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FACTORS CONTRIBUTING TO IMPROPER BIOMEDICAL WASTEMANAGEMENT AMONG HEALTH WORKERS IN OLI HEALTH CENTRE IV,ARUA DISTRICT. A CROSS SECTIONAL STUDY.

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ABSTRACT

Introduction

The purpose of this study was to determine factors contributing to improper Biomedical Waste management among Health workers in Oli Health Centre IV, Arua District

The specific objectives of the study were to determine; the individual factors and health facility factors contributing to improper Biomedical waste management among health workers.

Methodology

The study employed a retrospective study design; a purposive sampling technique was used. Data was collected using a questionnaire on a sample of 50 respondents. Data was analyzed manually by use of tally sheets and entered in the Excel computer program to generate tables graphs and pie charts

Results

Most of the respondents (60%) who work in Oli Health Centre iv were Nurses, most of the respondents (44%) were married, most of the respondents (60%) were females, most of the respondents (60%) did not receive training on biomedical waste management, most of the respondents (70%) segregated waste, majority of the respondents (96%) do use protective gears, majority of the respondents (64%) agreed that biomedical waste isn't an extra burden on their work, majority of the respondents (100%) agreed that different wastes are generated by the facility.

Conclusion

The overall results on individual factors about Biomedical waste management were pleasing in that most of the health workers always segregated waste at the point of generation, and knew the color-coded bins. about health facility related factors biomedical waste management was not so pleasing because few health workers knew about Biomedical waste management plans.

Recommendations

The health facility should provide more training sessions to Health Workers who are directly involved in medical waste management, and should also disseminate regulatory information which will help health workers to understand the issues and perform their jobs properly in compliance with those regulations.

Keywords; Improper, Biomedical Waste Management, Health Workers.
Submitted: Accepted

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INTRODUCTION

Background of the study

Biomedical waste is any waste, that is generated during the diagnosis treatment, or immunization of human beings or animals or from research activities, and contains potentially harmful microorganisms that can infect hospital communities and the general public (Karmakar N, 2016).

Biomedical waste includes sharps, non-sharps blood body parts chemicals pharmaceuticals medica l devices, and radioactive materials (Oli AN, 2016).

Common sources of biomedical waste include hospitals nursing homes clinics laboratories offices of physician's dental and veterinarians (Oli AN, 2016).

Biomedical waste is considered the second most hazardous waste globally after radiation waste According to the World Organization, nearly 85%of waste generated by hospitals is general and 15% of the waste is biomedical waste which include10% infectious waste and 5% of non-infectious waste such as radioactive and chemical wastes(COLLEGE GM, 2014).

Globally, the management of healthcare waste poses major environmental and public health challenges. Healthcare waste is all waste generated in healthcare facilities such as hospitals, clinics pharmaceutical manufacturing plants research laboratories, and nursing homes (LG Dzekashu,2017).

In low- and middle-income countries, the management of Health Waste is particularly challenging. For example, in most African countries insufficient knowledge on how to handle care waste among community health workers and other staff working in the health care setting(Mustafa Ali, 2017).

Some African countries are still plagued by poverty, an underfunded health care system, poor training and a lack of awareness of policies and legislations on handling medical waste have led to improved handling of waste within the hospitalshealth care facilities' transportation and storage of medical waste. Some African countries including Botswana Nigeria and Algeria do not have national guidelines in place to adhere to the correct disposal of such waste (Jade Megan Chisholm, 2021).

In Uganda, very limited data exists on safe drug disposal Nakiganda R et al, 2023). A study by Musoke and colleagues found that the majority of homesteads in the general public disposed of their unwanted medicine by dumping and burning it in rubbish pits a very dangerous practice (Musoke D, 2021).

According to statistical data, globally it is estimated that about 5.2 million people including 4 million children die each year due to BMW-related disease and exposure to BMW can range from gastro enteritisrespiratory and skin infections to more deadly diseases such as HIV/AIDS and Hepatitis B. Also, injections with contaminated syringes caused 21 million Hepatitis B infections 32% of infections 40% of hepatitis C new infections, and 5% of HIV/ AIDS new infections (Ethiopia FDRo, 2019).

In Uganda, During the evaluation of injection safety and BMWM, it was found that 92% of waste handlers have poor waste disposal methods (Lawrence Muhwezi, 2014).

Purpose of the study

To determine the factors contributing to improper Biomedical waste management among Health workers in Oli Health Centre IV Arua District

Specific objectives

To find out individual factors contributing to improper Biomedical waste management among health workers.

To find out the health facility factors contributing to improper Biomedical waste management among health workers.

METHODOLOGY

Study Area

This study was conducted from January 2023 to May 2023 at Oli Health Centre IV. The health facility is a district hospital that has several wards and serves a population of approximately 5000 people around the division. Oli HealthIV is located 45km away from Arua Town.

Study Design

A descriptive cross-section study was carried out to assess the factors contributing to improper Biomedical waste management among Health workers in Oli Health Centre IV using both qualitative and quantitative data.

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Study Population

The study included health workers in Oli Health Centre IV to assess the factors contributing to improper Biomedical waste management among health workers in Oli HealthCentre IV.

Sample Size Determination

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

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

Where;

N = desired sample size

P = Estimated population of desired characteristics

Z = standard deviation taken as 1.96 at a confidence level of 95%

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

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=0.5

$$N = \frac{(1.96)^2 \times 0.5\ 0.5}{(0.1)^2}$$

N=50.046875

N=50 respondents

Therefore, the researcher considered 50 respondents from Oli Health center IV who were available for the study.

Sampling technique

purposive sampling method was used where health workers easy to contact or reach were involved in the study.

Sampling Procedure

A purposive sampling method was used where health workers available and easy to reach were involved in the study

Sampling procedure

I would seek consent from the workers and in case you agreed to participate in the study choose randomly

Data Collection Procedure

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

Data Collection Tools

The data was collected using semi-structured questionnaires with both open and closed-ended questions.

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

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 Oli Health Centre IV and adjustments 1 were made appropriately based on their responses.

The data collected 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.

Inclusion and Exclusion Criteria

Inclusion Criteria

All workers of Oli Health Centre IV during the period of data collection and consent for the study

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Exclusion Criteria

All health workers of Oli Health IV were absent and did not consent to the study.

Data Analysis

Data was collected and entered into Microsoft Office Excel. Descriptive data was presented as frequencies and percentages and illustrated using frequency tables, pie charts, and bar graphs

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) of Oli Health CentreIV. Permission to collect data was obtained from the MS Oli Health Centre

An informed written consent was sought from respondents who were assured of confidentially of the information provided.

To ensure anonymity, the names of the respondents were not stated in any data collection either.

RESULTS

Demographic data

From table 1, majority of the respondents (40%) were aged between 30 to 39 whileminority of the respondents (8%) were above 50 years. In relation to sex majority of the respondents (60%) were female while minority of the respondents(40%) were males. Basing on Marital status, majority of the respondents (44%) were single whereas minority of therespondents (6%) were widowed. Basing on profession, majority of the respondents (60%) were Nurses/midwives while the minority of the Respondents (4%) were Clinical officers.

Table 1 Shows the distribution of respondents According to their Demographic factors N =50

AGE	Frequency (f)	Percentages (%)
20 – 29	10	20
30 – 39	20	40
40 – 49	16	32
Above 50	4	8
Total	50	100
SEX		
Female	30	60
Male	20	40
Total	50	100
Marital status		
Married	16	32
Single	22	44
Widow	3	6
Divorced	9	18
Total	50	100
Nurse/midwives	30	60

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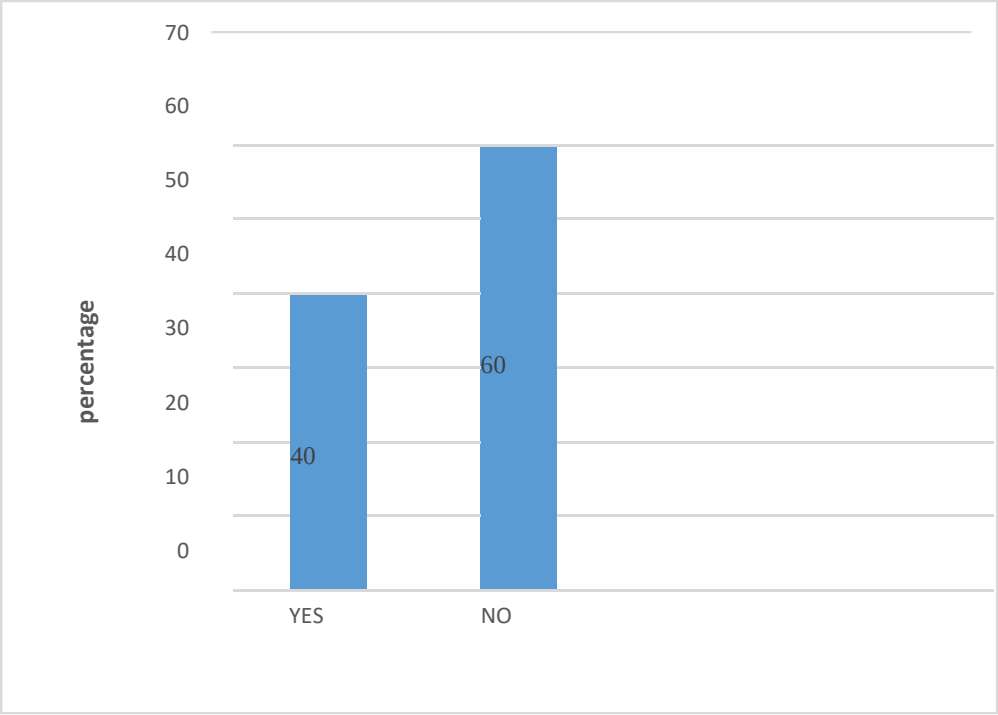
Clinical officer	2	4
Medical officer	3	6
Lab technician	6	12
Others	9	18
Total	50	100

Figure 1: Shows the distribution of respondents according to training received about biomedical waste management (N=50)



Individual factors contributing to improper biomedical waste management among health workers

From figure 1, the majority of the respondents (60%) agreed that, they did not receive training about biomedical waste management while minority of the respondents (40%) agreed that, they received training about biomedical waste management.

From figure 2, majority of the respondents (70%) agreed that, they segregated Biomedical waste according to different categories whereas minority of the respondents (30%) agreed that, they did not segregate biomedical waste into different categories.

From figure 3, majority of the respondents (64%) agreed that, they disposed sharps and syringes in safety box while minority of the respondents (4%) agreed that they disposed sharps and syringes in red bin.

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Figure 2: Shows the distribution of respondents according to Biomedical waste segregationinto different categories (N=50)

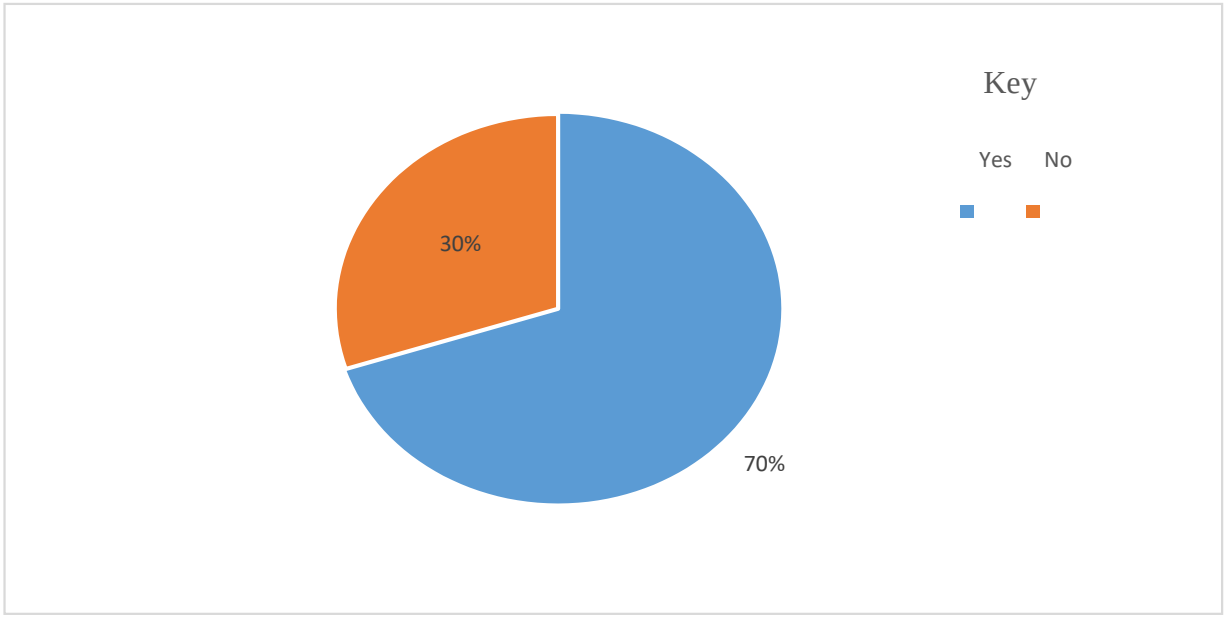

Figure 3: Shows the Distribution of respondents according to the Disposal of needles andsyringes (N=50)

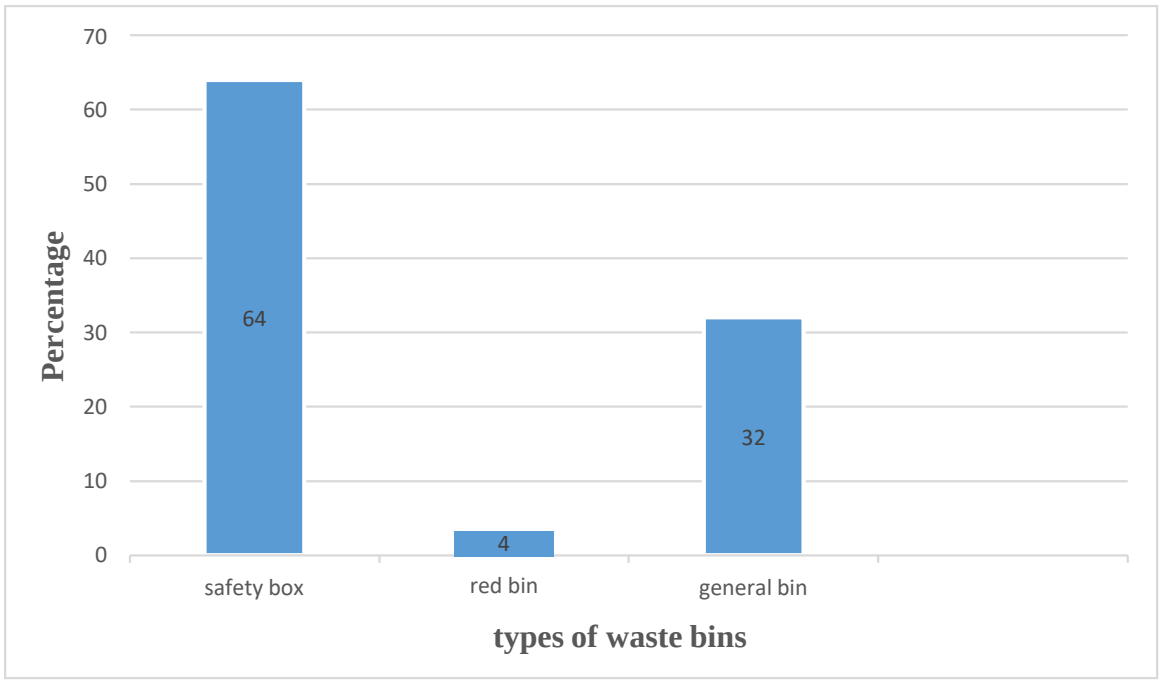

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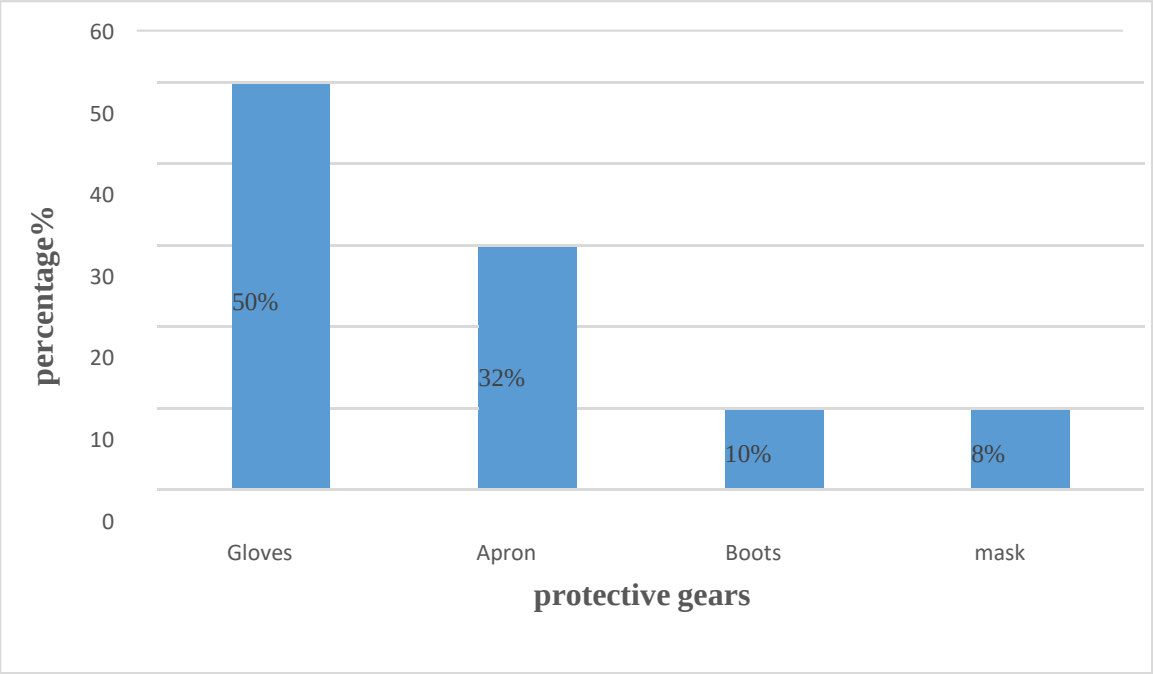
Table 2: Shows the distribution of respondents according to use of protective gears whendisposing biomedical waste.
(N=50)

Response	Frequency '	Percentages (%)
Yes	48	96
No	2	4
Total	50	100

Figure 4: Shows the distribution of respondents according to mostly used protective gearswhen handling biomedical management waste
(N=50)



From the table 2, the majority of respondents (96%) reported that, they used personal protective gear when handling biomedical waste while minority of the respondents (4%) did not use personal protective gears when handling waste. From the figure 4, a half of the respondents (50%) agreed that they mostly used gloves whilethe least of the respondents (8%) agreed that they mostly used gumboots.

From the figure 5, the majority of the respondents (64%) agreed that biomedical waste was not extra burden on their work whereas minority of the respondents (36%) agreed that biomedical waste was burden on their work.

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Figure 5: Shows the distribution of respondents according to burden of biomedical wastemanagement on their work. (N=50)

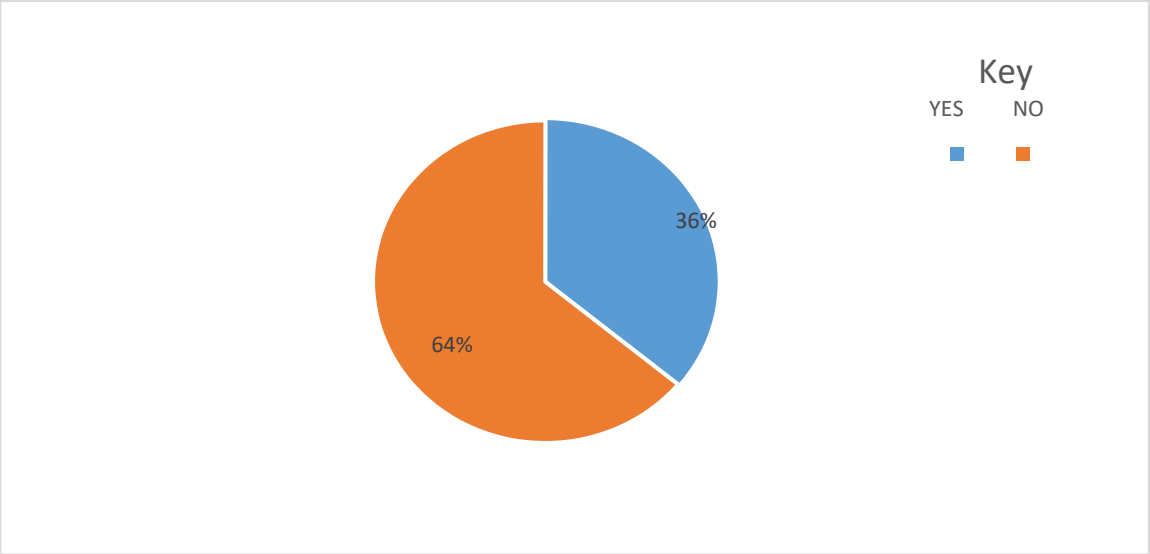
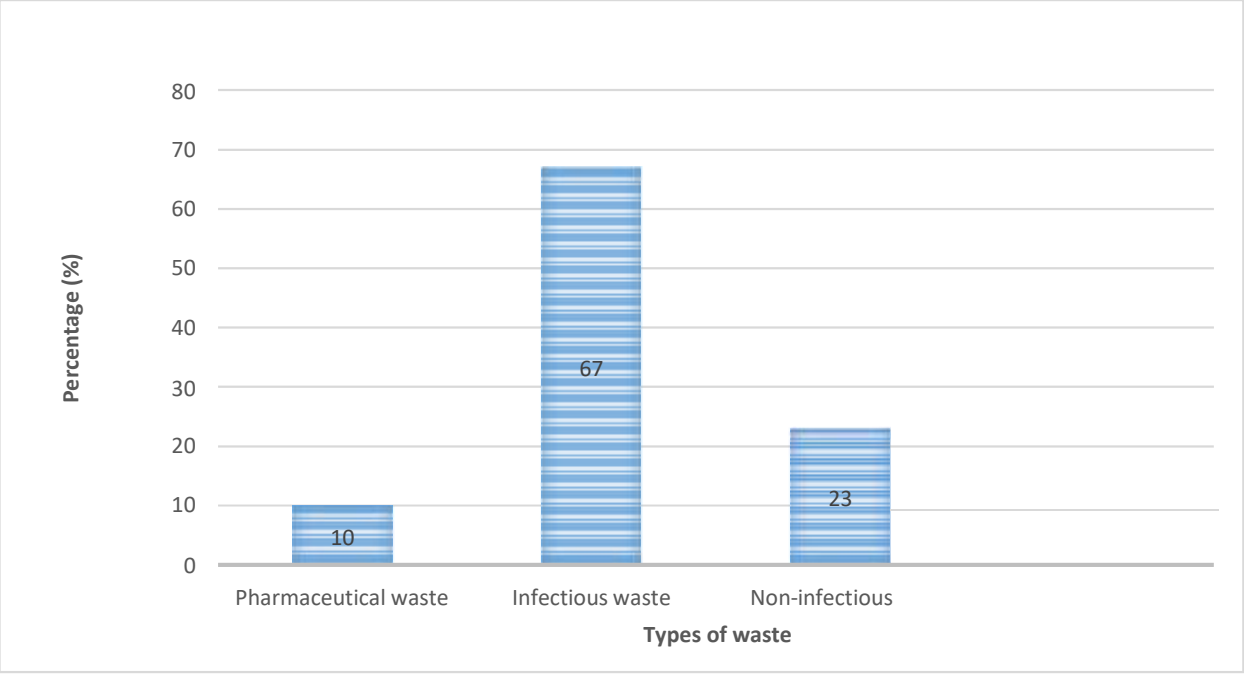


Table 3: Shows the distribution of respondents according to whether there were differenttypes of waste generated. (N=50)

Respondents	Frequency	Percentages (%)
Yes	50	100
No	0	0
Total	50	100

Figure 6: Shows distribution of respondents according different types of waste generatedin the hospital (N=50)



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Health facility factors contributing to improper biomedical waste management amonghealth workers

Regarding whether there were different types of waste generated, all 50(100%) of the respondents reported that there were different types of waste generated as shown in table 3.

From figure 6, the majority of respondents (67%) agreed that waste generated by the hospital was infectious waste while the minority of respondents (10%) agreed that waste generatedby the hospital was pharmaceutical waste.

Figure 7 shows, the majority respondents (70%) agreed that the hospital had biomedical wastemanagement plan while minority of respondents (30%) agreed that the hospital did not have biomedical waste management plan.

From table 4, the majority of the respondents (94%) agreed that the hospital had incineration method of biomedical waste disposal while the minority of respondents (6%), agreedthat they had open air burning method of biomedical waste disposal.

Figure 7: Shows the distribution of respondents according to biomedical wastemanagement plan of the hospital. (N=50)

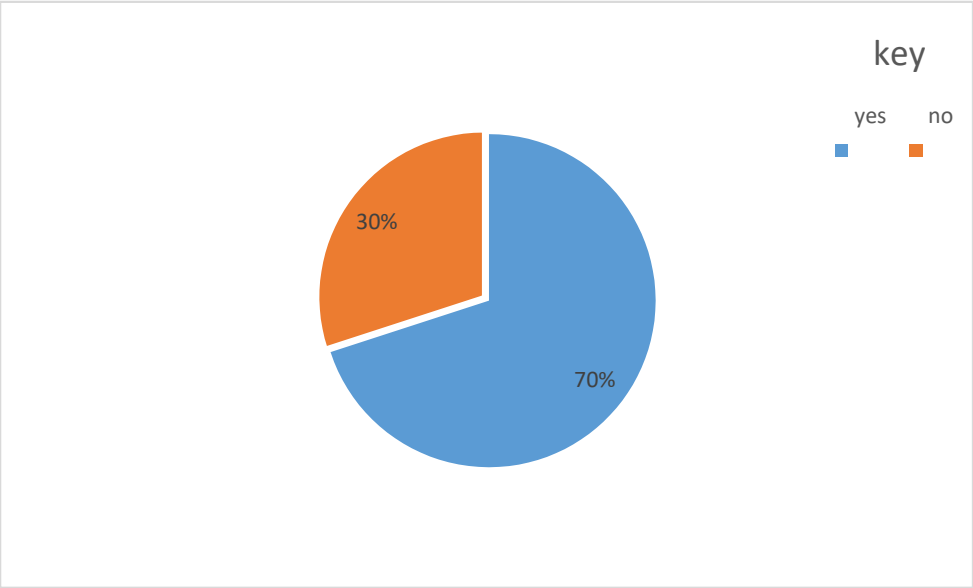

Table 4: Shows the distribution of respondents according to the methods used to disposeBiomedical waste by the hospitals
(N-50)

Methods used to dispose biomedical wastes	Frequency(f)	Percentage (%)
Incineration	47	94
Landfills	0	0
Open air burning	3	6
Pits	0	0
Total	50	100

DISCUSSION

Individual factors contributing to improper biomedical waste management among health workers

The current study findings reported that the majority of the respondents (60%) had not received training about Biomedical Waste Management this implies that the Hospital does not allocate funds for Waste management training. This study's findings were in agreement with Alkhald Al Asmani (2021) which reported that the majority of the primary care professionals did not receive sufficient infection training programs.

From the study, results showed that the majority of the respondents (70%) segregated waste according to different categories. This implies that the respondents knew Waste management. This study is similar to Muna Ibrahim et al (2020) where the majority of the respondents (64%) segregated waste in available color-coded bins sorting general, infectious, and sharp waste in different color-coded bins or boxes.

From the study findings, the majority of the respondents (64%) always put sharps in safety boxes this implies that the health workers knew waste disposal.

Results from the study conducted showed that a high percentage (96%) of the respondents used protective gear like gloves when handling waste implying that the respondents are aware of hazards associated with exposures this study's findings were in agreement with Husna Romin et al (2020) results revealed that majority of the respondents (92%) agreed that it was necessary to wear gloves to prevent exposures to highly hazardous waste and control spread of infractions

Furthermore, from the finding's majority (64%) of the respondents agreed that biomedical waste management isn't an extra burden on their work this is because the color-coded bins are within reach and are enough within the health facility.

Health facility factors contributing to improper biomedical waste management among the workers

From the study findings, the majority (98%) of the respondents reported that the hospital has biomedical color-coded bins which indicated that the health facility provides color-coded for use by the health workers. The study agrees with Akkajit P et al (2020) where results revealed that a high percentage of the respondents used color bins to identify and classify waste which indicated a high level of understanding of Medical Waste Management.

The study, the result showed that the majority of the respondents (96%) used the incineration method to dispose of medical waste this study is not in agreement with the study of Sambo Harona et al (2017) agreed that most used methods to manage waste were Open AirBurning.

CONCLUSIONS

Based on the general results of the study the researcher conducted, the overall results on individual factors about Biomedical improper waste management were the majority of the health workers always segregated waste at the point generation (70 %), knew the color-coded bins, the health workers always used protective gears (96%) when handling wastes and the never felt that biomedical waste management was an extra burden on their work (64%)

Regarding health facility factors in biomedical waste management, health workers were not awareBiomedical waste management plan and the hospital used incineration (96%) and open-air burning (4%) methods to dispose of waste

RECOMMENDATIONS

The health facility should provide more training sessions to Health Workers who are directly involved in medical waste management and should also disseminate regulatory information which will help health workers to understand the issues and perform their jobs properly in compliance with those regulations.

The health worker should always segregate waste at the point of generation and ensure the proper use of protective Gear.

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LIST OF ABBREVIATIONS AND ACRONYMS

BMWM: Biomedical waste management

BMWs: Biomedical wastes.

HCF: Health care facilities

HCW: Healthcare waste

MW: Medical Waste

MWM: Medical Waste Management

WHO: World Health Organization

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