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Phenomenological Study of the Implementation of Digitalization in the Management of Medical Hazardous Waste

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ABSTRACT

This study aims to describe the process of implementing digitalization in the management of medical hazardous waste at RSIA Siti Hawa Padang. The sub-focus of this research includes providing an overview of the application of Festronik, a description of the Festronik usage process, an overview of the benefits of using Festronik, and an overview of the management of medical hazardous waste and its environmental impact. The research method employed is qualitative, exploring the phenomenon in-depth. Data were obtained through interviews with 10 informants, comprising 2 primary informants and 8 key informants from RSIA Siti Hawa Padang. Sample selection was carried out using purposive sampling to ensure a comprehensive understanding. Data analysis in this study used Collaizi's nine-step data interpretation method (1978). The findings of this research reveal a comprehensive understanding of the general implementation of digitalization through Festronik at RSIA Siti Hawa Padang. The application of Festronik enhances the effectiveness of hazardous medical waste management, improves hospital accreditation assessments, and effective hazardous medical waste management has a positive impact on the hospital's environmental health.

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1. INTRODUCTION

Digitalization in a simple context is the process of converting information from analog formats into digital formats using technology and computer systems. This involves the transformation of printed material, audio, or video into digital form. The main goal of digitalization is to create document archives in digital form, which requires equipment such as computers, scanners, operators, and supporting software [1]. Advancements in digital technology have changed the way we create, transfer, store, and analyze data, with significant potential to shape and influence the world today [2].

Digitalization has not only impacted the financial and business sectors but has also rapidly evolved in various industrial sectors, including the management of Hazardous and Toxic Substances waste. Hazardous and Toxic Substances refer to materials that have the potential to pollute the environment, harm the ecosystem, and pose direct or indirect threats to human health and other creatures, in specific quantities and concentrations.

The management of medical hazardous waste in hospitals is based on Government Regulation (PP) No. 101 of 2014 concerning the Management of Hazardous and Toxic Substances. Common types of medical hazardous waste found in hospitals include chemicals, cancer drugs (such as cytostatics), reagents, antiseptics, disinfectants, infectious waste, radioactive materials, insecticides, cleaners, detergents, medical gases, and non-medical gases.

The management of medical hazardous waste in hospitals is part of establishing standard precautions, which are an essential component of Facility and Safety Management in hospitals. Proper management of medical hazardous waste can reduce the risk of infections in the hospital's vicinity because medical hazardous waste is infectious and contains viruses, bacteria, liquid and solid substances containing hazardous chemicals to human health. Good precautions in the management of medical hazardous waste are expected to improve environmental health, and this is one of the requirements in the National Hospital Accreditation Standards.

Sopian Hadi, Assistant Ombudsman for the South Kalimantan region, stated that since the start of the COVID-19 pandemic, Indonesia has faced a serious problem in managing hazardous medical waste. According to the Ombudsman's records, there are approximately 138 million tons of hazardous medical waste across Indonesia that has not been properly managed. Most of this waste comes from Healthcare Facilities and unfortunately, many cases of improper disposal of medical hazardous waste have occurred, including dumping in the streets, rivers, seas, and household waste disposal sites.

Additionally, the Ombudsman also noted that many Temporary Collection Sites and Wastewater Treatment Plants in Healthcare Facilities do not have official permits. As a result, the management of medical hazardous waste and hospital wastewater does not comply with existing environmental standards. In some cases, healthcare facilities even discharge liquid waste into the hospital's septic tanks [3].

Afdhalul Ikhsan, a contributor to kompas.com from Bogor Regency, reported that the Bogor Regency Police Chief, AKBP Harun, is searching for the owner of a laundry business from Tangerang Regency who dumped 230 bags of Personal Protective Equipment (PPE) mixed with medical hazardous waste in the Tenjo and Cigudeg sub-districts of Bogor Regency. This incident began with reports from local residents who witnessed the improper disposal of medical hazardous waste multiple times in their neighborhood. In this case, the Bogor Regency Police have identified two suspects, namely the laundry company's driver who carried out the disposal of medical hazardous waste [4].

Mohammad Kadafi, a reporter for merdeka.com, quoted Ni Made Mirnawati, the Head of the Environmental Agency of Gianyar Regency in Bali, stating that hospitals responsible for the improper disposal of medical hazardous waste in Bitara Village, Gianyar Regency, could face administrative and criminal sanctions. The case of medical hazardous waste dumping in Bitara Village began with a report from local residents. The Gianyar Regency Environmental Agency has reported this discovery of medical hazardous waste to the police for investigation to determine which hospital or individual was responsible for the improper disposal of medical hazardous waste [5].

The Mayor of Pekanbaru, Firdaus, as reported by the official website of Pekanbaru Municipality (pekanbaru.go.id), plans to form a team to investigate hospitals in Pekanbaru that have been improperly disposing of medical hazardous waste at the borders of Pekanbaru City. The Environmental Agency of Pekanbaru Municipality received reports from nearby residents about the improper disposal of medical hazardous waste. Mayor Pekanbaru emphasized that medical waste is very hazardous to health and the environment. If medical waste is not properly managed, it can cause up to 40% environmental damage [6].

Effective Hazardous and Toxic Substances waste management from healthcare facilities should consider the core elements of waste management, which include reduction, sorting, and proper waste identification. Proper handling, processing, and disposal will reduce waste management costs and improve environmental protection and management. Medical hazardous waste should be stored in packaging with clear symbols and labels. Except for sharp objects and liquid waste, medical hazardous waste from healthcare facility activities is generally stored in plastic packaging, containers fitted with plastic liners, or packaging with specific standards such as leak-proof containers.

According to regulations from the Environmental Impact Control Agency as stipulated in Decree No. KEP-02/BAPEDAL/09/1995, effective management of Hazardous and Toxic Substances medical hazardous waste requires documentation known as the Hazardous Waste Manifest. This document is issued when medical hazardous waste is handed over for transport from its place of origin to an off-site storage location or for collection, transport, processing, utilization, and final storage of processed medical hazardous waste. The medical hazardous waste document is often referred to as the Hazardous Waste Manifest and is divided into three sections, each of which must be filled

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out by the Generator/Collector, Transporter, and Collector/Utilizer/Processor. The purpose of using the medical hazardous waste Manifest is to control the movement of medical hazardous waste.

According to the Ministry of Environment and Forestry Regulation No. 4 of 2020 related to the transport of Hazardous and Toxic Substances medical hazardous waste. The Ministry of Environment and Forestry Regulation has transitioned from manual manifests to electronic manifests called "Festronik." In the context of hospitals as generators of medical hazardous waste, hospitals are required to adopt the Festronik Information System in managing their medical hazardous waste. This regulation became mandatory for hospitals starting from 1st August, 2020.

This means that the management of medical hazardous waste in hospitals can be done in real-time, from the moment the waste is generated, transported, to its final processing, all of which can be managed through a single account. The implementation of the Festronik Information System using the Festronik 2020 application, continuously updated by Ministry of Environment and Forestry Regulation, ensures that the transport of medical hazardous waste can be efficiently tracked. The digitalization of medical hazardous waste management is expected to enhance the management of medical hazardous waste in hospitals.

After conducting a search of available references and journals, the researcher has not found any qualitative studies specifically addressing the implementation of digitalization in the management of medical hazardous waste. Therefore, based on an understanding of the situation, conditions, and phenomena that have been described, the author is inclined to undertake a research study with the title "Phenomenological Study on the Implementation of Digitalization in the Management of Medical Hazardous Waste." This study will serve as a case study conducted at RSIA Siti Hawa in Padang.

2. RESEARCH METHOD

The location of this research was carried out at the Siti Hawa Mother and Child Hospital (RSIA) which is located at Jalan Parak Gadang Raya No. 35A, Simpang Haru, East Padang District, Padang City, West Sumatra Province. The main reason for selecting the research location at RSIA Siti Hawa Padang was because RSIA Siti Hawa had implemented digitalization of Medical Hazardous Waste management.

The research is planned to be carried out in April 2023, starting from 1st April 2023 to 30th April 2023. With a time allocation of 1 month, it is hoped that sufficient qualitative data regarding the Digitalization of Medical Hazardous Waste Management will be obtained. The collection of qualitative data will be the basis for later analysis, to draw conclusions about the Digitalization Process in Medical Hazardous Waste Management.

Population is the entire group of individuals or objects of interest to the researcher (Borockopp and Tolsma, 2000). Qualitative research is not intended to make generalizations

from research results. Therefore, in qualitative research there is no known population and sample. The research subjects will be informants who will provide various information needed in the research process. An informant is someone who is involved on a daily basis or who knows about a particular problem and will obtain clear, accurate and reliable information in the form of statements, information or data that can help in understanding an issue or problem. Sampling was carried out using a non-probability technique: purposive sampling, namely purposive sampling where the researcher determines the sample among the population according to the researcher's wishes. The qualitative sampling technique is clearly different from non-qualitative research, because qualitative sample selection is based on a natural paradigm which is intended to select a small number and does not have to be representative, with the aim of leading to in-depth understanding. In qualitative research, there are no fixed criteria or rules for determining sample size. The sample size is based on the information needs to be obtained.

Informants in phenomonelogical research are selected based on their knowledge/experience regarding the phenomenon to be studied with the aim that informants can share their knowledge (Speziale & Carpenter, 2003).

This research informants include several types, namely:

1) Key informants are parties who know and have the main information needed in the research.
2) Key Informants are parties who are needed in a study.

This research falls under the category of qualitative research because it aims to explore in-depth information about the implementation process of digitalization in the management of medical hazardous waste at RSIA Siti Hawa Padang. Information was obtained through interviews with 2 key informants and 8 key informants.

Key informants are the staff of RSIA Siti Hawa Padang directly involved in the digitalization of medical hazardous waste management process, specifically the environmental health department staff whose daily tasks include managing medical hazardous waste at RSIA Siti Hawa Padang. On the other hand, the primary informants are the top management of RSIA Siti Hawa Padang, who are the decision-makers in the process of digitalization of medical hazardous waste management. These informants are intended to provide strategic information about medical hazardous waste management, especially in relation to the company's overall objectives.

Researchers used a semi-structured interview guide based on research objectives. The semi-structured method will consist of a list of open-ended questions. This method allows new questions to arise because of the answers given by the informant, so that during the session information can be explored in more depth. Researchers use field notes which were developed to record non-verbal communication and environmental situations that support the results of interviews or verbal communication displayed by informants.

The research design follows the steps of a descriptive phenomenological approach, as proposed by [7]. The first stage is bracketing, which involves the researcher and the

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research participants or informants. In this stage, the researcher conducts bracketing with the goal of avoiding the influence of personal assumptions on the phenomenon being studied. The researcher maintains bracketing from the beginning to the end of the research, maintaining a neutral and open attitude towards the observed phenomenon.

The second stage is the analysis of the phenomenon. In the analysis of the phenomenon, the researcher conducts exploration, analysis, and description of the phenomenon to gain a deeper and more comprehensive understanding. The researcher identifies three important steps in this analysis of the phenomenon, namely: intuiting, analyzing, and describing [8].

Intuiting is the initial step in which the researcher begins to interact with the research participants or informants to understand the phenomenon of implementing digitalization in the management of medical hazardous waste. The researcher seeks a deeper understanding of how this process unfolds, and in this stage, the researcher serves as the primary instrument in data collection.

The second step is analyzing, where the researcher identifies the meaning of the explored phenomenon and explores the relationships and connections between the obtained data and the observed phenomenon. The third step is describing, where the researcher compiles written descriptions based on the classification and grouping of the phenomenon. In this stage, the researcher gains a deeper understanding of the phenomenon of implementing digitalization in the management of medical hazardous waste.

The data analysis of the research follows Collaizi's nine-step interpretation method, which involves describing the phenomenon under study, interviewing informants, reading interview results, quoting statements as keywords, breaking down statements into themes, creating theme groups, narrating interview results, conducting validation, and drawing conclusions as research findings [9].

3. RESULTS AND DISCUSSION

In this research, there are two crucial components to be discussed: the interpretation of research findings and the discussion of research findings. The process of interpreting and discussing research findings will involve a comparative analysis between the findings discovered in this research and relevant concepts, theories, regulations, and other research findings within the research context. The interpretation and discussion of research findings will be presented based on the predefined sub-research focuses.

3.1. Overview of Festronik Implementation

The subfocus of the general description of the implementation of Festronik consists of 5 discussions, namely, when did RSIA Siti Hawa Padang start using Festronik, socialization regarding the application of Festronik, procedures/SOPs/documents needed

when implementing Festronik, RSIA Siti Hawa Padang's readiness to use Festronik, and the reasons for RSIA Siti Hawa Padang uses festronik.

3.1.1. Commencement of Festronik Implementation in RSIA Siti Hawa Padang

The Festronik 2020 application is continuously updated with the aim of ensuring effective tracking of the transportation of Hazardous and Toxic Substances medical hazardous waste until it reaches its final disposal site. Through the Minister of Environment and Forestry Regulation No. P.4/Menlhk/Setjen/Kum.1/1/2020 on the Transportation of medical hazardous waste, the use of Festronik has become mandatory since August 1st 2020. In addition to providing the legal basis for the use of Festronik, the Ministry of Environment and Forestry has also made changes to the Festronik system. Currently, the use of Festronik is integrated with a reporting system known as SIMPEL or SIRAJA LIMBAH, which is used to report medical hazardous waste management. With this integration, medical hazardous waste management becomes more structured, and monitoring becomes more manageable.

Previous research on Festronik user data was not available. However, the researcher obtained data from the West Sumatra Environmental Agency regarding the number of medical hazardous waste generators in the healthcare sector that have Festronik accounts, which is 130. From this data, it can be observed that medical hazardous waste generators in West Sumatra have had Festronik accounts since the initial issuance of the Ministerial Regulation. Consistent with this data, the research findings state that RSIA Siti Hawa is one of the 130 medical hazardous waste generators in West Sumatra that has been using Festronik since the regulation was enacted. RSIA Siti Hawa received a circular letter from PT. Bioteknika Bina Prima, which is the first transporter of medical hazardous waste in West Sumatra entrusted with the task of socializing the use of Festronik to hospitals that collaborate with them.

"The Health Department is still lacking in outreach regarding the use of Festronik. PT Bioteknika Bina Prima is the one who actively promotes it so that hospitals understand the use of Festronik. PT Bioteknika teaches how to register and the conditions for using Festronik. "The Ministry of Environment and Forestry only provides the guidebook in the Festronik application." (Informant 2).

However, there was one finding from the survey conducted by the researcher with another medical hazardous waste transporter, PT. Andalas Bumi Lestari, which is based in West Sumatra, and also with the West Sumatra Provincial Environmental Agency. Although the data indicates that there are 130 accounts with Festronik users in West Sumatra, it is evident that only two hospitals, RSIA Siti Hawa Padang and RSUD M. Natsir Solok, are actively using Festronik up to the present. In the interviews conducted by the researcher with the environmental health staff of RSIA Siti Hawa, it was mentioned that the

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encouragement to use Festronik was primarily carried out by the medical hazardous waste transporter, while the local authorities at the provincial and district/city levels, such as the Department of Health and the Environmental Agency, were less proactive in promoting the use of Festronik. However, the promotion of Festronik usage is part of their obligation as the extended arms of Ministry of Environment and Forestry in the regions.

3.1.2. Socialization of Festronik Implementation

In Indonesia, the introduction and dissemination of information regarding the use of Festronik are often carried out by companies involved in the transportation of medical hazardous waste in collaboration with the Ministry of Environment and Forestry. For example, on May 19th, 2020, PT. Prasadha Pamunah Limbah Industri (PT. PPLI), in collaboration with the Directorate General of Waste, Hazardous Substances, and Toxic Waste Management (PSLB3) of Ministry of Environment and Forestry Regulation Republic of Indonesia, organized an online seminar with the theme "Socialization of Festronik Usage in the Transportation of Medical Hazardous Waste." The purpose of this socialization event was to assist PT. PPLI's clients in implementing Festronik in their medical hazardous waste transportation processes.

On July 9th, 2020, PT Arah Environmental Indonesia (ARAH), in cooperation with the Ministry of Environment and Forestry, specifically the Directorate General of Waste, Hazardous Substances, and Toxic Waste Management (Ditjen PSLB3), conducted a webinar with the theme "Benefits of ARAH's Digital Services in the Pandemic Era: Festronik as a Mandatory and Paperless Secure Documentation Alternative." PT. ARAH explicitly supported the program of Ditjen PSLB3 in implementing the Electronic Manifest System (Festronik). This was not only to meet the requirements stipulated in the Minister of Environment and Forestry Regulation No. P.4/MENLHK/SETJEN/KUM.1.1/2020 on the Transportation of Hazardous and Toxic Substances, but also as a digital solution for recording and reporting medical hazardous waste management in a safer and more efficient manner.

Based on research conducted by [10], it can be concluded that the socialization process regarding the use of Festronik at PT. Mitra Garuda Palapa, a waste transportation company, has been successful. The research findings indicate that 91.30% of clients understood the steps in the registration process, 82.82% of them knew how to fill out the forms, and approximately 99% of the clients were aware of the turnaround time for receiving medical hazardous waste when using Festronik as a requirement for waste transportation.

Furthermore, PT Biuteknika Bina Prima also organized training sessions in August 2020 to socialize the use of Festronik to hospitals in West Sumatra. PT Biuteknika Bina Prima is the first medical hazardous waste transporter company in West Sumatra. Hospitals were facilitated and funded for Festronik registration.

"Initially, PT Bioteknika Bina Prima introduced and socialized Festronik to hospitals that collaborated with them in transporting medical hazardous waste. PT Bioteknika Bina Prima provides training to hospitals including RSIA Siti Hawa. PT Bioteknika Bina Prima is the first transporter to enter West Sumatra so it is trusted to promote Festronik. "We were given training for one day, those who took part in the training were our general staff." (Informant 1)

RSIA Siti Hawa was one of the hospitals that received socialization through PT. Biuteknika Bina Prima in the form of a circular letter about Festronik usage. PT. Biuteknika Bina Prima provided one-day training, which was attended by the operational director and environmental health staff on behalf of RSIA Siti Hawa. Additionally, RSIA Siti Hawa was facilitated and funded to register for Festronik. The socialization conducted by PT. Biuteknika Bina Prima greatly assisted RSIA Siti Hawa in the process of using Festronik, ensuring better understanding and utilization of Festronik. This is evident from the fact that RSIA Siti Hawa is one of the two hospitals currently using Festronik in West Sumatra.

From the above facts, there are weaknesses in the socialization of Festronik usage for medical hazardous waste management in hospitals. Ministry of Environment and Forestry, as the initiator of Festronik usage, has not been proactive in conducting socialization and providing training to hospitals. The socialization of Festronik usage is generally carried out by medical hazardous waste transporters, and these transporters are encouraged to actively promote the use of Festronik. Based on interviews and observations conducted by the researcher, Ministry of Environment and Forestry Regulation emphasizes the obligation to use Festronik on medical hazardous waste transporters working in collaboration with hospitals. From discussions with medical hazardous waste transporters and the provincial environmental agency, it was revealed that this approach is a strategy by Ministry of Environment and Forestry Regulation to promote Festronik usage. Therefore, they push the obligation of socializing and using Festronik onto medical hazardous waste transporters because these transporters have close ties with hospitals. In practice, there are approvals at each step of Festronik usage by medical hazardous waste transporters.

3.1.3. Procedure of Festronik Implementation

The specific research results regarding the Festronik implementation procedure are not yet available. Based on the research conducted by [10], it was found that clients collaborating with PT. Mitra Garuda Palapa had a positive understanding of the Festronik usage process. As much as 91.30% of the clients understood the registration stage, while 82.82% of them understood the filling steps, and approximately 99% of clients understood the stages of re-acceptance in using Festronik as one of the requirements for medical. hazardous waste transport. This research concludes that the Festronik implementation procedure itself is easy to apply, as indicated by the high percentage of understanding.

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The extensive socialization conducted by waste transporters, as discussed earlier, has helped simplify the information about Festronik usage. Registration, commonly referred to as "registrasi," is one of the features available in the online manifest application (Festronik). This feature serves as a tool for online manifest registration, primarily used by medical hazardous waste generators such as hospitals.

The registration steps are as follows:

1. Registering online through the website http://festronik.menlhk.go.id.
2. Completing registration through a written method, where registration documents are submitted to Ministry of Environment and Forestry Regulation.
3. Ministry of Environment and Forestry Regulation administrators verify the Written Application and online registration data.
4. Access rights are automatically granted, and users can use their registered username and password.
5. Users receive their username and password information via email.

From the research conducted at RSIA Siti Hawa, in an interview with the Festronik administrator, it was stated that the required documents for registration included a letter of authorization from the director and other attached documents. RSIA Siti Hawa then received a username and password from the central Ministry of Environment and Forestry Regulation, which was sent via email. Afterward, the hospital could directly log in to use the Festronik application.

"...what I remember is that the requirements are only registration requirements. There are several attachments, one of which is a statement from the Director. "Then there was a statement letter to appoint a person who would be the admin of the hospital to hold Festronik at RSIA Siti Hawa" (Informant 3)

The above-described process concludes that RSIA Siti Hawa Padang finds registration to obtain a Festronik account not difficult because registration can be done online through the central Ministry of Environment and Forestry Regulation website. The required documents are not extensive, with the main requirement being a formal request letter and a letter of appointment by the hospital management designating one individual as the Festronik administrator. This finding aligns with the research mentioned above. According to the researcher's analysis, the difficulty of registration cannot be considered a reason for hospitals not to use Festronik because the account registration process is straightforward and can be done online.

From discussions between the researcher and waste transporter PT Andalas Bumi Lestari from West Sumatra, as well as Mr. Rian from the West Sumatra Environmental Agency, it was found that the registration requirements for waste transporters to obtain a Festronik account are much more challenging compared to hospitals. The Festronik registration by waste transporters must go through a document verification stage of the

medical hazardous waste transport licensing possessed by the waste transporter. In our analysis as researchers, this is a strategy employed by Ministry of Environment and Forestry Regulation for Festronik implementation, where waste transporters are encouraged as more responsible parties to assist and guide hospitals in using Festronik. The Ministry of Environment and Forestry Regulation sees waste transporters as having a more significant interest in waste manifest management, as until now, the preparation of physical waste manifests has always been done by waste transporters, and the physical distribution of waste manifests must also be carried out by waste transporters.

3.1.4. Readiness of RSIA Siti Hawa Padang for Festronik Implementation

Hospitals wishing to implement Festronik must be able to carry out the following four steps:

1. Registration is done in two ways, namely in writing and online.
2. Data will be checked, signatories will be determined, and if necessary, administrators will be added.
3. Communication will be established with the transporter and receiver. It is important that the transporter is registered as a transporter.
4. The transporter will create a manifest, the sender will approve the data, and the receiver will confirm whether the waste is accepted or rejected.

Specific research on the preparations required in the Festronik implementation process does not yet exist. However, the procedures and coordination required when using Festronik can be summarized in the points as mentioned above. In line with the results of this research, RSIA Siti Hawa has already completed the four points mentioned above. Registration has been carried out since the inception of Festronik usage, and communication with the transporter and disposal facilities has been conducted effectively. For the last condition, the medical waste transporter for RSIA Siti Hawa is PT. Andalas Bumi Lestari, while the receiver or processor of medical waste is the incinerator PT. Wastec International in Cilegon and the incinerator owned by the Department of Environment of West Sumatra in Aie Dingin, Padang City.

The results of discussions between the researchers and the medical waste generator RSIA Siti Hawa Padang, the medical waste transporter PT. Andalas Bumi Lestari, and also the Department of Environment of West Sumatra indicate that the usage of Festronik has been smooth and on schedule. Intensive communication of the hospital is with the transporter, PT. Andalas Bumi Lestari in this case, while communication with the processing facilities, namely PT. Wastec International and Department of Environment of West Sumatra, is carried out directly by the transporter, PT. Andalas Bumi Lestari.

In discussions with the Festronik manager at PT. Andalas Bumi Lestari (ABL), they stated that PT. Andalas Bumi Lestari is the active transporter of medical waste generated by RSIA Siti Hawa at present. ABL mentioned that they use two waste disposal facilities,

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namely PT. Wastec and Department of Environment of West Sumatra. This is because not all medical waste can be processed by Department of Environment of West Sumatra. The Department of Environment of West Sumatra is only capable of processing solid medical waste, while medical waste in liquid form such as laboratory fluids from the hospital and other types of medical waste like fluorescent lamps, used batteries, used oil, wastewater treatment plant waste, and others are still transported to PT. Wastec International in Cilegon, Banten.

3.1.5. Reasons for RSIA Siti Hawa Padang's Adoption of Festronik

According to the Ministry of Environment and Forestry Regulation No. P.4/Menlhk/Setjen/Kum.1/1/2020 concerning the Transportation of Hazardous and Toxic Waste, the use of FESTRONIK became mandatory starting from August 1, 2020. Research conducted by [11] states that the obligation to use Festronok applies not only to hazardous waste producers but also to parties involved in its transportation, collection, and storage.

Referring to the applicable regulations and the findings described above, the research conducted at RSIA Siti Hawa through interviews has revealed that RSIA Siti Hawa has been committed to using Festronik from the beginning, driven by the Ministry of Environment and Forestry Regulation.

"RSIA Siti Hawa is committed to using Festronik because we feel this is mandatory from the Ministry of Environment and Forestry. We have no reason not to want to use it. Our environmental staff health wants to learn to use this Festronik application. Perhaps many other hospitals in West Sumatra have not used it because of a lack of human resources, especially in the hospital department and the readiness of human resources to learn about this application." (Informant 1)

"For me, who is a staff member at RSIA Siti Hawa, when I was socialized at the beginning and said I had to use Festronik, I was committed to learning straight away so I have been using Festronik to this day." (Informant 3).

3.2. Process of Using Festronik

The sub-focus on the process of using Festronik consists of five discussions, namely the ease and challenges of using Festronik, coordination between the hospital and the second and third parties when using Festronik, the advantages and disadvantages of using Festronik, evaluation and supervision by the hospital in using Festronik, and the sustainability of Festronik application usage at RSIA Siti Hawa.

3.2.1. Ease and Challenges of Using the Festronik Application

The ease of using the Festronik application is facilitated by the availability of a user guide. A comprehensive guide on how to use the Festronik application is provided directly by Ministry of Environment and Forestry Regulation and can be accessed online or saved as a file. There are three guides provided: one for Generators, one for Transporters, and one for Handlers or Disposers.

"It's not difficult as long as you follow the steps for using it properly." (Informant 2)

"Using the Festronik application is quite easy because we can immediately log in to the application after getting the password sent to the hospital email after registering. It may be a bit complicated when initially preparing the registration requirements until the application is active. "(Informant 3)

"The Festronik application itself is also easy. After logging in, we will fill in some information regarding the waste produced in our hospital. Even though there's quite a lot to fill in, it's not difficult." (Informant 3)

The research conducted at RSIA Siti Hawa indicates that there were no significant challenges in the Festronik application usage process. The use of the Festronik application is considered easy as it involves following the provided steps. At RSIA Siti Hawa, the administrative responsibility for using the Festronik application falls on the Environmental Health staff. The environmental health staff at RSIA Siti Hawa stated that the application is user-friendly and they encountered no difficulties when using it. Moreover, RSIA Siti Hawa received prior training from PT Biuteknika Bina Prima regarding the implementation of the Festronik application.

"Barriers to using Festronik are almost non-existent." (Informant 1)

3.2.2. Coordination Between the Hospital and Transporter and Disposer

In practice, the use of Festronik requires coordination among waste generators, such as hospitals, waste transporters, and waste disposers. Communication among these three parties is essential because the process of using Festronik involves all three parties in a sequential manner.

Waste transporters of hazardous and toxic waste must be registered in the Festronik application and linked to both waste generators and waste disposers. Transporters without approval are not allowed to create electronic manifests (Festronik).

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The coordination process among hospitals, waste transporters, and waste disposers when using the Festronik application is as follows:

1. The waste generator, in this context, the hospital, must input all necessary data regarding hazardous and toxic waste into the transportation plan menu.
2. The waste transporter will fill in the data about the transportation activities based on the actual conditions during the transportation, including information about the date of transportation, quantity, vehicle type, and more.
3. The waste transporter will send the inputted data through the system for review and approval from the waste generator.
4. The waste generator will inspect the data after the hazardous and toxic waste has been loaded onto the transport vehicle. If the data is correct, it will be accepted, but if it is not, data revisions may be necessary. The revision process can also be carried out by the waste transporter.
5. After the data is sent by the waste transporter to the waste disposer, the disposer will inspect to ensure the accuracy of the data after unloading the hazardous and toxic waste at the disposal site.
6. The approved electronic manifest (Festronik) will be automatically reported to the government, both to the Ministry of Environment and Forestry and the provincial government, such as the Provincial Environmental Agency, as per the applicable regulations.

According to research conducted by [12], healthcare facilities like hospitals that generate hazardous and toxic waste and do not have the capacity to manage such waste on their own have legal permission to collaborate with waste management service providers in accordance with the relevant requirements. Typically, in managing such waste, the company generating the hazardous waste will collaborate with waste transporters and companies responsible for waste management or disposal.

"We at the hospital coordinate with the transporters and destroyers through the use of Festronik. In the Festronik application, we coordinate with each other and then in Festronik there is an approval button that they have to tick. At least there have been a few obstacles from the old destruction party in approving it, so we are hesitant about information about the journey of our waste." (Informant 3)

Based on the above facts, it aligns with the research findings that RSIA Siti Hawa collaborates with waste transporter PT. Andalas Bumi Lestari and waste disposers PT Wastec International and Department of Environment of West Sumatra for the management of hazardous and toxic waste. In the interviews, it was stated that the coordination among these three parties in using Festronik is smooth, and there are no significant obstacles encountered.

3.2.3. Advantages of Using Festronik

The Ministry of Environment and Forestry explains several advantages of using electronic manifests, one of which is simplifying the administrative and reporting process in hazardous and toxic waste management. With electronic manifests, there is no need for handwritten records, ensuring clear and consistent text without variations in paper color or the risk of document loss. All information is recorded and stored digitally. Additionally, data in Festronik can be monitored in real-time and easily confirmed by the involved parties, ultimately expediting the administrative process significantly.

"Our reports have become more complete and neat." (Informant 2)

"After using the Festronik application, reporting becomes clear and recording is easier. We actually still use manual manifests at the same time for our handles." (Informant 3)

Research [11] states that one of the advantages of using Festronik is the ease it brings to reporting medical hazardous waste management activities. In line with the research findings obtained at RSIA Siti Hawa through interviews, the management stated that the most noticeable change was in reporting, which became more organized. The hospital's reporting to Ministry of Environment and Forestry could be done directly because it was reported through the Festronik application. This is a key advantage of the Festronik system; document records and waste reporting became neat and timely, eliminating the accumulation of manual manifests in the office. When there is a need for waste data, even from past periods, it can be easily traced because it is neatly and systematically recorded in the Festronik system in real-time.

3.2.4. Evaluation and Supervision by Hospitals in Using Festronik

Through Minister of Environment and Forestry Regulation No. P.4/Menlhk/Setjen/Kum.1/1/2020 regarding the Transportation of Hazardous and Toxic Waste, the use of FESTRONIK has been mandatory since August 1, 2020. One of the main goals is to increase compliance with regulations in the process of handling and transporting medical. hazardous waste. With this system, the aim is to ensure that the regulations are followed by all stakeholders in the waste shipping and management process and to monitor and verify that medical hazardous waste management is carried out effectively and in accordance with applicable standards from start to finish.

In accordance with the statement above, hospitals are required to comply with existing regulations. The use of Festronik is carried out by an administrator appointed by the management. In the research conducted at RSIA Siti Hawa, the administrator responsible for Festronik is the environmental health staff. By using the Festronik

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application, manifests are directly reported to the Government, both to the Ministry of Environment and Forestry and the provincial and municipal governments. As part of the commitment to supervision from the management, monthly reports are requested and then evaluated.

"We request reports every month from environmental health staff." (Informant 1)

The results of this research indicate that the supervision process by the management of RSIA Siti Hawa, specifically the environmental health department responsible for managing medical medical hazardous waste at the hospital, has become effective and has improved its level of supervision. Monthly reports have been submitted on time before the 10th of each month. From this data, the management also knows how much medical hazardous waste the hospital generates, and this data is necessary for cost management, especially for waste transportation and disposal expenses.

However, the researchers also emphasize that hospitals must ensure the accuracy of the data reported in the Festronik application. According to [11] in their research, although the Festronik application can help hospitals meet their legal responsibilities in reporting medical hazardous waste, the use of the application must still meet the requirements set by the authorities.

3.2.5. Sustainability of Festronik Usage

The Ministry of Environment and Forestry explains several benefits of using electronic manifests, including effective monitoring of the transportation of hazardous and toxic waste. Festronik provides the ability for all parties to monitor the transportation process in detail, including destination, data consistency, supervision, and reporting stages. All involved parties, such as waste generators, waste transporters, waste receivers, the Ministry of Environment and Forestry, as well as relevant local government agencies, can directly participate in monitoring the movement of medical hazardous waste.

Furthermore, the online manifest system (Festronik) also simplifies the administrative process and reporting of medical hazardous waste management and transportation activities. With no need for manual record-keeping, the text is always legible without variations in paper color or the risk of document loss. All information is recorded and stored efficiently in digital format. Additionally, data in Festronik can be monitored simultaneously and easily confirmed by the involved parties, resulting in a more efficient administrative process.

"RSIA Siti Hawa will continue to use Festronik because there is no reason not to use it. I think the Festronik application is very good for supporting reporting at our hospital." (Informant 2)

"Initially for me as a staff member, when the Festronik regulations came out, then the regulations said that their use was mandatory, so in my opinion this application should be used for hospitals. After I studied this application, it turned out that it was not difficult to use, so there is no reason not to continue using Festronik." (Informant 3)

In line with the findings of this research, RSIA Siti Hawa is committed to continuing the use of Festronik because they have experienced the benefits of its usage. The analysis of the sustainability of Festronik usage for hospitals in this study confirms that hospitals that have adopted Festronik will remain committed to using it in the future. Based on this research, the high level of commitment among users in adopting this information technology is due to its usefulness and ease of use.

3.3. Benefits of Using Festronik

Sub-focus on the benefits of using Festronik consists of 2 discussions: improving the effectiveness of medical hazardous waste management and the advantages for hospital management in terms of accreditation.

3.3.1. Enhancing Medical Hazardous Waste Management

The Ministry of Environment and Forestry explains several benefits of using Festronik, including:

1. Ensuring a higher level of compliance in the hazardous waste management process.
2. Simplifying the administrative process and reporting of hazardous waste management activities.
3. Allowing all parties to directly monitor the destination and progress of waste transportation.
4. Reducing costs compared to using manual manifests.
5. Marking the beginning of a paperless manifest era.

"This is very useful for RSIA Siti Hawa because reporting to the Ministry of Environment and Forestry is easier because it is directly with this application too. We usually report the management of medical hazardous waste to the Ministry of Environment and Forestry every six months." (Informant 1)

"The management of medical hazardous waste at RSIA Siti Hawa is better with this Festronik, because the journey of medical waste can be known clearly. If our waste doesn't have a clear journey, the hospital will also be affected." (Informant 3)

In line with the research findings at RSIA Siti Hawa, the use of Festronik contributes to more systematic and organized reporting. The reporting system is a crucial part of

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hazardous waste management. Based on the facts and theories mentioned above, the researchers conclude that the Festronik system in hospitals serves to achieve the goal of improving the hospital's management performance in handling medical hazardous waste.

3.3.2. Benefits for Hospital Management in Terms of Accreditation

The results of the research conducted at RSIA Siti Hawa demonstrate that the organized reporting system and clear waste tracking provided by Festronik have been highly beneficial in the hospital's accreditation process. Festronik has played a significant role in assisting the hospital during its accreditation journey by effectively managing medical hazardous medical waste.

Furthermore, RSIA Siti Hawa has found that Festronik is particularly helpful during accreditation verifications conducted by accreditation bodies and other relevant authorities regarding medical waste management. The hospital can quickly access waste management data through Festronik and even generate printouts as needed.

"One of the requirements for applying for accreditation is what kind of medical hazardous waste management system the hospital has. Is the waste travel reporting clear? The report will be provided to the accreditation assessment team. Since using Festronik, our reporting is clear and neat, which benefits us for the accreditation process." (Informant 1)

The benefits realized by RSIA Siti Hawa in relation to hospital accreditation include easy access to data, especially during on-site verifications conducted by accrediting bodies. Festronik serves as a valuable record and enhances the hospital's standing during accreditation evaluations. When accreditation assessors inquire about medical waste management, the hospital's use of Festronik instills confidence in them, as it signifies that proper management of B3 medical waste has been diligently carried out.

3.4. Impacts of Medical Hazardous Waste on Environmental Health

World Health Organization (WHO) defines hospital environmental health as the overall physical, chemical, and biological conditions within hospitals that can affect the health and comfort of patients, staff, and visitors, and can impact the quality of healthcare provided. Hospital environmental health includes the management of medical waste, infection prevention and control, water and sanitation management, as well as chemical and radiation management.

WHO also emphasizes the importance of a healthy and safe environment within hospitals to enhance the safety and health of patients, staff, and visitors. Factors such as clean air, safe drinking water, adequate sanitation, proper medical waste management, and

effective infection control can help reduce the risks of infections and diseases due to poor environmental conditions in hospitals.

In the context of this research, the researcher employs the health planning model theory [13]. Hendrik L. Blum (1974) states that there are four factors influencing the health status of a community, and one of them is the environment. As explained, environmental factors can be categorized into two types: physical environment, such as infrastructure and sanitation, and non-physical environment, which includes social, economic, political, and cultural aspects. The physical environment, particularly the presence of waste or refuse, has the most significant impact.

Proper waste or refuse management is crucial for environmental health. Poor waste management can lead to environmental degradation and the transmission of various diseases through the presence of waste.

In hospital environments, aside from household waste issues, there is also hazardous and toxic waste known as Hazardous and Toxic Waste. Hazardous and Toxic Waste is a type of waste that can have negative impacts on the environment and human health. Inadequate management of medical hazardous waste can result in environmental pollution, ecosystem damage, and threats to public health. The medical hazardous waste in hospitals primarily originates from medical activities, treatments, and other support services.

"… what I know about medical hazardous waste is that it is infectious waste that must be disposed of in a special place in a yellow bag. If the management is not good it will affect the health of the hospital environment. One of them will be susceptible to disease." (Informant 4)

"Managing medical hazardous waste that does not comply with standards will also affect hospital permits. As far as I know, RSIA Siti Hawa's management of medical hazardous waste is good, there are waste transporters who come at certain times to pick up the waste at our hospital" (Informant 10)

The negative impacts of medical waste on society and the environment occur due to ineffective management [14]. Effective waste management involves the separation, storage, handling, and disposal of waste in accordance with applicable regulations to prevent negative environmental impacts [15].

Additionally, research by [16]-[20] states that waste management, as part of environmental health efforts in hospitals, aims to protect the community around the hospital from environmental pollution risks originating from hospital waste.

Based on the theoretical background, applicable regulations, and previous research mentioned above, in line with the research findings at RSIA Siti Hawa, the researcher concludes that indirectly, the use of Festronik in medical hazardous waste management has had a positive impact on improving environmental health at RSIA Siti Hawa Padang.

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4. CONCLUSION

In this research, it can be concluded in the form of a general description that the use of Festronik RSIA Siti Hawa has been used since the enactment of Minister of Environment and Forestry Regulation Number P.4/Menlhk/Setjen/Kum.1/1/2020 as of August 1st 2020. RSIA Siti Hawa was the first received socialization on the use of Festronik from PT. Biuteknika Bina Prima which is a transporter of medical hazardous waste. In this study, researchers found that Festronik must be used by producers, transporters and destroyers/processors of medical hazardous waste. This research also shows that Festronik is easy to use. This research shows more clearly the benefits of using Festronik to help hospitals in assessing accreditation elements in facility management and hospital safety. Researchers also concluded that Festronik in managing medical hazardous waste only helps in reporting the amount of medical hazardous waste produced by hospitals and information regarding waste transport and processing/destruction of medical hazardous waste. The final conclusion in this research is that medical hazardous waste management has an influence on environmental health at RSIA Siti Hawa Padang.

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