



Scan to know paper details and  
author's profile

# Factors Contributing to Poor Biomedical Waste Management among Health Workers in Katabi Military Hospital in Entebbe District

*Masagazi Edward*

## ABSTRACT

A descriptive cross-sectional study design was carried out from August 2021 to March 2022 to assess the factors contributing poor BMWM among health workers in Katabi Military Hospital. The study aimed at finding out the knowledge, practices and the effects of poor BMWM among health workers in Katabi Military hospital–Entebbe district and sample size of 50 respondents was determined using Kish and Leslie formula (1965). The study site was purposely selected because it was one of the areas having many staff we were targeting.

*Keywords:* NA

*Classification:* DDC Code: 289.5 LCC Code: BX6941

*Language:* English



LJP Copyright ID: 392873

London Journal of Medical and Health Research

Volume 22 | Issue 12 | Compilation 1.0



© 2022. Masagazi Edward. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncom-mercial 4.0 Unported License (<http://creativecommons.Org/licenses/by-nc/4.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



# Factors Contributing to Poor Biomedical Waste Management among Health Workers in Katabi Military Hospital in Entebbe District

Masagazi Edward

## Definitions

*Biomedical wastes:* This refers to any solid and or liquid waste including its container and any intermediate product which is generated during the diagnosis, treatment or immunization of human beings or animals or in research pertaining there to or in the production or testing thereof.

*Biomedical waste management:* This means the activities that are involved in handling wastes which include waste collection, segregation, storage, treatment, transport to final disposal site and final disposal.

*Pharmaceutical wastes:* It includes expired or unused pharmaceutical products spilled or contaminated pharmaceutical products, surplus drugs, vaccines or sera and many others.

*Segregation of wastes:* This refers to sorting and separation of waste types to facilitate recycling and correct onward disposal.

*Pollution:* Refers to the presence of harmful substances or poisonous substances in an environment.

*Infectious wastes:* Refers to waste contaminated with blood and other bodily fluids.

*Factors:* Refers to elements contributing to a particular result, situation.

## ABSTRACT

*A descriptive cross-sectional study design was carried out from August 2021 to March 2022 to assess the factors contributing poor BMWM among health workers in Katabi Military Hospital. The study aimed at finding out the knowledge, practices and the effects of poor*

*BMWM among health workers in Katabi Military hospital–Entebbe district and sample size of 50 respondents was determined using Kish and Leslie formula (1965). The study site was purposely selected because it was one of the areas having many staff we were targeting.*

*Respondents were interviewed using pre-coded questionnaires designed in English and the collected data was analyzed using SPSS version 20.0 and later presented in form of tables, pie charts, graphs, and text statements.*

*Social-demographic characteristics of the study participants were: majority (50%) of the respondents were aged between 30-39 years, males were more than females by (66%), (40%) were single and (42%) of the respondent were nurses. Respondents had some knowledge about any discarded biological products such as used cotton swabs and blood from wards and laboratories being regarded as medical wastes, Practices of health workers about BMWM were; disposing all kinds of waste into a general bin, not segregating the biomedical waste according to different categories. There is need to institute deliberate interventions by Katabi hospital to provide community with clean dust bins and sanitation facilities to ensure safe disposal of fecal and solid waste, Government and other stake holders should ensure that the health workers receive trainings on how to manage biomedical wastes of any form and supplies to be used should be readily available and should be taught on how to use them i.e. personal protective equipment like gloves, aprons, masks etc. The district health service provider should intensify effective health education of the community, paying special attention to biomedical waste disposal management*

*education and communication materials geared towards sensitizing them so as to reduce the incidence of pollutions and raising infections and DHO should work with and facilitate administrators, village health teams to promote good sanitary environment to reduce on the incidences of injuries from dumped sharp materials and infectious materials to both the staff and community at large.*

## I. CHAPTER ONE INTRODUCTION

This chapter briefly explains the background of the study, problem statement, study objectives, research questions, significance, justification and scope of the study.

### 1.1 Study Background

Biomedical waste refers to any waste that is generated during the diagnosis, testing, treatment, immunization of human beings or animals, in the research activities pertaining to their productions or testing (Mohit, 2017).

Health care institutions and various hospitals, diagnostic centers, blood banks, dental centers and research centers produce a variety of waste like dressing material, cotton pads, anatomical body parts, plastic disposal items, needles, drugs, chemicals, food items, intravenous tubing's, cannula and catheter (Annanthachari, 2016).

Waste management refers to managing waste by multiple techniques to achieve solid waste and resource conservation goals. The techniques may include waste reduction, re-use, re-cycling, composting, transformation, disposal to landfills and others.

Effective management of biomedical waste is a vital issue not only to hospitals, but also to the environment, law enforcement agency, media and to the general public (C, 2017). The purpose of BMWM is mainly to reduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection and improves safety for employees working in the system. For this, a conscious, coordinated and cooperative effort has to be made from physicians to ward boys (Chudasama, 2013).

The proper health care waste management include five steps namely segregation of biomedical waste at the point of generation, treatment, storage, transportation and final disposals. The segregation of biomedical waste at the source of generation is the first step, but crucial step in health care waste management (HCWM) because of specific methods needed for the treatment and disposal of different categories of waste. The health personnel who are involved in handling the biomedical waste at different point of generation in hospital include doctors, nurses, lab technicians, ward boy etc. Thus the knowledge regarding BMWM among health care personnel have greater impact on health and environment (Anish, 2013).

Globally, 18-64% of health care institutions are reported to have unsatisfactory BMWM facilities; predictors' lack of awareness, insufficient resources and poor disposal mechanism (WHO, 2013).

In Africa, healthcare waste (HCW) has not received the much needed attention that it deserves. This is because of the inadequate resources in these countries resulting into low priority for HCW management. In many countries, there is limited segregation of hazardous and medical wastes and usually mixed with non-infectious waste. Inadequate knowledge and attitude among the health care worker (Tsebeni, 2019).

In Uganda, during the evaluation of injection safety and BMWM, it was found out that 92% of waste handlers have poor waste disposal methods, 3.4% have acceptable waste disposal methods and 4.6% have good waste disposal methods (Muhwezi, 2014) and Katabi hospital is one of them.

### 1.2 Problem Statement

Globally, 18%-64% of health care institutions are reported to have unsatisfactory BMWM facilities; predictor's lack of awareness, insufficient resources and poor disposal mechanism (WHO, 2013).

One of the problems Uganda faces today is improper handling and disposal of biomedical wastes. During the evaluation of injection safety and BMWM in Uganda, it was found out that 92% of waste handlers have poor waste disposal methods, 3.4% have acceptable waste disposal methods and 4.6% have good waste disposal methods including Katabi military Hospital (Muhwezi et al, 2014)

Inadequate knowledge and unsatisfactory management practices among the health care workers are major challenges in the management of HCWs. Previous research indicates that HCWM may be affected by lack of formal training, lack of knowledge on HCWM, limited interest from hospital administration.

Biomedical wastes constitute a large portion of infectious wastes, which are potentially dangerous, because they may be resistant to treatment and possess high pathogenicity or ability to cause disease. Biomedical waste is also a source of contamination of land and water sources if not rendered harmless before its burial on land or disposal water. Furthermore, biomedical waste emits harmful gases, which leads to atmospheric pollution, when treated in open burning or burning in incinerators. The emissions can cause respiratory and skin diseases or even cancer, if precaution protocols are ignored.

Therefore, this study aims at assessing factors contributing to poor biomedical waste management among health workers in Katabi Military Hospital in Entebbe District.

### *1.3 Study objectives*

#### *1.3.1 General Objectives*

To assess factors contributing to poor BMWM among health workers in Katabi Military Hospital in Entebbe District.

#### *1.3.2 Specific Objective*

To find out the health facility related factors contributing to poor BMWM among health workers in Katabi military hospital- Entebbe district.

To find out the individual-related factors contributing to poor BMWM among health workers in Katabi military hospital- Entebbe district.

To assess the effects of poor BMWM among health workers in Katabi military hospital- Entebbe district.

### *1.4 Research questions*

What are the health facility related factors contributing to poor BMWM among health workers in Katabi military hospital- Entebbe district?

What are the individual related factors contributing to poor BMWM among health workers in Katabi military Hospital-Entebbe district?

What are the effects of poor BMWM among health workers in Katabi military hospital- Entebbe district?

### *1.5 Study Significance*

This study provides detailed information about the health facility related factors, individual related factors contributing to poor BMWM and effects of poor BMWM among health workers.

Results of this study were helpful in bridging the knowledge gap about proper BMWM to the health workers, hospital administration, the public of Entebbe district and the country at large that are at risk of the impact of poor BMWM.

The study findings were used by the researcher to compile a research report in partial fulfillment for the award of diploma in pharmacy.

### *1.6 Study Scope*

#### *1.6.1 Content scope*

The study aimed at determining the factors contributing to poor biomedical waste management among health workers in Katabi military hospital.

### 1.6.2 Geographical scope

The study was carried out in Katabi military hospital in Entebbe district in Entebbe UPDAF Air force base.

### 1.6.3 Time scope

The study was carried out between June 2021 and December 2021.

## II. CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

This section provides the background understanding of different research studies that have been carried out regarding to factors contributing to poor biomedical waste management among health workers. It focuses on health facility related factors affecting poor BMWM, individual related factors affecting poor BMWM and effects of poor BMWM among health workers in Katabi hospital- Entebbe district in the area of study.

Health facility related factors contributing to poor biomedical waste management among health workers in Katabi military hospital-Entebbe district.

The study carried out in low level health facility in Dar es Salaam by comparing Ilala and Kinondoni municipalities in Tanzania revealed that; most of the facilities have no specific disposal sites. In Ilala, 70% of the health facilities burn wastes in poorly designed incinerators, open pit burning or on the ground while in Kinondoni, 83% of the facilities bury wastes in the pits. More than 50% of the disposal sites surveyed are not fenced and were in close proximity to human settlements. About 60 and 70% of incinerators in the surveyed facilities in Ilala and Kinondoni municipalities, respectively, are not in good working conditions, 50% of them being of low capacity with some parts missing, e.g., chimneys, ash pits, covers for waste loading and ash removing doors. Also, 9 and 47% of the healthcare facilities in Ilala and Kinondoni, respectively, do not have the Standard Operating Procedures. Medical waste transportation is a serious problem, as 71% of the facilities in Kinondoni carry the wastes on hands to the

disposal sites while in Ilala, 40% of LLHFs use wheelbarrows. Waste segregation and color coding are poorly adhered to while most of the storage areas are too small. It was concluded that, the medical waste management in LLHFs is still poor. Awareness should be raised among LLHFs workers on proper management of the medical waste (SV Manyele, 2010).

A qualitative cross section study conducted in 30 of 52 health facilities in kumbo east and kumbo west health districts revealed that in 86.7% of health facilities, waste disposal was by burning in pits located within 400m away from the facility.

These pits were not protected from scavengers. Only 4 facilities had incinerators and all did not meet the required standards, as none was equipped with a scrubber. Even after segregation at the point generation, wastes were mixed at the point of final disposal. Waste bins were not color-coded and all facilities had appropriate safety boxes for sharps. (Gillian Dzekashu, 2017)

A study carried out on poor medical waste management practices and its risks to human health and environment showed that open dump sites in facilities are not even engineered or treated, thus exposed the entire public to risks of infection. All the hospitals sampled do not have any unit or department responsible for waste management. Also waste management with safe and environmentally sound methods cannot be over-emphasized thus Solid waste disposal methods indicated that open dump sites were most preferred while incineration was nonexistent in the hospitals, clinics. Most other hospitals do not segregate wastes into marked or color coded containers for the different waste streams neither do they keep records of waste generation and disposal (Garba, 2013)

A cross section study carried out on factors influencing adherence to proper health care waste management practices among health workers in Wakiso district, Uganda showed that most health facilities have 10 to 25 health care waste handlers (85.6 %) while a very negligible proportion (0.75%) of them have more than 45 HCW handlers. It also revealed that the type and size of the health facility affects the compliance to

HCWM of solid wastes and self-contained onsite treatment methods are more desirable and feasible in large public healthcare facilities but are impractical or uneconomical for smaller health facilities; and logically the size of the health facility dictates the mode of waste management (Josephine Babirye, 2020)

## *2.2 Individual related factors contributing to poor biomedical waste management among health workers in Katabi military hospital- Entebbe district*

The main factors in this group include knowledge, attitudes and practices about poor biomedical waste management among health workers.

A quantitative study carried out in jawah-lah showed that knowledge regarding the hazardous nature of BMW is much lower than expected standards especially among nursing staff and class 4 workers (12.5%) and 13.33% respectively, whereas awareness among doctors was lower than expectations (53.33%). The knowledge regarding the correct duration of storage of BMWS was poor amongst both nursing staff 31.75% and class 4 (66%), however their knowledge about BMW as a disease source was greater in nursing staff (93.75%); 80% in class 4. Disappointingly only 42.83% of doctors and 31.25% of nursing staff had received BMW management training (Mohit, 2017).

Biomedical waste management is still at the infancy stage and recently got attention due to increased awareness about human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and other potentially infectious diseases. Biomedical waste can transmit more than 30 dangerous blood borne pathogens. A systemic review of 150 articles published since 2,000 revealed that at least 50% of the world population is threatened by public health risks due to mismanagement of BMWs. This is because any carelessness of BMWM can spread infections and contaminate the entire environment (Teshiwal, 2018).

Segregation has been identified as an important aspect of healthcare waste management. It refers to the process of separating healthcare waste into

various selected or labeled categories. This is significant towards ensuring the safe management of healthcare waste as it entails that all waste should be separated from general waste at the source of generation (Sambo, 2017).

Injections with contaminated needles and syringes in low and middle-income countries have reduced substantially in recent years, partly due to efforts to reduce reuse of injection devices.

Despite this progress, in 2010, unsafe injections were still responsible for as many as 33,800 new HIV infections, 1.7million hepatitis B infections and 315,000 hepatitis C infections (WHO,2018).

Attitude among participants of the study regarding BMW management was encouraging especially in terms of realizing their responsibility towards waste management and volunteering to be a part of waste management team (greater than 90% in all 3 groups) (Kapoor, 2015).

One-fourth participants (26.14%) showed unfavorable attitude towards biomedical waste management. Most of participants 159(90.34%) felt poor handling of biomedical waste is an important issue and a matter for concern and it's a part of their duty but 69(39.2%) felt that it was an extra burden on work (Vanesh, 2016).

## *2.3 Effects of poor BMWM among health workers in Katabi military hospital- Entebbe district*

A person who experiences one needle stick injury from a needle used on an infected source patient has risk of 30%, 1.8%, and 0.3% respectively of becoming infected with Hepatitis B virus (HBV), Hepatitis C virus (HCV) and HIV (WHO, 2018).

A total of 80% of the waste generated in the hospitals is composed of general waste while the remaining 20% comprises of infectious, toxic or radioactive waste. Of this, 20% of the waste is highly infectious and dangerous and could cause serious damage to the society and the environment when it is not properly segregated and disposed of (Joseph, 2015).

Diseases associated with poor medical waste management include nosocomial diseases, typhoid, skin disorder, intestinal parasitosis and hepatitis. In addition, there is a potential risk of

HIV transmission to a susceptible human host from percutaneous injury by infected sharps (Julius, march 2015).

Poor medical waste management causes environmental pollution, unpleasant smell, growth and multiplication of insects, rodents and worms, and may lead to transmission of diseases like typhoid, cholera, and hepatitis through injuries from sharps contaminated with blood (Garba, 2013)

Medical waste is also a source of contamination of land and water sources if not rendered harmless before its burial on land or disposal in water. Furthermore, medical waste emits harmful gases, which leads to atmospheric pollution, when treated in open burning or burning in incinerators. These emissions can cause respiratory and skin diseases or even cancer, if precautionary protocols are ignored (Ibrahim, 2013).

### III. CHAPTER THREE: METHODOLOGY

#### 3.1 Introduction

This chapter describes the area of study, study design, study population, sampling procedure, sample size determination, tools for data collection, data analysis and presentation, ethical consideration and dissemination of results.

#### 3.5 Sample Size Determination

The sample size was determined using the Kish and Leslie formula (1965);

$$N = \frac{Z^2 PQ}{d}$$

Where;

N = desired sample size

P = Estimated population of desired characteristics

Z = standard deviation taken as 1.65 at a confidence level of 95%

If there is no measured estimate, we use 50% (constant) or 0.5 therefore:

P = 75%=0.75

d=Degree of accuracy desired 0.1 or 10% and in this case 95% confidence level has 10% errors, therefore 0.1 is a significance level.

q=Represents (1-p) where, q=0.25

#### 3.2 Study Area

The study was conducted in Katabi Military Hospital. The health facility is a district hospital that has several wards and serves a population of approximately 0.5million people from the Katabi municipal council, Entebbe town.

Katabi military hospital is located on the Entebbe road, in the town of Katabi town counsel, in Entebbe district.

District, about 0.5 kilometres west Entebbe Region Hospital. This is approximately 40 kilometres (25mi), south of Mulago National Referral Hospital. The coordinates of Katabi Military hospital are: 0005'01.0" N, 32028'50.0" E (Latitude:0.083612; Longitude:32.480557)

#### 3.3 Study Design

A descriptive cross section study was carried out to access the factors contributing to poor management of bio-medical waste among health workers in Katabi health center using both qualitative and quantitative data.

#### 3.4 Study Population

The study included health workers in Katabi health center IV to assess the factors contributing to poor management of bio-medical waste among health workers in Katabi health center.

$$N = \frac{(1.65)^2 \times 0.75 \times 0.25}{(0.1)^2}$$

N=51.046875

N=51 respondents

Therefore, the researcher will consider 50 respondents from Katabi Health center IV who were available for the study.

### 3.6 Sampling technique

Convenience sampling method was used where health workers easy to contact or reach will be involved in the study.

### 3.7 Sampling Procedure

Convenience sampling method was used where health workers available and easy to reach will be involved in the study.

This method involved the sample being drawn from the part of the population that was close to hand. People who are willing and available to participate were used in the study. The method was cheap, easy to conduct and the data needed is readily available.

### 3.8 Data Collection Procedure

The researcher got approval of the study from Kampala School of Health Sciences and thereafter was issued with an introductory letter to the Medical Superintendent Katabi hospital. The researcher introduced herself to the health workers at Katabi hospital. A consent form was issued to the participants for data collection. Questionnaires were used to obtain data during the study.

### 3.9 Data Collection Tools

The data was collected using semi-structured questionnaires of 21 open and closed ended questions.

#### 3.9.1 Questionnaire

This tool was used because large amounts of information was collected from a large number of people in a short period of time and was relatively cost effective.

### 3.10 Quality Control

The forms were checked for completeness before the respondent level to ensure that the methodology was able to answer the objectives of the study.

The questionnaire was pre-tested and administered to 10 respondents among health workers in Katabi hospital and adjustments were made appropriately basing on their responses.

The data collection tools were designed appropriately to ensure that they are of quality for example; questionnaires are structured with non-ambiguous and well-spaced questions to avoid congestion and provide tidy work.

### 3.11 Inclusion and Exclusion Criteria

#### 3.11.1 Inclusion Criteria

All health workers of Katabi military hospital present during the period of data collection.

#### 3.11.2 Exclusion Criteria

All health workers of Katabi Military hospital absent and did not consent to the study.

### 3.12 Data Analysis and Interpretation

Data was collected coded and entered into Microsoft Office Excel. Descriptive (univariate) data was presented as frequencies and percentages, and illustrated using frequency tables, pie charts and bar graphs. Qualitative data collected during the interviews was coded in themes and entered into master sheets by the researcher. Data was analyzed manually using Pearson Chi-square independent content analysis technique and findings integrated during report writing in form of quotes and narratives to supplement the quantitative data.

### 3.13 Ethical Considerations

The proposal was approved by the research committee of the school and an introductory letter was obtained from the school that introduced the researcher to the Medical superintendent (MS) Katabi hospital. Permission to collect data was obtained from the MS Katabi hospital.

An informed written consent was sought from respondents who will be assured of confidentiality of the information provided.

To ensure anonymity, the names of the respondents were not stated on any data collection tool.

### 3.14 Study limitation

Some respondents refused to disclose the information needed from them and this was reduced by guaranteeing maximum confidentiality and privacy.

The researcher was faced with financial problems due to lack of money for necessities like transport and research was tiresome. The researcher had to move from school to the health center and other various areas to collect and process data.

Some respondents were not able to understand the language used and therefore there was a need to hire interpreters.

### 3.15 Anticipated limitations and possible solutions of the study

The researcher faced financial difficulties. However, the researcher solicited for the required resources to complete the study within the required time frame and a budget to direct the required expenditure was developed and followed effectively.

### 4.2 Demographic data

*Table 1:* Shows the distribution of respondents according to their demographic features

Variables	Frequency (f)	Percentage (%)
Age		
20-29	18	36
30-39	25	50
40-49	2	4
50 and above	5	10
Total	50	100

Some respondents were not willing to participate in the study and this was solved by fully explaining purpose of the study to them and informed consent was obtained from the respondents before participating in the study.

Some respondents were not willing to reveal some important information as it could be treated as confidential to them. This was solved by explaining the purpose of the study to the respondents and assuring them with confidentiality of their information.

### 3.16 Dissemination of information

The findings were compiled and printed, three copies were produced and submitted to UAHEB, KSHS, Katabi Health Centre IV, supervisor and finally to the researcher.

## IV. CHAPTER FOUR: RESULTS

### 4.1 Introduction

This chapter consists of data analysis, presentation and interpretation and therefore it encompasses a summary of the findings from the data collected. Data for this study was collected by use of questionnaires guided by use of operational definition of variables in chapter three to meet the objectives of the study.

Respondents to these questionnaires were health workers in Katabi hospital. Health workers were interviewed by simple random sampling technique and the finding were then tabulated for presentation in summarized format guided by the objectives of the study as below.

Sex		
Female	17	34
Males	33	66
Total	50	100
Marital status		
Married	12	24
Single	20	40
Widowed	11	22
Divorced/separated	7	14
Total	50	100
Profession		
Nurse	21	42
Clinical officer/doctor	10	20
Midwife	15	30
Pharmacist/Pharmacy technician	4	8
Total	50	100

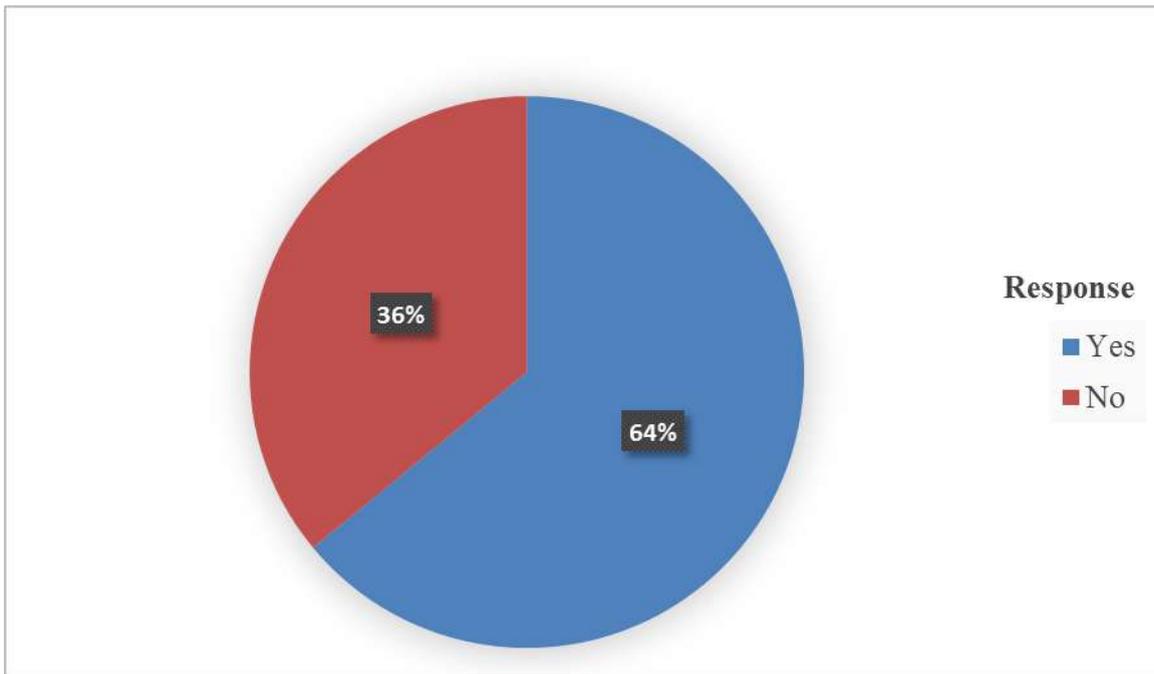
From the table above, most (50%) of the respondents were aged between 30-39 whereas least (4%) of the respondents were aged between 40-49.

Furthermore, basing on sex, most (66%) of the respondents were males whereas least (34%) of the.

Furthermore, basing on marital status, most (40%) of the respondents were single whereas least (14%) of the respondents were divorced/separated.

In conclusion, basing on profession, most (42%) of the respondents were nurses whereas least (8%) of the respondents were pharmacists/pharmacy technicians.

### 4.3 Facility related factors contributing to poor biomedical waste management



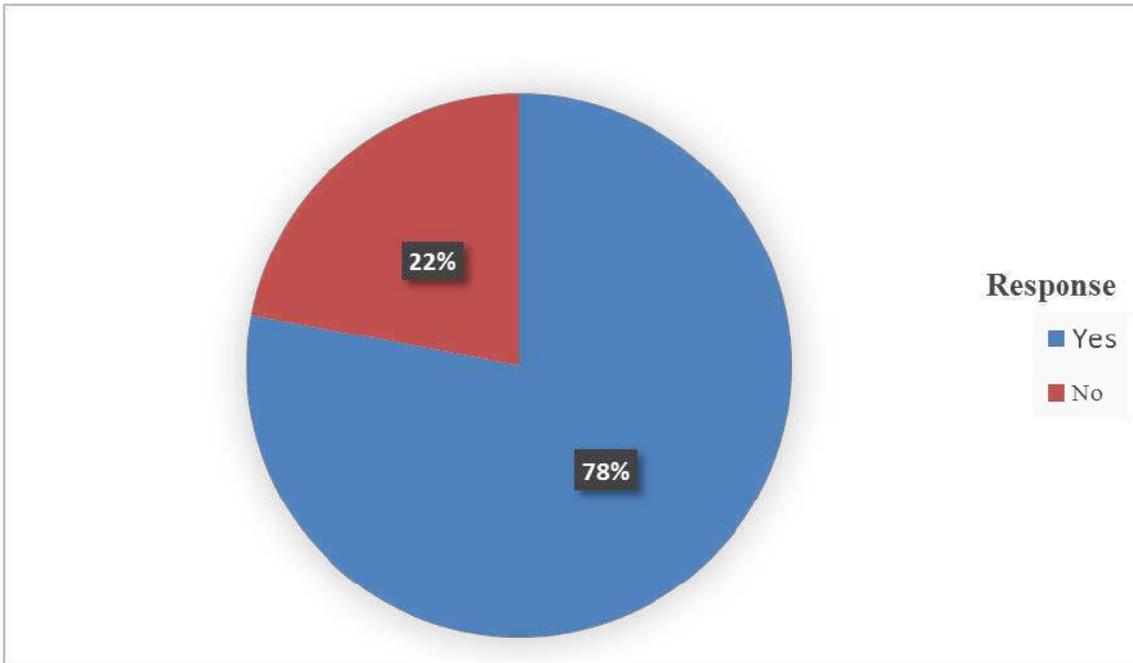
*Figure 1:* Shows the distribution of respondents according to if their different types of wastes generated

From the figure above, most (64%) of the health workers agreed that there were different types of wastes generated whereas the least (36%) of the health workers disagreed.

*Table 2:* Shows the distribution of respondents according to the different types of wastes generated in the hospital

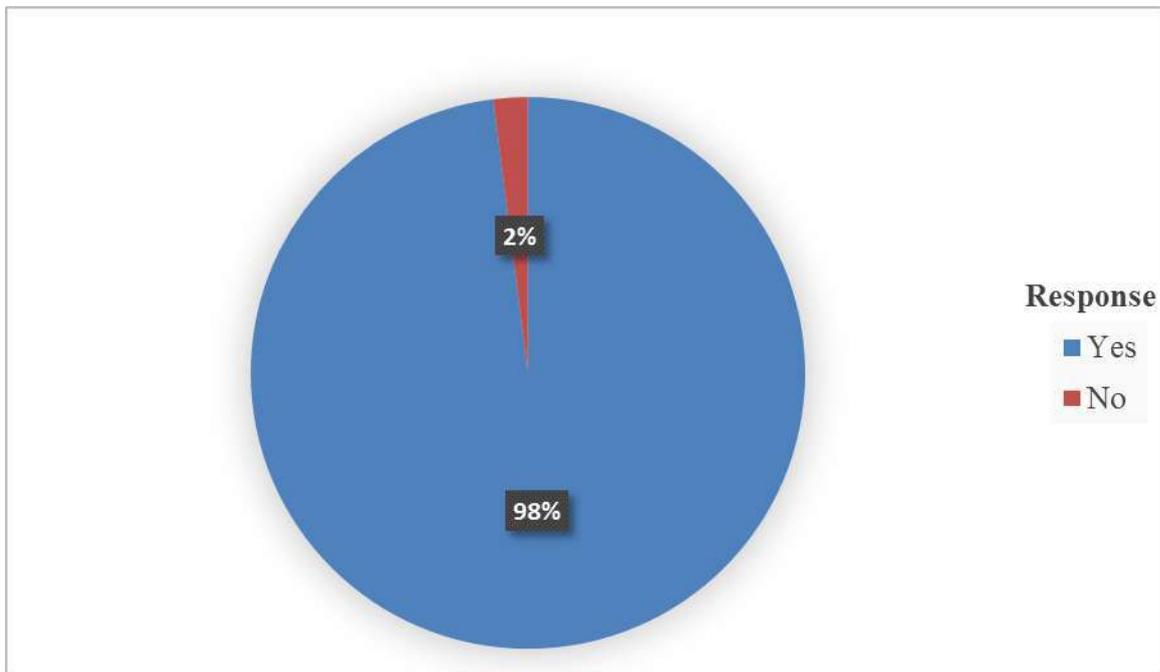
Waste generated	Frequency	Percentage
Cotton	12	37.5
Needle	8	25
Syringes	3	9.3
Gauze	4	12.5
Cannulas	2	6.25
Ampoules	3	9.3
Total	32	100

From the table above, most (37.5%) of the respondents said that cotton wastes were generated whereas least (6.25%) said that ampoule wastes were generated.



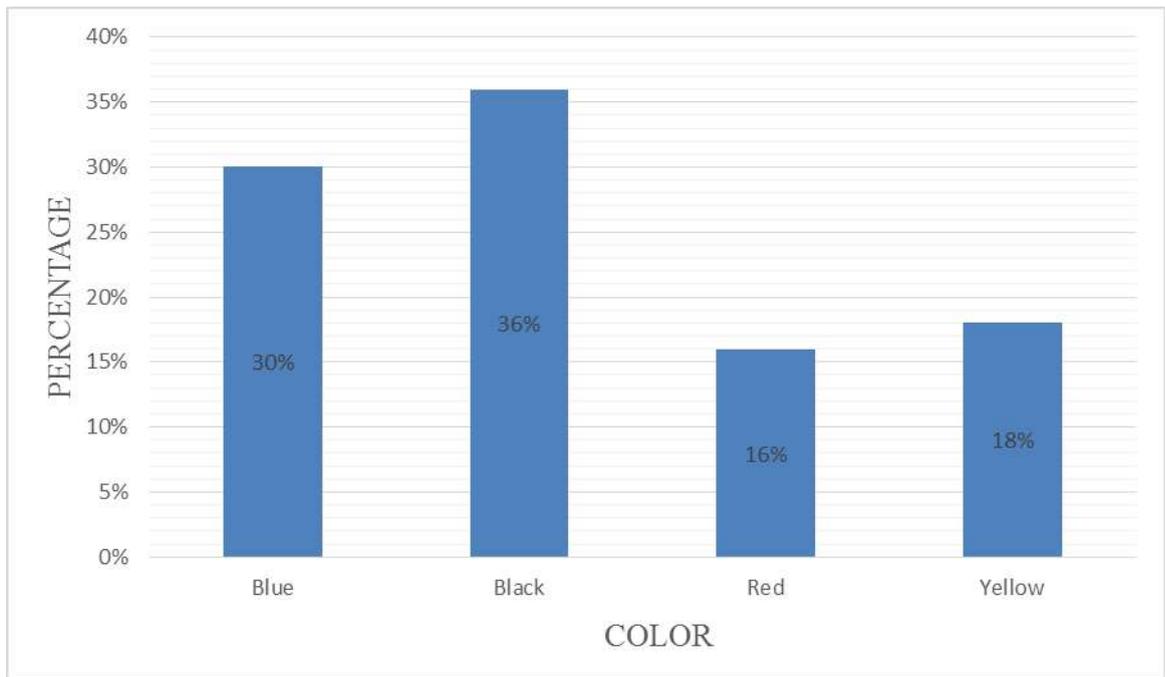
*Figure 2:* Shows the distribution of respondents according to biomedical waste management plan

From the figure above, majority (78%) of the respondents agreed that the hospital has a biomedical waste management plan whereas minority (22%) disagreed



*Figure 3:* Shows the distribution of respondents according to whether the hospital has color-coded bins

From the figure above, majority (98%) of the respondents agreed that the hospital has color-coded bins whereas minority (2%) disagreed.



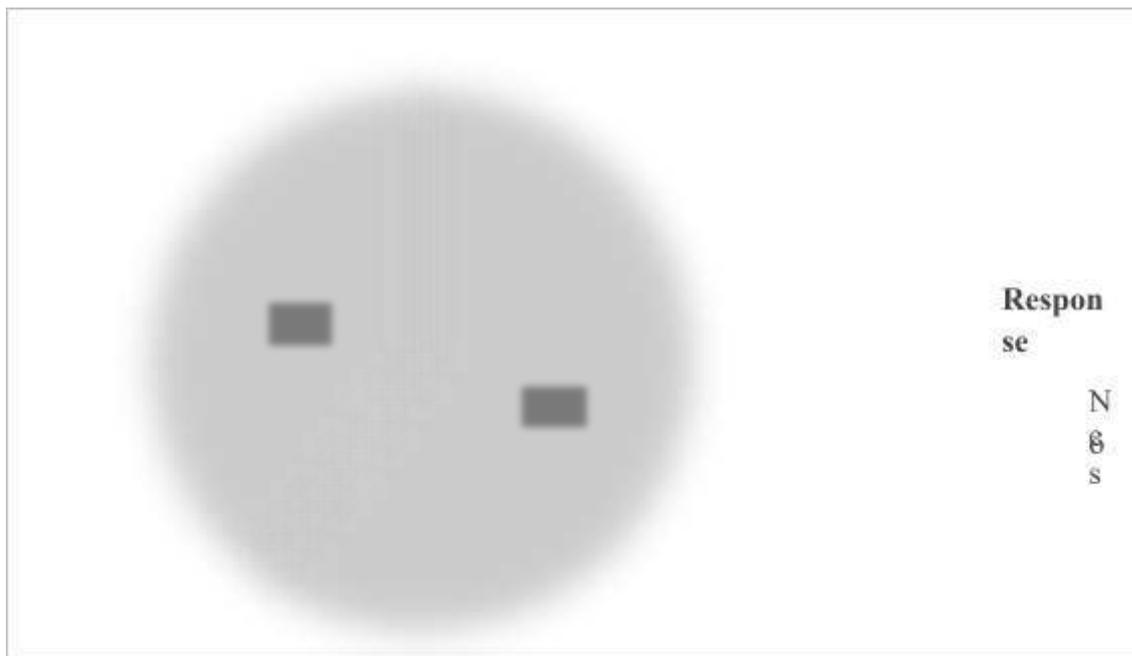
*Figure 4:* Shows the distribution of respondents according to the color of coded bins were coded black whereas least (16%) of the respondents said that the bins were coded red

From the figure above, most (36%) of the respondents said that the bins were coded black whereas least (16%) of the respondents said that the bins were coded red.

*Table 3:* Shows the distribution of respondents according to method of disposal used

Response	Frequency	Percentage
Incineration pits	24	48
Landfills	10	20
Pits	11	22
Others	5	10
Total	50	100

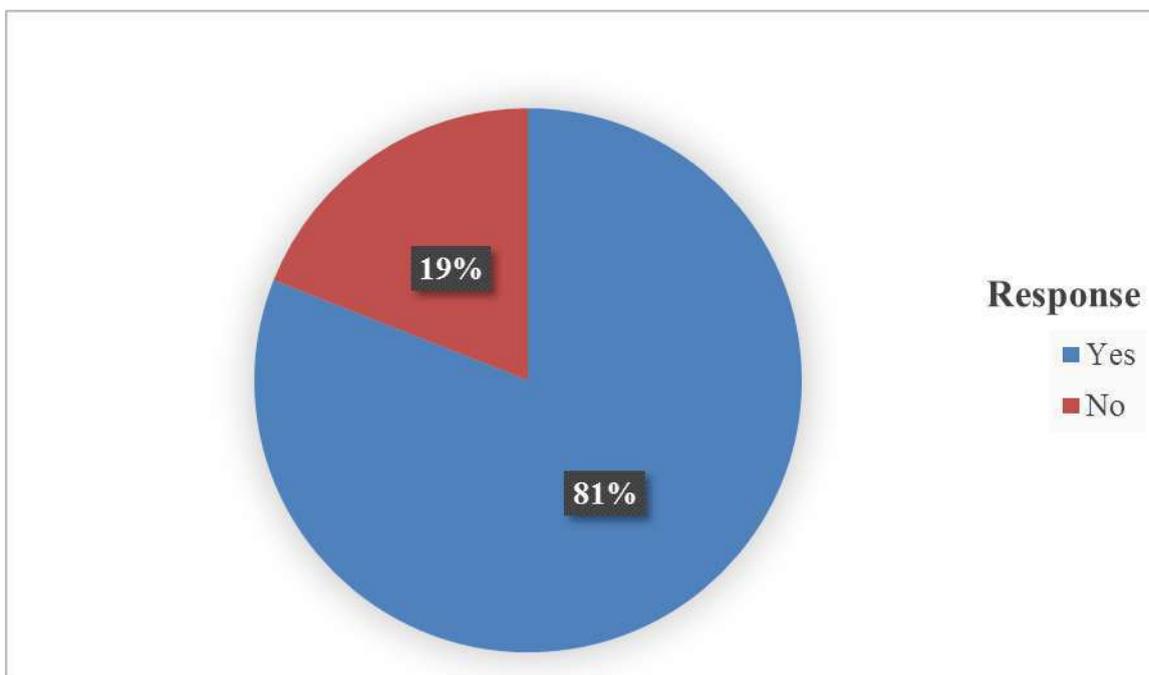
From the table above, most (48%) of the respondents said that incinerator pits were the method of disposal used whereas least (5%) of the respondents said that other methods of disposal were used.



*Figure 5:* Shows the distribution of respondents according to if the size of the hospital contributes to poor biomedical waste management

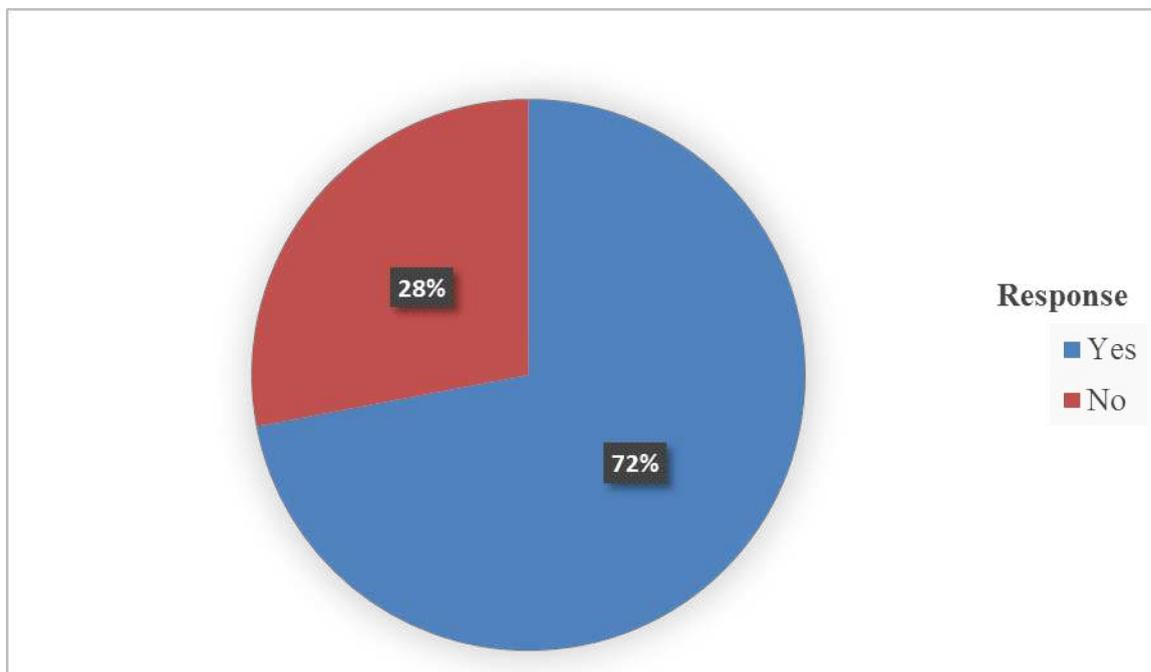
From the table above, most (60%) of the respondents agreed that the size of the hospital contributes to poor biomedical waste management whereas least (40%) agreed otherwise.

*4.4 Individual related factors contributing to poor biomedical waste management among health workers*



*Figure 6:* Shows the distribution of respondents according to information about biomedical waste management

From the figure above, majority (81%) of the respondents agreed that they have heard about information regarding biomedical waste management whereas minority (19%) of the respondents agreed otherwise.



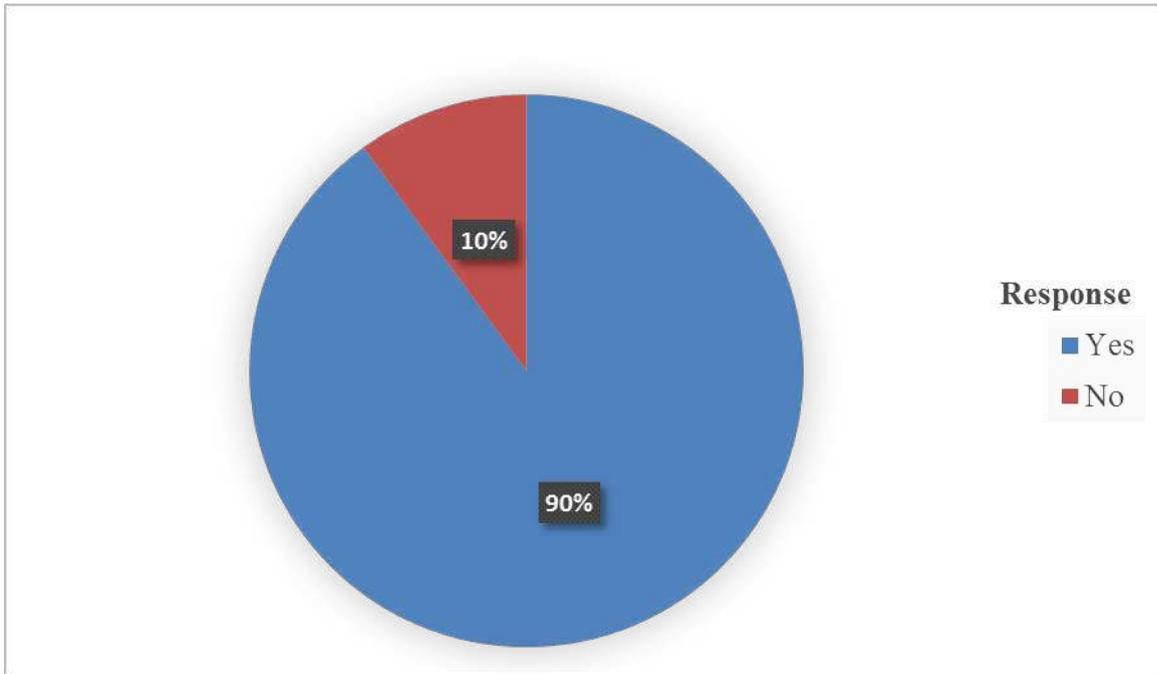
*Figure 7:* Shows the distribution of respondents according if they segregate biomedical wastes depending on different categories

From the figure above, majority (72%) of the respondents agreed that they segregate biomedical wastes depending on different categories whereas minority (28%) of the respondents agreed otherwise.

*Table 4:* Shows the distribution of respondents according to which color-coded bin they dispose syringes, needles, cotton and contaminated gauze

Bin color	Frequency(f)	Percentage (%)
Red bin	12	33.3
Blue bin	9	25
Black bin	5	13.8
General Bin	10	27
Total	36	100

From the table above, most (33.3%) of the respondents said that they dispose syringes, needles, cotton and contaminated gauze in a general bin whereas least (13.8%) of the respondents said that they dispose syringes, needles, cotton and contaminated gauze in a red bin.



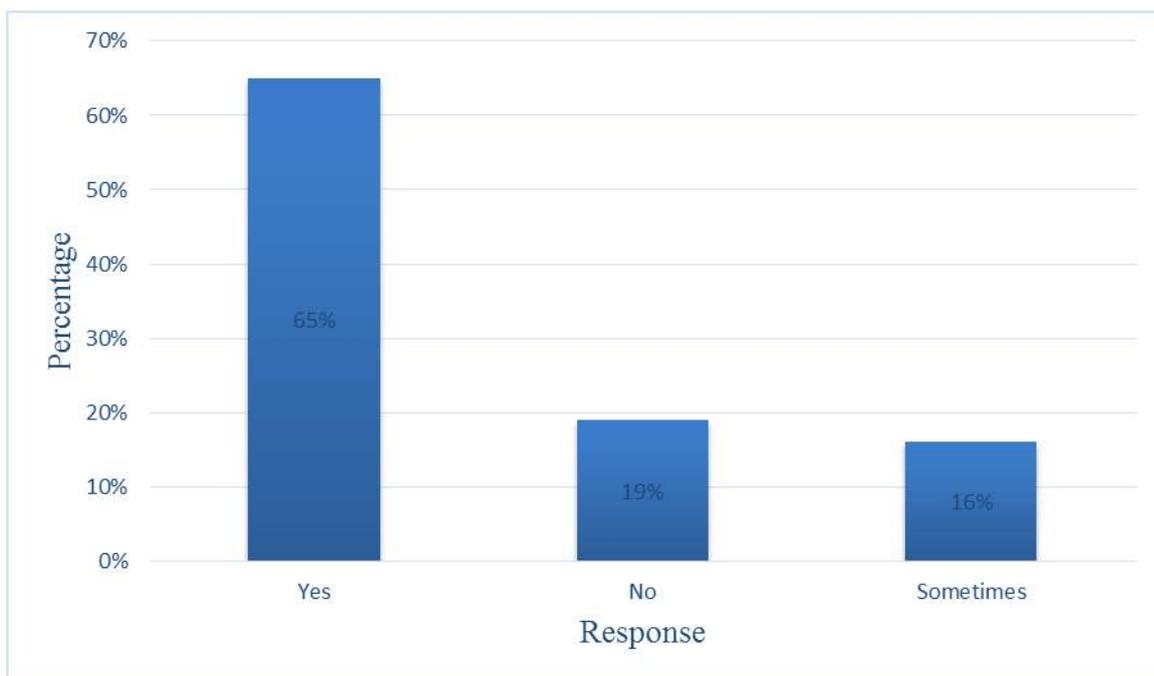
*Figure 8:* Shows the distribution of respondents according to the use of personal protective equipment when disposing biomedical wastes

From the figure above, majority (90%) of the respondents agreed that they use personal protective equipment's when disposing biomedical wastes whereas minority (10%) agreed otherwise.

*Table 5:* Shows the distribution of respondents according to which personal protective equipment they use in the hospital

Personal protective equipment	Frequency(f)	Percentage (%)
Gloves	18	40
Apron	7	15.5
Masks	8	17.8
Boots	10	22.2
Others	2	4.4
Total	45	100

From the table above, most (40%) of the respondents said that they use gloves whereas least (4.4%) of the respondents said that they use aprons.



*Figure 9:* Shows the distribution of respondents according to whether biomedical waste management is an extra burden to work

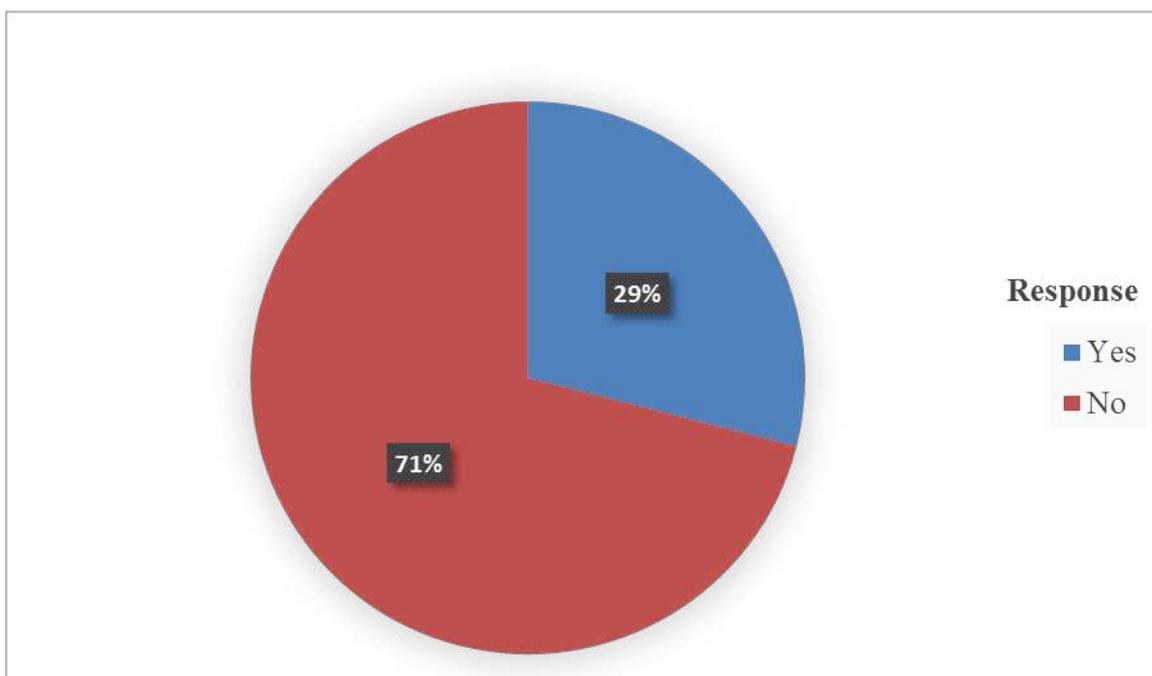
From the table above, most (65%) of the respondents said that biomedical waste management is an extra burden to work whereas least (16%) of the respondents said that sometimes biomedical waste management is an extra burden to work.

#### 4.5 Effects of poor biomedical waste management among health workers

*Table 6:* Shows the distribution of respondents depending on whether poor biomedical waste management can cause environmental pollution, unpleasant smell and multiplication of insects, rodents and worms

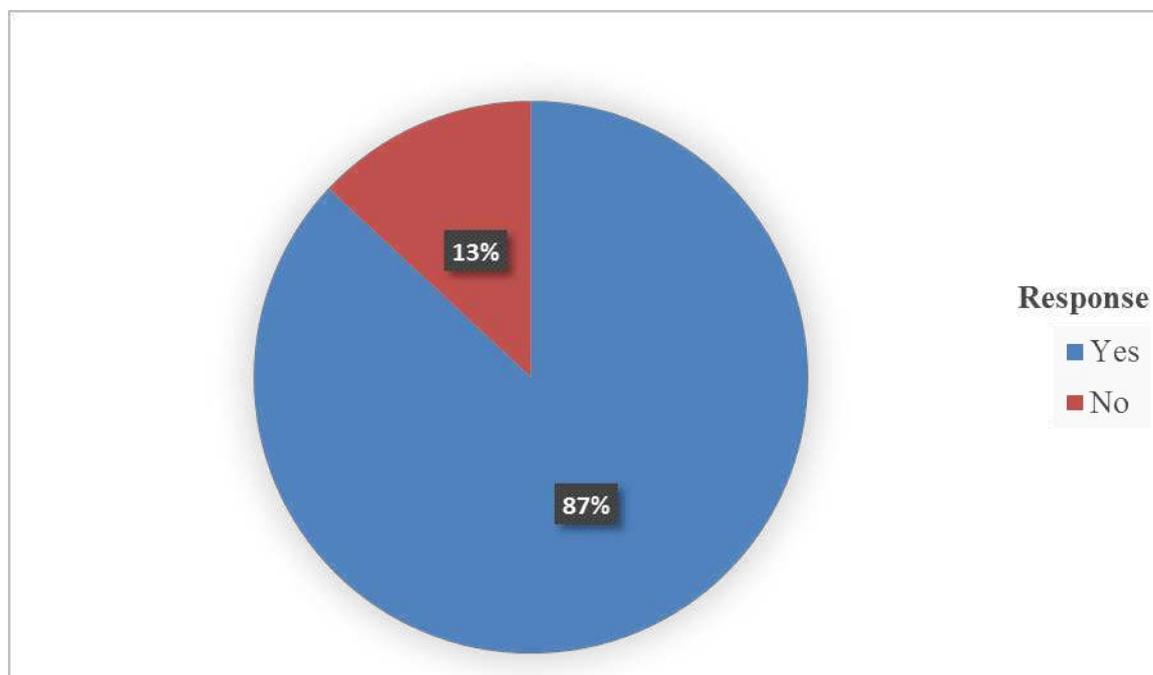
Response	Frequency(f)	Percentage (%)
Yes	40	80
No	3	6
I don't know	1	2
Sometimes	6	12
Total	50	100

From the table above, majority(80%) of the respondents said that poor biomedical waste management can cause environmental pollution, unpleasant smell and multiplication of insects, rodents and worms whereas minority (2%) of the respondents said that they didn't know if poor biomedical waste management can cause environmental pollution, unpleasant smell and multiplication of insects, rodents and worms.



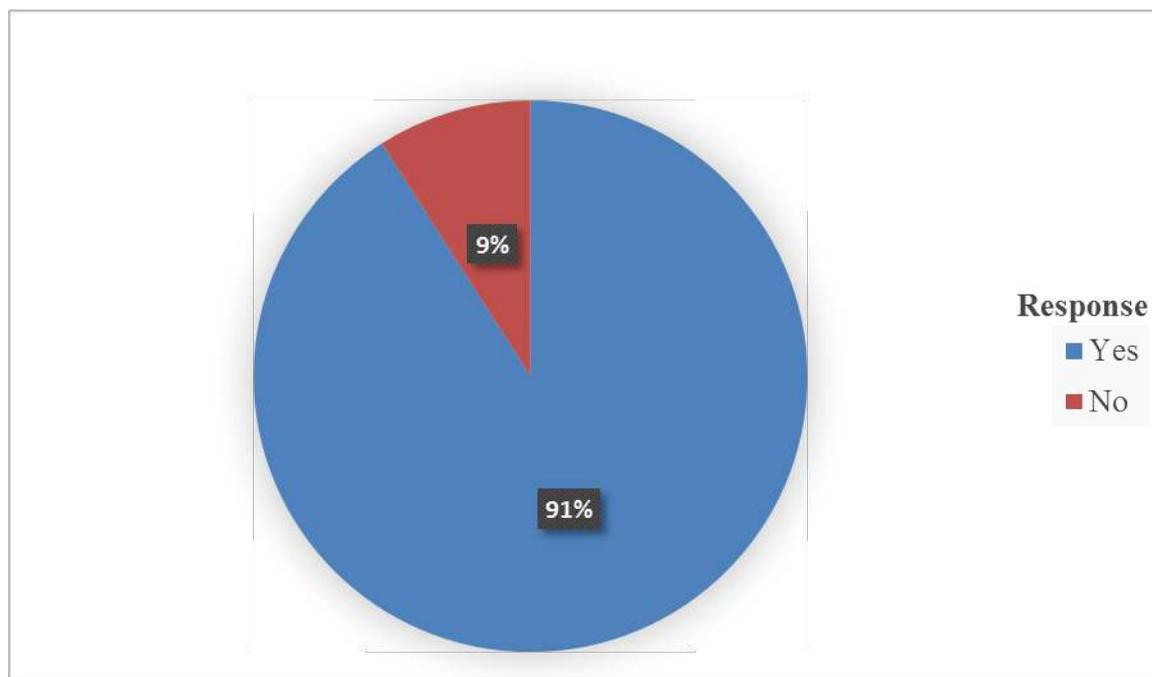
*Figure 10:* Shows the distribution of respondents according to if poor biomedical waste management causes accidents like needle stick injury

From the figure above, majority (71%) of the respondents agreed that poor biomedical waste management causes accidents like needle stick injury whereas minority (29%) of the respondents agreed otherwise.



*Figure 11:* Shows the distribution of respondents according to if poor biomedical waste management can cause illnesses

From the figure above, majority (87%) of the respondents agreed that poor biomedical waste management can cause illnesses whereas minority (13%) of the respondents disagreed.



*Figure 12:* Shows the distribution of respondents according to if poor bio medical waste management can cause nosocomial diseases and skin disorders

From the figure above, majority (91%) of the respondents agreed that poor biomedical waste management can cause nosocomial diseases and skin disorders whereas minority (9%) of the respondents agreed otherwise.

## V. CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Introduction

This chapter contains discussion of results, conclusions and recommendations. The study discussed the factors contributing to poor biomedical waste management among health worker. The findings were discussed under the following themes; Healthy facility-related factors, individual related factors contributing to poor biomedical waste management among health workers such as knowledge, attitude and practice and effects of poor biomedical waste management among health workers.

### 5.2 Discussion of results

*Health-facility related factors contributing to poor biomedical waste management among health workers.*

Most (48%) of the respondents said that the hospital has no well-designed incinerator pit sites

for waste disposal hence making segregation and waste management difficult since pits were not protected from scavengers thus contributing to poor biomedical waste management among health workers and this finding is in line with the a qualitative cross section study conducted in 30 of 52 health facilities in kumbo east and kumbo west health districts revealed that in 86.7% of health facilities, waste disposal was by burning in pits located within 400m away from the facility. These incinerator pits were not protected from scavengers. Only 4 facilities had incinerators pits and all did not meet the required standards, as none was equipped with a scrubber. Even after segregation at the point generation, wastes were mixed at the point of final disposal. Waste bins were not color-coded and all facilities had appropriate safety boxes for sharps. (Gillian Dzekashu, 2017).

Majority of the respondents (60%) agreed that size of the hospital contributes to poor biomedical waste management due to large quantity of wastes

generated yet disposal methods such as incineration, pit burning and burying are not practically done well thus compliance and adherence to proper waste management becomes a challenge and this study finding correlate with a cross section study carried out on factors influencing adherence to proper health care waste management practices among health workers in Wakiso district, Uganda showed that most health facilities have 10 to 25 health care waste handlers (85.6 %) while a very negligible proportion (0.75%) of them have more than 45 HCW handlers. It also revealed that the type and size of the health facility more desirable and feasible in large public healthcare facilities but are impractical or uneconomical for smaller health facilities; and logically the size of the health facility dictates the mode of waste management (Josephine Babirye, 2020).

#### *Individual related factors contributing to poor biomedical waste management among health workers*

Majority of the respondents (81%) had ever received any information about biomedical waste management such as methods of waste disposal, segregation of wastes and waste treatment before disposal. This finding does not correlates with a quantitative study carried out in jawah-lah which showed that knowledge regarding the hazardous nature of BMW is much lower than expected standards especially among nursing staff and class 4 workers (12.5%) and 13.33% respectively, whereas awareness among doctors was lower than expectations (53.33%). The knowledge regarding the correct duration of storage of BMWS was poor amongst both nursing staff 31.75% and class 4 (66%), however their knowledge about BMW as a disease source was greater in nursing staff (93.75%); 80% in class 4. Disappointingly only 42.83% of doctors and 31.25% of nursing staff had received BMW management training (Mohit, 2017).

Most of the respondents (65%) felt that biomedical waste management is an extra burden on their work since most times they are occupied by hospital work like attending to emergencies and other patients of all kinds hence no time to practice proper biomedical waste disposal hence

poor biomedical waste management and this finding is in line with the study which indicated that One – fourth participants (26.14%) showed unfavorable attitude towards biomedical waste management. Most of participants 159(90.34%) felt poor handling of biomedical waste is an important issue and a matter for concern and it's a part of their duty but 69(39.2%) felt that it was an extra burden on work (Vanesh, 2016).

Majority (72%) of the respondents segregate biomedical wastes according to different categories especially at the time of segregation hence protection from the injuries though sometimes they don't segregate at the time of generation due to work overload and pressure generated by the patients during treatment and this finding is in line with the study which showed that segregation has been identified as an important aspect of healthcare waste management. It refers to the process of separating healthcare waste into various selected or labeled categories. This is significant towards ensuring the safe management of healthcare waste as it entails that all waste should be separated from general waste at the source of generation (Sambo, 2017).

#### *Effects of poor biomedical management among health workers in Katabi hospital in Entebbe district*

Majority (91%) of the respondents agreed that poor biomedical waste management cause nosocomial diseases and skin infections. Other diseases include typhoid, cholera, HIV/AIDS, hepatitis which increases hospital visits and loss of lives. This finding is in line with the study which showed that diseases associated with poor medical waste management include nosocomial diseases, typhoid, skin disorders, intestinal parasites and hepatitis. In addition, there is a potential risk of HIV transmission to a susceptible human host from percutaneous injury by infected sharps (Julius, March 2015)

Majority of the respondents (80%) agreed that poor biomedical waste management cause environmental pollution, unpleasant smell and multiplication of insects, rodents and worms which leads to spread of infections which can be

life threatening and this study is in line with the study which showed that Poor medical waste management causes environmental pollution, unpleasant smell, growth and multiplication of insects, rodents and worms, and may lead to transmission of diseases like typhoid, cholera, and hepatitis through injuries from sharps contaminated with blood (Garba, 2013). Also it is in line with the study which showed that Medical waste is also a source of contamination of land and water sources if not rendered harmless before its burial on land or disposal in water.

Furthermore, medical waste emits harmful gases, which leads to atmospheric and environmental pollution, when treated in open burning or burning in incinerators. These emissions can cause respiratory and skin diseases or even cancer, if precautionary protocols are ignored (Ibrahim, 2013).

Majority of the respondents (71%) agreed that poor biomedical waste management causes accidents like needle stick injury especially from those which are already used and they are infectious hence many people ending up getting infected with hepatitis, HIV and this in line with the study which showed that a person who experiences one needle stick injury from a needle used on an infected source patient has risk of 30%, 1.8%, and 0.3% respectively of becoming infected with Hepatitis B virus (HBV), Hepatitis C virus (HCV) and HIV (WHO, 2018). And also it is in the same line with the study which showed that a total of 80% of the waste generated in the hospitals is composed of general waste while the remaining 20% comprises of infectious, toxic or radioactive waste. Of this, 20% of the waste is highly infectious and dangerous and could cause serious damage to the society and the environment when it is not properly segregated and disposed of (Joseph, 2015).

## VI. CONCLUSIONS

Social-demographic characteristics of the study participants were: majority of the respondents were aged between 30-39 years (50%), males were more than females (66%), single (40%), Majority of respondents were nurses (42%).

Concerning individual related factors about BMWM, (81%) had some knowledge about biomedical waste management and majority (72%) of the respondents were segregating wastes according to their different categories as required in different color coded bins and most were using personal protective equipment while disposing off the wastes.

Practices of health workers about BMWM were; disposing all kinds of waste into general bin.

Not segregating the biomedical waste according to different categories, denying that they had training on biomedical waste handling and disposal.

Effects of poor BMWM were; poor disposal of medical wastes contaminates water sources, poor disposal of pharmaceutical wastes leads to diseases like cancer, causes accidents, waste is highly infectious and dangerous and cause serious damage to the society and the environment, lead to transmission of diseases like typhoid, cholera, and hepatitis through injuries from sharps contaminated with blood, hazardous and toxic parts of waste from healthcare establishments comprising infectious, medical and radioactive material as well as sharps constitute a grave risk to mankind and the environment.

## VII. RECOMMENDATIONS

*Recommendations to Policy makers and Government agents*

Following the conclusions above, the following recommendations should be considered:

1. The Government and other stake holders should ensure that the health workers receive trainings on how to manage wastes of any form and supplies to be used should be readily available and should be taught on how to use them.
2. The district health service provider should intensify effective health education of the community, paying special attention to waste disposal management education and communication materials geared towards sensitizing them so as to reduce the incidence of pollutions and raising infections.

3. The DHO should work with and facilitate administrators, village health teams to promote good sanitary environment to reduce on the incidences of injuries from dumped sharp materials and infectious materials to both the staff and community at large.

### ACKNOWLEDGEMENT

I acknowledge the Ministry of Education and Sports and Ministry of Health for incorporating the research project in the curriculum which has helped me develop writing and research skills.

I acknowledge my mother Mrs. Nalubwama Evelyn, my friend Lakop Esther Faith who have tirelessly stood with me in all times of struggle both academically and socially, my supervisor Mr. Nimwesiga Gordon who has always been there for me as my role model where he has always guided me about my career and for all their support towards my academic struggles.

May God bless them all.

#### List of Abbreviations and Acronyms

BMWM:	Biomedical Waste Management
BMWs:	Biomedical Wastes
HCFs:	Health-Care Facilities
HCWM:	Health-Care Waste Management
HCWs:	Health-Care Wastes
MS:	Medical Superintendent
MW:	Medical Waste
MWHs:	Medical Waste Handler
MWM:	Medical Waste Management
UAHEB:	Uganda Allied Health Examination's Board
WHO:	World Health Organization
KMH:	Katabi Military Hospital
DHO:	District Health Officer

### REFERENCES

1. Anish. (2013). Awareness and practice on biomedical wastes management among health care personnel in kenyatta national hospital.
2. Annanthachari. (2016). A study on assessment of knowledge on biomedical waste management among health care workers of Malabar medical college teaching hospital, calicut, kerala, india.
3. C, G. (2017). KAP study of biomedical waste management among health care workers in Delhi.
4. Chudasama, R. (2013). KAP on biomedical waste management among health workers at tertiary care hospital in Rajkot. Research article.
5. Garba. (2013). A critical review on Biomedical Waste and Effect of mismanagement. International journal of engenering research and Technology.
6. Gillian Dzekashu, J.-F. T. (2017). Medical waste management and disposal practices of health facilities in Kumbo East and Kumbo West health districts. international journal of medicine and medical sciences.
7. Ibrahim. (2013). impact of improper biomedical waste disposal on human health and environment.
8. Joseph. (2015). Awareness and practices about biomedical waste management among healthcare workers in tertiary teaching hospitals.
9. Josephine Babirye, P. V. (2020). factors influencing adherence to proper health care waste management practices among health workers in Wakiso District, Uganda. journal of environmental sciences and public health.
10. Julius. (march 2015). Solid medical waste management in Africa. African journal of environmental sciences and technology .
11. Kapoor, P. K. (2015). effects of poor biomedical management among health workers.
12. Mohit. (2017). Assessment of knowledge, attitude and practices regarding biomedical waste management among health care personnel in Jawahar Lal Nehru medical college and hospital.
13. Muhwezi. (2014). Health care waste management in uganda, soroti Regional Referral Hospital.
14. Sambo. (2017). assessment of healthcare waste management practices employed by health workers in Health facilities in Bushenyi district Western Uganda.
15. SV Manyele, T. L. (2010). Factors affecting medical waste management in Low level health

- facilities in Tanzania S.V. African journal of environmental science and technology.
16. Teshiwal. (2018). assessment of knowledge, attitude and practices about biomedical waste management and associated factors among the health care proffesionlas at Debre Markes Town heathcare facilities.
  17. Tsebeni, S. (2019). Health care waste management among health workers and associated factors in primary health care facilities in kampala. BMC Public health .
  18. Vanesh. (2016). KAP on biomedical waste management among health workers in hospital. WHO. (2013). Hospital waste management.
  19. WHO. (2018). assessing knowledge, attitude and practices of healthcare workers regarding biomedical waste management at Bigem-Assi district hospital.
  20. WHO. (2018). Health care waste management.

#### *Appendices Appendix I: Consent Form*

Dear respondents, my name is Masagazi Edward, a pharmacy student at Kampala School of Health Sciences pursuing a diploma in pharmacy; doing a study on “Factors contributing to poor biomedical waste management among health workers in Katabi Military hospital in Entebbe District.” The study is basically for my academic purpose; I humbly request for your complete participation and the information given shall remain confidential. For your participation, the process of the study has no payment, or special benefit. I can assure that the study also has no any physical or psychological trauma as well as political problem, but participation in the study by giving correct answers can play great role in the successfulness of the study and also it will provide great input to bring change in quality of health. Therefore, you are kindly requested to respond genuinely and voluntary with patience. To fill these questions, it may take 25 minutes.

#### *Respondent's Consent*

I consent to participate in this study and I am aware that the study is purely academic, my participation is voluntary, and my responses are to the best of my knowledge and belief and will be treated with the utmost confidentiality.

Respondent's signature..... Date: .....

#### *Appendix II: Questionnaire*

Dear respondents, my name is Masagazi Edward, a pharmacy student at Kampala School of Health Sciences pursuing a diploma in pharmacy; doing a study on “Factors contributing to poor biomedical waste management among health workers in Katabi hospital in Entebbe District. “The purpose of this study is purely academic. Kindly do request for your assistance by sparing some of your precious time to participate in this study. The study will take about limited time 20-30 minutes only. All information provided will be handled and treated with utmost confidentiality.

*Instructions*

Do not mention your name and feel free to mention what you know about the question.

A tick (✓) will be used in a box provided or answer sheet written by interviewer in the space provided against each question.

**SECTION A**

Demographic data

1. Age of the respondent  
(a) 20-29            (b) 40-49            (c) 30-39            (d) 50 and above
2. Sex of the respondent  
(a) Female            (b) Male
3. What is your marital status?  
(a) Married            (b) Widowed            (c) Single            (d) Divorced/ separated
4. What is your profession?  
(a) Nurse            (b) Midwife            (c) Clinical officer/doctors            (d) Others (specify)

**SECTION B:** Facility related factors contributing to poor biomedical waste management among health workers in Katabi military Hospital-Entebbe district

5. Are there different types of wastes generated by Katabi hospital?  
(a) Yes            (b) No
6. If yes, what are these wastes?  
.....  
.....
7. Does the hospital have a biomedical waste management plan?  
(a) Yes            (b) No
8. Does the hospital have color-coded bins?  
(a) Yes            (b) No
9. If yes, which color-coded bins?  
(a) Blue            (b) Red            (c) Black            (d) Yellow
10. Which disposal methods does the hospital use?  
(a) Incineration pits            (b) Pits            (c) Landfills            (d) Others
11. Does the size of the hospital contribute to poor biomedical waste management?  
(a) Yes            (b) No

**SECTION C:** Individual related factors contributing to poor biomedical waste management among health workers in Katabi military Hospital-Entebbe district.

12. Have you ever received any information about biomedical waste management?  
(a) Yes            (b) No
13. Do you segregate biomedical wastes according to different categories?  
(a) Yes            (b) No
14. Where do you dispose needles and syringes, cotton, gauze contaminated with blood?  
(a) Red bin            (b) Blue bin            (c) Black bin            (d) General bin
15. Do you use personal protective equipment when disposing biomedical wastes?  
(a) Yes            (b) No
16. Which personal protective equipment do you use?  
(a) Gloves            (b) Boots            (c) Apron            (d) Masks            (e) Others
17. Is biomedical waste management an extra burden on your work?  
(a) Yes            (b) No            (c) Sometimes

*SECTION D: Effects of poor biomedical management among health workers in Katabi hospital in Entebbe district*

18. Does poor biomedical waste management cause environmental pollution, unpleasant smell and  
(a) Yes                      (b) Yes                      (c) I don't know                      (d) Sometimes
19. Does poor biomedical waste management causes accidents like needle stick injury?  
(a) Yes                      (b) No
20. Can poor biomedical waste management cause illnesses?  
(a) Yes                      (b) No
21. Do you agree that poor biomedical waste management can cause nosocomial diseases and skin disorders?  
(a) Yes                      (b) No



## KAMPALA SCHOOL OF HEALTH SCIENCES

P.O.BOX 14263  
KAMPALA  
KATALE- SEGUKU  
TEL: 0700563464,  
0773748592/ 0701748592,  
0782413473/0704895614  
Email: [info@kshs.ac.ug](mailto:info@kshs.ac.ug)  
[www.kshs.ac.ug](http://www.kshs.ac.ug)

03/12/2021

Dear Sir/Madam,

**RE: DATA COLLECTION FROM YOUR ORGANIZATION**

This is to introduce to you **Mr. Masagazi Edward** who is a third year student at Kampala School of Health Sciences offering a diploma in Pharmacy.

He is conducting a study on “**Factors Contributing To Poor Biomedical Waste Management Among Health Workers In Katabi Hospital, Wakiso District**” as a partial fulfillment for the award of a Diploma.

The purpose of this communication is to request you offer him an opportunity to collect data from your organization.

Any assistance rendered to his study will be highly appreciated.

Yours faithfully,

**MUBANGIZI PROSPER**

**PRINCIPAL**



Appendix IV: A Sketch Map of The study Area  
kaTabi Military Hospital

