnel will definitely get training on how to handle medical waste..."	Waste procedure training	HR Training & Orientation
		4 reported	"Training is provided so that every officer understands the steps of waste management..."	Understanding of procedures	HR Training & Orientation
		5 reported	"I took part in training on waste management according to work procedures."	Operational initial training	HR Training & Orientation
		6 reported	"I was given special training on how to handle medical waste."	Technical Handling Training	HR Training & Orientation
5	Is the background of HR education	1 reported	"Education that is in accordance with the skills needed."	Educational suitability	HR Education Qualifications

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
	in accordance with the provisions?				
		2 reported	"Recruitment based on appropriate educational background..."	Education-based selection process	HR Education Qualifications
		3 reported	"Most medical personnel already have a supportive educational background..."	Education is relevant	HR Education Qualifications
		4 reported	"The workforce has met the educational requirements relevant to its field of duty."	Education according to the field of duty	HR Education Qualifications
		5 reported	"We are equipped with nursing education that includes medical waste materials..."	Nursing education includes waste	HR Education Qualifications
		6 reported	"Our education is geared towards understanding... medical waste management."	Education supports competence	HR Education Qualifications

Based on the results of interviews with six informants consisting of leaders, management, K3 employees, and nurses at RSU Mitra Sejati Medan, it was obtained that human resources (HR) play a significant role in supporting the implementation of medical waste management in dental and oral health services.

All informants stated that waste management had been carried out in accordance with the hospital's standard operating procedures (SOP), including the stages of sorting, packaging, transportation, and storage of waste. This shows that human resources have a good technical understanding of medical waste management procedures. The informants also emphasized that the implementation of waste management is very important because medical waste has the potential to pose a risk of infection, biological and chemical hazards, and pollute the environment if not handled properly.

In addition, in terms of quantity and quality, the available human resources are considered sufficient and competent, with appropriate educational backgrounds and skills relevant to their field of work. The hospital also consistently provides training and debriefing to new workers to ensure that the understanding and implementation of waste management procedures is carried out in accordance with safety standards and applicable regulations. Therefore, it can be concluded that the human resources at RSU Mitra Sejati Medan have met the criteria in supporting optimal management of medical waste, both in terms of

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quantity, competence, compliance with SOPs, and commitment to safety and environmental protection.

Results of Evaluation of Facilities and Infrastructure in Waste Management in Dental and Oral Health Services at Mitra Sejati Hospital Medan

The following are the results of research by conducting interviews with informants to find out the evaluation of facilities and infrastructure in waste management in dental and oral health services at Mitra Sejati Medan Hospital.

Table 4. Results of the NVivo Table Evaluation of Facilities and Infrastructure in Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

Yes	Question	Report	Kutipan NVivo	Open Coding	Category
1	Is the implementation of waste management in accordance with the initial policy?	1 reported	"It has been done in accordance with the initial policy."	Implementation according to the initial policy	Policy compliance
		2 reported	"... follow the policies that have been set from the beginning by the management and applicable regulations."	Follow policies and regulations	Policy compliance
		3 reported	"... refers to the initial policy that has been written and socialized to all work units."	Refer to written policies	Policy compliance
		4 reported	"... must follow hospital guidelines and SOPs that have been determined from the beginning..."	Following the initial SOP	Policy compliance
		5 reported	"... follow all SOPs that have been set since the initial training."	Implementation based on training SOPs	Policy compliance
		6 reported	"... we do it according to the SOP that has been conveyed during orientation."	Orientation SOPs are carried out	Policy compliance
2	Is there any evaluation or monitoring?	All informants	"There are monitoring	Daily and periodic	Monitoring and Evaluation

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
			evaluations and they are done every day." (Leader) "... Monitoring is carried out daily and also periodic evaluation..." (Management), etc.	evaluation	
3	What is the form of evaluation/monitoring?	All informants	"Monitoring to the shelter... If it is not appropriate, education and reprimands are given." "Our team conducted a live review..."	Field monitoring, education, reporting	Monitoring and Corrective Action
4	What are the facilities and infrastructure for waste management?	All informants	"Facilities and infrastructure... is in accordance with the SOP and is met." "Complete facilities ranging from medical waste bins, labels, PPE, TPS..."	Complete and standard facilities	Facilities and Infrastructure
5	Are the facilities and infrastructure worth using?	All informants	"It's worth using and it's been fulfilled." "... Regular checks are always carried out on the facilities..."	Suitable for use and regularly checked	Facility Eligibility
6	Are there any obstacles in implementation?	All informants	"There are no significant obstacles." "... just a minor technical error or negligence of the new staff."	Minor or insignificant constraints	Implementation Barriers
7	What are the obstacles and how to overcome	All informants	"Negligence of nurses in waste	Education, reprimands,	Obstacle Management

Yes	Question	Report	Kutipan NVivo	Open Coding	Category
	them?		sorting... education and reprimands." "... The Fault of the New Staff... retraining."	briefings, retraining	Strategy

Based on the results of in-depth interviews that have been analyzed through a thematic approach with the help of NVivo, it can be concluded that the availability and feasibility of waste management facilities and infrastructure in dental and oral health services at Mitra Sejati Medan Hospital has been running quite optimally. Informants from various backgrounds, such as room heads, waste management officers, implementing nurses, and K3 teams, stated that facilities that support waste management—including labeled and colored medical waste bins according to standards, personal protective equipment (PPE), medical and non-medical waste plastic bags, and Temporary Shelters (TPS) have been fully available and in accordance with applicable regulations.

Several quotes from informants corroborate this finding, such as the statement that "facilities and infrastructure have been fulfilled and are suitable for use", as well as routine efforts by the hospital to check and maintain the facilities used. This reflects the hospital's management's commitment to quality and safety in the medical waste management process. In addition, the use of these facilities has also been carried out according to procedures. Health workers seem to understand the function of each facility, although in some cases there are minor errors from the new staff. However, the hospital actively conducts coaching and training so that these mistakes do not recur.

Furthermore, the evaluation system for facilities and infrastructure has also been carried out periodically. The K3 team and hospital management conduct daily monitoring and periodic evaluations of the use of facilities, as well as provide reprimands or education if discrepancies are found in the implementation. Thus, not only physical facilities are the focus, but also managerial aspects and officer behavior are also considered. Overall, the results of the evaluation show that waste management facilities and infrastructure in dental and oral health services at RSU Mitra Sejati Medan have been adequately available, well utilized, and managed sustainably to support environmental safety and occupational health.

Results of Budget Evaluation on Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

The following are the results of research by conducting interviews with informants to find out the budget evaluation on waste management in dental and oral health services at RSU Mitra Sejati Medan.

Table 5. Results of the NVivo Table Budget Evaluation on Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

Yes	Question	Report	Kutipan NVivo	Open Coding	Category
1	Is there a budget for waste management in	1 reported	"There is a budget for waste management, it's just that it is incorporated	Budgets available but not specific	Availability of a budget

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
	dental and oral services?		into the general budget."		
		2 reported	"Yes, there is a budget for waste management activities, it's just that it is not specifically separated..."	Budget blends with operations	Availability of a budget
		3 reported	"Yes, the budget is there, although it is not separate for each unit."	General budget, covering all units	Availability of a budget
		4 reported	"There is. Although it is not a specific budget for dental and oral waste..."	The budget covers all waste needs	Availability of a budget
		5 reported	"As far as we know, waste management already has a budget..."	Don't know the details, but available	Availability of a budget
		6 reported	"There is. The budget is integrated into the hospital budget for medical waste handling..."	General budget of the hospital	Availability of a budget
2	How much budget is spent?	1 reported	"The amount of the budget is uncertain because it is combined with the general budget."	Non-specific, combined	Budget inseparability
		2 reported	"Can't be detailed specifically because the budget post is merged..."	Cannot be detailed	Budget inseparability
		3 reported	"There is no exact figure because there is no separate allocation..."	No special allocation is made	Budget inseparability
		4 reported	"The numbers can't be specific..."	Non-specific	Budget inseparability
		5 reported	"We don't know the details of the number..."	Don't know the number	Budget inseparability
		6 reported	"We don't know the exact number..."	Not knowing the allocation	Budget inseparability
3	Is the current budget sufficient?	1 reported	"The current budget is sufficient."	Enough	Budget adequacy
		2 reported	"Enough, so far the allocated funds are able to support the needs..."	Funds support needs	Budget adequacy

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Yes	Question	Report	Kutipan NVivo	Open Coding	Category
		3 reported	"So far we have not experienced a shortage of facilities or materials..."	Not suffering from shortcomings	Budget adequacy
		4 reported	"Yes, so far all waste management needs have always been met..."	Requirements met	Budget adequacy
		5 reported	"From the implementation in the field, there is no shortcoming..."	No flaws	Budget adequacy
		6 reported	"Enough, because all our equipment and needs are always available."	Equipment is always available	Budget adequacy

Based on the results of interviews with six informants consisting of leaders, management, K3 officers, and nurses at RSU Mitra Sejati Medan, it is known that the budget for medical waste management is generally available and also includes dental and oral health services, although it is not made specifically or separately for the unit.

All informants said that the waste management budget exists, but it is combined in the general budget of the hospital, especially the operational budget or the overall medical waste management budget. There is no detailed or specific allocation of funds for dental and oral service units. This shows that the budgeting system used at RSU Mitra Sejati Medan is centralized and comprehensive, not based on each service unit.

All informants also stated that the amount of the budget could not be stated definitively, because there was no separation or recording of the budget based on service units. This indicates limitations in the transparency or details of financial management for waste management at a specific unit level, such as dental and oral polys. This can be one of the weaknesses in the evaluation and monitoring system for the effectiveness of waste management financing.

Nevertheless, all informants agreed that the available budget is sufficient to support the implementation of waste management, including in dental and oral health services. This is shown by the informant's statement stating that there has never been a shortage of tools, materials, or facilities in the waste management process. In other words, even though there is no special budget, the needs in the field can still be met.

In general, in terms of effectiveness, the available budget is adequate, but in terms of efficiency and accountability, the absence of specific budget allocation for each service unit, including dental and oral polyclinics, is an important note. Future evaluations can consider separating or recording budgets in more detail to facilitate the process of control, auditing, and measuring budget efficiency per service unit.

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The results of the evaluation of solid medical waste management at RSU Mitra Sejati Medan based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 56 of 2015 concerning Procedures and Technical Requirements for B3 Waste Management in Health Service Facilities, and other related regulations

This study was conducted to evaluate the management of solid medical waste at Mitra Sejati Hospital Medan based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 56 of 2015 concerning Procedures and Technical Requirements for B3 Waste Management in Health Service Facilities, as well as other related regulations. The focus of the evaluation is directed at three main stages in waste management, namely efforts to reduce and sort, transportation, and storage of solid medical waste.

The results of the research were compiled based on a comparison between the implementation in the field and the standards that have been set in the regulation. The reduction and sorting stages were evaluated to assess the extent to which the hospital had attempted to separate waste according to its type and characteristics from the source. The stages of transportation are analyzed from the aspects of procedures, facilities, and safety in moving waste from the point of origin to the temporary storage site. Meanwhile, at the storage stage, the assessment is focused on the suitability of the facility and the duration of storage of medical waste before it is handed over to the licensed waste manager.

Table 6. Comparison of Efforts to Reduce and Segregate Medical Waste at Mitra Sejati Hospital Medan with PerMinister of Environment and Forestry No. 56 of 2015

Yes	Reduction and Separation of Medical Waste from Health Care Facilities	Existential Conditions	Information			Achievement Score	Maximum Score
			Appropriate	Less Suitable	Inappropriate		
1	Monitor the flow or distribution of chemicals up to their disposal.	Ya	√			3	3
2	Centralize Chemical Procurement dangerous.	Ya	√			3	3
3	Implement a "first in first out" or (FIFO, first in first out) system in the use of products or chemicals.	Ya	√			3	3
4	Use products or chemicals to the point of exhaustion.	Ya	√			3	3

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5	Always ensure the expiration date of the entire product when delivered by the supplier adjusted to the speed of consumption of the product.	Ya	√		3	3
6	Procuring products/chemicals in small quantities compared to buying large quantities at once.	RSU Mitra Sejati Medan procures large quantities of products/ chemicals		√	2	3
7	Replace the mercury thermometer with a digital one.	Ya	√		3	3
8	Reuse.	Mitra Sejati Medan Hospital does not reuse	√		3	3
9	Doing good housekeeping through the elimination of the use of chemical air fresheners (whose purpose is only to remove odors but release harmful and toxic substances).	Ya	√		3	3
10	Substituting harmful chemicals with non-toxic ones.	Ya	√		3	3
11	The use of more harmless cleaning	Ya	√		3	3

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	methods, such as using pressurized steam disinfection rather than using chemical disinfection.						
12	Reduce product packaging.	Ya	√			3	3
13	Recycling.	No		√		2	3
14	Sorting is carried out close to the source.	Ya	√			3	3
15	Sorting is carried out in every place in all locations according to the source of waste and its category	Ya	√			3	3
16	Sorting by type, group, or characteristics of waste.	Ya	√			3	3
17	Containerization by type, group, or characteristics of waste.	Ya	√			3	3
Total Score						**50**	**51**
Percentage of Suitability of Medical Waste Reduction and Sorting by RSU Mitra Sejati Medan (98%)							

Table 6 shows the results of a comparison of the implementation of the stages of reduction and separation of medical waste in dental and oral health services at Mitra Sejati Hospital Medan with the provisions listed in the Regulation of the Minister of Environment and Forestry No. 56 of 2015. Based on the observation results, the level of conformity with the reduction and separation of B3 medical waste at Mitra Sejati Hospital Medan reached 98%, which shows that the implementation has been in accordance with applicable regulations.

Table 7. Comparison of Efforts at the Stages of Medical Waste Transportation at Mitra Sejati Hospital Medan with the Minister of Environment and Forestry Regulation No. 56 of 2015

No	Reduction and Separation of Medical Waste from Health Care Facilities	Existential Conditions	Information			Achievement Score	Maximum Score
			Appropriate	Less Suitable	Inappropriate		
1	Waste must be	Ya	√			3	3

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	collected at a minimum daily or as needed.				
2	The collection schedule can be done according to the route or zone	Ya	√	3	3
3	Avoid areas where many people or goods pass.	Ya	√	3	3
4	Do not use the same elevator as visitors.	Ya	√	3	3
5	Conveyors in the form of trolleys or wheeled containers can be loaded and unloaded, easy to clean.	Ya	√	3	3
6	Waste transportation equipment is disinfected every day.	Ya	√	3	3
7	The waste bag should be closed/securely tied with a rabbit leash.	Ya	√	3	3
8	Any removal of containers or waste bags must be immediately replaced with new containers/bags and the like.	Ya	√	3	3
9	New waste containers/bags are always available.	Ya	√	3	3
10	Each waste bag must be equipped with a symbol and label.	Ya	√	3	3

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11	The Waste Bag must be closed or tightly tied when it has been filled to 3/4 of its maximum volume.	Ya	√		3	3
12	Appointment of responsible personnel.	Ya	√		3	3
13	Waste personnel are equipped with PPE (helmets, face masks, eye protection, aprons, foot guards, and disposable gloves).	Ya	√		3	3
14	B3 waste transportation is mandatory to use means of transportation that have obtained a B3 waste management permit for B3 waste transportation activities using transportation equipment that already has a permit.	The means of transport used are the same as the means of public transport of general waste		√	2	3
15	Every B3 waste transport equipment on land must be given a symbol according to the characteristics of B3 waste and each B3 waste container is given a symbol and label according to	Ya	√		3	3

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	the characteristics of B3 waste					
16	B3 waste land transportation equipment has the identity of the company name, contact number, and B3 waste symbol according to the characteristics on the truck body.	Ya	√		3	3
17	Solid waste is placed in containers such as drums, flexible containers, and barrels.	Ya	√		3	3
18	The transport of B3 waste is equipped with a 6-fold manifest.	Ya	√		3	3
Total Score					**53**	**54**
Percentage of Suitability of Medical Waste Transportation by RSU Mitra Sejati Medan (98%)						

Table 7 presents the results of a comparison of the implementation of the stages of transporting medical waste in dental and oral health services at Mitra Sejati Hospital Medan with the provisions of the Regulation of the Minister of Environment and Forestry No. 56 of 2015. Based on the results of observations, the level of suitability of the B3 medical waste transportation process at Mitra Sejati Medan Hospital reached 98%, which shows that the activity is in accordance with applicable regulations.

Table 8. Comparison of Medical Waste Storage Efforts at Mitra Sejati Hospital Medan with PerMinister of Environment and Forestry No. 56 of 2015

No	Reduction and Separation of Medical Waste from Health Care Facilities	Existential Conditions	Information			Achievement Score	Maximum Score
			Appropriate	Less Suitable	Inappropriate		
1	The storage location must be fixed, away from the patient's room, laboratory,	Ya	√			3	3

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	operating room, or publicly accessible area.				
2	It is a flood-free area.	Ya	√	3	3
3	The storage location is marked: "HAZARDOUS: STORAGE OF MEDICAL WASTE – ONLY FOR INTERESTED PARTIES".	Ya		3	3
4	Far away from where food is stored or prepared.	Ya	√	3	3
5	Water source or water faucet available.	Ya	√	3	3
6	Easily accessible for waste storage.	Ya	√	3	3
7	It is easily accessible by waste transport vehicles.	Ya	√	3	3
8	Can be locked to avoid unauthorized access.	Ya	√	3	3
9	Impermeable floors, concrete or cement floors.	Ya	√	3	3
10	Protected from sunlight, rain, strong winds, flooding, and other factors.	Ya	√	3	3
11	Inaccessible to animals, birds.	Ya	√	3	3
12	It is equipped with ventilation and lighting.	Ya	√	3	3
13	Cleaning equipment, PPE,	Ya	√	3	3

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	and waste containers/bags are placed close to the location of the storage facility.				
14	Cleaning of polling stations, walls, floors every day.	Ya	√	3	3
15	Infectious, sharp objects, and/or pathological waste should not be stored for more than 2 (two) days to avoid bacterial growth, putrecation, and odor.	Ya	√	3	3
16	Waste is placed in containers according to the category.	Ya	√	3	3
17	Provide the B3 symbol and label on the container.	Ya	√	3	3
18	Waste handling is carried out carefully.	Ya	√	3	3
19	The container used must be resistant to punctures or scratches, typically made of solid metal or plastic, equipped with a lid. The container must be sturdy and impermeable to accommodate sharp objects and liquid remnants from the syringe.	Ya	√	3	3
20	Compaction or	Ya	√	3	3

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	pressing of Waste in Waste containers or bags with hands or feet should be avoided absolutely.				
21	Chemical waste or Pharmaceutical waste in small quantities can be collected along with Infectious waste.	No	√	3	3
Total Score				**63**	**63**
Percentage of Suitability of Medical Waste Storage by RSU Mitra Sejati Medan (100%)					

Table 9 illustrates the results of a comparison of the implementation of the stages of medical waste storage in dental and oral health services at Mitra Sejati Hospital Medan with the provisions of the Regulation of the Minister of Environment and Forestry No. 56 of 2015. Based on the results of observations, the suitability level of B3 medical waste storage at RSU Mitra Sejati Medan reached 100%, which shows that the activity has been fully in accordance with applicable regulations.

Table 10. Results of Waste Management Suitability in Dental and Oral Health Services at Mitra Sejati Medan Hospital

No	Management Stage	Percent Conformity (%)	Maximum Fit Percent
1	Waste reduction and sorting	98	100
2	Waste transport	98	100
3	Waste storage	100	100
	Total Score	**296**	**300**
Percent of waste management suitability		**98,6**	

Table 10 shows the percentage of suitability of waste management in dental and oral health services at RSU Mitra Sejati Medan. Based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 56 of 2015 concerning Procedures and Technical Requirements for B3 Waste Management in Health Service Facilities, and other related regulations, which is 98.6%, where the percentage is included in the category of achievement in accordance with the provisions.

DISCUSSION

Results of Human Resource Evaluation on Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

Based on the results of in-depth interviews with six informants from various backgrounds at RSU Mitra Sejati Medan, namely leaders, management, K3 employees, and nurses, consistent information was obtained that human resources (HR) at the hospital have played

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an important and strategic role in the medical waste management process, especially in dental and oral health services. From the informants' answers, it can be seen that almost all officers understand and carry out waste management in accordance with the standard operating procedures (SOP) set by the hospital, starting from the process of waste sorting, packaging, transportation, to storage. This shows that HR has good understanding and technical skills.

In addition to compliance with SOPs, the informants also emphasized the importance of medical waste management as part of efforts to prevent health hazards and environmental pollution. Medical waste from dental and oral services, such as used syringes, gloves, bloody cotton pads, and chemical residues from treatments, contains a high potential risk if not managed properly. Therefore, all officers show high awareness of this risk and state that waste management is a shared responsibility. In terms of the number and readiness of the workforce, all informants stated that the human resources at RSU Mitra Sejati Medan were sufficient and able to carry out their duties according to the provisions. Human resources involved in waste management have relevant educational backgrounds, such as nursing, environmental health, or K3 (Occupational Safety and Health). This is strengthened by the existence of a recruitment system that considers competencies and educational backgrounds that are in accordance with the tasks to be carried out.

Training is also one of the important aspects that supports human resource readiness. Based on interviews, it is known that the hospital routinely provides training and debriefing to new personnel, as well as refreshing old staff to ensure that all waste management procedures are carried out according to applicable standards. The training includes procedures for sorting B3 waste, safe storage, work safety procedures, and introduction to the latest applicable regulations. The response of informants from the K3 section shows that their involvement as supervisors as well as implementers of medical waste management is also very important. They play a role in ensuring that all workers follow SOPs and use personal protective equipment (PPE) correctly when carrying out activities related to medical waste. This also strengthens the hospital's commitment to occupational safety and environmental protection. Based on these results, it can be seen that HR involvement is not only administrative, but also operational and educational. The nurses, management, and K3 officers collectively showed good coordination in the implementation of their duties, which is an indicator that waste management has been carried out systematically. The knowledge and awareness possessed by each individual in the service team is the main supporting factor for the success of medical waste management, especially in the dental and oral service unit.

Overall, this discussion shows that RSU Mitra Sejati Medan has competent human resources, is aware of responsibility, and is consistent in carrying out medical waste management procedures in accordance with applicable regulations, namely the Minister of Environment and Forestry Regulation No. 56 of 2015 and other supporting regulations. Support from hospital management in providing training, as well as the disciplined implementation of SOPs, has helped create a medical waste management system that is not only effective, but also safe and sustainable.

Results of Evaluation of Facilities and Infrastructure in Waste Management in Dental and Oral Health Services at Mitra Sejati Hospital Medan

Based on the results of in-depth interviews with six informants from various backgrounds such as leaders, management, K3 employees, and nurses, it can be concluded that the hospital has committed to providing medical waste management facilities and infrastructure in accordance with standard operating procedures (SOPs) and applicable regulations. In

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general, all informants stated that facilities and infrastructure such as garbage cans labeled according to the type of waste, PPE (personal protective equipment), waste containers, safety boxes, and temporary shelters (TPS) have been available and used according to procedures. This shows that in terms of physical provision, RSU Mitra Sejati Medan has met the minimum standards required in medical waste management, especially in dental and oral health services that are at risk of producing B3 waste (hazardous and toxic substances).

In terms of feasibility of use, the informants also explained that the available facilities are still in good condition and suitable for use. In fact, hospitals routinely check facilities and infrastructure, and replace them if damage or decline in function of equipment is found. Several informants mentioned that this checking process is part of an internal quality monitoring system that aims to maintain the continuity of safe and hygienic waste management. Regarding the use of these facilities and infrastructure, the informants described that waste management procedures have been carried out quite well by all health workers, especially those who have understood the SOPs since the orientation period. However, minor obstacles such as errors in the separation or placement of waste still sometimes occur, especially from new staff or due to individual negligence. However, this obstacle is not systemic and is immediately addressed through educational approaches, reprimands, and retraining.

The hospital also actively monitors and evaluates, both daily and periodically, through the K3 team and quality management. The monitoring process is carried out by direct inspection of waste shelters, checking waste sorting in rooms, and documenting findings as evaluation and improvement materials. If a violation of the procedure is found, the hospital immediately provides education to the relevant officers to prevent the recurrence of the same mistake. From the entire interview, it can be seen that the management of medical waste facilities and infrastructure has become an important concern for RSU Mitra Sejati Medan. The availability of adequate facilities and continuous evaluation efforts reflect management's commitment to maintaining environmental safety and health workers. Although there are still some minor technical obstacles, the countermeasures taken are quite effective in maintaining the quality of the overall waste management system.

Overall, this discussion shows that RSU Mitra Sejati Medan has managed medical waste management facilities and infrastructure in dental and oral health service units well. Commitment to SOPs, routine evaluations, and educational approaches to technical constraints show a management system that runs as expected. This is important to ensure that medical waste is handled safely and does not negatively impact patients, medical personnel, or the surrounding environment.

Results of Budget Evaluation on Waste Management in Dental and Oral Health Services at RSU Mitra Sejati Medan

Based on the results of interviews with informants, ranging from leaders, management, K3 teams, to nurses at Mitra Sejati Hospital Medan, quite consistent information was obtained that the budget for medical waste management is indeed available, including for dental and oral health service units. However, an important note is that the budget is not detailed specifically or separately for each unit, but is incorporated into the general hospital waste management budget. The management and hospital leaders explained that waste management budgeting is carried out in an integrated manner for all parts of the hospital. This means that there is no specific recording or allocation only for dental and oral services, so the exact amount of the budget cannot be known in detail by the unit. However, they

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assessed that the funds available in general were still able to cover the needs of all units, including dental and oral units, without any significant shortfalls.

K3 employees who are responsible for the technical implementation of waste management also said that so far the needs for waste management tools, materials, and facilities in the field have been well met. This indicates that even though the budget is not allocated separately, the use of funds is still efficient and can meet the operational needs of waste management. They stated that they have never experienced a shortage of facilities or equipment, so that the medical waste disposal process continues to run according to applicable procedures and standards. The same thing was also conveyed by nurses in the dental and oral health service unit. They admitted that they did not know the exact amount of budget spent, because it was fully handled by the management and logistics department. However, in terms of implementation in the field, they have never experienced obstacles or shortages in terms of waste disposal facilities, such as the availability of waste bags, temporary shelters, and transportation by waste officers. In general, all informants agreed that the waste management budget available so far is considered sufficient, even though it is not specifically for each service unit. This shows efficiency in the integrated use of the budget, but at the same time shows weaknesses in the aspects of budget recording and accountability. When budgets are not separated per unit, it is difficult to assess precisely how much the real needs of each unit, including dental and oral services, are. In terms of evaluation, this is an important note that transparency and more detailed budget details are needed so that management can evaluate accurately, both in terms of planning and realization of budget use. The separation of the budget per service unit will help in monitoring the efficiency, effectiveness, and actual needs of each section in a more structured manner.

Thus, it can be said that the budget management for medical waste at RSU Mitra Sejati Medan is already running well and supports operational needs, but there is still room for improvement in terms of more specific budget classification and reporting. This evaluation is important so that in the future waste management, especially in the dental and oral units, can be more optimal, accountable, and sustainable.

The results of the evaluation of solid medical waste management at RSU Mitra Sejati Medan based on the Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 56 of 2015 concerning Procedures and Technical Requirements for B3 Waste Management in Health Service Facilities, and other related regulations

The results of the observation show that the implementation of medical waste management in the dental and oral service unit of Mitra Sejati Hospital Medan has been running with a very high level of conformity with the provisions stipulated in the Minister of Environment and Forestry Regulation No. 56 of 2015. At the stage of reducing and sorting B3 medical waste, the conformity rate was recorded at 98%, which means that the process of separating hazardous and toxic waste from non-B3 waste is carried out with procedures that are almost completely in accordance with regulations. This shows that there is high awareness and compliance from medical personnel and waste management officers to the basic principles of waste management, namely sorting from the source. Sorting carried out in the dental and oral units also includes the use of colored waste bags according to standards, labeling, and correct placement. Furthermore, at the stage of transporting B3 medical waste, the conformity rate was also recorded at 98%. This means that the activity of transporting waste from the source (dental and oral procedure room) to the temporary storage site has been

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carried out in a safe and procedurally correct manner. Transportation is carried out by officers who are equipped with personal protective equipment (PPE), using closed means of transportation, and minimizing the risk of contamination or exposure to the surrounding environment. This is very important because the transportation process is one of the critical stages in the B3 waste management chain which can have a direct impact on the safety of officers and patients if they do not meet standards.

At the B3 stage of medical waste storage, the implementation at RSU Mitra Sejati Medan actually shows a 100% suitability level, which means that all technical aspects in waste storage have met the applicable requirements. Waste is stored in a place that has met technical requirements such as having ventilation, not mixing between types of waste, having a label, and being in a building or room that meets the standards of the Ministry of Environment and Forestry. Storage is carried out in a temporary storage place (TPS) of medical waste that is monitored, safe, and not within the reach of the general public. This is an indicator that hospital management has paid special attention to the final stage of waste management before it is handed over to a third party that has a B3 waste management permit. Overall, the achievement rate of B3 medical waste management in the dental and oral health service unit of RSU Mitra Sejati Medan reached 98.6%. This figure was obtained from the results of the average observation of the stages of reduction-sorting, transportation, and storage compared to the standards of the Minister of Environment and Forestry No. 56 of 2015. This value is in the category of "very appropriate" and reflects that the medical waste management system implemented in this hospital is very close to the maximum standard. This high level of compliance indicates that there is a well-functioning internal monitoring system, as well as training or education for health workers on the importance of proper waste management.

However, there is a small room for improvement, especially in the reduction and transportation aspects, in order to achieve 100% conformity as per the storage stage. This improvement can be done by strengthening routine supervision, providing advanced training to officers, and evaluating the effectiveness of existing procedures on a regular basis. In the context of dental and oral health services, where waste such as needles, bloody cotton, and sharp tools are often generated, standard-compliant management is critical to prevent the risk of infection and contamination.

CONCLUSION

Human resources at RSU Mitra Sejati Medan have supported waste management in dental and oral health services well, characterized by compliance with SOPs, adequacy in the amount of manpower, competence according to duties, and regular training and debriefing for officers. Waste management facilities and infrastructure in dental and oral health services at RSU Mitra Sejati Medan are fully available, suitable for use, and in accordance with the applicable standard operating procedures (SOP). The use of the facility has also been well carried out by the officers, although there are still minor mistakes that are generally made by new staff. However, the hospital routinely conducts evaluations, monitoring, and provides education to ensure that waste management runs optimally and sustainably. The waste management budget at RSU Mitra Sejati Medan is available and considered sufficient, but it is not specifically allocated for dental and oral health services, but is incorporated into the general budget of the hospital. Nevertheless, the waste management needs in the unit are still met without significant obstacles. This shows that the implementation of the budget has been effective, but there is still a need for improvement in

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budget recording and separation to be more transparent and measurable per service unit. Based on the results of the evaluation, the management of solid medical waste in dental and oral health services at Mitra Sejati Medan Hospital has been in accordance with the Regulation of the Minister of Environment and Forestry Number 56 of 2015 and other related regulations, with a conformity rate of 98.6% which is included in the category according to the provisions.

SUGGESTION

It is recommended that hospitals strengthen the medical waste management system, especially from dental and oral health services, by implementing standard protocols in accordance with Ministry of Health regulations and updating waste collection and destruction facilities regularly. Hospitals also need to increase internal supervision of waste disposal procedures so as not to harm the environment and the surrounding community. Government agencies are expected to increase supervision and evaluation of medical waste management in health facilities, including providing regular technical assistance and guidance. It is also necessary to conduct regular environmental audits to ensure that all hospitals have met safe and environmentally friendly waste management standards. For employees of RSU Mitra Sejati Medan, it is expected to increase compliance with standard operating procedures (SOPs) in medical waste management. Periodic training and socialization about waste hazards and how to handle them correctly are very important to increase employee awareness and skills in maintaining work safety and the environment.

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