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THE CAUSES AND EFFECTS OF IMPROPER WASTE MANAGEMENT IN HOSPITALS: A CASE STUDY OF HAUNA DISTRICT HOSPITAL IN ZIMBABWE, 2023.

BY

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A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN HEALTH SERVICES MANAGEMENT IN THE COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCE

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ABSTRACT

This dissertation explores the causes and effects of improper waste management in hospitals, with a focus on Hauna District Hospital in Zimbabwe. Improper waste management poses a huge challenge to many hospitals. Hauna District Hospital (HDH) has not been exempted from this problem and thus the need to investigate the causes and effects of improper waste management at the hospital. The improper disposal of waste poses a significant risk to health care workers and patients thereby leading to increased transmission of diseases and infections. HDH has waste handlers who are in charge of handling waste and (EHTs) to facilitate on waste management. However, there are still health problems associated with improper waste management being recorded at the hospital. The purpose of the study was to examine the types of waste generated, causes and effects of improper waste management at HDH from August 2021 to December 2022 and identify possible solutions. The study employed a case study design, in which qualitative research approach was used. The selected design gave the researcher an in-depth understanding of phenomena. The target population for this research were health care workers of the hospital. The study had a total of 19 participants and data was collected through interviews, observations and questionnaires. The data was analyzed through thematic and context analysis. Purposive and simple random sampling were used to select the key informants for this study. The research findings revealed that HDH generates different types of waste including syringes, chemicals, papers, food stuffs, bottles just to mention a few. The study also revealed that HDH has limited resources allocated for waste management as one of the main causes to improper waste management. These factors have resulted in a range of adverse effects, including an increased risk of infections, environmental pollution, and occupational hazards for hospital staff members. The study concludes by recommending the adoption of effective waste management practices, increased funding for waste management, and training of healthcare practitioners on proper waste management. Overall, the study contributes to the literature on effective waste management strategies, highlighting the need for comprehensive WM policies and practices in healthcare settings.

Key words: causes, effects, waste management.

DECLARATION

I Triphina Mazwanga student number 190600 hereby, affirm that this dissertation entitled '*The Causes And Effects Of Improper WM In Hospitals: A Case Study Of Hauna District Hospital In Zimbabwe,2023''* is my own original work and that it has never been submitted to any University or higher learning institutions for the award of a degree course. All the works that are not mine have been acknowledged.

…Triphina Mazwanga…	……	…30/01/2023…
Student	Signature	Date
……	…….	…….....
Supervisor Full Name	Signature	Date

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DEDICATION

I dedicate this work to my sponsors Kathy and Simon who have been providing everything necessary for my education in order for me to achieve my Bachelor's Degree. I also dedicate it to my loving parent have been my source of strength each time I felt like giving up.

LIST OF ABBREVIATIONS

AUREC	Africa University Research Ethics Committee
DMO	District Medical Officer
DHSA	District Health Services Administrator
EHT	Environmental Health Technician
HSA	Health Services Administrator
HDH	Hauna District Hospital
WM	Waste Management

DEFINITION OF KEY TERMS

Incinerator: An incinerator is a facility that thermally treats waste materials by burning them at high temperatures, thereby reducing the volume and hazardousness of the waste. (US EPA, 2021)

Medical waste: Medical waste refers to any waste generated in healthcare facilities, such as hospitals, clinics, veterinary offices, dental practices, and research facilities that may contain infectious materials or other types of hazardous waste. (WHO, 2021)

Waste: Waste refers to any unwanted or discarded material, substance, or product that is no longer useful or valuable to the person who produced it. (EPA, 2021)

WM: WM encompasses all the activities and measures undertaken to reduce, collect, transport, treat, dispose of, and monitor waste materials in a safe, efficient, and environmentally responsible manner. (UNEP, 2021)

Waste segregation: Waste segregation is the process of separating different types of waste, such as recyclable, hazardous, or organic waste, from each other at the source of generation, in order to facilitate their proper treatment, disposal, or recovery. (SEPA, 2021)

WM policy: refers to a set of guidelines and regulations aimed at reducing, controlling, and managing waste generated by human activities. Such policies are essential in promoting efficient waste disposal methods, protecting the environment, and ensuring public health and safety (EPA, 2019.

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CHAPTER 1 INTRODUCTION

1.0 Introduction

This chapter of the research study seeks to investigate the Causes and Effects of Improper WM in Hospitals especially at Hauna District Hospital. It Chapter presents the following; background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitations of the study and delimitation of the study.

1.1 Background of the Study

Hauna District Hospital (HDH) was constructed in 1998 but became fully operational in 1999. It is located in Honde valley, 100km from Mutare, 30km from DC Mutasa off Nyanga road in Zimbabwe. The hospital is headed by a District Medical Director (DMO). It has a number of departments which includes the laboratory, x-ray. Administration, and the theatre just to mention a few.

Hauna district hospital like many other health facilities is facing the challenge of WM. It is currently facing challenges of disposing bio hazardous waste due to the fact that the hospital incinerator is not in use. This forces the waste handlers to dispose hazardous waste in the same pit as the waste from the kitchen and other general waste which is then burnt thereby causing air pollution. The waste zone area is close to the residents so it is easy for children to pick on waste such as infected sharp objects which when used may transmit diseases such as HIV/AIDS, hepatitis B and C.

1.2 Problem Statement

The problem of WM at Hauna district hospital is a great concern because despite the many efforts made by the government and other relevant stakeholders in an attempt to solve the problem of improper WM, the crisis still persists to this day and little is known about the causes and effects of improper WM let alone the possible and immediate solutions to be put in place. It is for this reason that the researcher decided to explore more on the cause and effects of improper WM at HDH and try to critically investigate what could be the possible solution to this problem. HDH does not have the recommended methods for waste treatment and disposal of the waste that is generated on a daily basis. The different kinds of waste generated at the hospital is disposed of in the pit meant for general waste due to the fact that the incinerator meant for biohazards waste is currently not operational.

1.3 Purpose of the Study

The purpose of the study was to investigate the type of waste generated, causes and effects of improper WM at Hauna district hospital from august 2021 to December 2022 and identify possible solutions.

1.4 Research Objectives

The study was guided by the following specific objectives:

- To describe the types of waste generated at Hauna District Hospital from August 2021 to December 2022.
- To explore the causes of improper WM at Hauna District Hospital from August 2021 to December 2022.

- To ascertain the effects of the improperly managed waste at Hauna District Hospital from August 2021 to December 2022.
- To establish the realistic answers or solutions to the causes and effects of improper WM at Hauna District Hospital from August 2021 to December 2022.

1.5 Research Questions

- What type of waste is generated at Hauna District Hospital?
- What are the causes of improper WM at Hauna District Hospital?
- What are the effects of the improperly managed waste at Hauna District Hospital?
- What are the solutions to the causes and effects of improper WM at Hauna District Hospital?

1.6 Significance of the Study

The policy makers and those with the authority to make decisions stated that the study was helpful as it made them realize the gaps that are there in WM and how to utilize the available resources channeled towards WM. The waste handlers had an appreciation on the need to manage the waste properly after having understood the negative effects that improper WM has on the health of humans as well as the impact on the environment.

1.7 Delimitation of the Study

The research was conducted at Hauna District Hospital which is situated about 100 km away from Mutare. The study looked at the period from August 2021 to December 2022.The participants included the health care workers such as waste handlers, the district

medical officer, the health services administrator, the EHTs and 1 representative from each of the following departments; procurement, accounts, human resources, pharmacy and laboratory services. However, the health services administrator was transferred to another hospital thereby not taking part in the study.

1.8 Limitations of the Study

The study was conducted at Hauna District Hospital and purposive sampling was used which is liable to bias. Some of the participants were not able to fully elaborate as they had limited time and had commitments to their work looking at the nature of their jobs.

The researcher had challenges in terms of limited time as there was no period set aside to collect data and being a final year the researcher had other university courses which the researcher was learning. The other challenge was about the budget. Unfortunately, the researcher was unable to fully fund the study so financial resources were insufficient to make necessary travels and to print questionnaires.

1.9 Summary

The chapter outlined the background to the study stating clearly the magnitude of the problem of WM in hospitals in Zimbabwe. It has also outlined the problem of WM at HDH elaborating the actual problem on ground. The delimitations were clearly stated as well as the limitations faced by the researcher when conducting the research.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter has focused on the literature review of the study which has based its findings from the research goals and objectives of the study in relation to what was already been studied or written by other scholars. It is based on the theoretical framework outlined as Theory of WM. It also clearly stated the relevance of the theoretical framework to the study. Views of different scholars were outlined on the causes, effects and possible solutions to improper WM.

2.1 Theoretical Framework

The study was based on the Theory of WM which presented a more in-depth account of the domain and contains conceptual analyses on the causes and effects of waste, the activity upon waste, and a holistic view of the functions and goals of WM. A conceptual description of WM was offered, providing novel, dynamic definitions of waste and WM. It was asserted that when one is looking for a scientific systematization, and ultimately aiming at establishing an explanatory and predictive order among the domain problems of WM, a theory is required, (Pongrácz, 2002). It is for this cause that the theory of WM was deemed relevant for this dissertation which offered a scientifically founded and optimal choice of WM options at Hauna district hospital.

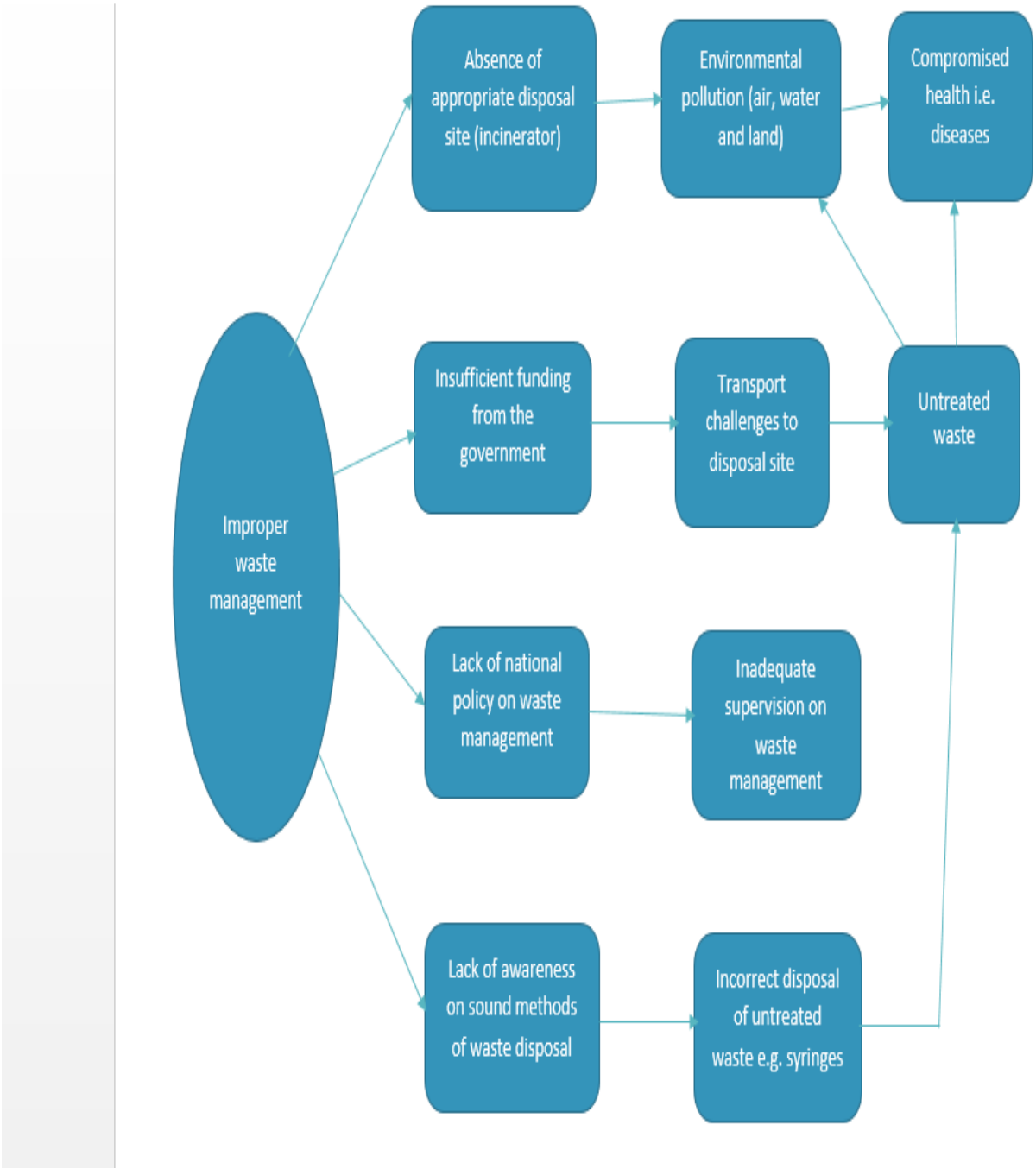

Figure 1: WM theory showing the causes and effects of improper WM at HDH.

2.2 Relevance of the Theory

By using the WM theory, it made it easy for the researcher to have a broader scope of understanding on the causes and effects related to improper WM as can be deduced from figure 1. The above figure succinctly brought to light the causes and effects of improper WM at Hauna District hospital. In this way, it was facilitated the researcher in achieving the objectives on the causes and effects of improper WM and their impacts to the surrounding environment and the community thereby assisting in finding the immediate potential solutions.

2.2.1 The Types of Waste Generated in Hospitals

Hospitals generate a variety of waste which can be harmful to both humans and the environment. One of the types of waste generated is general waste which is regarded as non-hazardous and includes food waste, paper and packaging materials. This type of waste accounts for the largest proportion of waste generated (Kumar et al. 2013). Sharma et al.(2014) added that there are also pharmaceutical wastes which includes expired drugs and chemotherapy agents. Another type of waste is radioactive waste which includes items that are contaminated with radioactive materials such as gloves, gowns and syringes use in nuclear medicine procedures (Aghilinejad et al. 2015).

Waste can also be hazardous, this type of waste contains items that are toxic, flammable, or reactive such as chemicals and electronic equipment and they account for approximately 5% of the total waste generated in hospitals (karamouz et al. 2015). Waste can also be generated from treatment of patients with infectious diseases such as tuberculosis, hepatitis and HIV. This type of waste is called infectious waste and accounts

for approximately 10 % of the total waste generated (Saini et al.2016). In addition, Saini et al. classified waste as sharps which includes needles, lancet and other objects that can puncture the skin.

2.2.2 The Causes of Improper WM.

Improper WM has for many years been a public health concern which needs critical understanding of the causes if solutions are to be found. Various scholars have identified many causes of improper WM especially in hospitals. The WHO, (2000) outlined a number of causes to improper WM and among them included the lack of awareness on the negative effects of improper WM. The document states that many people including health care providers along with patients are unaware of the outcomes of not managing waste which as a result makes them act ignorantly to this cause. However, the gap which the researcher identified in this document is that it did not specify which health care providers needed awareness on the causes to improper WM and it also did not state the need to raise awareness to the garbage collectors let alone the local people.

Another important cause of improper WM as argued by the Centers for Disease Control and Prevention (2012, August), is the insufficient allocation of both financial and human resources. Many hospitals are unable to finance for the transportation of medical waste to areas of disposal, treatment or to construct recommended incinerators to burn the hazardous wastes whereas in other cases the human resources in charge of WM is insufficient to handle the amount of waste generated. The absence of a national policy for WM is also a cause for improper WM as it should give guidance on WM strategies so as to ensure a safe environment for all. The study is relevant to the entire health sector despite

not giving an estimated amount of funds and human resources needed for a hospital to run with the minimum affection from improper WM.

2.2.3 Effects of Improper WM.

Akter, (2000), pointed out that medical waste is generated in healthcare facilities during treatments, immunization, diagnosis of patients and other hospital activities which pose a threat to the health of heath staffs, patients, waste handlers and the general public when it is improperly managed. The strength of this study is that it mentions the importance proper WM and other tedious effects related. However, it does not have anything in it to do with what can be done to alleviate the detrimental effects. The current study aims to fill this existing gap in the extant knowledge.

Taylor, (2016), noted that when waste is left without proper treatment at the waste site, it may be washed away into water sources thereby contaminating it, the same water is used by the general public resulting in development of sickness and ailments which are water borne diseases such as typhoid, bilharzia, cholera, worm infections and diarrhea from consuming food contaminated with bacteria. When general and infectious waste are treated together that is by burning especially in open pits, harmful gases are emitted into the atmosphere which pollutes the air. These gases when inhaled can cause respiratory diseases such as bronchitis, pneumonia, pulmonary fibrosis, asthma and skin diseases such as eczema and atopic dermatitis. Additionally, (Garba et. al, 2013) also reported that improper WM can lead to the spread of blood borne diseases such as HIV/AIDS and Hepatitis through sharps-inflicted injuries. In this study, challenges that lead to improper WM were not included. Hence, the need for this research to fill in the gap in the present study.

2.2.4 Solutions to the Causes and Effects of Improper WM.

Promoting appropriate education and training on proper WM goes a long way in solving the causes and effects of improper WM. Anyone who may come in contact with waste needs to be educated on the negative effects waste poses on their health and the environment and health care workers must be trained on all processes of WM (Adams, 2014). However, Manyele, (2004) argued training should not only be focused on those health staff who handle waste but must include all health staff who are involved in waste generation such as doctors, nurses, laboratory staff and others in order to make the training effective with the desired outcomes. This study apart from education did not address the need for enough funds to facilitate all processes.

Establishment of medical WM regulations which clearly stipulates the rules and regulations on WM from the point of generation to final method of disposal is very essential if waste is to be managed and mitigate the adverse effects it has on health care workers, patients and the general public (Manyele V. 2004). The study did not emphasize the need for a positive work culture for all the health practitioners in all points of WM as this report will.

Segregation of waste is a very important technique that may seem rather simple but a very useful factor in the management of waste. When waste is segregated according to its kind being either hazardous or non-hazardous, it becomes less toxic, reduces the volume and makes it easy to transport to the site of disposal. This can be facilitated by color coding the waste bags and labeling them clearly as to which type of waste to be disposed of there (Zarook M, 2012). Much has been studied and written regarding good WM and providing

solutions to mitigate the adverse effects thereof. However, there exists knowledge gap with regard to the insufficient financial resources on WM which happens to be one of the major causes of improper WM. This has a direct link to the useful materials that are used for WM such as bins. This is the case with HDH as it does not have enough bins plotted around the healthcare facility for specific type of waste making it difficult to fully segregate waste.

2.3 Summary

The chapter has highlighted the theoretical framework that the researcher used as well as its relevance to the study. It has also expressed what various scholars have said about the causes of improper WM which included what WHO had to say on that theme. The results of some of the related literature that the researcher has reviewed on the themes: causes, effects and solutions to improper WM have been clearly stated. The researcher will discuss on the methods of gathering data that were used in the next chapter.

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter presents methodology of the study. The qualitative approach was used in the research methodology. Essentially, this chapter looks at how the data for the study was gathered in order to answer the research questions. It includes research design, study setting, target population, population and sampling, inclusion criteria, exclusion criteria, sample size, sampling procedure, instruments for data collection, pretest, data collection procedure, data analysis and organization and ethical considerations.

3.2 Research Design

The study used a case study research design, in which qualitative research approach was used. A case study seeks to describe a unit in detail, in context and holistically (Kombo and Tromp, 2017). A case study was chosen as a design for this study because it enabled the researcher to obtain in-depth information about a phenomenon. It allowed the researcher to rely on secondary data and revised existing literature as well as both informal and formal qualitative approaches.

3.3 Study Setting

The study was conducted at Hauna District hospital where the target population is located. The hospital is in Honde valley which is about 100km away from Africa University. The hospital has been operational since 1998. The total number of staff at the hospital is 132 which has the following professions; doctors, Registered General Nurses, nurse aids, health services administrator, procurement officer, accountant, human resource officer, records and information assistant, administration assistant, executive assistant, pharmacy

technician, dispensary assistant, laboratory scientist, laboratory technologist, radiographer, x-operator, darkroom assistant, dental therapist, dental surgery assistant, rehabilitation assistant, mortuary attendant, linen checker and general hands. The hospital has the following departments; the environmental health department, x-ray department, stores department, catering, procurement, accounts, human resources department, records and health information systems department, laundry department and out patients department. The services that are offered include Promotive services such as health information, education and communication, preventive services such as family planning, monitoring and surveillance of epidemic and endemic diseases, curative services such as minor and major surgeries, rehabilitative services and dental services. In terms of waste disposal, the hospital has an incinerator for biohazard waste. However, it has not been operational since August 2021 which pose a challenge on disposal of this type of waste.

3.4 Population and Sampling

The study targeted employees that are responsible for the WM procedures either directly or indirectly involved at Hauna District Hospital.

3.4.1 Inclusion Criteria

The study included the DMO, HSA, EHT, nurse(s) in-charge, general hands, a representative from each of the following departments; accounts, human resources, procurement, pharmacy and laboratory services at Hauna district hospital. All these aforementioned health practitioners have a vital role to play where WM is concerned which is why they were chosen and took part in the study. The researcher made a site

observation and administered questionnaires to the respondents in order to obtain the primary data.

3.4.2 Exclusion Criteria

All participants that are not directly or indirectly involved in WM procedures among them patients and cooks and all other staff who are not employed at Hauna District Hospital were excluded in the study.

3.5 Sample Size

The study had 1 DMO, 1 HSA, 1 EHT, 6 nurse in-charge, 5 general hand, 1 representative from each of the following departments; accounts, human resources, procurement, pharmacy and laboratory services. The sample size had 19 participants intended for the study.

3.6 Sampling Procedures

Purposive sampling particularly typical case sampling was used in this study to select key informants such as the DMO, EHT, and HSA. A typical case sampling is a type of purposive sampling in which one or more individuals are selected to provide a local profile. Meanwhile, nurse(s) in-charge, representatives from five departments and general hands were selected using simple random sampling. Simple random sampling was employed because it allowed all the participants in a research site to have an equal chance of participating in a study which as a result minimized biasness. In using simple random sampling, all the nurses were made to pick random numbers and those who picked the

sixth became the participants in order to collect data for the study. The same process was applied to the representatives from each department.

On the part of the general hands, they were put in one place respectively and random numbers were made from 1 up to 15 because there are 15 general hands at the hospital and every participant who picked a third number qualified to be part of the sample and. According to Creswell (2012), purposive sampling targets only the people believed to be reliable for the study. Kombo and Tromp (2006), asserts that when the desired population for the study is rare or very difficult to locate and recruit for a study, purposive sampling may be the only option.

3.7 Data Collection Instruments

The accomplishment of the research objectives of this research study was done through data collection. The researcher employed primary and secondary data collection instruments. Data was collected using open-ended questionnaires which were administered to the DMO, HSA, EHT, nurse(s) in-charge, general hands and representatives from five departments. The researcher made a list of open ended questions that were divided in themes that facilitated the achievement of the research goals. The themes were; types of waste generated, causes of improper WM, effects and possible solutions to improper WM. Face to face interviews were also done with the help of the interview guide which had a total number of nine questions to supplement the responses from respondents. Participant observation was also done on the general hands as this method is applicable during the field work and necessary in identifying phenomenon such

as methods of collecting solid wastes and how they are managed and disposed of. It provided primary data used to supplement data from other sources like questionnaires, particularly obvious phenomena which the researcher could record upon observation.

3.8 Pre-test

A pretest was conducted at Africa university clinic. The participants included 1 administrative staff, 1 sister in-charge and 1 general hand. A pretest was conducted in order to check the validity and reliability of the data collection tools before they could be used at HDH.

3.9 Data Collection Procedure

First of all, the researcher went ahead and obtained a research permit or approval from Hauna District Hospital through the office of the District Medical Officer. Approval was then given from Africa University Research and Ethics Committee (AUREC). This was done through the provision of a letter of approval from the committee.

During data collection, the researcher explained the significance of the study and why the chosen participant was an important participant in the study. The participants stated their willingness to participate and gave their informed consent. The participants were told that their participation in the study was completely voluntary and that they might leave at any time and confidentiality was assured to them. Open-ended questionnaires were distributed to the DMO, HSA, EHT, nurse(s) in-charge, general hands and representatives from five departments as listed under the inclusion criteria. When the respodents had filled in the

questionnaires, they were collected from them. The researcher observed the general hands during their time of waste collection and disposal.

3.10 Data Analysis and Organization

Data analysis is a systematic search for meaning in data which can be communicated to others. Hatch (2015), states that analysis means organizing and interrogating data in a way that enables the researcher to see patterns, identify themes, discover relationships and make interpretations or generate theories. The research gatherings from the study were subjected to content and thematic analysis as the methods that were used to analyze the collected qualitative data.

3.10.1 Thematic Analysis

Thematic analysis is a method for analyzing qualitative data that entails searching across a data set to identify, analyze, and report repeated patterns (Braun and Clarke 2006). It is a method for describing data, but it also involves interpretation in the processes of selecting codes and constructing themes. A distinguishing feature of thematic analysis is its flexibility to be used within a wide range of theoretical and epistemological frameworks, and to be applied to a wide range of study questions, designs, and sample sizes. The most widely-accepted framework for conducting thematic analysis involves a six-step process: familiarizing yourself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This holistic analysis of data will be done in order to understand the issues in the study.

3.10.2 Context Analysis

Context is everything in a research for a researcher. It is the, who, what, where, when, and why of a situation or event. And it is important because it helps the researcher to make sense of things. Contextual analysis is the process of breaking down a complex issue or problem in order to better understand it (Hosam, 2021).

By looking at the different elements that make up a situation, in this the causes, effects and possible solutions to improper WM, the researcher will we see how they all fit together. This will be helpful for the researcher to find other causes, effects and possible solutions to improper WM. Conducting context analysis will also help the researcher build a more complete picture of a situation and see it from multiple perspectives.

The collected data from open-ended questionnaires, face to face interview and observations will be grouped under relevant themes or topics namely the causes, effects as well as the possible solutions to improper WM.

3.10.3 Measures to Ensure Trustworthiness, Validity and Reliability

The study will endeavor to remain credible and trustworthy. The following strategies will be employed to achieve this. The researcher will engage in crystallization and triangulation methods to ensure credibility, validity and reliability of the data that will be collected. Hemming (2018) explains that under crystallization, methods of data collection are mixed. In this study, interviews and self-administered questionnaires will be used to help give a deeper insight and holistic picture of the issues in the practices in assessment centers. In other words, triangulation of methods gives collaborative evidence from different sources.

The study will equally use member checking. According to Punch (1998), member checking means checking the script with the people who gave data. In this study, interview transcripts will be taken to the participants before and during analysis for them to check for accuracy, confirm, validate and verify information captured in scripts.

3.11 Ethical Consideration

Several ethical considerations were implemented in accordance with the guidelines and regulations of the Africa University Research Ethics Committee (AUREC). As a result, the following guidelines were followed: The researcher was granted access to the data gathering sites thanks to approval letters from the Africa University Research and Ethics Committee (AUREC) (appendix 7 and from Hauna District Hospital through the office of the District Medical Officer (DMO) (appendix 6)

More so informed Consent or Consent Based on Information, before participating, the participants were given an Informed Consent Form (Appendix 1) that included information on the purpose of the study, benefits from the study and confidentiality protection. Participant's identity and privacy, likewise the need to protect the participant's identity and privacy was done through the use numbers. Both The research adopted the use of numbers to maintain participant's privacy. And the numbers were used to maintain ethical consideration.

3.12 Summary

The methodologies and procedures that were used to investigate the causes and effects of improper WM were elaborated in this chapter. The study used a qualitative study design and purposive sampling to select the participants. The data collection instruments such as open-ended questionnaires and interview guides were used for purposes of collecting data. In order to collect data, procedures were followed which included getting permission from AUREC and study site which were done given the evidence in the appendix section. Ethical considerations that were followed have also been clearly outlined in this chapter.

CHAPTER 4 DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The findings of this study are presented in this chapter. The aim of the study was to investigate the types, causes and effects of improper waste maagenment at Hauna District Hospital and to identify posssble solutions. The data for this study was collected in line with the research objectives. The themes or headings in this chapter were generated from thematic and content analysis. This facilitated the researcher to gather informtion from the questionnaires and group it in a way that facilitated the analysis and presentation of the data collected. The presenatation and analysis is as follows:

4.2 Socio-demograghic characteristics of respondents.

Table 1: Socio-Demograghic Characteristics of Respondents.

Variables	Male	Female	Frequency	Percentage(%)
Participants	7	12	19	100%

As shown in above table (table1), all the intended 19 participants (100%) took part in the study. The participants agreed to participate in the study upon reading the informed consent and recognizing the importance of having knowledge on the causes and effects of improper WM Hauna District Hospital. According to the demographic presentation above, there are more female participants who comprise 63% as compared to male participants with 37%.

4.3 Types of Waste Generated

Table 2: Shows the Types of Waste Generated at HDH

Department	Types of Waste Generated
Wards	Sharps, syringes, chemicals, medical devices, soiled dressing, sanitary wear, food stuffs
Laboratory	Sharps, blood stool, urine, sputum samples, paper, bottles
Pharmacy	Paper, IV fluids and expired drugs
Theatre	Sharps, syringes, chemicals, medical devices, soiled dressing, sanitary wear
Administrastion	Food stuffs, plastic, paper, bottles
Kitchen	Food stuffs, plastic, paper

The shown in Table 1 above, the types of wastes that are generated at HDH have been depicted. They are classified accordig to how the participants indicated in the questionnaires. The nurses and the EHT indicated that Sharps, syringes, chemicals, medical devices, soiled dressing, sanitary wear, and food stuffs are the types of wastes that are generated from the wards. They also stated that sharps, blood stool urine sputum samples, paper, bottles are generated at the laboratory. The DMO added that waste is also generated at the theatre which includes sharps, blood stool urine sputum samples, paper,

and bottles. The HSA, Human Resources Officer, the accountant, procurement officer and the DMO indicated that at the administration department, the types of waste generated include food stuffs, bottles, plastics and paper. The general hands being the ones responsible for handling the waste mentioned all the types of wastes. All of the above types of wastes are generated at HDH and require proper management.

4.4 The causes of Improper WM

The DMO said "one of the major causes of improper WM we are facing at the hospital is the lack of sufficient funding. There are no funds that are allocated distinctively for the purposes of WM which makes it hard for us to effectively manage issues related to WM in this regard". Lack of sufficient funding was also stated by the HSA and the representatives from other administrative departments. They elaborated that the funds allocated are not enough to cater for the challenges of managing waste. They also pointed out that implementation of the national policy on WM is weak which they indicated that is also amongst the causes of improper WM. According to the EHT, there is a challenge of waste at the disposing stage, "our department is providing color coded bin liners for purposes of waste segregation, however, the different types of waste generated at the hospital are not segregated and when disposing the waste, it is combined despite the color codes which distinguish one type of waste from the other but this is being done because the incinerator is currently not functional". The nurses also stated that lack of an operational incinerator is a cause of IWM. The EHT added that there is also lack of supervision for those handling the waste and further alluded that this is in connection with the shortage number of staff at the environmental department to do the supervision on

WM. The general hands mentioned that they are not aware of the recommended methods of disposal and why it is necessary to adhere to them. They also stated that they do not have enough Personal Protective Equipment (PPE). One of the general hands said" sometimes when I am empting the bins in the morning, I have to ask from my colleagues for gloves because they are not sufficient".

4.5 The effects of Improper WM

With regard to the effects of improper WM, the EHT and the nurses indicated that they are fully aware of the effects that arise from improper WM and they indicated the effects. The nurses said that one of the effects of improper WM is that it causes a variety of diseases, including respiratory diseases such as asthma, bronchitis, and pneumonia, skin diseases such as eczema and rashes, and gastrointestinal diseases such as cholera, diarrhea and food poisoning. They also mentioned that improper WM of different types of waste like blood, syringes, sharps, stool, urine and sputum samples can lead to the spread of infectious diseases such as hepatitis, HIV/AIDS and tuberculosis.

The EHT further stated "burning of waste at the hospital releases toxic chemicals and other pollutants into the air which can be inhaled by hospital staff, patients and nearby residents which can cause respiratory diseases such as bronchitis". The EHT also said "burning also produces ash which contaminates soil and water thereby contaminating food and water sources". Two of the general hands indicated that they have had diarrhea in the past two years.

4.6 Solutions to Improper WM

The accountant, procurement officer and the HSA suggested that there is need to have funds that are allocated specifically for WM. They expressed that such funds would go a long way in situations like the one they have of the incinerator which is not working. They said that the funds would be used to maintain the incinerator or used for transporting waste to nearby incinerators. The HRO stated that there is need to recruit more staff for handling waste and in the environmental department so that there are adequate supervision of waste at all stages. The HRO also stated that there is need for training on WM at least twice every year so that if there are new or improved methods of waste disposal, they can be availed to the waste handlers. According to the general hands, they said that there is need to procure enough PPEs to reduce the chances of being infected by waste when handling waste. They also indicated that there should be enough bins so that waste can be segregated.

The DMO, EHT and the HSA proposed that there should be a policy on WM which is strictly implemented and should be known to all key staff with regard to WM.

4.7 Summary

This chapter presented the finding of the study on the types, causes, effects and possible solutions for improper WM which were in line with the study objectives. The findings show that 95% of the participants indicated the types of wastes found at HDH to be wastes from the wards, laboratory, kitchen, administration and theatre such as Sharps, syringes, chemicals, medical devices, soiled dressing, sanitary wear, food stuffs Sharps, blood stool,

urine, sputum samples, paper, bottles while 5% mentioned the types of waste generated from the pharmacy such as expired drugs. The findings also show that 37% mentioned insufficient funding and lack of and poor implementation of a national policy as causes of improper WM, 37% indicated lack of an incinerator and lack of supervision as causes and 26% indicated that insufficient PPEs are causes respectively. With regard to the effects, all the participants stated that improper WM has an effect on human life by causing diseases and pollutes the environment. Finally the findings clearly brings out the possible solutions to IWM. The need for a strong implementable policy and sufficient funding was proposed by 63% of the participants, 26% said procurement of sufficient PPEs woes a long way in WM and 11% indicated that there is need for regular staff training and recruitment of enough staff.

CHAPTER 5 SUMMARY, CONCLUSION S AND RECOMMENDATIONS

5.1 Introduction

In this chapter the researcher discusses the findings of the research study which were presented in chapter four by summarizing major findings and including the gaps identified. The researcher will also outline the limitations of the study, draw conclusions and make recommendations from the findings of the study.

5.2 Discussion

5.2.1 Types of Waste Generated

Amongst the most generated waste types include the plastics, papers, bottles and food staffs according to 50% of the respondents and this finding concurs with what Kumar et al. (2013) alluded. They reported that plastics, bottles, food staffs and papers are types of wastes generated by most hospitals and that these type of waste forms the largest proportion of waste generated and is less harmful to human health. However the latter are not true to this research in the sense that the mentioned waste types do not form the largest proportion of waste generated in some hospitals and we cannot rule out the fact that no matter the quantity and type of waste, if improperly managed it leads to diseases that are life threatening. It is therefore important to manage and dispose of all waste types and look for improved and sustainable ways of managing all waste types generated in hospitals and health facilities without overlooking its type or amount.

The other types of waste generated as postulated by the other half of respondents included medical tools, sharp syringes, surgical gloves, face masks, chemicals and expired drugs

as well as many others. This finding corresponds to what Sharma (et al. 2014) filed in their work pertaining to pharmaceutical waste, radioactive materials and chemotherapy agents among other types. These types are the most hazardous since they contain toxic, flammable and reactive substances which are very perilous to human health. Knowing well how to dispose these types of waste is just as important as eating clean and covered food (Aghilinejad et al. 2015).

5.2.2 The Causes of Improper WM

Insufficient funding is one of the major causes of improperly managed waste and it was the people from the administration that pointed out that lack of adequate funding for WM especially fuel for transportation of waste and maintenance of equipment used for WM for example repairing malfunctioned incinerators to mention one amongst many. This finding is in tandem with the CDCs august article of 2012 which stated the lack of proper allocation of funds to hospitals for transportation and construction of incinerators as some of the main causes to improper WM. What still remains unknown to this date is the minimum and possibly maximum approximate amount of funds that are needed for a hospital to manage its waste and reduce the possible detrimental effects thereof. This leaves room for further research in the future. It is important to state that a clear health policy and an act of parliament must be advocated for to ensure that there are funds always readily available to be channeled in the coffers for the sole purpose of proper WM. This research recommends enough and consolidated funding from the ministry of health to all hospitals and clinics in both urban and rural areas to ensure proper WM processes are carried out effectively.

Other respondents mentioned lack of awareness on safe and recommended WM strategies. This finding is supported by literature from the World Health Organisation's paper who attested that most waste handlers and even amongst other health personnels lack the knowledge on the right procedures of segregating waste types hence mixing up different wastes (WHO, 2000). This calls for mini and periodic workshops on WM for all health personnels to be trained on how to properly manage waste in their respective places of work. Knowledge on how to properly dispose of waste is important to minimize the effects since there are different waste types and each type needs separate treatment and disposal methods like burning, burying or recycling.

5.2.3 The Effects of Improper WM

All respondents (100%) declared a good number of diseases that fall into categories of water borne, airborne and contagious diseases in their responses on the effects of improper WM and these findings affirm the popular reports of Garba et. al, (2013) that indicated many more of such diseases to result from poor WM in hospitals. The researcher found out that the effects are not only limited to human diseases but improper WM can also adversely affect the local economy and can lead to missed recycling opportunities in the sense that there is revenue in recycling and places that do not implement proper removal and recycling of wastes miss out on this. They also miss on the resources that can be reused and on the employment opportunities that a recycling center brings. Another effect is the extreme climate changes. Decomposing waste emits gases that rise to the atmosphere and trap the heat. Greenhouse gases are one of the major culprits behind the extreme weather changes that the world is experiencing. From extremely strong typhoons,

cyclones or storms to smouldering heat, all these result from negative effects of greenhouse gases. All these are slowly killing our planet because of our careless handling of waste is harming it. Taking care of the environment is everyone's responsibility, for us, for our planet and our children.

5.2.4 Solutions to the Causes and Effects of Improper WM.

Money is not everything but everything requires money, true to this famous saying are responses from all participants who all did not leave out the need to lobby for enough funds as the most reliable solution to answer the call of the causes and effects of improper WM. This finding is in contrast to the report by Zarook, (2012) who advocated for thorough segregation of waste between hazardous and non-hazardous. From the researcher's view, there is a direct link between proper WM and financial support since the segregated waste will need to be transported from one point to another by means of a vehicle that moves on fuel that can only be bought with financial means. The bins for waste disposal need to be bought and the same can be said for the construction of the needed magnitude incinerator. Both the data from the findings and from literature needs to be used hand in hand for sustainable WM in hospitals.

Other responses proposed for a clear WM policy on waste handlers and other staffs which satisfies the literature from Manyele, (2004), who included clear establishment of WM regulations and rules for all persons that come into contact with waste to abide by. This policy should clearly state the dos and don'ts, proper disposal methods, following occupational and health safety rules when handling wastes. The policy should state the

punishment for not doing as it demands. Suffice to mention that the policy can be put in place for the entire nation to follow, but it will still come down to supervisors in all hospitals to ensure these policies are followed strictly so that waste can be disposed of in its rightful place.

Most respondents (70%) suggested training on how to handle waste as a solution and this finding is also fully backed up by Adams, (2014), who noted that anyone who may come in contact with waste needs to be educated on how to segregate, treat and dispose of waste as well as its negative effects on human health and the environment. In other words, it is highly recommended that all health care workers must be trained on all processes involved in WM to reduce the harmful effects.

5.3 Study Limitations

This study only focused on one public health care institution which was HDH and had a small sample size of 19, so it may be difficult to generalize the results to all public healthcare institutions. Some participants felt their privacy was being violated, but the investigator was required to explain the study's purpose and confidentiality policies. The researcher’s presence during data collection, which is often unavoidable especially when conducting interviews, could have affected the interviewee’s responses. A few of the hospital employees thought they were being investigated for professional misconduct, so the researcher had to explain that the study was strictly for academic purposes. However, this could have influenced their responses and resulted in biased information. The research

quality is also heavily dependent on the individual skills and more easily prejudiced by the researcher's personal favoritisms and idiosyncrasies.

5.4 Conclusions

The research was carried out at Hauna District Hospital. The response rate was 19 (100%). The study's goal was to find out the types of waste generated, causes and effects of improper WM at Hauna District Hospital and identify possible solutions. The study employed a case study research design, in which qualitative research approach was used as it enabled the researcher to describe the occurrences in prodigious details. Purposive sampling and simple random sampling were used to select suitable participants required for the study. Purposive sampling is a non-probability sampling that is based on characteristics of a population and the objective of the study. Simple random sampling is a method where subsets of individuals are chosen from a larger population. Open ended questionnaires were used as data collection instruments and were administered to the informants. The researcher sought permission from HDH being the study area and an approval letter from AUREC to go on ahead with the data collection procedure. Informed consent was gotten from all the participants and confidentiality was assured to them. Thematic and contextual analyses were used in this research as tools for data organisation and analysis. Thematic analysis is a method for analyzing qualitative data that entails searching across a data set to identify, analyze, and report repeated patterns. Context analysis is the process of breaking down a complex issue or problem in order to better understand it. The data from the participants was presented, analyzed and discussed according to the themes; types of waste generated, causes and effects of improper WM

and the possible solutions. The findings from study indicated that there are different types of wastes generated at HDH such as fluids, chemicals, papers, bottles, sharp syringes, medical devices and many more. From the findings, lack of funding, insufficient knowledge on how to correctly dispose of waste, and absence of clear policy are the prominent causes to improper waste controlling. Mentioned on the effects is the transmission of life threatening diseases such as HIV/AIDS, bronchitis, diarrhea, and other diseases that result from poor waste handling. The effects have been discussed to go as far as affecting the environment, human productivity and the economy.

The suggested solutions to the causes and effects from this report have included adequate funding to hospitals, trainings to be undergone by all health personnel that come into contact with waste, and formulating a clear policy on WM by the ministry of health.

From the findings, the researcher concludes by saying that most waste generated at HDH is improperly managed, untreated and disposed of in open dumbs. Left unmanaged, the growing volume and changing composition of waste including non-biodegradable and plastic waste will continue to contribute to an increase in greenhouse gas emissions and global and local land and water pollution, which affect the health and welfare of impoverished people disproportionately. Waste from HDH should be managed through a waste hierarchy approach that puts efforts to reduce consumption and increase reuse ahead of efforts focused on waste collection, recovery, and disposal.

5.5 Implications to the Practice

This research investigated a public health problem at HDH and provided information that will help to improve the efficiency and effectiveness of hospitals' WM system. If the findings of this study are successfully addressed and the recommendations are implemented, it will help to enhance best WM practices at HDH which will lead to the provision of healthcare services in a clean, healthy and safe environment, as well as reducing the exposure of healthcare workers and the public to health hazards that result from poor WM such as injuries, infections, and other toxic effects, as well as reducing environmental pollution. It is hoped that the findings of this study will not only help HDH to improve the efficiency and effectiveness of its current WM system, but all the public hospitals and clinics in the whole country, as well as provide valuable insights for other researchers. The findings of this study will also help the ministry of health and policy makers to identify practical interventions in evaluating and implementing strategies to enhance WM services. It will also draw the attention of healthcare donors, partners and agencies to see worthwhile investing opportunities to promote environmental and public health safety a priority.

5.6 Recommendations

Recommendations to the Hospital Administration

The Hospital administration which includes the DMO, HSA, EHT, nurse in-charge and Department Representatives, should formulate a WM Policy which stipulates the following: Types of waste generated in all departments, proposed methods of waste segregation, Quantifying instruments and waste registers, Waste handling

and transportation processes, and Methods of disposal. The formulated policy must be enacted to all staff and displayed in all departments. The hospital executive should propose waste minimization and reduction strategies which are applicable without compromising infection control, such as recycling. Implementers of WM strategies must be provided with personal protective equipment such as plastic aprons, gowns, suits, rubber boots, and heavy-duty rubber gloves to use during waste collection and each plastic apron must be disposed of immediately it is used in respect of prevention and infection control. The hospital should desist from transporting waste in the Ambulance as an infection control measure.

Recommendation to General Hands

General hands should support the health executives by following the set guidelines for effective WM, disposal and waste reduction strategies and by taking initiative to keep their environment clean as well as proper use of the personal protective equipment.

Recommendation to the Ministry of Health

The ministry of health must ensure that the currently existing environmental health and WM financing policies are adequately implemented by the government of Zimbabwe in order to promote proper management of healthcare waste. The ministry should ensure that enough finances are channeled towards effective WM strategies. The ministry should also work collaboratively with other sectors such

as policy makers to ensure WM policies are being implemented as stipulated. The ministry should also explore the potential of new technologies, such as waste-to-energy systems, to improve WM practices in healthcare facilities in Zimbabwe. The ministry of health to invest in research by providing funds to the researchers for their mobility needs on sites

5.7 Results Dissemination

The researcher created a PowerPoint presentation on the findings of the research and recommendations which will be presented to the health executive of HDH and a copy of the research will also be given to the hospital administration so that it can be shared with the healthcare workers and stakeholders. A copy of the research will also be submitted to the administration of Africa University. Lastly the results of this study will also be made accessible to the general public via open repository such as Academia.edu and Research gate so that it can be used by future researchers, academic scholars and also by donors and policy makers for decision making.

5.8 Suggestions for Further Studies

- Conduct a comparative study of WM practices in different hospitals in Zimbabwe to identify any common challenges and best practices.

- Analyze the economic costs and benefits of proper WM in healthcare facilities, including the costs of waste disposal, potential revenue from recycling, and the health and environmental benefits of proper WM.
- To research on the minimum amount required for WM at both rural and urban hospitals and clinics.
- Evaluate the effectiveness of existing WM policies and regulations in Zimbabwe, and identify areas for improvement.
- Other researchers to use large sample sizes and quantitative approaches that will allow the measurement of the discussed issues.
- Other researchers should use other waste WM theories to address the causes and effect Of improper WM
- To research more on the underlying causes and effects of improper WM and sustainable practices
- To explore the potential of new technologies, such as waste-to-energy systems, to improve WM practices in healthcare facilities in Zimbabwe.

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APPENDICES

Appendix 1: CONSENT FORM

My name is Triphina Mazwanga. I am a student at Africa University doing my programme of Bachelor of Health Services Management. I am carrying out a research on the causes and effects of improper WM. I am requesting you to participate with 18 other participants after you have read and understand the information provided.

Purpose of the Study

The purpose of the study is to find out the causes and effects of improper WM at Hauna District Hospital from August 2021 to 2023 and find possible solutions.

Benefits of the Study

This study will go a long way in identifying causes and effects of improper WM and aiding policy makers in decision making through possible solutions that will be found. There is no monetary benefit of any sort to the participants but will improve knowledge, skills and health outcomes.

Voluntary Participation

You are free to decide whether to participate or not. You may as well withdraw from the study at any time.

Confidentiality

No information that can be identified with you will be disclosed to anyone.

If you have decided to take part in the study after having understood the above information, please sign this form then answer the questions that will be given to you.

Name and signature of participant……..

Date……

Name and signature of researcher……...

Date……

Appendix 2: QUESTIONNAIRE ON DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENT

Variable	**Tick where applicable**
Sex	1. Male 2. female
Age	1. 20-30 years 2. 31-40years 3. 41 years and above
Marital status	1. Single 2. Married 3. Separated 4. widowed
Level of education	1. none 2. primary 3. secondary 4. college/university
Occupation	Please indicate
Religious affiliation	1. Christian 2. Islamic 3. pagan

How long have you worked at Hauna District Hospital?	1. 1-3 years 2. 4-10 years 3. 10 years and above

Appendix 3: QUESTIONNAIRE ON IMPROPER WM

Section A: type of waste

1. What is the type of waste generated?

   ……

   ……

   ……

2. Where is waste generated disposed of?

   ……

   ……

   ……....

3. How are the different types of waste treated?

Section B: causes of improper WM

1. Is WM been done correctly at the hospital? If yes, explain your answer

   ……

   ……

   ……

   ……

2. What do you think are the causes of improper WM?

   ……

   ……

……

……

……

Section C: effects of improper WM

1. What are the effects of improper WM on:

    a) Human health?

    ……

    ……

    ……

    ……

    ……..

    b) The environment?

    ……

    ……

    ……

    ……

    ……..

Section D: possible solutions to improper WM

1. What do you suggest as possible solutions to improper WM?

    ……

    ……

    ……

……

……

……

……

Thank you for your cooperation

Appendix 4: INTERVIEW GUIDE FOR GENERAL HAND (WASTE HANDLERS)

1. What type of waste is generated here at the hospital?
2. Where do you store the waste generated?
3. How often do you collect waste?
4. How is the waste disposed of?
5. Do you have the correct personal protective equipment for handling waste?
6. What problems do you encounter when handling waste?
7. What knowledge do you have about the effects of improper WM?
8. Do you know any diseases that result from improper WM?
9. Have you had any of the diseases in the past 2 years? If yes, mention the disease(s).
10. What do you think should be done to improve WM at the hospital?

Thank you for your cooperation.

Appendix 5: SHONA INTERVIEW GUIDE FOR GENERAL HAND (WASTE HANDLERS)

1. Itsvina ipi inogadzirwa pano paChipatara.

2. Munochengetera kupi tsvina inenge yagadzirwa pano

3. Munounganidza Tsvina iyi kangani

4. Munorasa sei Tsvina iyi

5. Munezvikwanisiro chaizvo here zvekuti mukwanise kubata tsvina iyi

6. Munosangana nematambudziko api pakubata tsvina iyi

7. Muneruzivo rwupi pamusoro pezvinozoitika kubudikidza nekutadza kubata tsvina idzi zvakanaka

8. Zvirwere zvipi zvinongonzerwa ne tsvina idzi

9. Makamboita zvirwere izvi here mumakore maviri akapfura. Kana makamboita, chirwere chipi

10. Munofunga kuti zvinyi zvingaitwa kuti tsvina dzikwaniswe kubatwa zvakanaka pachipatara pano

Appendix 6: APPTOVAL LETTER FROM FACULTY SUPERVISOR

AFRICA UNIVERSITY
"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

UNITED METHODIST-RELATED INSTITUTION

P.O. BOX 1320, MUTARE, ZIMBABWE – TEL.: (263-20) 60075/60026 – FAX: (263-20) 61785 – E-MAIL: deanchans@africau.edu, chansadmin@africau.edu, chanssec@africau.edu, hoddphn@africau.edu, hoddbmls@africau.edu WEBSITE: www.africau.edu

_22/02/2023

To AUREC Administrator

Dear Sir/Madam

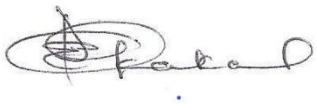
Re: Permission to Submit to AUREC for _Triphina Mazwanga_____Reg No. 190600_____

Programme: __Bachelor of Health Services Management_____

This letter serves to confirm that the above-mentioned student has satisfied all the requirements of the Department in developing his/her dissertation proposal and is ready for assessment.

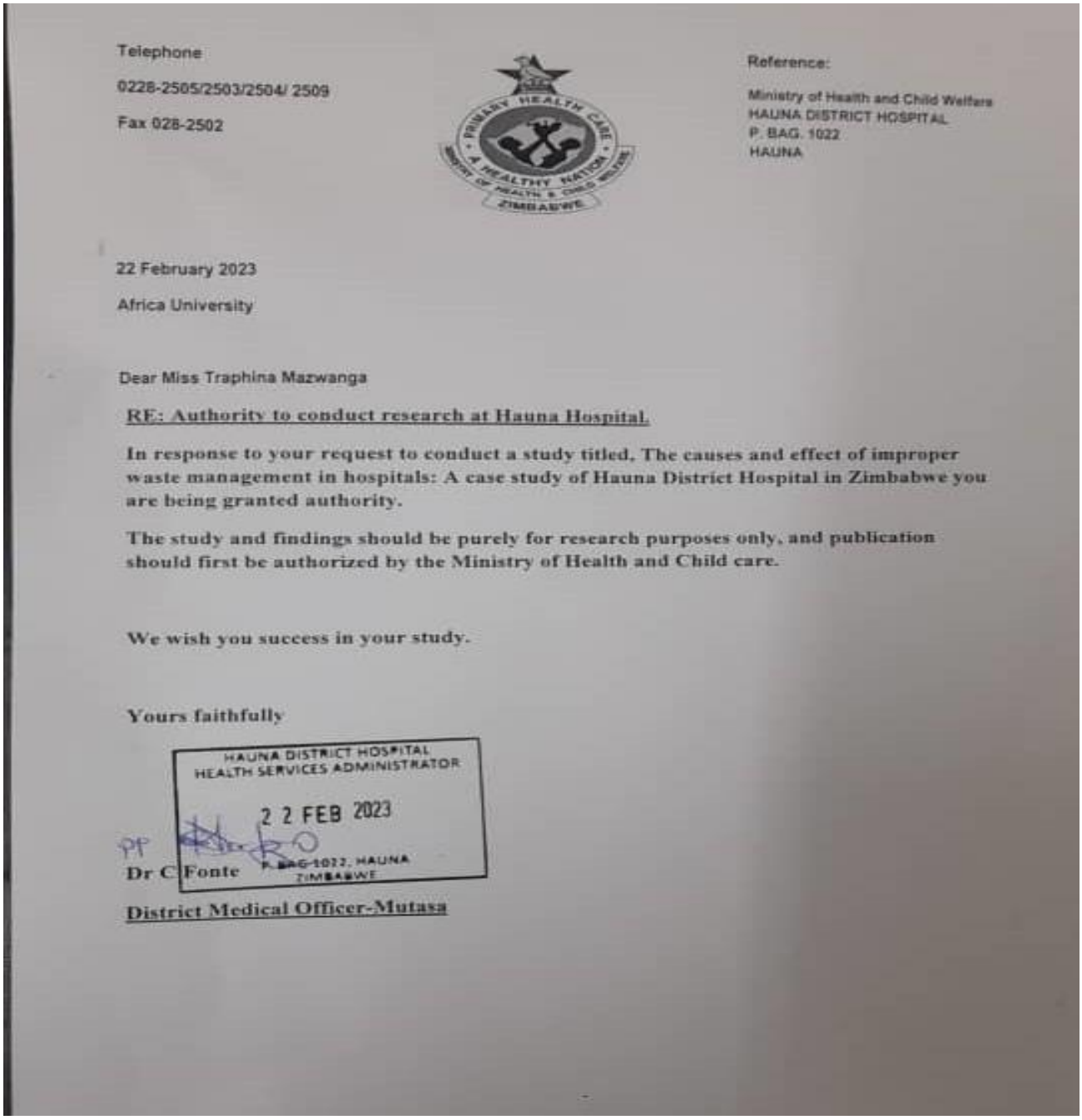
Your facilitation for review of the proposal is greatly appreciated.

Thank you



_____

(Primary Supervisor)



Telephone

0228-2505/2503/2504/ 2509

Fax 028-2502

Reference:

Ministry of Health and Child Welfare
HAUNA DISTRICT HOSPITAL
P. BAG. 1022
HAUNA

22 February 2023

Africa University

Dear Miss Traphina Mazwanga

RE: Authority to conduct research at Hauna Hospital.

In response to your request to conduct a study titled, The causes and effect of improper waste management in hospitals: A case study of Hauna District Hospital in Zimbabwe you are being granted authority.

The study and findings should be purely for research purposes only, and publication should first be authorized by the Ministry of Health and Child care.

We wish you success in your study.

Yours faithfully

HAUNA DISTRICT HOSPITAL
HEALTH SERVICES ADMINISTRATOR
22 FEB 2023
P. BAG 1022, HAUNA
ZIMBABWE

pp

Dr C Fonte

District Medical Officer-Mutasa

Appendix 7: APPROVAL LETTER FROM STUDY SITE.

Appendix 8: APPROVAL LETTER FROM AUREC.

Investing in Africa's future

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2734/23 5 April, 2023

TRIPHINA MAZWANGA
C/O Africa University
Box 1320
MUTARE

RE: **THE CAUSES AND EFFECTS OF IMPROPER WASTE MANAGEMENT IN HOSPITALS: A CASE STUDY OF HAUNA DISTRICT HOSPITAL IN ZIMBABWE, 2023**

Thank you for the above-titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

a) Research proposal

- **APPROVAL NUMBER** AUREC 2734/23
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** April 5, 2023
- **EXPIRATION DATE** April 5, 2024
- **TYPE OF MEETING** Expedited
  After the expiration date, this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before the expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)
APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE