

**SHARPS WASTE MANAGEMENT AT KIDONGO - CHEKUNDU
NATIONAL MENTAL HOSPITAL - ZANZIBAR TANZANIA**

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by the Open University a dissertation titled: “*Sharp Waste Management at Kidongo Chekundu National Mental Hospital Zanzibar Tanzania*” in fulfillment of the requirements for the degree of Master of Science in Environmental Studies –Health Stream of the Open University of Tanzania.

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Date

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I, Mansab Ramadhan Mansab, do hereby declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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Date

DEDICATION

First I would like to dedicate this dissertation to my beloved wife Mrs. Salama Rashid Haroub for her endless love, kindness, caring, help and tireless support for me and caring of our son and daughter.

Second the dedication goes to my beloved son Mohamed, Abdulwahid, Mahmoud and Yussuf for their tolerance and moral support during conducting this course. I wish all of them happiness and success in their lives.

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ABSTRACT

Sharps waste is part of infectious medical waste; its management seems as a significant problem in Mental Hospital Zanzibar. This study aimed to describe the current sharps waste management at Mental hospital Zanzibar. The study was carried out at Kidongo Chekundu National Mental Hospital on sharp waste management. Twenty five (25) staffs of Kidongo Chekundu National Mental hospital and 25 people living nearby the hospital participated in the study. Non probability purposive sampling method was used to recruit study participants. A questionnaire, observation and focus group discussion was done in order to know the real practice of sharp waste at the hospital. It was found out that there is a great diseases transmission risk posed by poorly disposed sharp waste at the hospital. Also there is environmental pollution caused by sharp waste following poor planning and monitoring of health care waste; inadequate financial resources and equipment, lack of motivation and negligence of health care workers. Hospital management should plan and implement on the best ways. Sharps waste can be managed to avoid unnecessarily disease transmission and environmental pollution.

Key words: sharps waste management, impact on health and environment, Kidongo – Chekundu National Mental Hospital Zanzibar.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
FGD	Focus Group Discussion
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCW	Health Care Workers
HIV	Human Immuno Deficiency Virus
HPCSA	Health Professions Council of South Africa
IPC	Infection Prevention Control
KCMHZ	Kidongo – Chekundu Mental Hospital Zanzibar
NBS	National Bureau of Statistic
NRMU	Natural Resources Management Unit
OPD	Out Patient Department
OUT	Open University of Tanzania
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization
USAID	United State of America International Development

CHAPTER ONE

1.0 INTRODUCTION

1.1 Introduction

Common medical materials treated as sharps waste are injection devices, syringes, blades, lacent and slides (Memish *et al.*, 2002). Numbers of studies have indicated that; inappropriate and poor handling disposal of healthcare waste poses health risks such as hepatitis to health workers who may be directly exposed to waste and to people who live nearby health facilities particularly children and scavengers (Abah and Ohimain, 2011).

Sharp waste is a common problem in developing countries including Zanzibar, in study done in Tanzania mainland at the municipal health facilities level found that sharps waste was transported by hands leading to high risks of exposure to needle stick injuries (Manyele *et al.*, 2003). Moreover it was found that boots, aprons and masks were among the personal protective equipment missing in health facility, while latex gloves that cannot protect workers from injuries caused by sharps waste were readily available at the hospital (Manyele *et al.*, 2003). According to Manyele and Lyasenga (2010) African countries practicing poor medical waste management which also including sharp waste as they quoted to (Leonard, 2003; Manyele *et al.*, 2003, Manyele, 2004a; Manyele 2004b; Manyele and Anicetus, 2006).

Management of sharps wastes needs greater attention because of the risks to both human health and the environment caused by inadequate waste management

practices. Urgent actions are needed to save the current situation on sharps waste management at Mental hospital, if the situation is neglected it can cause health risk to the surrounding people. A study done in Tanzania mainland in municipal health facilities found that patients are at higher risk of infection with needle sticks or sharps during medical care. Frequency of these injuries is related to the daily tasks of each health care group such as doctors, nurses, and waste handlers as well as the patients in the hospital and nearby community (Manyele *et al*, 2003).

Sharps waste is a product of provision of health care. Its poor management exposes health care workers, waste handlers and the community to infections, toxic effects and injuries including contamination of the environment, resulting in an increased burden of disease worldwide. The World Health Organization estimates that each year there are 8 to 16 million new cases of Hepatitis B virus (HBV), 2.3 to 4.7 million cases of Hepatitis C virus (HCV) and 80,000 to 160,000 cases of human immune deficiency virus due to unsafe injections and mostly arising from very poor waste management systems in various health care facilities (WHO, 1999).

Mismanagement of healthcare waste poses health risks to people and the environment by contaminating the air, soil and water resources. Hospitals and healthcare units are supposed to safeguard the health of the community. However health care wastes, if not properly managed can pose greater threat than the original diseases themselves found in health care waste (Abah and Ohimain, 2011).

The current disposal method adopted by the various health care facilities, which is dumping and burning medical wastes in open premises poses health risks to patients

and people living closer to health care facilities (Kuroiwa *et al.*, 2008). For instance, when medical waste burnt, dioxin is a major air pollutant of concern from chlorinated polymer as reported by the World Health Organization (WHO, 2004).

Hazardous health care wastes poses potential risk of injury or infection to all exposed person such as medical staffs, doctors, nurses, sanitary staff and hospital maintenance personnel, patients receiving treatment in health care facilities as well as their visitors and relatives. In addition workers who support services linked to health care facilities such as laundries, waste handling, transportation services and workers in waste disposal facilities have great risk of infection compared to other health professions. Furthermore scavengers and general public especially children who play with items scavenged from open waste dumps, are all at risk (HPCSA, 2008).

The WHO (2002) estimates that over 20 million infections of Hepatitis B, C and HIV occur yearly occurred in the world due to unsafe injection practices, reuse of syringes and needles in the absence of sterilization. Improperly disposed hazardous health care waste also poses indirect risks to humans through direct environmental effects by contaminating soils and ground water of respectively place (Abah and Ohimain, 2011).

During open burning or incineration of hospital waste, air pollutants are released into the atmosphere causing respiratory illnesses to nearby populations. Immediate improvements in the waste disposal system can be achieved through a combination

of waste segregation and a simple high temperature system as means of disposing medical waste (Abah and Ohimain, 2011).

The study aimed to assess the current sharp waste management and its impacts to the environment of Kidongo Chekundu Mental hospital. This hospital care insane people who has poor insight and bizarre behaviour and they do not care about their health. Insane people are in great risk of acquiring communicable disease due to playing with rubbish and disposal matters.

1.2 Problem Statement

Medical sharp waste is a growing problem in Zanzibar where the disposal sites are few. There is a poor method of handling it which is unsafe to the handler and the environment. Sharp wastes are dumped in open pits so it is very easy for children to play with it as well as patient. Client cared in Mental hospital are insane and sometimes experiencing hallucination and illusion which influence their insight and behavior (Patel, 2008).

There are no studies on sharp waste management and its environment impact conducted in Zanzibar especially mental hospitals. The magnitude and impact of poor management of sharp waste in Mental hospital still is inadequately known so it is necessary to conduct study in order to explore the real situation for better reservation of environment and prevention of communicable diseases in surrounding society.

1.3 Research Objectives

1.3.1 General Objective

The main objective of the study was to assess the management of sharp wastes and their impact on health and the environment at Kidongo Chekundu Mental Hospital, Zanzibar.

1.4 Specific Objectives

- (i) To evaluate the risks posed by sharp waste management at KCMHZ
- (ii) To determine the extent of environment contamination due to sharp waste management at KCMHZ
- (iii) To establish the barriers that hinder safe handling and disposal of sharps waste.
- (iv) To assess the awareness of the community, medical personnel and waster handlers on health and environmental effect of sharp waste management

1.5 Significance of the Study

Sharp waste management is of increasing importance in the issue of public health and environmental conservation. This study provides detail information about sharp waste management and how it affects the environment and community surrounding the hospital. The information gained will be a guide for proper handling and disposal of sharp waste in the hospital.

Findings of this study is useful to health workers, hospital management, Municipal Council and community surrounding the environment of hospital that are at great risk to the impact of poor management of sharp waste in the hospital. Also the study is a

starting point for further studies on sharp waste management and generates new knowledge to the community.

1.6 Hypotheses

- (i) Risk factors associated with sharp waste around Kidongo - Chekundu Mental Hospital is high.
- (ii) The extent of environment contaminated with sharp waste is high in Kidongo – Chekundu Mental Hospital.
- (iii) Inadequate resources hinder safe handling of sharp waste at Kidongo - Chekundu Mental Hospital.
- (iv) Lack of knowledge of community members, medical personnel and waste handler on health and environmental effect of sharp waste management affects proper management of sharp waste at Kidongo – Chekundu Mental Hospital.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of Sharp Wastes

Waste management means collection, transportation, recovering, final disposal of waste and supervision of its operations and after care of disposal sites (Selin, 2013).

2.2 Health Risks Posed by Sharp Waste Management

Improper management of wastes generated in health care facilities can severely affect the health of caregivers, patients and other members of the community (Lakbala, 2012). Pollution from poor treatment and handling of waste can indirectly affect the health of the community. If not handled properly medical waste is very hazardous waste because of its negative effects on society and public health. There are many diseases that can be transmitted by medical waste such as viral hepatitis B and viral hepatitis C, AIDS through the exposure of wounds, acute medical needle contaminated with the blood of patients infected with viruses such HpC, HpB, and HIV as the hospitals are the main source for the production of medical waste (Al-Azzawi, 2012).

Waste generated by health facilities includes sharps, non-sharps, blood, body parts, chemicals, pharmaceuticals, medical devices and other materials. In many countries, the disposal of used injection equipment and reuse of contaminated syringes and needles pose a significant public health threat. Therefore, a comprehensive health care waste management system is an integral part of good immunization safety

practices (WHO, 2000). Doctors, nurses, technicians, washermans, sweepers, hospital visitors, patients, rag pickers and their relatives are exposed routinely to health care waste and are at more risk from the many fatal infections due to improper management (Yadav, 2001).

The handling, collection, and disposal of contaminated sharps waste pose one of the greatest occupational hazards facing health care workers worldwide because of the frequency of needle stick injuries and the potential transmission of blood borne pathogens. Accepted performance criteria for sharps containers include puncture resistance, rigidity, durability, leak resistance on the sides and bottom, ability to be closed, and functionality under all normal conditions during their use at health care facilities (NRMU, 2002). Worldwide, 8-16 million hepatitis B, 2.3 - 4.7 million hepatitis C and 80 000-160 000 HIV infections are estimated to occur yearly from re-used of unsterilized syringes and needles. The re-use of disposable syringes and needles for injections is particularly common in most developing countries (WHO, 2005).

Improper management of medical waste exposes the medical staff, waste handling, worker, environment and the surrounding communities to infection, toxic effects and injuries, this condition pose a serious health problem in most of developing countries of the world including Zanzibar (WHO, 1999). Poor management of medical waste causes serious environmental problems in terms of air, water and land pollution. Pollutants can be classified as biological, chemical and radioactive. Environment problems can arise from the simple generation of medical waste and from the process

of handling, treatment and disposal (Manyele, 2004a). Poor disposal of hospital waste and exposure to such waste possess serious threat to environment and to human health that requires specific treatment and management prior to its final disposal (Mathur *at el.*, 2012).

There are many adverse and harmful effects to environment and human beings which are caused by the Hospital waste generated during the patient care. Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area. The problems of the waste disposal in the hospitals and other health-care institutions have become issues of increasing concern in the world especially in developing countries (Mathur *at el.*, 2012).

Hospital waste including sharps waste which involves syringes, needles, cannula, guide wires, broken glassware, scalpel, blades have the highest chance of disease transmission. Almost 85% of sharp injuries are caused between their usage and its disposal and more than 20% of those handle them encounter stick injuries. The emphasis should be on safe handling, rather than on the various treatment and disposal options. The medical staff involved in waste handling should be given all personal protection measures such as caps, masks, gum boots and gloves. They should also be vaccinated for tetanus and hepatitis B and follow up health checkup with record keeping regarding their health status (Yadav, 2001).

2.3 Environmental Effect of Poor Sharp Waste Management

Unsafe health care waste practices expose health care professionals, waste handlers and the community to infections and injuries. Needle stick injuries, reuse and resale

of contaminated syringes and needles are great risks to human health and the cause of infectious disease worldwide. Poor waste management is also an environmental hazard that can result in the release of toxic compounds into the air, soil and water. To reduce these risks, infectious waste should be separated from other waste, treated and disposed. Systematic monitoring and evaluation of health care waste technology and good waste management practices are vital to improving public health initiatives in health care facilities (WHO, 2000).

Medical care is vital for human life and health, but the waste generated from medical care represents a real problem of living nature and human world. Improper management of waste generated in health care facilities causes a direct health impact on the community living nearby hospital, health care workers and environment. Large amount of potentially infectious waste are generated in the health care hospitals and facilities around the world (Mathur *et al.*, 2012).

Inadequate health care waste management cause environmental pollution, unpleasant smell, growth and multiplication of vectors like insects, rodents and worms which lead to the transmission of diseases such as typhoid, cholera, hepatitis and AIDS through injuries from syringes and needles contaminated with human body products during provision of health care services (Mathur *at el.*, 2012).

2.4 Standard Sharp Waste Management

Whether sharps are infected or not infected its considered highly dangerous and potentially infectious waste due to their puncture or cutting property (Memish *et al.*, 2002). Good health care waste management practices complies with appropriate

standards and guidelines adopted from regulatory authorities, throughout the risk chain such as handling, storage, transportation, treatment and final disposal (USAID, 2009). In Toronto, Canada the Ministry of Health has developed a regulation and guideline for handling of hospital waste including sharps waste (Liss *et al.*, 2006).

In developing countries, improper management of waste generated in health care facilities causes direct health impact on the community nearby hospital, the personnel working in health care facilities, and on the environment (WHO, 2012). In addition, pollution due to inadequate treatment of waste can cause indirect health effects to the community. McGill (2012) argues that training on sharps waste is very essential not only for waste handlers but for all health professionals. Untreated medical waste shall be transported only in a special vehicle owned by a competent authority specified by the government. No untreated medical waste shall be kept or stored in health care facility beyond a period of 48 hours (Manyele, 2004a).

Training of health care workers is the core task of health care waste management programmes enabling workers to recognize health and safety hazards, and to prevent further exposure to hazards posed by hospital waste. In reality, health care worker training programmes have increased the workers' morale. However, the training focused only on those handling hospital waste and health officers, while the waste generators such as nurses and medical doctors were not involved. For this reason, a comprehensive integrated health and safety training programme has been developed at the University of Dar es Salaam to provide a cost-effective means of meeting health care waste management needs in Tanzania (Manyele, 2004a).

Hospital waste management is a part of hospital hygiene and maintenance activities involving management of range of activities such as collection, transportation, operation or treatment of processing systems, and disposal of wastes (Mathur *at el.*, 2012). There is great need of managing hospitals waste in order to prevent injuries from sharps leading to infection to all categories of hospital personnel, patients and waste handlers. Nosocomial infections are common in patients from poor infection control practices and poor waste management (Mathur *at el.*, 2012).

Health care waste management process involve properly waste collected, segregated, stored, transported, treated and disposed of in safe manner to prevent hospital acquired infection (Mathur *at el.*, 2012). Sharps containers are picked up by orderlies and emptied into a box or placed in a large bag for incineration. Several large boxes full of sharps were found in the alley outside the laboratory awaiting transport for disposal (NRMU, 2002). Health care waste needs special attention in its management due to its effect to health, environment and legal aspects (Yadav, 2001).

There is no perfect environment strategy for eliminating health care waste, however, when selecting health care waste technology and treatment, risks and benefits should be carefully weighed to ensure best practice and minimize risks to health care workers and the community. A variety of waste technology and treatments are currently available and should be chosen to suit the needs of a health care facility and community (WHO, 2000).

Hospital waste disposal routes can vary according to health care facility policy. In many situations, plastic bags are placed in a central storage area or in a temporary

storage container and sent to be processed as potentially infectious waste. Non-harmful waste should, at all times, be stored separately from all potentially infectious waste. Waste bags should not be hand carried for long distances as this increases the risk of injury or spillage. Storage areas should be kept neat and restricted to authorized personnel only. When handling waste, all health personnel should wear appropriate protective gears such as gloves, boots, trousers or aprons, and maintain good hand washing and infection control practices at all times (WHO, 2000).

All health facilities that generate health care waste require a waste management policy and a comprehensive system of best practices and safety standards. Strong political and economic support with sufficient human and financial resources is required to create a health care waste management system. An understanding of current legislation related to environmental protection is also important to the proper assessment and implementation of hospital waste management and infection control practices. An effective hospital waste management framework can best be achieved through coordinated efforts of health care professionals, municipalities and regional administrators, Ministries of Health, environmental agencies and other key partners (WHO, 2000).

Health care professionals at all levels should have waste management training and education. The public should also be educated and become aware of the risks associated with poor health care waste management. Advocacy campaigns that target policy makers, health organizations, the media and the public can help to ensure a shared responsibility for safe disposal of health care waste. Within health care

establishments, occupational health nurses, nurse managers and others should participate in the surveillance of infection control and waste management practices. Poor hospital waste management practices need to be identified and addressed to reduce risks and establish guidelines for infection control. Because nurses are directly involved in providing immunization services, they must be involved at all levels of health care waste management policy (WHO, 2000).

The disease burden caused by poor management of health care waste is prompting a commitment and behaviour change among health care professionals, the public and others involved in the health care waste management. An effective health care waste management system ensures the safe collection, disposal and destruction of used injection equipment, protecting the public from injury and exposure to hazardous waste products (WHO, 2000).

2.5 Improper Sharp Waste Management Affects Health of Health Workers

Health care waste management is still a major challenge for health facilities in developing countries where the health care staff and surrounding population is exposed to risks due to poor handling of hospital waste. The toxic hospital waste generated by hospitals worldwide includes used syringes, bandages, intravenous drip bottles, blood bags, biomedical waste such as organs and medical instruments. Sharp waste has the highest rate of causing injuries to hospital staff and transmission of infections (Kumar *et al.*, 2010).

Mismanagement of hospital waste includes improper handling of waste during generation, collection, storage, transport and treatment. Improper handling combine

several unsafe actions, such as handling without personal protective equipment, poor storage such as high temperature conditions combined with prolonged storage times before treatment, manual transport for longer distances and use of uncovered containers instead of closed plastic bags. Other examples include exposure times beyond acceptable limits, lack of worker and equipment decontamination procedures which affect hospital workers in different ways (Manyele, 2004a).

Health care waste scattered in and around the hospitals invites flies, insects, rodents, cats and dogs that are responsible for the spread of communication disease like plague and rabies. Rag pickers in the hospital, sorting out the garbage are at a risk of getting tetanus and HIV infections. The recycling of disposable syringes, needles, IV sets and other article like glass bottles without proper sterilization are responsible for Hepatitis, HIV, and other viral diseases. It becomes primary responsibility of Health administrators to manage hospital waste in most safe manner (Mathur *at el.*, 2012).

The problem of health care waste disposal in the hospitals and other healthcare establishments has become an issue of increasing concern, prompting hospital administration to seek new ways of scientific, safe and cost effective management of the waste, and keeping their personnel informed about the advances in this area. The need of proper hospital waste management system is of major importance and is an essential component of quality assurance in hospitals (Mathur *at el.*, 2012).

2.6 Barriers to Proper Sharp Waste Management

Geronnimo and Sanez (2005) insisted the importance of developing information materials for the employees and patients in the form of posters, handouts and waste

manual as a constant reminder for all personnel involved in sharps waste management in hospitals. In this study it is important to understand barriers which hinder the proper implementation of sharps medical waste in hospital. Hagstrom (2006) observed that inadequate horizontal and vertical communication, resistance to change, inexperience of medical and nursing staff members and time constraints are barriers to proper management of sharp medical wastes.

According to a World Health Organization assessment there were about 22 countries in 2002 which had about 64% hospitals with no proper waste disposal methods. Hospitals in developing countries including Asia suffer from a lack of proper management of waste. A study from Nepal showed that; improper management of sharp waste, it was due to the lack of waste management plan and carelessness of doctors, patients and visitors who visit the hospital premises (Kumar *et al.*, 2010).

Staff working in hospital of developing countries lacks knowledge about the transmission of hospital acquired infections caused by poor handling of health care waste, also poor attitude of hospital staff towards hospital policy and guideline on handling hospital waste, and improper training of staff on health care waste management causes poor sharp waste disposal at the respectively hospitals (Kumar *et al.*, 2010). In Pakistan, studies indicated that, most hospitals and independently working physicians do not comply with health care waste management practices exposing themselves, other staff, and patients to sharp injuries and infection (Kumar *et al.*, 2010).

2.7 Current Situation of Sharp Waste Management in the KCMH

Currently sharp waste management at Kidongo Chekundu Mental Hospital is poor and unsafe to the environment. Sharp wastes are disposed and burned in a pithole or open burning which produce toxic gases from plastic which contribute in air pollution. Also sharp waste mixed with other waste such as paper and remained food particles and discarded in open space of the surrounding hospital compound. However, there are no studies on sharp waste management and its environmental impact in Zanzibar. The magnitude and scenario of the impacts of management of medical waste at Kidongo Chekundu Mental Hospital environment is still unexplored so it is important to focus on the management of sharp medical waste and its impacts to the environment, staffs, patient and community.

In Tanzania Mainland treatment techniques for hospital waste are still poor. There are no proper methods of treating sharp waste (Manyele, 2004a). Study conducted in Baquba teaching hospital revealed that; medical waste is not given sufficient priority or concern. There is no safe system of medical waste management and lack of necessary supplies and facilities to hospital workers who take care of medical waste. Also lack of knowledge among health workers and a lack of coordination among different ministries in handling care waste hinder safe handling of hospital waste.

Furthermore high level of knowledge of hospital staff on sharps waste as ingredients of medical waste was, due to the familiarity of health workers with syringes and needles accidents that happen as a result of sharps injury. Knowledge of exposure to occupational hazard reported was lower for 75.0 % in Egypt hospital (Al-Azzawi, 2012).

A study conducted in Uganda, July 2003 it was established that more than 45% of the health care providers interviewed reported at least one needle stick injury in 12 months. The study further established that 38% of the health facilities visited had sharps and other wastes on ground or in other un supervised areas of hospital premises, exposing the community to needle stick injuries. Although the study falls short of giving the number and type of infections that could have been acquired from these injuries and exposures, the possibilities of infections arising from such injuries and exposure cannot be ignored (Muhwezi, 2014).

During the evaluation of injection safety and health care waste management in Soroti Regional Referral Hospital of Uganda, it was found that 92 percent of waste handlers have poor waste disposal methods, 3.4 percent have acceptable waste disposal methods and 4.6 percent have good waste disposal methods. Hospital waste management is one of the biggest challenges facing Soroti Regional Referral Hospital in addressing the growing quantity of waste generated (Muhwezi, 2014).

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Introduction

This chapter contains description of the research methodologies which was used to collect data during conducting the study. The methodology includes study design, area where the study conducted, population involved, study variable, sampling techniques, sample size, data collection tools, data processing and analysis methods and ethical/permission.

3.2 Study Design

The study was descriptive exploratory study which was carried out at Kidongo Chekundu Mental Hospital on sharp medical waste management. Both qualitative and quantitative research design methods were employed to collect data. Qualitative data are those information obtained during focus group discussions with hospital management, ward in charges and waste handlers through interviews and observation while quantitative data are those information obtained from community members via questionnaire.

3.3 Study Area

Zanzibar is a part of the United Republic of Tanzania, which is composed of two islands, Unguja and Pemba. It has a total population of 1,303,568 with a growth rate of 3.1%. Over half of the population (61%) lives below the poverty line and majority of them are women (NBS, 2012). Nearly all people in Zanzibar believe in God, majority of them are Muslims, who make over 90% of population, and the remaining

are Christians and Hindus. Because of the high number of Muslims, the culture of Zanzibar is influenced by strong religious beliefs, traditions, ethics and norms.

This study was carried out at Kidongo Chekundu National Mental hospital found in the western party of Zanzibar Municipality about 6 km from Zanzibar Town Centre. Kidongo Chekundu National Hospital is the only referral hospital caring for mental patients in Zanzibar. It provides mental health services to about 30,000 people.



Figure 3.1: Map of Zanzibar Island

Source: http://www.colorsofzanzibar.com/zanzibar-guide/unguja_map/

The hospital has four departments namely OPD, Inpatient with male and female ward, occupational therapy and administration. The hospital has 350 beds capacity and admits 1956 patients per year. The researcher decided to select this area because

mentally ill patients are prone to health risk; therefore, they need extra care against communicable diseases such as Hepatitis and HIV.

3.4 Study Population

The study populations included staffs from all department of Kidongo Chekundu National Mental hospital which are OPD, Male and Female Ward as well as Management of the hospital and people living near the hospital.

3.5 Inclusion Criteria

The study included staffs that were available in the duty roaster during data collection period. In addition, adults (18 years and above) from the community near the hospital were also included.

3.6 Exclusion Criteria

The study did not include staff who are on leave either their normal or academic studies.

3.7 The Sample Size

The sample size was 50 people. 25 staff based on the available staffs that are daily involved in collection and disposal of sharp waste in the hospital and 25 people from the surrounding community. The formulae for calculate sample size was as follows:

$$N = \frac{P(100 - P)}{E^2}$$

Where N = Sample size required

P = Percentage prevalence 57 %

E = Allowable error 7%

$$\text{Hence } N = \frac{57(100 - 57)}{7^2} = \frac{57 \times 43}{49} = 50$$

Therefore, the sample size is 50 people.

3.8 Sampling Technique

Non probability purposive sampling method was used to recruit staffs and people from the community in the study.

3.9 Data collection Tools

Semi structured questionnaire was used to collect data. The questionnaire contained both open and closed ended questions. Face to face interviews were performed by the principal investigator and the research assistants and all information obtained were recorded. The questionnaire comprises questions with items that are designed to cover all the specific objectives of the study. Also observation and focus group discussion was done in order to know the real practice of sharp waste management in the hospital. During focus group discussion hospital workers and waste handlers were asked to explain the effectiveness of sharp waste at the hospital by using likert scale which supposed to say if the sharp waste is satisfactory or not in their hospital premises.

3.10 Training of Research Team

Training of research assistant was done a week before pre testing the research tools in order to be familiar and to know some ethics on collecting the data safely.

3.11 Pre- Testing/ Validation of Research Instruments

Pilot study was done at Mnazi Mmoja Hospital before actual study in order to test the validity and reliability of the research instruments then researcher made necessary corrections and modification of the instruments. To ensure reliability in this study all interviews were scheduled and familiarization of questions was done by a research team. Furthermore, a pilot study was done by at least two different people interviewing one person to calibrate interviewing procedures. Interviewing skills was improved to avoid controversy and misunderstanding of questions when participants demand clarity.

3.12 Data Management (Quality Control)

The data was regularly checked every day after collection by the researcher and problems arising were discussed to ensure availability of reliable data. Also the principal investigator checked the interview guide before processing the information collected.

3.13 Data Processing and Analysis

All interview guides were checked for completeness and consistency and the data was processed and analyzed manually with help of calculator including computer programme SPSS version 16 of 2008 which was used for descriptive analyses. Measures of central tendency and standard deviation were used to test variables in order to identify the measurement of observed data.

3.14 Ethical Consideration

Permission to conduct the study was obtained from the Hospital management, Urban District Commissioners, Sheha of Kidongo Chekundu Shehia and in charge of all

departments with assistance of letter from OUT University and an explanation was given to all respondents regarding purpose and benefits of the study. Consent for participation was obtained from the respondent and confidentiality of the information was ensured. Respondents told that they have right to withdraw from the study at any time without losing any of their benefit. All attentions was observed and respected regarding their right, privacy and protection from any harm resulting from the information given out in the field.

In general ethical principles were considered in all stages of the study. People were free to make decisions to answer or not, any questions. Secrecy was a priority and they did not disclose their names; only a code number in the questionnaire was used.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

A total of 25 health workers (hospital managers 48%, nurses 24% and ward attendants 28%) were enrolled in the study. In addition 25 community members who live nearby the Kidongo Chekundu National Mental Hospital were asked about the sharp waste management at Kidongo Chekundu Mental hospital. Also observation checklist was used to obtain current practice of sharp waste management at the hospital.

4.2 Background Variable of the Respondents

Some background variables of the respondents (community member who live nearby hospital) that were considered in this study included the sex, age and their employment status. 56.0% of the respondents were female, 52% were house wife and 20% were in the age of thirty five years. The minimum age was 22 and the maximum age was seventy three years, the mean was 43 and standard deviation was 13.2 as illustrated in the (Table 1).

Age of respondents was an important as it shows the matureness of respondent as most of the respondents were aware about what is happening as far as their experience is concerned while sex of respondent show that most were female than male which were 11(44 %).

Table 4.1: Background Variables of the Respondents in the Study Area

Variable	Number	%
Age of community member participated in the study (n=25)		
22	1	4.00 %
27	1	4.00 %
28	2	8.00 %
30	1	4.00 %
35	5	20.00 %
38	1	4.00 %
40	1	4.00 %
42	2	8.00 %
43	1	4.00 %
44	1	4.00 %
45	1	4.00 %
50	2	8.00 %
54	1	4.00 %
55	1	4.00 %
57	1	4.00 %
65	1	4.00 %
67	1	4.00 %
73	1	4.00 %
Sex of community member participated in the study (n=25)		
Female	14	56.00 %
Male	11	44.00 %
Employment status of community member of the study area (n=25)		
Government employees	1	4.00 %
House wives	13	52.00 %
Self-employees	11	44.00 %

n=25 Research data (Mansab, 2014)

4.3 The Risks Posed by Sharp Waste Management at Study Area

Health workers were asked about the risk factor posed by sharp waste at hospital. It was found that there is a great risk posed by sharp waste at the hospital such as disease transmission from one person to another, needle injury and used syringe are

scattered at some part of the hospital premises. Used sharps are when come into contact with patients, there is a high chance of transmitting communicable diseases such as HIV, Hepatitis etc. Also the sharp wastes were observed in improvised boxes in the staff offices and sluice rooms.

The community members who live nearby the hospital again were asked about safeness of sharp waste around the hospital and the environment. It was found that 56% of respondents explained that; the environment of hospital has low risk of sharp waste management compared to 10% of respondents who agreed that the environment of hospital has a high risk of sharp waste at the hospital and nearby surrounding and 1% of respondents did not saw any the risk exposed to the hospital by sharp waste management as illustrated in (Table 4.2).

Table 4.2: Risk Posed by Sharp Waste Management at the Study Area

Risk posed by sharp waste management	Frequency	Percent
Do not know	1	4.00 %
High risk	10	40.00 %
Low risk	14	56.00 %
Total	25	100.00 %

n=25 Research data (Mansab, 2014)

4.4 Extent of Environment Contamination Due to Sharp Waste Management at the Study Area

A total of 25 health workers were asked through focus group discussion to state about environmental contamination due to sharp waste at the hospital. All health workers mentioned that; there is scattered of used sharp waste in the hospital

environment which pollute the environment, used sharp discarded in pithole and in open space where the patient can easy access the used sharp. Also the sharp wastes observed on some of the office window and overflow in the improvised boxes and mixed with other waste discarded in the hospital premises.

A total of 25 community member were interviewed using structured questionnaires on the extent of environment contamination caused by sharp waste management at the study area. 56% mentioned the environment is not contaminated as they are not affected by sharp waste surrounding at their environment but 28% mentioned that the environment surrounding the hospital is contaminated with sharp waste used at the hospital and 12% mentioned that the hospital environment is highly contaminated with sharp waste produced at the hospital as illustrated in (Table 4.3).

Table 4.3: Extent of Environment Contamination Due to Sharp Waste Management at the Study Area

Extent of environment contamination at the study area	Frequency	Percent
Contaminated	7	28.00 %
High contaminated	3	12.00 %
Highly contaminated	1	4.00 %
Not contaminated	14	56.00 %
Total	25	100.00 %

n=25 **Research data (Mansab, 2014)**

4.5 Barriers that Hinder Safe Handling and Disposal of Sharps Waste

All health workers asked during focus group discussion mentioned that; lack of planning and monitoring of health care waste, lack of budget, training, materials and equipment (safety box) and incinerator are the barriers that hinder safe handling and disposal of sharp waste at the hospital. Furthermore lack of motivation of health workers, inadequate number of health care workers, and lack of infection prevention officer and negligence of some of health workers hinder safe handling of sharp waste at the hospital.

4.6 Awareness of the Community, Medical Personnel and Waster Handlers on Health and Environmental Effect of Sharp Waste Management

During focus group discussion health workers assessed their knowledge on health and environmental effects of sharp waste. The medical personnel (48%) have high knowledge on sharp waste and its effect as they know the effects of sharp waste and its consequences to the environment if it is not handled properly. Waste handler (28%) at the hospital have low knowledge on health and environmental effect of sharp waste management as they lack training on how to take care and they do not know any injection safety policy and guidelines and disposal policy. During the study no staffs were observed wearing protective gear when handling or transporting sharp waste and there is no special designated place to dispose the health care waste.

Also a total of 25 community member who live nearby the hospital asked about their awareness on environmental effect of sharp waste management, 76% have high awareness on environment effect of sharp waste management as they were able to

mention the sharp waste, their effect to human and environment and ways of its disposal while 24% had low awareness in environment effect of sharp waste management as they were not able to know properly what is sharp waste, their effect to human and environment as illustrated in (Table 4.4).

Table 4.4: Awareness of Community on Health and Effect of Sharp Waste at Study Area

Awareness of community on health and effect of sharp waste at study area	Frequency	Percent
High knowledge	19	76.00 %
Low knowledge	6	24.00 %
Total	25	100.00 %

n=25: Research data (Mansab, 2014)

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Introduction

The results of the present study show that sharp waste management in Kidongo Chekundu National Mental hospital Zanzibar is poorly practiced and below the standards required. The study revealed that; the health workers patients and community who live nearby the hospital environment are in great risk of acquiring communicable diseases such as HIV and hepatitis due to injury caused by used syringes. The most striking observation during the time of study was the scattered used syringe in open spaces of the hospital premises where the patient can come in contact with them.

5.2 The Risks Posed by Sharp Waste Management at KCMHZ

The present study has indicated needle injury, disease transmission such as HIV and hepatitis are great risk posed by sharp waste at the study area as used syringe and needle are scattered in open spaces around the hospital premises. (Lakbala, 2012) observed that improper treatment of waste generated in health care facilities can severely affect the health of patients and other members of the community. Furthermore WHO (1999) reported that improper management of medical waste exposes the medical staffs, waste handlers, environment and the surrounding communities to infection, toxic effects and injuries. The finding shows that sharp waste is not given a priority at Kidongo Chekundu Mental hospital. This condition prove hypothesis of the study that; the risk factors associated with sharp waste

management at Kidongo Chekundu Mental hospital is high in the study area. Therefore, the hospital management should ensure that hospital waste must be cared in order to prevent harm that might occur to health care workers, patients and the nearby hospital community.

5.3 Extent of Environment Contamination Due to Sharp Waste Management at KCMHZ

The present study found that the extent of environment contamination in the study area is high as sharp waste and other hospital waste are scattered around the hospital area. Study observed used sharps discarded in pithole and in open space of hospital premises, this situation also explained by hospital staff during focus group discussion. Furthermore sharp waste observed on some of the office and window of some ward and sharp waste mixed with other waste discarded in the hospital premises. Some of community member who live nearby the hospital found some children playing with used syringe which poses a great danger to their health as they may be affected with infectious disease such as HIV and Hepatitis.

According to (Mathur *et al.*, 2012) stated that; inadequate biomedical care cause environment pollution, unpleasant smell, growth and multiplication of vector like insect, rodents and worm that may lead to transmission of disease like typhoid, cholera, hepatitis and AIDs through injuries of syringe and needles contaminated with human body products.

The findings approve the hypothesis of the study that; the extent of environment contaminated with sharp waste is high in the study area. Hence the hospital

management should develop strategies of improving sharp waste management by adhering with standards and policy developed by WHO in caring sharp waste management at a desirable standards.

5.4 Barriers that Hinder Safe Handling and Disposal of Sharp Waste

This study has revealed that barriers that hinder safe handling and disposal of sharp waste are lack of planning, monitoring of health care wastes and lack of budget for smooth running of hospital activity. Furthermore lack of training, lack of material and equipment, lack of incinerator, negligence, inadequate number of staffs and lack of motivation of worker in doing their daily routine work are barrier. Geronnimo and Sarez (2005) insisted the importance of developing information material for the employee and patient in form of poster. Handout and hospital waste manual is a constant remainder for all health personnel involved in sharp waste management. On the other hand, Hagstrom (2006) observed that inadequate horizontal and vertical communication among medical staffs, resistance to change and time constrain are barrier to proper management of sharp medical waste.

The findings of the study approve the hypothesis of the study that; financial constrain and shortage of staffs limit safe handling of sharp waste at the hospital. The hospital management in collaboration with Ministry of Health Zanzibar should work on those barriers that hinder standard sharp waste management at the study area in order to improve the condition which is worse in the hospital premises. Building modern incinerator within the hospital premises is the best solution for proper management of sharp waste produced at hospital as current practice. There is a process of

transporting of used sharp from Kidongo Chekundu National Mental Hospital to Mnazi Mmoja hospital for disposal. This process sometimes takes longtime due to lack of transport and improper working of the hospital incinerator as explained by all health workers during focus group discussion.

5.5 Awareness of the Community, Medical Personnel and Waste Handlers on Health and Environmental Effect of Sharp Waste Management

The study finding has shown that, almost all health care workers have general knowledge/ understanding on health and environmental effect of sharp waste if it is not handled properly. However there are still about 28% of waste handlers who are not knowledgeable on health and environmental effect of sharp waste as they lack training on how to take care and they do not know any injection safety policy, guideline and disposal policy. While Al-Azzawi (2012) stated that, lack of knowledge among health workers and a lack of coordination among different ministries in handling care waste hinder safe handling of hospital waste.

Furthermore high level of knowledge of hospital staff on sharps waste as ingredients of medical waste was, due to the familiarity of health workers with syringes and needles accidents that happen as a result of sharps injury. Knowledge of exposure to occupational hazard reported was lower for 75.0% in Egypt hospital. Hence it is the duty bound by the hospital management to make sure that it provides a sufficient knowledge on proper sharp waste management. This will improve individual performance which will lead to the hospital performance and hence the maximization of quality healthcare provision.

The study also found that; 76% of community member who live nearby the hospital have high awareness on environment effect of sharp waste. This finding has great implication when it comes to introducing intervention measures through health education. Community member learn more quickly on the matter related with their health. Emphasis should be given to all community because there is some community member who has low understanding of health matter including environmental effect of sharp waste management.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

In conclusion, sharp wastes pose high risk to health care workers, patients, waste handlers and community surrounding Kidongo Chekundu National Mental hospital Zanzibar because the health workers, patients and visitor might be injured and get infectious diseases such as hepatitis and HIV due to sharp waste scattered at hospital environment. The extent of risk is high because the used sharp is obvious seen in hospital environment disposed in open space or mixed with other waste. Barriers for proper sharp waste management at the hospital are lack of hospital planning, budget, monitoring, training, material and equipment and negligence of health care workers and waste handlers on taking care of hospital waste including sharp waste management.

Health workers and members of the community nearby hospital have high knowledge on sharp waste and its environmental effects to the environment that surrounding the hospital. Although there is a small portion of hospital employees and community member who are unknowledgeable on effects of sharp waste to the environment of hospital. This portion is very important for hospital management and employees to take responsibilities and become aware of the risk.

6.2 Recommendation

Findings of the study on sharp waste management based only in Kidongo Chekundu National Mental Hospital Zanzibar that might not be sufficient to generalize and

conclude on the sharp waste management and its implication to the environment therefore there is a need to carry out an in depth investigation in other hospital of Unguja and Pemba so that their experiences can be documented and shared. This will help to come up with exclusive conclusion on the sharp waste management practiced in the hospitals of Zanzibar.

Furthermore Ministry of Health Zanzibar should improve education to health workers through training, prepare guideline and policy on standard management of sharp waste at the hospital. Material and equipment should be supplied to the hospital and organize a waste handlers management team which will be supervised by IPC Officer in order to improve sharp waste management. Hospital management should plan budget and solicit funds in order to build modern incinerator at the hospital premises in order to abolish environmental pollution caused by hospital waste including sharp waste management.

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APPENDICES

Appendix 1: In-Depth Interview Guide for Hospital Management (Matron, IPC In-Charge and Ward In-Charges)

Time starts: Time end.....

Date.....

1. Could you describe the current situation of sharps waste in your hospital? Probe on
 - Collection - time
 - Waste storage
 - Segregation of healthcare waste
 - Hazards from care waste
 - Problems that can face the community if sharp waste do not cared properly
 - Public importance of sharp waste
 - Involved personnel
2. How do you disposal the sharp waste in your hospital?
 - Existing Policy /guideline
 - Final disposal (uses of incinerator/burial/ pit hole)
3. Do hospital allocated budget for sharps waste management?
 - Funds for materials, training and equipment
4. Explain material /equipment you which provide to the waste handlers
 - Use of safety boxes in hospital
 - Use of protective gears

- Packing of sharp waste before disposal
5. Does hospital have training programs in sharps waste (Post Exposure Prophylactic - PEP)?
 6. What action taken to prevent health care workers with the effects of sharp wastes
 7. Does hospital have planning and monitoring of health care waste?
 8. Are you aware of any legislation applied to hospital waste management?
 9. How do you perceive the current situation of sharp waste management in your hospital?
 10. What can you say on sharp waste in relation to human health and environment?
 11. What do you think are the challenges on sharp waste management in your hospital?
 12. What are your opinions, to ensure good sharp waste management in your hospital?

Thank you for your cooperation

Appendix 2: Focus Group Discussion Guide for Waste Handlers (Ward Attendant)

Time starts: Time end.....

Date.....

1. Could you describe current disposal practices related to sharps waste generated?
2. What is your view on sharps waste disposal and its health consequences in the environment?
3. Let us discuss the barriers that hinder safe handling and disposal of sharps waste in hospital.
4. What can you say about the current situation on sharps waste handling in your wards? Probe on
 - Collection and transportation – (how, time)
 - Segregation from other waste
 - Materials and equipment's used
 - Disposal point
 - Disposal methods
5. Do you think you have been given enough training to handle sharps waste?
6. To what extent do you think the process of handling sharps waste is satisfactory in your ward? (use Likert scale)
7. What are the effects to human health and environment when these wastes are not well handled?
8. What precaution do you take to preserve the patient against sharp waste in the hospital?

9. What do you think are the challenges on handling sharps waste from your wards
(reflect on Financial, infrastructure (incinerator), motivation to handlers,
training, equipment's low number of handlers)
10. What should be done to improve the situation?

Thank you for your cooperation

Appendix 3: Questionnaire for Community Member Surrounding the Study Area

The purpose of this questionnaire is to collect data for sharp waste management practice at Kidongo Chekundu Mental Hospital. Please feel free and give maximum cooperation as the information you volunteer to give is confidential and will be used for the purpose of study only.

1. What is sharp waste?

.....
.....

2. Are you aware of the sharp waste and their effects to environment of Kidongo Chekundu Mental Hospital?

Yes No

3. Do you get any disturbance from sharp waste products disposed from Kidongo Chekundu Mental Hospital?

Yes No

If yes, what disturbance do you get?

.....

4. Is the existing sharp waste management system appropriate?

Strong agree Agree No response Disagree strongly disagree

5. Is the existing sharp waste management system safe to the environment around the hospital?

Yes No

If no, what is vulnerable?

6. How often have you observed children playing with sharp waste nearby the hospital?

Once twice more than twice never

7. In your own view sharp waste kept properly in Kidongo Chekundu Mental Hospital?

Yes No

8. In your own opinion what is the best alternative sharp waste management system?

Promotion and awareness of environment conservation

Construction of modern incinerator in the hospital

Allocation of special area for dumping

Establishment of commercial incinerator

Thank you for your cooperation

Appendix 4: Observation Tool at Kidongo Chekundu Mental Hospital

S/NO	DESCRIPTION	YES	NO	REMARKS
1	Are there any loose disposable needle and syringe in the ward (syringe out of the packaging)			
2	Is there any loose disposable lacent			
3	Is there any loose disposable intravenous infusion outside the package			
4	Is any evidence to sterilize disposable injection equipment for reuse			
5	Is there any infection waste other than used sharps			
6	Is there any multi-dose vial with a needle left in a diaphragm			
7	Are there any overflowing or pierced sharps containers of any type in any area of the hospital			
8	Are there any used sharps in an open container in any area of the hospital			
9	Are there separate waste container in each of the injection area of the hospital of sharp waste infection and non-infectious			
10	Are there job aid posted that promote safe			

	administration of injection or safe disposal of injection			
11	Are all used sharp container awaiting final destruction completely closed			
12	Are fully sharp container stored in a locked area or otherwise stored safely away from public access			
13	Are there any used sharps on the ground immediately outside the hospital or around the disposal site			
14	What types of find waste disposal are used for sharps at hospital (tick as appropriate)			
	An open burning on the ground			
	Open burning in a hole			
	Burial			
	Dumping in protected pit			
	Dumping in unsupervised area			
	Transportation outside hospital			
15	Did any patient bring their own syringe			
16	Are needle sterilized			
17	Did the provider recap the used needle and syringe			
18	Is there an injection safety policy/guideline			

19	Is there a health care waste disposal policy/guideline			
20	Is staffs wear protective gear when handling and transporting sharp waste			
21	Is there a designated staff that dispose of health care waste			

Source: adapted from WHO revised injection safety assessment tool 2008