

Analysis Factors Affecting Medical Waste Management at Sumenep District Public Health Center

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ABSTRACT

Medical waste is various types of waste produced by public health center and health service units which can endanger and cause health problems for visitors, the community, especially the officers who handle it. The purpose of this study is to analyze the effect of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center. The design of this research is an observational quantitative study with a cross sectional approach with the focus of the research directed at analyzing the influence of knowledge, attitudes and infrastructure on medical waste management. at the Sumenep District Health Center. The total population is 135 respondents and a sample of 100 respondents is taken by using Simple Random Sampling technique. Data analysis using Linear Regression test. The results showed that smost of the respondents have high category knowledge as many as 63 respondents (63%). Most respondents have sufficient category attitude as many as 59 respondents (59%). Most of the respondents have infrastructure in the good category as many as 61 respondents (61%). Most respondents have medical waste management in good category as many as 58 respondents (58%). Based on the results of Multiple Linear Regression analysis shows that with a p-value of 0.000 <0.05 then H1 is accepted so it is concluded that simultaneously there is an influence of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center with a magnitude of influence 86.7%. It is hoped that respondents will be better at managing medical waste so that in Sumenep Regency can fully have good medical waste management to the fullest.

Keywords: attitude, facilities, knowledge, waste management

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INTRODUCTION

Medical waste is various types of waste produced by public health center and health service units which can endanger and cause health problems for visitors, the community, especially the officers who handle it. (Ministry of Health RI, 2012).

The Public health center is a technical implementing unit from the district/city health office located in the sub-district area to carry out operational tasks for health development. The construction

of Public health center in each sub-district has a very important role in maintaining public health (Sumenep District Health Office, 2019).

In low- and middle-income countries, health care waste is usually less than in high-income countries. However, the range of differences between middle-income countries may be as large as the range of differences between high-income countries, as well as between low-income countries. Health care waste generated according to the level of national income of countries, in high-income countries for all health care waste can reach 1.1 – 12.0 kg per person per year, and hazardous health care waste 0.4 – 5.5 kg per person per year, in middle-income countries for all health care waste shows the figure of 0.8 - 6.0 kg per person per year while hazardous health care waste is 0.3 - 0.4 kg per person per year.

In the profile, it is revealed that there are 30 health centers in Sumenep Regency, and of which 30 are nursing health centers and 0 non-maintenance health centers, with a total of 461 beds (TT) (Sumenep Regency Health Office, 2019).

According to the results of observations and secondary data at 6 Public health center in Sumenep Regency in 2019, namely Guluk-guluk Health Center, Batuputih Health Center, Batang-Batang Health Center, Ambunten Health Center, Pragaan Health Center and Giligenting Health Center, it shows that the average production of medical waste is $\pm 0,73$ kg per day. (Secondary Health Center Data, 2019). Further analysis shows that the production of waste (solid waste) in the form of domestic waste is 76.8% and in the form of infectious waste is 23.2%. Based on this description, it can be concluded that Public health center have great potential to pollute the environment and the possibility of causing accidents and disease transmission if medical waste management is not in accordance with standards.

In addition, the results of these observations also found that the container was found to contain medical waste and mixed with non-medical waste. A medical waste plastic bag was found using a black plastic bag. During the collection, medical waste was found scattered around the public health center. In storage, a temporary medical waste storage area was found which was still open. Storage of medical waste for more than 2 x 24 hours without being put into a special B3 freezer before being transported and destroyed by an external medical waste manager (third party).

Based on 2019 data from the HRK (Health Human Resources) section, the number of sanitarian/health workers at the public health center is 30 people and the number of cleaning services is 92 people. So the public health center officers are involved and play a major role in the management of medical waste starting from the stages of sorting, collecting, storing, transportation, to final waste disposal/destruction (Sumenep District Health Office, 2019).

Health center waste is considered as a link in the chain of spread of infectious diseases. Waste can be a place for disease organisms to accumulate and become a nest for insects and rats. Besides that, the garbage also contains various toxic chemicals and sharp objects that can cause health problems and injury. Dust particles in the waste can cause air pollution which will spread germs and contaminate medical equipment and food (Depkes RI, 2017). Health center waste can be divided into non-medical waste and medical waste.

Non-medical waste has characteristics such as waste generated by the household environment and the community environment in general. This non-medical waste in the Public health center environment can come from offices/administration, service units, nutrition units/kitchens and yards (Depkes RI, 2017).

Medical waste is waste originating from medical services, dental care, pharmacy or the like, research, treatment, care or education that uses materials that are toxic, infectious, dangerous or can be dangerous, unless certain safeguards are carried out (Adisasmito, 2017).

Waste sorting management can be interpreted as a process of waste management activities starting from effective resources starting from sorting, collecting, storing, transporting to destroying through environmental management organizational control, so that it can achieve the goals or targets that have been set, namely a waste-free environment. Santoso, 2013).

Sorting solid medical waste from sources consisting of infectious waste, pathological waste, sharp object waste, pharmaceutical waste, cytotoxic waste, chemical waste, radioactive waste, pressurized container waste, and waste containing heavy metals. Radioactive waste uses red color, highly infectious waste uses yellow color, infectious waste, pathology and anatomy uses yellow color, cytotoxic waste uses purple color, chemical and pharmaceutical waste uses brown color (Aulia, 2012).

Garbage collection is said to be good if the garbage collection officer has understood / understands how to do a good collection, garbage must be collected every day from predetermined locations, which use bags and containers to transport garbage, while collection is still lacking due to lack of knowledge. staff are still minimal or the container is inadequate (Ellen, 2015).

Garbage is usually stored in waste production sites for some time. For this reason, each unit should be provided with a shelter with a shape, size and quantity that is adapted to the type and amount of waste as well as local conditions. Garbage should not be left in the shelter for too long. Sometimes the waste is also transported directly to the block shelter or disposal site. Storage of medical waste must be in accordance with the tropical climate, namely the rainy season for a maximum of 48 hours and the dry season for a maximum of 24 hours (Depkes RI, 2004).

Based on the above conditions, the author is interested in researching about analysis factors affecting medical waste management at the Sumenep District Health Center

MATERIALS AND METHODS

In this study, the researcher used an observational quantitative design with a cross sectional approach, which is a study to study the dynamics of the correlation between risk factors and effects, by approaching, observing or collecting data all at once (point time approach), that is, each subject The study was observed only once and measurements were made on the status of the character or variable of the subject at the time of examination. This does not mean that all research subjects are observed at the same time (Soekidjo, 2012). This research will analyze the influence of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center. The total population is 135 respondents and a sample of 100 respondents is taken by using Simple Random Sampling technique. Data analysis using Linear Regression test. This research has gone through the ethical test phase with the number SK: 2293/KEPK/III/2021.

RESULTS

Table 1 Results of linear regression analysis analysis of factors that affect medical waste management at the Sumenep District Health Center which was carried out on February 1-30 2021 with a total of 100 respondents

No	Variable	Sig	B	R^2	Sig
1	(Constant)	0.001	1,657	0.867	0.000
2	Knowledge	0.003	0.357		
3	Attitude	0.000	0.686		
4	Infrastructure	0.001	0.547		

1. Partial

a. The Effect of Knowledge on Management

Based on the results of Linear Regression analysis shows that the p-value is 0.003 < 0.05 then H1 is accepted so it is concluded that partially there is the effect of knowledge on medical waste management at the Sumenep District Health Center.

b. Influence of Attitude on Compliance

Based on the results of Linear Regression analysis shows that the p-value 0.000 < 0.05 then H0 is rejected and H1 is accepted so it is concluded that partially there is the influence of attitude on medical waste management at the Sumenep District Health Center.

c. The Effect of Motivation on Compliance

Based on the results of Linear Regression analysis shows that the p-value is 0.001 < 0.05 then H0 is rejected and H1 is accepted so it is concluded that partially there is the influence of infrastructure on medical waste management at the Sumenep District Health Center.

2. Simultaneous

Based on the results of Multiple Linear Regression analysis shows that with a p-value of 0.000 < 0.05 then H1 is accepted so it can be concluded that simultaneously there is the influence of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center with a magnitude of influence 86.7%.

DISCUSSION

Knowledge of medical waste officers in sumenep district health center

The results showed that almost half of the respondents had knowledge of the high category as many as 63 respondents (63%). In addition, a number of 31 respondents (31%) have moderate category knowledge. Meanwhile, 6 respondents (6%) have low category knowledge.

Knowledge is an impression in the human mind as a result of using the five senses. Knowledge is the result of human sensing, or the result of someone knowing about objects through their senses (eyes, nose, ears, and so on) (Notoatmodjo, 2013). According to Hendra (2013) knowledge is also influenced by sources of information. Information can be obtained from various sources, namely the mass media, health workers as well as from friends and family.

Factors that influence knowledge are socio-economic, culture (culture, religion), education, experience. Education is an effort to provide knowledge so that positive behavior changes occur. The higher a person's knowledge, the better his behavior will be (Notoatmodjo, 2012).

According to Asrini et al (2012) the factors that influence knowledge in society are socioeconomic, culture (culture and religion), education and experience. Behavior based on knowledge is enduring. Knowledge is divided into six stages, namely knowing, understanding the application of analysis, synthesis, and evaluation, so that it can be understood that to form good behavior one must reach the level of application.

According to researchers, knowledge is the basis for someone to do something. If the knowledge is good, then what will be done will be directed, while if the knowledge is lacking, what will be done tends to be undirected. Based on the results of the study, it was found that many officers who had knowledge of medical waste were in the high category where this was due to the effectiveness of the education program and health worker actualization program carried out by the Sumenep district health office. However, there are still some respondents who have less knowledge about medical waste in the category where this is due to the lack of willingness of the health workers to want to learn more about medical waste and its proper and proper management.

Attitude of medical waste officers in sumenep district health center

The results showed that almost half of the respondents had a moderate category attitude as many as 59 respondents (59%). In addition, a number of 33 respondents (33%) had a moderate attitude category. Meanwhile, a number of 8 respondents (8%) had an attitude of less category.

An individual is very closely related to their respective attitudes as their personal characteristics. Attitude in general is often interpreted as an action taken by an individual to respond to something. The notion of attitude is explained by Saifudin Azwar (2010) attitude is defined as a reaction or response that arises from an individual to an object which then raises individual behavior towards the object in certain ways.

Gerungan (2014) also describes the notion of attitude or attitude as a reaction to the views or feelings of an individual towards a particular object. Although the object is the same, but not all individuals have the same attitude, it can be influenced by individual circumstances, experiences, information and the needs of each individual is different. A person's attitude towards the object will shape the individual's behavior towards the object.

Human attitudes are not formed since humans are born. Human attitudes are formed through social processes that occur during their lives, where individuals get information and experience. This process can take place within the family, school or community. When there is a social process there is a reciprocal relationship between the individual and his surroundings. The existence of these interactions and relationships then forms a pattern of individual attitudes with their surroundings. Saifudin Azwar (2010) describes the attitude-forming factors, namely: strong experience, the influence of other people who are considered important, the influence of culture, mass media, educational institutions and religious institutions, the influence of emotional factors.

According to researchers, attitude is the response of someone who is still closed to a stimulus or object. The manifestation of that attitude cannot be directly seen, but can only be interpreted beforehand from closed behavior. Attitudes will be more easily formed if the personal experience occurs in situations that involve emotional factors. Based on the results of the study, it was found that most of the respondents had good attitudes but there were still some respondents who had less

attitudes. The lack of attitude of the respondents is due to the lack of motivation of respondents to want to manage medical waste properly and correctly.

Medical waste management facilities at the sumenep district health center

The results showed that almost half of the respondents had infrastructure in the good category as many as 61 respondents (61%). In addition, a number of 32 respondents (32%) have adequate infrastructure facilities. While a number of 7 respondents (7%) have infrastructure in the category of less.

Public health center waste is all solid or wet waste originating from public health center activities, both medical and non-medical activities, which are likely to contain microorganisms, toxic chemicals, and radioactivity. If not handled properly, public health center waste can cause problems both in terms of service and aesthetics in addition to causing environmental pollution and becoming a source of disease transmission (nosocomial infections) (Gianto, 2014).

Handling of medical waste is one of the processes of movement and supervision/control of an activity by using resources to achieve the goals that have been set. Consists of sorting, storing, collecting, storing, transporting waste and destroying it. Qualifying for waste handling has a process of movement and supervision/control of an activity by using resources to achieve the goals that have been set (Hustiani, 2016).

Collection, transport, processing, recycling or disposal of waste materials. This sentence usually refers to waste materials that are generated from human activities, and are usually managed to reduce their impact on health, the environment or beauty. Waste management is also carried out to restore natural resources. Waste handling can involve solid, liquid, gas and radioactive substances with special methods and skills for each type of substance (Anonymous, 2014).

According to researchers Facilities and infrastructure are important elements to support the success of an activity. Facilities and infrastructure refer to a set of things that are used to assist the process of activities so that the objectives of these activities can be achieved. Based on the results of the study, most of the respondents have good infrastructure facilities where all equipment for medical waste management is available from the public health center or in collaboration with third parties to help manage medical waste. However, there are still some respondents who have infrastructure facilities in the category of less where this is because the incinerator used is sometimes damaged and causes medical waste to accumulate quite a lot.

Medical waste management at the sumenep district health center

The results showed that most of the respondents had good medical waste management as many as 58 respondents (58%). In addition, 35 respondents (35%) had medical waste management in the sufficient category. Meanwhile, 7 respondents (7%) have medical waste management in the poor category.

Health center medical waste sorting is a type of waste sorting place that is available and used at the public health center. Qualify if the sorting place used is not polluting the air, water, or soil, does not cause fire, does not cause odor, and meets the requirements from an aesthetic point of view (Jatmiko, 2011).

The public health center waste container is a type of waste container used in the public health center. The material used is not waterproof, tightly closed, easy to clean, easy to empty or transport, equipped with plastic bags, resistant to sharp and pointed objects and evenly distributed in every part (Hendra, 2013).

Collection is an effort to collect waste originating from various sources of medical waste in each section or room at the public health center, then take it to a temporary shelter. Qualified to use closed carts, collection is carried out based on the type of waste, garbage collection is carried out every day, nothing is scattered at the time of collection, waste is transported directly to the TPS. Medical waste collection is a medical waste collection process that starts from a medical waste collection site from a waste source to a temporary collection point or directly to a final disposal site. Taking medical waste more often the better, it's just that the cost is not small and is not effective and efficient (Hersina, 2012).

Temporary shelter (TPS) is a place used to store or place medical waste before it is transported by the City cleaning service to the final disposal site. Qualified if there is no trash

scattered around the TPS, easy to empty and clean, placed in an area that is easily accessible to officers, must be closed and watertight and not easy to leak in order to avoid the reach of insects, rats and other animals, only temporary and must not be more than one day. Temporary shelter is urgently needed before waste is disposed of (Sulistya, 2015).

Medical waste transportation is the activity or activity of bringing waste from TPS to final disposal sites. Meets the requirements not to disturb the road at the public health center, the trolley used in it must be flat and watertight, easy to clean and empty, the garbage in the container is easily transported to the trolley and transferred to the TPA (Herlambang, 2015).

Medical waste bags are collected and separated according to their color code at the same time. Medical waste from non-clinical sections, for example, is taken to the compactor, medical waste from the clinic section is taken to incinerators. Transportation by special vehicles (perhaps in collaboration with the Public Works Department) the vehicles used to transport medical waste should be emptied and cleaned every day, if necessary (for example if there is a leak of medical waste bags) cleaned using a chlorine solution (Fikri, 2014).

Most of the medical and similar waste is destroyed by incinerator or by using the sanitary landfill method. This method is used depending on specific factors in accordance with the institution, applicable regulations, environmental aspects that affect the community. Incinerator is a term used to describe the combustion process carried out in a double chamber incinerator which has a mechanism for strict monitoring and control of combustion parameters (Hendro, 2011).

According to researchers, medical waste is waste that is very dangerous if it contaminates the surrounding environment. Good waste management can minimize the impact of environmental pollution. The emergence of various kinds of diseases and environmental damage is the result of the accumulation of waste by human activities that are not managed properly. Based on the results of the study, it was found that most of the respondents had good medical waste management but there were still some respondents who had medical waste management in the poor category where this was due to the respondent's lack of knowledge in understanding the dangers of medical waste for human survival. In addition, it is also caused by the attitude of health workers who do not take the safety of medical waste seriously. And also due to the lack of supporting infrastructure.

The effect of knowledge on medical waste management at the sumenep district health center

Based on the results of Linear Regression analysis shows that the p-value is $0.003 < 0.05$ then H_1 is accepted so it is concluded that partially there is the effect of knowledge on medical waste management at the Sumenep District Health Center.

According to Bahtiar et al (2013) knowledge is formed by being influenced by several factors that can be classified into two parts, namely internal and external factors. Internal factors include age and intelligence, while external factors include education, environment, experience, information, and people who are considered important. Education as an external factor forming knowledge by looking at the results of research that the level of knowledge of students in disposing of medical waste is mostly sufficient, namely 60% of D3 graduates, compared to 30% of undergraduate graduates. The lower a person's education, it will hinder the development of a person's attitude towards the acceptance, information and values he has just introduced. Conversely, the higher a person's education, the easier it is to receive information.

The internal factor that affects knowledge is age, where the older a person gets, the less the power of capturing information will be. This is proven in this study that respondents aged 36-40 are much more, namely 50% compared to respondents aged 20-25, namely 10%. This indicates that knowledge-forming factors, both internal and external, affect a person's level of knowledge (Susanti, 2013).

Non-medical waste has characteristics such as waste generated by the household environment and the community environment in general. This non-medical waste in the Public health center environment can come from offices/administration, service units, nutrition units/kitchens and yards (Depkes RI, 2017). Medical waste is waste originating from medical services, dental care, pharmacy or the like, research, treatment, care or education that uses materials that are toxic, infectious, dangerous or can be dangerous, unless certain safeguards are carried out (Adisasmito, 2017).

According to the researcher, a person who works in the field of public service must master his field of work well. Moreover, the field of handling and managing toxic and hazardous materials that

are in the former use for patients or commonly called medical waste must be managed properly. Good management does not escape the high knowledge of how to manage medical waste properly and correctly. Where in accordance with the results of the study, namely the influence of knowledge on the management of medical waste in all health centers in Sumenep Regency.

The influence of attitudes on medical waste management at the sumenep district health center

Based on the results of Linear Regression analysis shows that the p-value $0.000 < 0.05$ then H_0 is rejected and H_1 is accepted so it is concluded that partially there is the influence of attitude on medical waste management at the Sumenep District Health Center.

Health center waste is considered as a link in the chain of spread of infectious diseases. Waste can be a place for disease organisms to accumulate and become a nest for insects and rats. Besides that, the garbage also contains various toxic chemicals and sharp objects that can cause health problems and injury. Dust particles in the waste can cause air pollution which will spread germs and contaminate medical equipment and food (Depkes RI, 2017). Health center waste can be divided into non-medical waste and medical waste.

Waste sorting management can be interpreted as a process of waste management activities starting from effective resources starting from sorting, collecting, storing, transporting to destroying through environmental management organizational control, so that it can achieve the goals or targets that have been set, namely a waste-free environment. Santoso, 2013).

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Garbage is usually stored in waste production sites for some time. For this reason, each unit should be provided with a shelter with a shape, size and quantity that is adapted to the type and amount of waste as well as local conditions. Garbage should not be left in the shelter for too long. Sometimes the waste is also transported directly to the block shelter or disposal site. Storage of medical waste must be in accordance with the tropical climate, namely the rainy season for a maximum of 48 hours and the dry season for a maximum of 24 hours (Depkes RI, 2004).

According to researchers in the management of medical waste there is a great risk of work accidents or environmental pollution due to poor management. The attitude of an officer who is responsible for medical waste management must be able to ensure that medical waste is managed properly, namely by carrying out routine checks ranging from waste sorting, waste collection to medical waste collection. The full responsibility lies with the health workers in charge of these fields, so that a good attitude by the officers can build a good and effective medical waste management. So in accordance with the results of the study, namely the influence of attitudes on the management of medical waste in all health centers in Sumenep Regency.

The effect of infrastructure on medical waste management at the sumenep district health center

Based on the results of Linear Regression analysis shows that the p-value is $0.001 < 0.05$ then H_0 is rejected and H_1 is accepted so it is concluded that partially there is the influence of infrastructure on medical waste management at the Sumenep District Health Center.

Medical waste is various types of waste produced by public health center and health service units which can endanger and cause health problems for visitors, the community, especially the officers who handle it. (Ministry of Health RI, 2012).

The Public health center is a technical implementing unit from the district/city health office located in the sub-district area to carry out operational tasks for health development. The construction of Public health center in each sub-district has a very important role in maintaining public health (Sumenep District Health Office, 2019).

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In the profile, it is revealed that there are 30 health centers in Sumenep Regency, and of which 30 are nursing health centers and 0 non-maintenance health centers, with a total of 461 beds (TT) (Sumenep Regency Health Office, 2019).

Based on 2019 data from the HRK (Health Human Resources) section, the number of sanitarian/health workers at the public health center is 30 people and the number of cleaning services is 92 people. So the public health center officers are involved and play a major role in the management of medical waste starting from the stages of sorting, collecting, storing, transportation, to final waste disposal/destruction (Sumenep District Health Office, 2019).

According to researchers, medical waste management by officers is very important given the high vulnerability to danger from medical waste if it is polluted to the environment. Good management must be supported by the completeness of existing infrastructure. Infrastructure for medical waste management starts from trolleys of trash cans with different colors ranging from organic waste or wet waste with red bins, plastic waste or dry waste with green bins and then for medical waste with yellow bins covered with plastic bags on the sides. in the trash. Then also with the existence of a special safety box for medical waste syringes. Officers must also be equipped with personal protective equipment ranging from the common things, namely gloves and masks. Medical waste must be collected prior to waste disposal.

CONCLUSION

1. Most of the respondents have knowledge of the high category as many as 63 respondents (63%).
2. Most respondents have sufficient category attitude as many as 59 respondents (59%).
3. Most of the respondents have infrastructure in the good category as many as 61 respondents (61%).
4. Most respondents have medical waste management in good category as many as 58 respondents (58%).
5. Exist the influence of knowledge on medical waste management at the Sumenep District Health Center.
6. Exist the influence of attitudes on medical waste management at the Sumenep District Health Center.
7. Exist the effect of infrastructure on medical waste management at the Sumenep District Health Center.

SUGGESTION

1. For Respondents
It is hoped that respondents will be better at managing medical waste so that Sumenep Regency can fully have good medical waste management to the maximum.
2. For Other Researchers
It is hoped that further researchers need to deepen and add more research on the influence of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center.
3. For Educational Institutions
It is hoped that educational institutions can use the results of this study as learning input in the influence of knowledge, attitudes and infrastructure on medical waste management at the Sumenep District Health Center and can be redeveloped for further research to be more useful for readers and researchers.

ACKNOWLEDGMENT

I solemnly declare that to the best of my knowledge, in this thesis there is no scientific work that has been submitted by another person to obtain an academic degree at a university, and there is no work or opinion that has been written or ordered by anyone. others, except those quoted in this manuscript and mentioned in the citation sources and bibliography.

CONFLICT OF INTEREST

In this study, there is no interest whatsoever concerning myself or with other institutions other than the Indonesian Strada Institute of Health Sciences, Kediri City.

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