CHAPTER 1: INTRODUCTION

This chapter covers background information (1.1), literature review (1.2), the research problem (1.3) and discusses the aims (1.4) and objectives (1.5) of the research. It also explains some background to the methodology used.

1.1 BACKGROUND INFORMATION

Health care waste remains a big threat to health care, potentially compromising the strides that have already been made by health personnel in improving the quality of life in Swaziland. The researcher had noted that waste was generally not handled well and treated safely, posing a danger to both health workers and entire communities.

Large volumes of sharp waste material are poorly handled by health care professionals on a daily basis, and this increases the chances of injury (Pruss, 1999). Contraction of disease through such injury may compromise the quality of health care being provided in local clinics and hospitals.

Health care waste is the waste that is generated from health care facilities. The World Health Organization (WHO) defines health care waste as waste from clinics, hospitals, laboratories, blood banks, dental clinics, birth centers and hospitals (Pruss, 1999). It also includes waste from vaccination programmes and waste produced when caring for the ill at home.

This waste is, in the majority of cases, a danger to both human and animal life. Pruss (1999) further states that some health care waste is contaminated with blood or body fluids that may carry harmful microbes and spread disease. Used needles and other sharp tools can cause injury, as well as spread diseases. Some health care waste contains dangerous chemicals that can poison the water, soil and air.

Path (2007) emphasizes that sharp waste is particularly of major concern because it can penetrate the skin. The waste can carry blood-borne pathogens that can be responsible for the transmission of blood-borne diseases like Hepatitis B (HBV), Hepatitis C (HCV) and HIV.

The most vulnerable to infection in such cases are health professionals, who handle such waste.

Swaziland rural clinics

The study targeted the working environment of the Swaziland government's rural clinics. There were 70 rural clinics and 16 urban clinics in Swaziland at the time the study was conducted. These clinics were managed by the Ministry of Health and Social Welfare. The rural clinics were distributed throughout the country in the Hhohho (14), Manzini (21), Lubombo (18) and Shiselweni (17) regions.

The clinics were structured and operated in a similar fashion. Each clinic was headed by a senior sister, also referred to as a clinic manager, and had a dental hygiene office, environmental health office and a nursing department.

The clinics rendered the following services**:** a) mental health care b) primary health care c) HIV/AIDS care d) family planning services e) antenatal care and f) treatment of communicable diseases.

Clinics generally operate from 08h00 to 16h45 (Monday to Friday), and from 08h00 to 13h00 on Saturdays. All the services provided by clinics generated medical waste.

1.2 LITERATURE REVIEW

INTERNATIONAL PERSPECTIVE

Globally unsafe disposal of health care waste material happens at a high rate. Health care workers and communities remain the most highly exposed to health care waste. Contaminated injections are unsafely disposed off in a number of countries and this pose a risk to health care workers and to the public at large. More than 16 billion injections are administered worldwide. Of these, 95% are curative in nature, and 5% are administered in immunization settings. It is estimated that more than 50% of injections given in developing countries are unsafe, and these account for 33% of new hepatitis B infections, 42% of new hepatitis C infections, and 2.5% of new HIV infections (Path, 2007).

In its own study, the World Health Organization (WHO) vindicates Path as it states that health care waste leads to adverse health effects. These includes infectious waste (15% – 25% of total health care waste), sharp waste (1%), body parts (1%), chemical waste (3%), and radioactive waste (1%). The unsafe disposal of health-care waste (e.g. contaminated syringes and needles) poses public health risks. Contaminated needles and syringes present a bigger threat as failure to dispose them safely may lead to dangerous recycling and repackaging, thus leading to unsafe re-use. Contaminated injection equipment may be scavenged from waste areas and dumpsites and either re-used or sold to be used again (WHO, 2000).

WHO estimated that in 2000, injections with contaminated syringes caused;

- 21 million hepatitis B virus (HBV) infections (32% of all new infections);
- 2 million hepatitis C virus (HCV) infections (40% of all new infections); and
- at least 260 000 HIV infections (5% of all new infections) (WHO, 2000)

Most literature on sharp waste indicated that some of this waste is disposed off unsafely in unrestricted areas. Waste handlers and scavengers, including children, are highly exposed to the hazards since many of the dumping areas are not restricted.

WHO (2000) further states that there are dangers in dumping health care waste, especially sharp waste, in areas with unrestricted access. Children and scavengers may come into contact with the waste and use the contaminated needles and syringes. Epidemiological surveys indicate that a person injured by a needle after it was used on an infected source

patient has risks of 30%, 1.8%, and 0.3%, respectively of becoming infected with HBV, HCV and HIV.

In the United States of America, approximately 35% of nurses and 6.4% of aides experienced at least one sharps injury during their home health care career; corresponding figures for other blood and body fluid exposures were 15.1% and 6.7%, respectively. Annually, it has been discovered that sharps injuries incidence rates were 5.1 per 100 full-time equivalent (FTE) nurses and 1.0 per 100 FTE aides. Contributing factors were sharps injuries; poor sharps waste disposal, contact with waste, and patient handling (Quinn, 2009).

Blenkharn (2009) stated that errors in clinical waste management continue to happen; adding that among the major risk is depositing sharps in bags not designed for holding these. Blenkharn says ancillary, support staff and waste handlers are the most highly exposed if this waste is not properly managed.

NON-AFRICAN STUDIES

Health care waste management systems seem to be inadequate also in non-African countries, as indicated above. Many health care facilities do not have resources to segregate, store, transport and dispose waste properly.

A survey by Chen, Zhang , et.al. (2009) found that 71.3% of health care workers in nine hospitals in Fujian had sustained SOIs (sharp object injuries) during the past year. The rates of sharp object injuries (SOIs) among surgeons, nurses, anesthesiologists, and clinical laboratory workers was 68.7%, 76.9%, 88.1%, and 40.2%, respectively. Approximately 50% of the SOIs occurred while devices were being used. The survey clearly states that disposable syringes caused most of the injuries. Lack of protective and safe devices, heavy workloads and carelessness contributed to SOIs. The survey states that SOIs can be reduced among health care workers by using safety devices, disposing of used objects properly and reasonably allocating workloads.

Mesdaghinia, Naddafi et.al. (2009) found, in a study of nine hospitals in Tabriz, that there were poor health care waste management systems. Their results shows that regional management failed to accept responsibility to medical waste due to financial constraints.

Segregation and minimization of waste were not carried out correctly in any of the hospitals. It was perceived that protective clothing in 70% of clinics was not in line with their standards. Almost all the hospitals had waste management officers, but there was no effective training programme in place. Improper segregation and recycling of medical waste was carried out at the final disposal site.

Hussain M (2005) conducted a study in Pakistan on injection and sharp waste disposal practices among general practitioners. The results confirmed that there was a problem with sharp waste management, as 16 (53%) of doctors were disposing their sharp waste in the municipality waste, while 12 (40%) were burying it and 2 (6.7%) were burning it. No one was using specialized containers for sharp waste disposal. Eleven (37%) of doctors were separating needles, while 19 (63%) were not separating the needles prior to disposal of the waste.

In a study conducted in Cambodia, it was found that injections were overused as opposed to other means of administering treatment. It was argued that the use of injections contributed to large quantities of health care waste, especially sharps whose production could be prevented simply by resorting to other means of administering treatment. The investigators found that there were 13% of the used needles that were not disposed of properly because of lack of appropriate resources (Vong Perz, & Sok, et. al (2002)).

A study in Palestine conducted by Issam (2007) revealed that 10.8% of centres segregated waste properly and, 15.7% treated their medical waste. Open burning was the method that was used to dispose of waste. He stated that this method exposed health care workers and the community to health risk. Since there was poor management of health care waste to improve the situation, there should be enforcement of laws and provision of necessary infrastructure for proper waste management. Training of health care workers and cleaners should be encouraged.

AFRICAN STUDIES

The standard of health care waste management systems is very low in some African countries. There is generally poor availability of resources used for segregating, storing, transporting and treating waste. This situation is exacerbated by poor legislation.

Beghdadi (2009) presented the results of a survey on reported occupational blood exposures (OBE) in West Algeria. At least 108 exposures were reported by 70 women and 38 men. Needle stick injuries represented 81% of cases. He further states that cleaning staff and hygiene workers were the people that were most highly exposed to blood contamination. It is stated that 1/3 of injuries occurred due to poor management of waste. He elaborates that 42% of injuries could be avoided if objects were thrown away correctly in specific containers.

Taru & Kuvarega, et.al (2005) confirmed that there is poor management of health care waste in developing countries. In a study conducted at Parirenyatwa Hospital in Harare, Zimbabwe, an overwhelming 98% of employees interviewed reported that health care waste was not segregated and stored according to its composition. It was also observed that health care risk waste and health care general waste were largely collected and stored together.

Zanni (2007) on the same note states that the developing world does not have enough resources to properly manage sharps. He elaborates that transportation equipment is one of the facilities that was not available in developing countries. It was noted that there were many patients in health care facilities, but that all health care facilities were understaffed. This can lead to accidental needle stick injuries, reuse, or misuse.

Janjua (2010) says developing countries are fraught with problems in the area of health care waste management as health care facilities mix all types of waste. There was no segregation of sharp waste. Syringes could be retrieved from the rubbish pit. It was noted in this study that some health care facilities disposed off syringes in latrines. When syringes are not disposed off properly by burning (incineration) or burying, infection can occur.

In a UNDP research aimed at assisting sub-Sahara Africa dispose of health care waste properly, it was noted that most countries lacked legal policy for health care waste and sanitary landfill (Michelle, 2010). Eritrea, Lesotho and Ghana were among the countries that did not have legislation for health care waste management. Gambia, Ghana, Lesotho, Nigeria, Senegal, Tanzania had no sanitary landfills; while Kenya and Zambia only had crude dumpsites. It was estimated that there were more than 1000 incinerators in Africa, many of which had been reported to be inoperative or operating below standards. The UNDP noted that the high cost of safety boxes for proper disposal of sharps limited the use of these boxes. African countries were still buying them from outside vendors and this limited the use of these containers because they are expensive.

Gabela (2010) investigated health care waste management in 30 separate rural health care facilities in KwaZulu-Natal and found that there was poor availability of resources; segregation was not done; a variety of containers was used for sharp waste; there was no uniform procedure followed and none of the containers was labeled. In all the clinics, waste was physically carried by general workers and nurses to the central waste collection point.

Leonard (2003) revealed that there was generally poor management of health care waste in South Africa, where there have been numerous reports confirming that medical waste was disposed of in an incorrect manner.

The researcher noted that there is little information on what is happening in Swaziland, where health care waste management has been a low priority for a long time. Through the observation of the researcher, there was poor management of sharp waste in the country. This was seen in some of the health care facilities where health care waste was poorly managed. No studies have been done in the country on health care waste, though there is legislation in place.

LEGISLATION PERSPECTIVE

Policies, laws and guidelines provide a legal framework for the protection of the environment and public health. Various laws, guidelines and policies have been developed over the years at different levels to protect the public against the adverse health effects of health care waste. These have been developed at international, national and facility levels. If these laws were properly implemented, the risks associated with health care waste could be significantly reduced.

At the international level, several guidelines have been developed to deal with health care waste. WHO has developed a manual to guide countries on the management of health care waste, starting from generation, segregation and transportation to the disposal site (Pruss, 1999). The World Bank has put in place a guidance note to complement the WHO efforts on health care waste management (World Bank, 2000).

In Swaziland, at the national level, there have been a number of initiatives that government embarked on to address the problem of health care waste. Some legislation has been formulated, including the Waste Management regulation 2000 and the National Health Care Waste Management Guidelines, 2009.

Waste Management Regulation 2000

Sharp waste management in Swaziland is governed by the Waste Management Regulation 2000, which was implemented in 2000. It requires the licensing of all waste management facilities. **Section 24 of the Act states:** 'The owner or occupier of any land or premises on which clinical waste is produced shall ensure that all clinical waste produced on the premises is well managed'.

Swaziland National Health Care Waste Management Guidelines, 2009

Swaziland's National Health Care Waste Management Guidelines were implemented in 2009. These address waste segregation and storage, color-coding, transportation, disposal site, training and protective clothing.

Waste segregation and storage

The guidelines stated that effective management of health care waste considers the basic elements of waste minimization, segregation and proper identification of the waste.

Color coding

The guidelines clearly specified that the most appropriate way of identifying the categories of health care waste is by sorting the waste into color-coded containers.

Storage

It stipulated that storage location for health-care waste should be designated inside the Health-care establishment.

Transportation

The guidelines stipulated that one room inside the clinic needs to be specifically for storing waste. The final disposal site should be inside the clinic. Waste trolleys should be used when transporting the waste.

Protective clothing. (Used when Segregating, Storing, Transporting and disposing/ Treatment.)

The type of protective clothing used will depend on the extent of the risk associated with the health-care waste.

1.3 PROBLEM STATEMENT

Poor management of health care waste can cause serious disease to health – care personnel, waste workers, patients and the greater public. The greatest risk is posed by infectious waste. Through the observation of the researcher, the management of sharp waste in rural clinics in Swaziland seemed to be inadequate because waste is often seen scattered around the clinic. No studies had been done on this issue in Swaziland.

1.4 AIM OF THE STUDY: The aim of the study was to evaluate the management of sharp waste in 35 rural clinics in Swaziland.

1.5 OBJECTIVES OF THE STUDY

a) To assess the degree to which resources are available to enable staff to adhere to procedures regarding the segregation, storage, transportation and treatment of sharp waste in rural clinics in Swaziland.

b) To determine if relevant documents to address the management of sharp waste in rural clinics are available and accessible.

c) To determine perceptions of clinic managers for failures to comply fully with sharp waste management standards.

CHAPTER 2: MATERIALS AND METHODS

2.0 INTRODUCTION

This chapter covers materials and methods. It describes the study setting, study design, the sampling method, measurement tools, data collection, data analysis and the ethical issues.

SETTING OF THE STUDY

The study targeted the work environment of Swaziland government's rural clinics. There were 70 rural clinics and 16 urban clinics in Swaziland at the time of the study. The clinics were managed by the Ministry of health and social welfare. The rural clinics were distributed through the country in the Hhohho, Manzini, Lubombo and Shiselweni regions. There were 14 rural clinics in the Hhohho, 18 in the Lubombo**,** 21 in the Manzini and 17 in the Shiselweni regions**.**

2.1 STUDY DESIGN

The study design was a cross sectional descriptive survey. Methods of data acquisition were by observations through a walkthrough survey checklist followed by interviews of clinic managers with regard to perceptions of sharp waste management practices in their clinics.

There was a total population of 70 rural clinics in Swaziland which were distributed in the four regions of Swaziland: as shown in table 1

2.2 SAMPLE

A convenience sampling method was used. Clinics that were sampled were 50% . These were easily accessible.

TABLE 1 Number of rural clinics by region and number and percentage sampled.

Region	Number of rural clinics	Number of clinics sampled (%)
Hhohho	14	7(50%)
Manzini	21	10(48%)
Shiselweni	18	9(50%)
Lubombo	17	9(50%)
Total	70	35(50%)

Articles in scientific journals, other researchers' reports, research text books, the National Health Care Waste Guidelines, Waste Regulation 2000 were used as sources of information to design the measurement tools used in the study. The measurement tools used were also based on the objectives formulated**. (**Annexure 1-3 show some details of regulations and guidelines used to develop the measurement tools)

2.3 Pilot study

Both the walkthrough survey and interview questions were used in a pilot study. All the names of the rural clinics were written down and one clinic was randomly selected for the pilot study. The selected clinic was from the Manzini Region. The Manager was interviewed and a walk through survey was conducted.

The results of the pilot study were used to refine questions in the measurement tools to improve understanding.

2.4 Selection of clinic managers for interview

The study sample subjects consisted of the clinic manager in the four regions (Hhohho, Manzini, Lubombo and Shiselweni). Each clinic was headed by one clinic manager who was responsible for the overall management, development of policies, procedures and implementation plans. Thirty five clinic managers were interviewed.

The researcher conducted interviews with clinic managers. They were interviewed in English as all clinic managers were conversant in English. An appointment was made with clinic managers for the interviews. Interviews were conducted during their normal working hours.

2.5 Data collection on availability of resources

Data were collected during a walkthrough survey using a checklist in each clinic. The checklist comprised 13 items based on the Waste Management Regulation 2000 and the Swaziland National Health Care Waste Management Guidelines of 2009.

2.5.1 Walkthrough survey checklist

Data were collected by a walkthrough survey coupled with observations and careful recording of the observations using a checklist on resources for sharp waste management with 13 items. The walkthrough survey checklist is shown in Annexure 4. Both the walkthrough survey and interview questions were done at the same visits.

Observations were made in line with the checklist items while at the same time questions were raised on issues that needed further clarification or confirmation.

The Researcher conducted the observation walkthrough survey. All the sampled clinics were visited. Observation checklist was used to assess the degree to which resources were available to enable staff to adhere to procedures. One period of observation was done per clinic.

2.5.2 Availability of documentation

Information for objective two was acquired through checking files to see if each clinic had the relevant documents to address the management of sharp waste.

The interview questions were mostly open – ended to encourage managers to identify the reasons for non-compliance and to express views on support needed to improve compliance.

2.5.3 Interviews with clinic managers

In addition, interviews were conducted with clinic managers. The questions asked of clinic managers as shown in (annexure 5.)

Interview questions were based on the Swaziland National Health Care Waste Guidelines and the Waste Management Regulations 2000.

Appointments for interviews were made with the respective clinic managers by the researcher who was employed by the Ministry of health and social welfare.

2.6 Data analysis and management

Data obtained were analyzed in relation to the study objectives. Positive responses were identified with positive practices that reduce the risks or hazards, while negative responses were identified with negative practices that increase the risks and hazards. All these were captured and presented in the form of percentages. The existence of negative responses and observations in relation to the requirements of the regulations imply non-compliance while the positive responses and observations imply compliance with the regulations.

Data obtained were presented in tables to determine frequencies of occurrence of positive or negative practices in terms of responses and observations, it was then exported to Epi info software where chi-square test were done on propotions of compliance. From these tabulations and frequencies, percentages were used to determine compliance or non-compliance.

2.7 Ethics

Clinic managers were fully consulted and involved in the study to understand the objectives of the study as well as the procedures followed in collecting data and its subsequent analysis and reporting. Subsequent to the common understanding of the purpose of the study, information from the population sample was obtained and analyzed. Where mismanagement of sharp waste was observed, the necessary control

measures were recommended without prejudicing the personnel and the institution concerned.

Strict confidentiality was maintained by the use of clinic survey numbers allocated to participating clinics instead of names of such clinics on all outcomes from the research instruments. Only the researcher had a list of names and clinic survey numbers linked to particular clinics and participation was voluntary, such that those who declined participation was not adversely affected in any way. Data obtained was locked up for proper safe keeping.

Permission was obtained from the Human Research Ethics committee of University of the Witwatersrand and also the Ethical committee from the Ministry of Health in Swaziland to conduct the study. The permission letters were used as a facilitating tool to enter selected sites to collect data required.

CHAPTER 3: RESULTS

INTRODUCTION

In this chapter, data collected were presented in accordance with the three main objectives.

Section 3.1 Covers resources available for sharp waste management and first presents data on all 35 clinics followed by clinics grouped by the four regions and then the individual clinics.

3.2 Covers the availability of relevant documents and first presents data on all 35 clinics followed by clinics grouped by the four regions and then the individual clinics.

3.3 Covers perceptions of clinic managers on clinic compliance and presents data on all 35 clinics.

3.1 Assessment of resources available to enable staff to adhere to sharp waste management

3.1.1 All 35 clinics, summed compliance

TABLE 2: Resource availability for sharp waste management in 35 rural clinics, Swaziland 2010

QUESTION	ELEMENT	YES N (%)	NO N (%)	TOTAL
1	Sharp waste segregation	33(94%)	2(6%)	**35(100%)**
2	Puncture proof container used	23(65%)	12(34%)	**35(100%)**
3	Sharp waste containers coded	28(80%)	7(20%)	**35(100%)**
4	Sharp waste containers sealed at ¾ full	30(86%)	5(14%)	**35(100%)**
5	Availability of storage	7(20%)	28(80)	**35(100%)**

	area			
6	Availability of sharp waste transportation trolley	1(3%)	34(97%)	**35(100%)**
7	Availability of protective clothing for the health personnel(Nurses)	35(100%)	-	**35(100%)**
8	Availability of protective clothing for waste handlers	8(22%)	27(77%)	**35 (100%)**
9	Availability of a risk waste pit/ incinerator	17(49%)	18(52%)	**35(100%)**

As it can be seen in table 2, resource availability varied greatly among clinics from 100% to 3%. There was 100% compliance on the availability of protective clothing for the nurses. Only 1(3%) clinic had a sharp waste trolley.

There was also poor availability of PPE for waste handlers and less than 50% of clinics had a risk waste pit/incineration.

3.1.2: 35 Clinics by region

In the tables below, the resources available are shown for the 35 clinics by region.

Q1: Sharp waste segregation

TABLE 3: Sharp waste segregation availability, Swaziland 2010 by Region

REGION	**YES**	**NO**
HHOHHO	7(100%)	0(0%)
LUBOMBO	7(78%)	2(22%)
MANZINI	10(100%)	0(0%)
SHISELWENI	9(100%)	0(0%)
TOTAL	33(94%)	2(6%)

All clinics had 100% compliance except Lubombo Region which had 78% compliance.

A chi-square test showed that there was no statistically significant difference among the regions (chi - square = 6.128, p= 0.106)

Q2: Puncture proof containers availability

Table 4: Puncture proof containers in 35 clinics, Swaziland 2010 by Region

REGION	**YES**	**NO**
HHOHHO	6(86%)	1(14%)
LUBOMBO	7(78%)	2(22%)
MANZINI	6(60%)	4(40%)
SHISELWENI	4(44%)	5(56%)
TOTAL	**23(66%)**	**12(34%)**

As reflected in the table above, no clinic had complete compliance on the availability of puncture proof containers. Shiselweni Region had a very poor compliance as compared to other regions.

Although Shiselweni had lowest compliance in providing puncture proof containers, there was no statistically significance difference among the regions (chi-square = 3.776, p= 0.287)

Table 5: Availability of sharp waste containers in 35 rural clinics, Swaziland 2010 by Region

Q 3: Sharp waste containers availability

REGION	**YES**	**NO**
HHOHHO	6(86%)	1(14%)
LUBOMBO	8(89%)	1(11%)
MANZINI	8(80%)	2(20%)
SHISELWENI	6(67%)	3(33%)
TOTAL	**28(80%)**	**7(20%)**

As seen above, sharp waste containers were generally available. Shiselweni compliance was lower than other the other regions. Hhohho Region had the best compliance as compared to other regions.

A chi-square test showed that there was no statistically significant difference among the regions (chi- square = 1.587, p= 0.662)

Table 6: Sharp waste containers sealed when ¾ full in 35 rural clinics, Swaziland 2010 by Region

Q4: Sealing sharp waste containers when 3/4

REGION	YES	NO
HHOHHO	7(100%)	0(0%)
LUBOMBO	8(89%)	1(11%)
MANZINI	8(80%)	2(20%)
SHISELWENI	7(78%)	2(22%)
TOTAL	30(86%)	5(14%)

As seen above, it was observed that most clinics sealed their containers when ¾ full. The Shiselweni region has lowest compliance by 78% and the Hhohho region had 100% compliance.

A chi-square test showed that there was no statistically significant difference among the regions (chi - square = 1.587, p= 0.662)

Table 7: Availability of a storage area in 35 rural clinics, Swaziland 2010 by Region

Q5: Storage area availability

REGION	YES	NO
HHOHHO	1(44%)	6(88%)
LUBOMBO	0(0%)	9(100%)
MANZINI	1(10%)	9(90%)
SHISELWENI	5(56%)	4(44%)
TOTAL	7(20%)	28(80%)

As seen above, there was poor availability of storage areas. All the regions had less than 50% compliance except the Shiselweni region at 56% compliance.

A chi-square test showed that there was a statistically significant difference among the regions (chi- square = 10.133, p =0.175)

Table 8: Availability of transportation waste trolleys in the 35 clinics, Swaziland 2010 by Region

Q6: Transportation waste trolley availability

REGION	**YES**	**NO**
HHOHHO	0(0%)	7(100%)
LUBOMBO	0(0%)	9(100%)
MANZINI	0(0%)	10(100%)
SHISELWENI	1(1)	8(89%)
TOTAL	**1(3%)**	**34(97%)**

As can be seen in table 2, there was very poor availability of transportation waste trolleys. Only one clinic, in the Shiselweni region, had a transportation waste trolley.

There was no statistically significant difference among the regions (chi-square = 2.974, p= 0.396)

Table 9: Availability of protective clothing for health personnel in rural clinics, Swaziland 2010 by Region

Q7 Protective clothing availability

REGION	**YES**	**NO**
HHOHHO	7(100%)	0(0%)
LUBOMBO	9(100%	0(0%)
MANZINI	10(100%)	0(0%)
SHISELWENI	9(100%)	0(0%)
TOTAL	**35(100%)**	**0(0%)**

As reflected above, there was 100% availability of protective clothing for the health personnel.

Table10: Availability of protective clothing for waste handlers in 35 rural clinics, Swaziland 2010 by Region

Q8: Protective clothing availability

REGION	**YES**	**NO**
HHOHHO	0(0%)	7(100%)
LUBOMBO	3(33%)	6(67%)
MANZINI	0(0%)	10(100%)
SHISELWENI	5(56%)	4(44%)
TOTAL	**8(23%)**	**27(77%)**

As can be seen, there was poor availability of protective clothing for waste handlers. Only one region was 50% compliant, the rest had a very poor compliance.

The Hhohho and the Manzini Region had the lowest compliance availability of protective clothing for waste handlers. There was a statistically significant difference among the regions (chi- square = 11.053, p = 0.011).

TABLE 11: Availability of risk waste pit/incinerator in 35 rural clinics, Swaziland 2010 by Region

Q9: Risk waste pit availability

REGION	**YES**	**NO**
HHOHHO	2(29%)	5(71%)
LUBOMBO	6(67%)	3(33%)
MANZINI	2(20%)	8(80%)
SHISELWENI	7(78%)	2(22%)
TOTAL	**17(49%)**	**18(51%**

As shown in the table, there was poor availability of risk waste pit/incinerator in the Hhohho and the Manzini regions. Their compliance was less than 50%. the Shiselweni and the Lubombo regions were above 50% compliance.

The chi-square shows that there is a statistically significant difference among the regions (chi- square = 8.642, p = 0.034)

OVERALL MEAN COMPLIANCE

The overall mean percentage compliance with elements 1-9 for each region showed that the Hhohho had a mean percentage of 57%, the Lubombo 49%, the Manzini 50%, and the Shiselweni 66%

The compliance did not differ significantly among the regions

Table 12: Summed compliance by 35 clinics with questions 1-9 on resource availability for sharp waste management

CLINIC NUMBER	OVERALL COMPLIANCE
1	2/9 (22%)
2	3/9 (33%)
3	3/9 (33%)
4	3/9(33%)
5	3/9(33%)
6	4/9 (45%)
7	5/9(56%)
8	5/9 (56%)
9	5/9 (56%)
10	5/9 (56%)
11	5/9 (56%)
12	5/9 (56%)
13	5/9 (56%)
14	5/9 (56%)
15	5/9 (56%)
16	5/9 (56%)
17	5/9 (56%)
18	5/9 (56%)
19	6/9 (66%)

20	**6/9 (66%)**
21	**6/9 (66%)**
22	**6/9 (66%)**
23	**6/9 (66%)**
24	**6/9 (66%)**
25	**6/9 (66%)**
26	**6/9 (66%)**
27	**7/9 (78%)**
28	**7/9 (78%)**
29	**7/9(78%)**
30	**7/9 (78%)**
31	**7/9 (78%)**
32	**7/9 (78%)**
33	**8/9 (89%)**
34	**8/9 (89%)**
35	**8/9 (89%)**

As can be seen in Table 12, Only 3 clinics exceeded 80% compliance, 18 clinics had less than 60% compliance and this clinics includes 7 which were from the Manzini region, 5 were from the Hhohho region, and 2 were in the Shiselweni region and 2 in the Lubombo region.

3.2 Determination of availability of relevant documents

3.2.1 All clinics, summed compliance

TABLE 13: Availability of sharp waste management Legislation by 35 clinics with questions (10-13)

QUESTION	DESCRIPTION	**YES** **N (%)**	**NO** **N (%)**	**TOTAL**
10	Availability of waste regulation	**4(11%)**	**31(88%)**	**35(100%)**
11	Availability of HCWM Plan	**4(12%)**	**31(89%)**	**35(100%)**
12	Availability of schedule on training	**10(29%)**	**25(71%)**	**35(100%)**
13	Availability of National Health Care Waste Guidelines	**5(14%)**	**30(86%)**	**35(100%)**

As can be seen in Table 13, availability of regulations was very poor in all the regions. The highest clinic had 29% compliance and the lowest clinic 11%.

3.2.35 Clinics by Region

In the tables that follow, availability of regulations are shown for the 35 clinics by Region.

Table 14: Availability of Legislation in 35 rural clinics, Swaziland 2010 by Region

Q10: Legislation in place

REGION	**YES**	**NO**
HHOHHO	0(0%)	7(100%)
LUBOMBO	3(33%)	6(67%)
MANZINI	0(0%)	10(100%)
SHISELWENI	1(11%)	8(89%)
TOTAL	**4(11%)**	**31(89%)**

As seen above, availability of regulations was very poor in all regions. All regions were far from reaching 50% compliance.

Although the Hhohho and the Manzini Region had the lowest compliance in the availability of Waste regulations. The Chi-square test showed that there was no statistically significant difference among the regions (chi- square = 6.461, p =0.091)

Table15: Availability of Health Care Waste Management document in 35 rural clinics, Swaziland 2010 by Region

Q11: Health care waste availability

REGION	**YES**	**NO**
HHOHHO	0(0%)	7(100%)
LUBOMBO	3(33%)	6(67%)
MANZINI	0(0%)	10(100%
SHISELWENI	1(11%)	8(89%)
TOTAL	**4(11%)**	**31(89%)**

As can be seen in table 4, availability of the Health Care Waste Management document was very poor in all regions. In Hhohho and Manzini regions there was no compliance with the availability of Health Care Waste Management Document.

There was no statistically significant difference among the regions. (chi- square = 6.461, p =0.091)

Table16: Availability of Schedule of Training in 35 rural clinics, Swaziland 2010 by Region

Q12: Schedule of training availability

REGION	**YES**	**NO**
HHOHHO	1(14%)	6(86%)
LUBOMBO	3(33%)	6(67%)
MANZINI	0(0%)	10(100%)
SHISELWENI	6(67%)	3(33%)
TOTAL	10(29%)	25(71%)

As seen above, the availability of a Schedule of training was very poor in all the regions, particularly in Manzini Region.

There was the statistically significant difference among the regions **(**chi- square = 11.203,

p =0.010)

Table 17: Availability of National Health Care Waste Guidelines in 35 rural clinics, Swaziland 2010 by Region

Q13: National health care waste availability

REGION	**YES**	**NO**
HHOHHO	0(0%)	7(100)
LUBOMBO	3(33%)	6(67%)
MANZINI	0(0%)	10(100%)
SHISELWENI	2(22%)	7(78%)
TOTAL	**5(14%)**	**30(86%)**

As seen above, the availability of National Health Care Waste Guidelines was very poor.

There is no statistically significant difference among the regions. Chi- square = 5.963, p =0.113

Overall mean percentage compliance with elements 10 - 13 for each region indicated that Hhohho had a mean percentage of 3.5%, Lubombo 33%, Manzini 0%, Shiselweni 27.5%

Table 18: Summed compliance by 35 clinics with question 10-13 on the availability of documents.

1	**0/4(0%)**
2	**0/4 (0%)**
3	**0/4(0%)**
4	**0/4(0%)**
5	**0/4(0%)**
6	**0/4(0%)**

7	**0/4 (0%)**
8	**1/4(25%)**
9	**1/4(25%)**
10	**1/4(25%)**
11	**1/4 (25%)**
12	**1/4 (25%**
13	**1/4(25%)**
14	**1/4(25%)**
15	**1/4(25%)**
16	**1/4(25%)**
17	**1/4 (25%)**
18	**1/4(25%)**
19	**1/4(25%)**
20	**1/4(25%)**
21	**1/4(25%)**
22	**1/4(25%)**
23	**1/4(25%)**
24	**1/4(25%)**
25	**1/4(25%)**
26	**1/4(25%)**
27	**1/4(25%)**
28	**1/4(25%)**

29	**1/4(25%)**
30	**1/4(25%)**
31	**1/4(25%**
32	**2/4(50%)**
33	**2/4(50%)**
34	**2/4(50%)**
35	**3/4(75%)**

There was no 100% compliance with the availability of documents by any clinic. No clinic had exceeded 80% compliance. Among the 35 clinics, 34 had less than 60% compliance.

Of the 35 clinics with less than 60% compliance, all clinics were below 60% except one clinic which is from the Lubombo region.

3.3. Determination of perception of clinic managers.

3.3.1 Summed perception of clinic managers on clinic compliance

Q1: Knowing aspects that needs some improvement on sharp waste management

All the 35 clinic managers agreed that they knew that there were short falls in sharp waste management.

TABLE 19: Improvement on sharp waste management

Q2: Why there was no compliance in clinics

CLINIC MANAGER'S RESPONSE	NUMBER RESPONDED
There was poor availability of resources to adhere to sharp waste management	30(86%)
No provision of protective clothing	2(6%)
There was no availability of regulations	3(9%)
TOTAL	35(100%)

Eighty six percent of clinic managers reported that there was poor availability of resources in their clinics and that was why their clinics were not complying.

Table 20: Clinic compliance

Q3 What needs to be done for the clinics to comply?

There should be availability of resources to adhere to sharp waste management	30(86%)
Provision of protective clothing	2(6%)
Regulations should be available	3(9%)
TOTAL	35(100%)

As seen above, 86% of clinic managers recommended that there should be availability of resources; few recommended that they should be provided with protective clothing and regulations.

Table 21: Regional management support

Q4 Support needed from the regional management

CLINIC MANGERS' RESPONSE	NUMBER RESPONDEND
Training on health care waste	7(20%)
Regional management to regularly visit clinic to identify needs	3(9%)
Technical support on incinerators/risk waste pit	25(71%)
TOTAL	35(100%)

As seen above, most clinic managers needed technical support on the incinerators/risk waste pit and 20% needed support on training for health care waste management.

SUMMARY OF RESULTS

FINDINGS FROM WALK THROUGH SURVEY

- At the time of doing the study, nationally 94% of clinics had resources for segregating waste properly. All the regions had the resources to segregate sharp waste, except for the Lubombo region, which had two clinics that did not have such resources.
- Some 65% of clinics had puncture proof containers; and 80% of clinics had coded sharp waste containers; 86% sealed sharp waste at ¾ full. The Shiselweni region was the worst region as it had poor compliance with the availability of sharp waste containers, availability of colour-coded sharp waste containers, and in sealing sharp waste containers when they were ¾ full.
- Twenty percent of the clinics in the regions had storage areas for sharp waste. All the regions had poor compliance with the availability of storage areas at 50%. The Shiselweni region was 56% compliance.
- Nationally, there was poor compliance in the availability of waste trolleys; only one clinic in the country, based in the Shiselweni region, had a waste trolley.
- Nationally, all health personnel had protective clothing, though 77% of clinics did not have full protective clothing for waste handlers. In the Hhohho and Manzini regions, there were no waste handlers that had full protective clothing.
- Nationally, 51% of the clinics did not have risk waste pits/incinerators. The Hhohho and Manzini regions had poor compliance at less than 50%.
- All the clinics in the four regions had poor compliance with the availability of documents. (Waste Regulations 2000, Healthcare Waste Management Plan Document and National Healthcare Waste Guidelines).

FINDINGS FROM THE PERCEPTIONS OF CLINIC MANAGERS

Most of the clinic managers indicated that they were aware that their clinics did not comply, and cited the following reasons for non-compliance:

- There were no risk waste pits/incinerators in most of the clinics.
- Little training and technical support was provided to the clinics.

They indicated that regional management should encourage compliance by supporting the construction of risk waste pits/ or incinerators. Regional management should give technical support and training to all clinics.

CHAPTER 4: DISCUSSION

4.0 INTRODUCTION

The aim of the study was to evaluate resources for the management of sharp waste in 35 rural clinics in Swaziland. This study was the first attempt to assess sharp waste management in these rural clinics. The findings were also based on the perceptions of clinic managers.

4.1 LIMITATIONS

It is worth noting that observation was conducted only once in the clinics and that was a limitation because the findings might not reflect a true picture. The study would have been stronger if data were collected on more than one occasion for each site.

The focus of this study was only on government rural clinics; therefore, the results obtained from this research may not represent the status quo of all clinics in Swaziland. Missionary and private clinics were not sampled, and for that reason, the results of this study may not be generalized to all clinics in Swaziland also convenience sampling undermines genereralisability.

Responses obtained from clinic managers, through interview questions, were not substantiated and could thus affect the accuracy, reliability and validity of the findings arrived at.

Interviews with clinic managers did not provide real insight into the underlying reasons for poor compliance e.g. financial constrains, poor provisioning etc. A more detailed interview with clinic managers would have been more informative.

Actual practice was not observed; rather resources for sharp waste management were identified.

4.2 FINDINGS

4.2.1 OBJECTIVE 1: To assess the degree to which resources are available to enable staff to adhere to procedures regarding the segregation, storage, transportation and treatment of sharp waste in rural clinic Swaziland.

Generally, there was poor availability of resources to enable staff to adhere to procedures regarding the segregation, storage, transportation and treatment of sharp waste in rural clinics in Swaziland. This may be due to financial constraints but this was not investigated in this study. The scarcity of health care resources and facilities is not only limited to Swaziland, but is prevalent in most developing countries (Mesdaghinia and Naddafi 2009)

In the area of sharp waste segregation, almost all the clinics had basic resources. Only two clinics in the Lubombo region did not have the resources to segregate waste. There was poor availability of a storage area in many of the clinics, with only the Shiselweni region being above 50% compliance. Just one clinic in the country had a transportation waste trolley. Most clinics do not have risk waste pits or incinerators, the exception being the Lubombo and Shiselweni regions, which were above 50% compliant on the availability of risk waste pit or incinerator.

Mesdaghinia and Naddafi (2009) note in their study conducted in Tabriz that there were no practical instructions or suitable supervision on different levels of waste management in most clinics in the developing world. Health authorities and hospital managers do not take responsibility for medical waste due to financial problems and the study notes that there is lack of awareness regarding the hazard of medical waste. It is noteworthy that the study highlights that there was no improper segregation and minimization of waste in all the hospitals surveyed, nor did they have proper equipment. Developing countries have challenges since they cannot manage the volume of health care waste that is being generated in clinics.

Zanni (2007) says the volume of sharp waste generated in health care facilities cannot be well managed because of scarcity of resources. He further elaborates that developing countries do not have disposal incinerators and waste transportation equipment. He also brings up the issue of understaffing and unskilled staff, which contributes in the poor management of sharps. This challenge has been seen as a limitation in the enforcement of waste disposal protocols. All this could lead to accidental needle stick injuries, reuse, or misuse.

Path (2000) supports the researcher's findings, and statistically demonstrates that annually, more than two million needle-stick injuries occur among health care workers worldwide. This is due to unsafe injection and sharps disposal practices, including syringe reuse, inadequate waste storage facilities and lack of access to safer medical devices. Inadequate storage facilities are one of the challenges in developing countries, where only 20% of clinics have these storage facilities. In Swaziland, the compliance percentage was very low, just as Path had found in his study.

A study conducted by Janjua (2010) unearthed similar results as that of this researcher. The findings were that in developing countries there was poor health care waste management. It found that in most health care facilities, rubbish pits were used for disposal of used syringes and needles. These were found to be so shallow that used syringes could be retrieved from them easily. Some health facilities were found to be disposing syringes in latrines. In the case of Swaziland, the researcher found that only two regions were above 50% in the availability of pits or incinerators, a similar finding as that of Janjua.

Direct re-use of contaminated injection equipment results in occupational hazards to health workers, waste handlers and scavengers (WHO (2000). Where waste is dumped in areas without restricted access, children may come into contact with contaminated waste and play with used needles and syringes, thus putting their lives in danger. Epidemiological studies indicate, as indicated above, that a person who experiences one needle stick injury from a needle used on an infected source patient has risks of 30%, 1.8%, and 0.3%, respectively, of becoming infected with HBV, HCV and HIV.

This study reveals that there was poor compliance in the use of protective clothing by waste handlers. Shiselweni was found to be the only region to have above 50% compliance.

Mesdaghinia and Naddafi (2009) agree with the result in the study at Tabriz. The study confirmed that there was proper protective clothing for some of the health workers. The study revealed that 70% of the health care facilities use protective clothing that was not in agreement with the standard. Chen (2009) surveyed health care workers in nine hospitals in Fujian between December 2005 and February 2006. The survey also confirmed that sharp object injuries occurred because of lack of protective clothing. The author agreed with the researcher's results that protective clothing was not adequately provided to the waste handlers and this increases the object injuries in health care centres.

4.2.2 OBECTIVE 2: To determine if relevant documents to address the management of sharp waste in rural clinics are available and accessible.

There was poor availability of relevant documents in most of the clinics. All the clinics in the four regions had poor compliance with the availability of Regulations (Waste Regulations 2000, Health Care Waste Management Plan document and National Health Care Waste Guidelines) at less than 50% compliance.

Policies, laws and regulations are very important in health care waste management. If proper legislation was in place, the risk associated with poor waste management in health care centers could be reduced. Clinics need to put in place proper structures to facilitate implementation. These structures should include measures to ensure that health care professionals and other employees of the hospitals have sufficient knowledge, not only about the existence of such documents, but also about their requirements. They would then be able to engage in practices that prevent infections and injuries within and outside the clinics.

A study conducted by Issam (2007) in Palestine encourages the establishment and enforcement of laws and argues that this is necessary for proper health care waste management and training of health care workers and cleaners. The WHO developed a manual to guide countries in the management of health care waste (Pruss, 1999). The World Bank (2000) put in place a guidance note to complement the WHO efforts on health care waste management.

At the national level, Swaziland has a number of initiatives to address the problem of health care waste such as legislation, which includes the Waste Management Regulation 2000 and the Health Care Waste Guidelines. These clearly stipulate how to establish a proper health care waste management system.

Waste Management Regulation 2000 specifically addresses sharp waste management in Swaziland. Section 24 of the Act states that the owner or occupier of any land or premises on which clinical waste is produced must ensure that these are well managed. If the owner does not comply, there are charges of 25 thousand that are paid.

4.2.3 OBECTIVE 3: To determine perceptions of clinic managers for failure to comply fully with sharp waste management standards.

Most clinic managers indicated that they were aware that their clinics did not comply and attributed this to unavailability of risk waste pits or incinerators in most of the clinics. It also emerged that there was little technical training and support provided to the clinics on health care waste management.

The managers felt that compliance in clinics should be encouraged by regional management through giving support on the construction of risk waste pits/incinerators. Technical support and training should also be encouraged by the regional management in all clinics.

Mesdaghinia and Naddafi (2009) confirmed in a study that health authorities were not able to take their full responsibilities in health care centres because of financial constraints. The study revealed that segregation and minimization of waste were not carried out correctly in any of the hospitals. There was no effective training programme for the staff. Illegal segregation and recycling of medical waste was carried out at the final disposal site.

The researcher's result state the same thing as Mesdaghinia and Naddafi. Both the researcher and the authors agree that there is poor training and poor support from the regional management due to financial constraints.

CHAPTER 5: RECOMMENDATIONS

It is hereby recommended as follows:

- Each clinic should form a health care waste management team to develop a written waste management plan for the clinic. The plan should clearly define duties and responsibilities of all members of staff, both clinical and non-clinical, in respect of the handling of health care waste, and establish lines of accountability.

- Clinic Managers should be work-shopped on the existing legislation of health care waste.

- A training course should be developed at a national level

- Matrons or Nurse Managers and Hospital Managers should be responsible for training health personnel in the correct procedures for segregation, storage, transport and disposal of waste. They should, therefore, liaise with the waste management officer.

- The Ministry of Health should create a post for a waste management officer (WMO) in each region. Waste management is far too important to be treated as voluntary work. Among the responsibilities of the WMO would be to supervise and co-ordinate the waste management plan and training. The WMO would also ensure that health care waste is disposed off in accordance with the national guidelines.

- Supply officers should liaise with waste management officers to ensure a proper and continuous supply of the items required for sharp waste management. Among these are sharp waste containers, protective clothing etc. These items should be ordered in good time to ensure that they are always available.

- The WMO should be responsible for day-to-day monitoring of the waste management system.

- In the **area of sharp waste collection,** the WMO should control internal collection of waste containers and their transportation to the central waste storage facility of the clinics.

- In the **area of sharp waste storage,** the WMO should ensure the correct use of the central storage facility for health care waste, which should be kept locked, but should always be accessible to clinic staff.

- In the **area of sharp waste disposal,** the WMO should co-ordinate and monitor all waste disposal.

- The Matron or Nurse Manager should help in allocating sufficient financial and personal resources to ensure efficient operation of the plan.

- The Ministry of Health would be expected to facilitate the development of the Health Care Waste Management Policy.

- The Clinic Manager should make sure that the Waste Regulation 2000 and the National Health Care Waste should be made accessible to all the clinics.

- There must be an immediate attention to those clinics that had poor compliance.

RECOMMENDATION FOR FUTURE STUDY

Future studies should be planned to observe practice and implementation as well as availability of resources, including financial and training resources

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ANNEXURE 1: Extract from Waste Management Regulation 2000

Section 24 of the Act states that;

(1) The owner or occupier of any land or premises on which clinical waste is produced shall ensure that all clinical waste produced on the premises is immediately placed in heavy duty plastic bags or other containers prescribed by the Authority, which are color-coded in accordance with sub-regulation:

(2) All plastic bags and containers containing clinical waste shall be color-coded and labeled as follows:

a) all clinical waste which has not been sterilized and rendered non-infectious shall be placed in heavy red plastic bags at the point of generation;
b) all clinical waste which has been sterilized by autoclave, microwave chemical or other non-burning method, shall be placed in heavy duty yellow plastic bags;
c) all sharps, whether sterilized or not, shall be, placed in rigid, sealed plastic containers clearly marked 'clinical waste – sharps in red lettering

3) All clinical waste shall be sterilized prior to final disposal, in accordance with the requirements of the Authority, either on the premises where the waste was produced or at an authorized waste disposal facility.

(4) Every owner or occupier of premises on which clinical waste is produced shall provide periodic training on proper clinical waste handling procedures to all employees who may come in contact with clinical waste, in accordance with the requirements of the Authority.

ANNEXURE 2: Extract from Swaziland National Health Care Waste Management Guidelines, 2009

2.2.1 Waste segregation and storage

The effective management of health care waste considers the basic elements of waste minimization, segregation and proper identification of the waste.

Segregation is the process of separating different types of waste at the point of generation.

Sharp waste should be placed in clearly marked containers that are appropriately labeled for the type and weight of waste.

Sharps should be collected together; containers should be puncture proof and be fitted with covers

Sharp containers should be removed when they are three quarters full.

To improve segregation efficiency proper placement and labeling of containers must be carefully determined.

2.2.2 Color coding

The most appropriate way of identifying the categories of health care waste is by sorting the waste into color-coded containers.

COLOUR – CODE SCHEME FOR HEALTH CARE WASTE

Type of waste	Color of container and markings	Type of container
Infectious waste	Red	Heavy duty plastic
Pretreated waste	Yellow	Heavy duty plastic
Sharps	Red	Puncture proof container
General waste	Black	Heavy duty bag

2.2.3 Storage

Storage location for health-care waste should be designated inside the Health-care establishment.

2.2.4 Transportation

One room inside the clinic needs to be specifically for storing waste. The final disposal site should be inside the clinic

Transportation to the storage area and disposal site is usually performed using the waste trolleys. Waste trolleys should be easy to load and unload the waste. They must not have any sharp edges that could damage waste bags.

2.2.5 Protective clothing (Used when Segregating, Storing, Transporting and disposing/ Treatment

The type of protective clothing used will depend on the extent of the risk associated with the health-care waste; but the following should be made available to all personnel who collect or handle health-care waste:

b) Eye protection (i.e. safety goggles) - waste handlers during Incineration

c) Overalls – Obligatory for waste workers

e) Industrial boots – obligatory for waste workers

f) Disposable gloves and heavy gloves for health care staff

Industrial boots and heavy duty gloves are particularly important for waste workers. The thick soles of the boots offer protection in the storage area as a precaution from spilled sharps and where floors are slippery.

Operators of manually loaded incinerators should wear helmets. During ash and slag removal and other operations that create dust, dust masks should be provided for operators.

ANNEXURE 3: SPECIFICATIONS FOR SHARP WASTE MANAGEMENT

When using the observation tool, these are some specifications that would be followed. They are based on the Waste Management Regulation of 2000 and the National Health Care Waste Guidelines for 2009

1. Sharp waste should be segregated at the point of generation

- Sharps must be put into rigid, puncture - proof containers which should be available at the health worker's workplace supplied by the Ministry of Health.
- Segregation should be done at the point of generation, using the yellow/red marked container. It should be the one that is supplied by the Ministry of Health

2. Sharp waste placed in puncture proof container

- Container to be used should be puncture proof and should be the one that is supplied by the Ministry of Health to each clinic

3. Sharp waste container coded red

- Should be properly color coded with yellow/red color.

4. Sharp waste containers sealed when ¾ full

- When ¾ full, the containers should be disposed of safely. Containers should have some markings

5. Storage area used

- Storage location for the clinic waste should be designated inside the health care establishment.

6. Sharp waste transportation trolleys used

- Trolley should be used.
- Should be easy to load and unload
- Should not have sharp edges that could damage waste bags

7&8 Protective clothing used

- Leg protectors and or industrial boots – Waste worker
- Overall – Waste worker
- Surgical gloves - Medical staff
- Heavy – duty gloves - Waste workers
- Safety goggles- Waste worker
- 9. Treatment (Pit/Incineration) used for sharp waste

- Sharp waste burial pit should be covered with a lid

- The place should be fenced to prevent unauthorized entry.

OR an Incinerator should be used

10. Waste Management Regulation 2000 used in clinics

- There should be a file that contain Waste Management Regulation 2000

11. Health care waste management plan document used in clinics

- There should be a file with Health Care Waste standards document operating procedure.

12. Training on Health personnel, on Health Care Waste Management in place

- There should be a schedule on training

13. National Health Care Waste Management Guidelines available

ANNEXURE 4: WALKTHROUGH SURVEY OBSERVATION CHECKLIST

CLINIC SURVEY NUMBER ……

NO OF NURSES ……

NO OF WASTE HANDLERS …….

REGION …….

1. Waste segregation is done at the point of generation ☐

Comment ……

……

2. Sharp waste placed in puncture proof container (should be the one that is being supplied by the Ministry of Health) ☐

Comment ……

…….

3. Sharp waste container coded with red color (should be the one that is supplied by the Ministry of Health)

Comment …….

…….

4. Sharps containers sealed when ¾ full (containers should have clear markings)

Comment …….

……..

5. Storage area provided for health care sharps waste (should be designated inside the clinic, should be separated from other rooms)

Comment ……..

……

6. Sharp waste transportation trolleys used in the clinic

Comment……

……

7. Protective clothing used by health personnel

Comment……

……

8. Full protective clothing used by waste handlers

Comment ……

……

9. Treatment (Pit/Incinerator) used for sharp waste

Comment ……

…….

10. Waste Regulation 2000 used and easily accessible in the clinic

Comment ……..

……..

11. Health Care Waste Management Plan document used and easily

Accessible in the clinic.

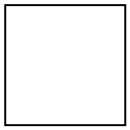
Comment ……..

……..

12. Schedule of training of Health personnel available and easily accessible in the clinic

Comment ……

…….



13. National Health Care Waste Guidelines used and easily accessible

In the clinic

Comment……

……..

NB

Y – Resource/Equipment available

N – Resource/Equipment not available

ANNEXURE 5: INTERVIEW WITH CLINIC MANAGER

CLINIC SURVEY NUMBER ……..

REGION ……

I. WANT TO DISCUS WITH YOU SHARP WASTE MANGEMENT IN THE CLINIC SO THAT MEASURES CAN BE IDENTIFIED THAT WILL HELP CLINICS IN THE MANAGEMENT OF SHARP WASTE.

DURING THE SURVEY OF THE CLINIC, I NOTICED SOME ASPECTS THAT NEED IMPROVEMENT FOR EFFECTIVE SHARP WASTE MANAGEMENT

2. DID YOU KNOW ABOUT THESE ASPECTS THAT NEED IMPROVEMENT?

……

……

3. WHY DO YOU THINK YOUR CLINIC DOES NOT FULLY COMPLY WITH SHARP WASTE MANAGEMENT STANDARDS

……..

…….

…….

4. WHAT DO YOU THINK NEEDS TO BE DONE TO IMPROVE THE CLINIC'S COMPLIANCE WITH SHARP WASTE MANAGEMENT STANDARDS?

……

……

5. DO YOU NEED SUPPORT FROM THE REGIONAL MANAGEMENT TO FULLY COMPLY WITH THE SHARP WASTE MANAGEMENT STANDARDS? IF YES, WHAT DO YOU NEED?

……..

……..

ANNEXURE6: SUBJECT INFORMATION AND CONSENT FORM

ENQUIRIES: GLENROSE MALINGA

TEL NO:+00268 6039093

EMAIL:
malingaceliwe@yahoo.co. uk

GREETINGS

INTRODUCTION

My name is Glenrose Malinga and I am conducting a study for a Master Degree at the University of the Witwatersrand. The study is being conducted in rural clinics of Swaziland and focus is on Sharp Waste management system.

PURPOSE OF THE STUDY

This study aims to 1) assess the segregation, storage, transportation and treatment of sharp waste in the rural clinics in Swaziland. 2) To determine if documented standard operating procedures that are in place to address the management of sharp waste in rural clinics. 3) To determine perceptions of clinic managers for failures to comply fully with sharp waste management standards.

RIGHT AS A PARTICIPANT IN THIS STUDY

Rural clinics that are convenient to the researcher will be selected in this study and your clinic is one of the clinics that will be selected to participate. The researcher will conduct the study herself. Walkthrough survey observation checklist will be used in all the selected rural clinics. Clinic managers will be interviewed on their perception for failures to comply fully with sharp waste management standards. 35 clinics will be selected that are nearer to Researcher's work jurisdiction.

Before agreeing to participate, it is important that you read and understand the following explanation of the purpose of the study, the study procedures, benefits, risks, discomfort and

precautions as well as the alternative procedures that are available to you, and your right to withdraw from the study at any time

RISKS

There are no risks which are anticipated as a result of participation in this study. There are no punitive measures that will be taken against you based on the information you provide.

BENEFITS

Participants will benefit because hazards will be identified and necessary recommendations will be made to eliminate or minimize such identified hazards. This will also help with legal compliance. Your participating in this study will contribute a lot in generating information that will be used to prevent infections transmitted by untreated sharp waste.

WITHDRAWAL

The study is completely voluntary. Refusal to participate will involve no penalty or loss of benefits to which the participants is otherwise entitled and that the subject may discontinue participation at any time without penalty loss of benefits to which the participation is otherwise entitled. You may choose not to answer any question that you do not like to answer. If you have any questions, do not hesitate to ask me. If you decide to take part in the study, you will be asked to sign this document to confirm that you understand the study.

ETHICAL APPROVAL

This study protocol has been submitted to the University of the Witwatersrand, Human Research Ethics committee (HREC) and written approval has been granted by that committee

CONFIDENTIALITY

Confidentiality will be maintained by the use of clinic survey numbers allocated to participating clinics instead of names of such clinics on all outcomes from the research instruments. Only the researcher will have a list of names and clinic survey numbers linked to particular clinics. This will be kept and locked in an office.

This information will be reviewed by authorized representative of the Wits school of Public Health

You will be informed of any findings of importance to management of Sharp Waste but this information will not be disclosed to any third party in addition to the ones mentioned above without your written permission. Data that may be reported in scientific Journals will not include any information that identifies you as a participant in this study

SOURCES OF ADDITIONAL INFORMATION

In case you have any queries, more information may be obtained from the Researcher's no that will be available for 24 hrs +002686039093.

If you want any information regarding your rights as research participants, or complaints regarding this research study, you may contact Professor Clinton, chairperson of the University of the Witwatersrand, Human Research Ethics committee (HREC), which is an independent committee established to help protect the rights of research participants.

You can also contact the chairperson of the Human Ethics committee in the country who is DR S.V Magagula if you want more details regarding your rights as a research participants. This is the number 002684042431

INFORMED CONSENT

I hereby confirm that I have been informed by the investigator about the nature, conduct, benefits and risk of the study: SHARP WASTE MANAGEMENT IN RURAL CLINICS IN SWAZILAND

I have also received, read and understood the above written information regarding the study.

I am aware that the result of the study, including personal details regarding my initials will be anonymously processed into a study report.

I may, at any stage, without prejudice, withdraw my consent and participation in the study

I have had sufficient opportunity to ask questions and declare myself prepared to participate in the study.

I understand that strict confidentiality will be maintained and that only codes will be used.

PARTICIPANT

Printed Name Signature

Date and Time

I Glenrose Malinga, herewith confirm that the above participant had been fully informed about the nature, conduct and risks of the above study.

INVESTIGATOR

Print Name Signature

Date and Time

ANNEXURE: 7

Telegrams:
Telex:
Telephone (+268 4042431)

THE MINISTRY OF HEALTH
P.O. BOX 5
MBABANE
SWAZILAND

THE KINGDOM OF SWAZILAND

14. 07.2010

Glenrose Malinga
P. O. Box 5022
Mbabane

Dear Madam

RE: CONDUCTING A STUDY ON "SHARP WASTE MANAGEMENT" IN THE COUNTRY

A letter has been received, requesting to conduct a research on "Sharp Waste Management" in rural clinics in the country.

The Research can be conducted. This will benefit the country in knowing what exactly is happening on the ground regarding "Sharp Waste Management" in rural clinics. As soon as the University of Witwatersrand approves your proposal you can go on with the Research.

Looking forward to your study

Yours Faithfully

PUBLIC HEALTH UNIT ADMINISTRATION 04 JUL 2010 P.O. BOX 1118 MBABANE SWAZILAND

D. Ndzimandze
NATIONAL PUBLIC HEALTH MATRON

ANXURE 8

Telegrams:
Telex:
Telephone: (+268 404 2431)
Fax: (+268 404 2092

MINISTRY OF HEALTH
P.O. BOX 5
MBABANE
SWAZILAND

THE KINGDOM OF SWAZILAND

FROM: The Chairman
Scientific and Ethics Committee
Ministry of Health & Social Welfare
P. O. Box 5
Mbabane

TO: Mrs GC Malinga
P.O Box 5022
Mbabane

DATE: 14th September 2010

REF: MH /599B

RE: SHARP WASTE MANAGEMENT IN THE COUNTRY.

The Scientific and Ethics committee has reviewed the protocol on the above mentioned study.

In view of the fact that there are no ethical issues, you are therefore granted authority to conduct the above mentioned study.
You are kindly requested to adhere to the processes outlined in the protocol, if there are any changes, you are advised to notify the chairman of the committee before you effect any changes.

The committee is looking forward to the findings of the study to inform decision making in this area.

Yours Sincerely,

MINISTRY OF HEALTH
17 SEP 2010
P O BOX 5 MBABANE

DR S.V MAGAGULA
DEPUTY DIRECTOR OF HEALTH SERVICES
(SEC CHAIRMAN)

cc: SEC members

ANNEXURE 9

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Ms Glenrose Malinga

CLEARANCE CERTIFICATE	**M10841**
PROJECT	Sharp Waste Management in Rural Clinics in Swaziland
INVESTIGATORS	Ms Glenrose Malinga.
DEPARTMENT	School of Public Health
DATE CONSIDERED	27/08/2010
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 29/09/2010 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Prof David Rees

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

ANNEXURE 10

Faculty of Health Sciences
Medical School, 7 York Road, Parktown, 2193
Fax: (011) 717-2119
Tel: (011) 717-2745

Reference: Ms Tania Van Leeve
E-mail: tania.vanleeve@wits.ac.za
13 August 2010
Person No: 0509747E
PAG

Mrs GC Malinga
P O Box 5022
Mbabane
0000
Swaziland

Dear Mrs Malinga

Master of Public Health (Occupational Hygiene): Approval of Title

We have pleasure in advising that your proposal entitled "*Sharp waste management in rural clinics in Swaziland*" has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

ANNEXURE 11

SEGREGATION

SHARP WASTE CONTAINERS

WASTE TROLLEY

RISK WATE PIT