

## Institutional Factors Associated Medical Waste Management Practices among Selected Private Healthcare Facilities in Kampala Uganda

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### ABSTRACT

The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste; inadequate and inappropriate knowledge of handling healthcare waste would have severe direct and indirect health consequences on the health care providers, waste handlers, and a significant negative impact on the environment. The objective of this study was to determine the institutional factors associated medical waste management practices among selected private healthcare facilities in Kampala, Uganda. Descriptive cross-sectional study design was used employing quantitative and qualitative methods of data collection. A sample size of 240 respondents was considered across all Health workers involved in waste generation in the 3 selected Health facilities. Data were analyzed using SPSS; descriptive, bivariate, and multivariate analyses were done at a 95% confidence interval. Average number 106/211 (50.2%) of the respondents had good waste management practice, while 105/211 (49.8%) had poor waste management practice. Factors such as: the presence of hospital policy in waste management ( $X^2=22.434$ , P-value = 0.000), availability of manual or guideline document on management of hospital waste ( $X^2=25.327$ , P-value = 0.000), waste management plan by the Hospital ( $X^2=45.241$ , P-value = 0.000) and standard operation procedure on the management of waste by the Hospital ( $X^2=34.611$ , P-value = 0.000) were all associated with medical waste management practices. Acceptable waste management practices were found in 50% of Health workers and in private health facilities in Kampala studied. The 50% non-compliance to good waste management practice is very significant. Also, the absence of hospital policy on waste management, non-availability of manual or guideline document on management of hospital waste, lack of waste management plan document by the Hospital, and standard operating procedures on the management of waste by the Hospital were found to be significant factors associated with poor waste management.

**Keywords:** Medical wastes, Institution, Pathogens, Hazard, Policy, Health Care workers



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## INTRODUCTION

**M**edical Waste is defined as any useless by-product that is generated in the diagnosis, treatment, or immunization of human beings or animals in a related field of research, biological production, or testing.<sup>1</sup> Institutional factors are structures in a society or organization. It considers processes by which systems, including schemes, rules, norms, and routines, become established as authoritative guidelines that guide behavior. Anything institutional will consist of specific rules and regulations that must be abided by to participate in it<sup>2</sup>.

Ugandan National Environmental Management Agency classified Hospital and Medical Wastes as Hazardous waste, and these are Wastes generated from” medical care and medical examination in hospitals, clinics, elderly medical care centers, and maternity wards and medical care centers and wastes from medical examination in medical examination laboratories. In Uganda, Waste Management is under the environmental health sector, which is overseen by the Ministry of Water and Environment. The Government of Uganda adopted a National Environment Policy in 1994, and one of the policy objectives is to collect, analyze, store and disseminate reliable information relating to environmental management issues<sup>3</sup>.

It is mentioned under the bio-medical waste Management rules 1998 that every health care provider must have adequate knowledge regarding medical waste management and should respect the correct practice of handling and disposal of medical waste<sup>4</sup>. In hospitals, clinics, and places where diagnosis and treatment are conducted, there are medical waste, and management of these wastes is a challenge of great concern due to possible public health risks associated<sup>5</sup>. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge of handling healthcare waste would have severe direct and indirect health consequences to the health care

providers, waste handlers, and a significant negative impact on the environment<sup>6</sup>. As a consequence, these increase the risk of nosocomial infections (pneumonia, diarrhea, and wound infection), impaired staff and patient safety, increased infectious diseases like hepatitis B, C, HIV among health care providers and medical waste handlers, poor environmental hygiene, the putrid smell of the environment, and increased waste disposal cost<sup>7</sup>.

Medical waste management continues to be a significant problem, mainly in most healthcare facilities of the developing countries where it is affected by different factors such as technology, economic, social difficulties, and inadequate training of staff responsible for the handling of medical waste<sup>7</sup> Unlike many other hazardous wastes, there is currently no international convention that directly covers medical waste management, so categorization systems vary from country to country. However, waste is usually categorized according to the risk it carries. The majority of medical waste around 75 to 85 percent is similar to regular municipal waste and of low risk unless burned<sup>8</sup>. This involves generation of air pollutants and dioxins which can cause cancer, endocrine damage, infertility, damage to immune system interference with hormones and birth defects<sup>9</sup>.

## MATERIALS AND METHODS

**Study Design:** This study employed a mixed research approach (both qualitative and quantitative) using a descriptive cross-sectional observational research design. The data were collected through survey questionnaires and observational checklist from three (3) healthcare facilities from different categories of respondents.

**Study Population:** The study population was all the health workers involved in Medical wastes in selected Private health facilities in Kampala district, Uganda. The target population of the hospitals was estimated to be 600 workers from the selected Healthcare facilities. Sample Size Calculation: The researcher used the Sloven's

formula to determine the sample size from the study population. This formula was used because an estimated number of Health workers associated with waste in the selected private Hospital was 600. The Sloven's formula was given by;  $n = \frac{N}{1+Ne^2}$

Where; n = sample size, N = Target population size, e = Margin of error (0.05) Using this formulary therefore; N= 600

$1+ 600(0.05)^2$  n= 210 health workers

**Study Site:** Three Healthcare facilities were involved in this study, namely: Kibuli Muslim Hospital, Kibuli, Kampala, and Lubaga Hospital (Uganda Martyrs hospital). Lubaga and Wandegeya Medical chambers, Kampala. The three were purposively selected due to their high volume of workload. Hence large volume of medical waste was always generated. Sampling procedure: The respective number of health workers were determined using the proportional probability method as indicated in the table above:

Hospital	Target Population	Sample size
Kibuli Muslim Hospital	200	70
Lubaga Hospital	250	88
Wandegeya Medical Chambers	150	53
Total	600	211

### Data Processing and Analysis

Data analysis was done using the Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.)<sup>11</sup>. Frequency tables and cross-tabulations were generated, and the level of significance was determined by a p-value of less than 0.05 and 95% Confidence Intervals (CI). Univariate, bivariate, multivariate and logistic regression analyses were conducted to determine various associations between the variables.

### Ethical considerations

A scientific and ethical approval and administrative clearance were sought from the ethical committee of the

selected hospitals; permission to conduct the study and collect data was obtained. Informed consent was sought from the participants.

## RESULTS

### Demographic characteristics of the respondents

Female respondents were higher in number compared to the males, 130/211(61.6%). The majority 113 /211 (53.6%) of the respondents, were within the age bracket of 20-29 years and 92 / 211(43.6%) of the respondents had attained diploma level of education

The majority 207/211 (98.6%) of the respondents indicated that there was a collection of waste services at their hospitals, while 204/211 (97.1%) of the respondents stated that there was segregation of waste process at their health facility. The highest number, 206/211 (97.6%) of the respondents, indicated that there were waste storage facilities at their hospital. Also, the majority 198/211 (94.3%) of the respondents stated that there were waste transportation services at their hospital, and most of the respondents, 113 (53.6%) indicated that there were modern waste disposal services at their hospital (Table 1)

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Presence of hospital policy in waste management ( $X^2= 22.434$ , P-value = 0.000), Availability of manual or guideline document on management of hospital waste ( $X^2= 25.327$ , P-value = 0.000), Waste management plan by the Hospital ( $X^2= 45.241$ , P-value = 0.000) and Standard operation procedure on the management of

waste by the Hospital ( $X^2= 34.611$ , P-value = 0.000) were the Institutional factors associated with Medical Waste Management among Selected Private Hospitals in Kampala (Table 3).

Table: 1 Demographic characteristic of the respondents

Variable	Categories	Frequency	Percentage (%)
Gender	Male	81	38.4
	Female	130	61.6
Age	20-29	116	53.6
	30-39	75	35.5
	40-49	16	7.6
	50 and above	7	3.3
Educational level	Certificate	61	28.9
	Diploma	92	43.6
	Degree	45	21.3
	Post-graduate	7	3.3
	Others	6	2.8

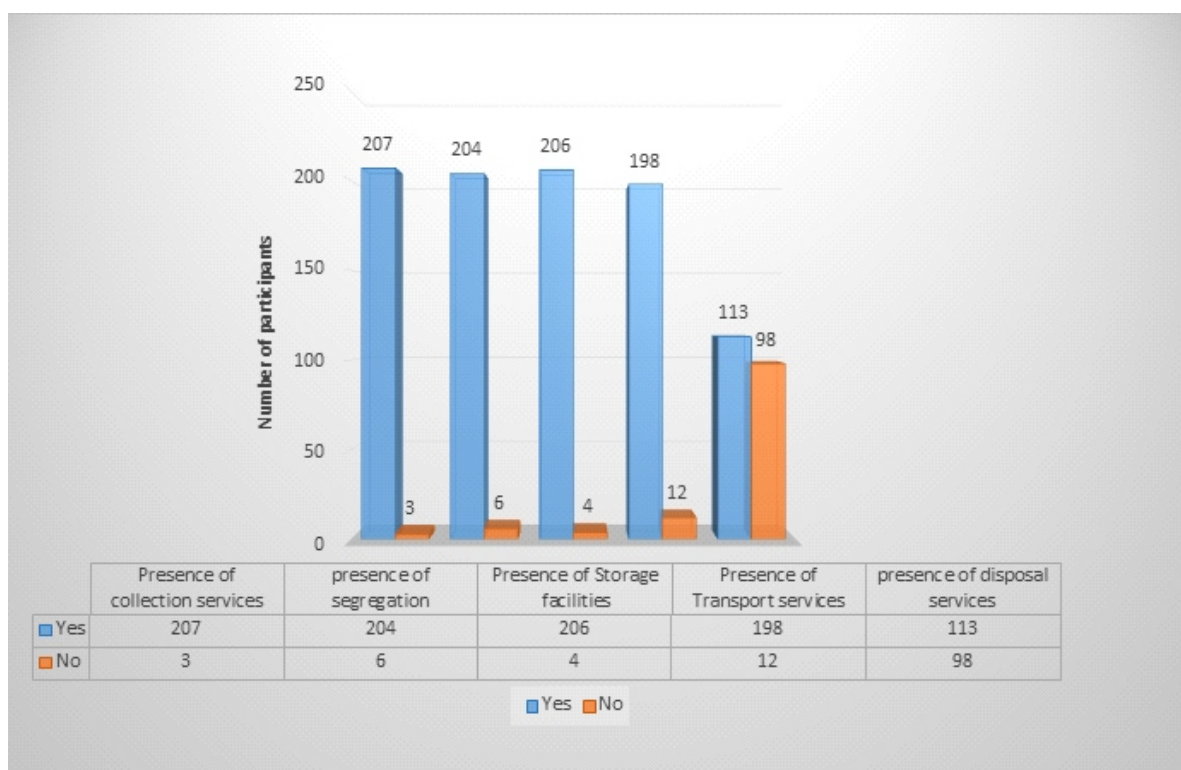


Figure 1: Bar chart showing the processes of waste management practice among the private hospitals.

Table 2: Medical waste management Practices Performance among private health facilities in Kampala District Uganda

Variable	Categories	Frequency	Percentage (%)
Waste management practice	Good	106	50.2
	Poor	105	49.8

Table 3: Institutional factors that Influence Medical Waste Management among Selected Private Hospitals in Kampala at Bivariate level

Variable	Categories	Good	Poor	X <sup>2</sup>	P-value
Presence of hospital policy in waste management	Yes	61 (40.1%)	91 (59.9%)	22.434	<b>0.000</b>
	No	44 (75.9%)	14 (24.1%)		
Availability of manual or guideline document on management of hospital waste	Yes	49 (37.4%)	82 (62.6%)	25.327	<b>0.000</b>
	No	56 (73.7%)	20 (26.3%)		
Waste management plan by the Hospital	Yes	44 (32.8%)	90 (67.2%)	45.241	<b>0.000</b>
	No	61 (81.3%)	14 (18.7%)		
Standard operation procedure on management of waste by the hospital	Yes	47 (35.3%)	86 (64.7%)	34.611	<b>0.000</b>
	No	59 (77.6%)	17 (22.4%)		
Personal protective equipment provided by the Hospital	Yes	98 (49%)	102 (51%)	1.361	0.243
	No	5 (71.4%)	2 (28%)		
Waste receptors in all wards or units in the hospital	Yes	105 (50%)	105 (50%)	0.995	0.318
	No	1 (100%)	0 (0%)		
Supervision of waste management by the Hospital	Yes	95 (53.1%)	84 (46.9%)	3.270	0.71
	No	11 (35.5%)	20 (64.5%)		

*P<0.05 significant level*

## DISCUSSION

Half, 106/ 211(50.2%) of the respondents had good waste management practice, and 105/211 (49.8%) had poor waste management practice. This implies 5 in every ten workers indicated that their hospitals practiced a good waste management system. This is similar to the report of a study on healthcare waste management in Northern Ethiopia by Azage et al., which found that 31.5% of the healthcare workers had good waste management practices<sup>12</sup>. This present research showed that good waste management practices had not been widely accomplished among health institutions studied. Good waste management practiced in only one of the health facilities had compensated for the shortcomings of the other facilities. It was identified that some of the services or facilities might be present, but not all five elements

were put into use by most of the healthcare centers under study. Furthermore, when assessing the medical waste practices, 98.6% of the respondents indicated that at their respective hospitals, there were waste collection services, 97.1% of the respondents stated that there was segregation of wastes, 97.6% stated that there were waste storage facilities, 94.3% of the respondents indicated that there were transportation services for medical wastes and 53.6% of the respondents indicated that there were modern waste disposal services. This is in agreement with the report of research finding carried out in Cairo by Hakim et al<sup>13</sup>

The presence of hospital policy in waste management was among the Institutional factors influencing Medical Waste Management among Selected Private Hospitals in Kampala. However, the presence of a waste management plan by the



Hospital had the highest likelihood to influence good medical waste management practice. The policy ought to guide individuals on what is required for proper medical waste management practice. Management of healthcare waste depends on the input from the administration and active participation by trained staff in segregation, storage, collection, transportation, treatment, and disposal. The availability of manual or guideline documents on the management of hospital waste was among the Institutional factors influencing the Medical Waste Management among selected private hospitals in Kampala. Non-availability of manual or guideline to educate and guide the workers on the management of waste and its practice may hinder the good practice of waste management. Furthermore, if the waste management practice of the Hospital is not comprehensive enough to address all that is required it will also hinder the waste management process. This is in line with a study by Azage et al., which found that 96.9% of the healthcare workers do not have access to any guideline document on waste management practices, which hindered their waste management practices substantially<sup>12</sup>. Waste management plan by the Hospital was among the institutional factors influencing the medical waste management among selected private hospitals in Kampala and majority of the hospitals under this study equally lacked this document on waste management plan.

## CONCLUSION

It was concluded that medical waste management in most of the healthcare facilities studied was still poor. All the health facilities had materials for waste segregation at the point of collection, although there was a need to improve on color-coded receptors as waste segregation and color coding were poorly adhered to while most of the storage areas were too small with no restriction to them. The findings also showed that nearly all the health facilities in the study area practiced poor management of medical wastes, and no environmental measures or recycling

activities (except in one facility) were available. Typically, the handling of medical wastes was left to healthcare workers who had no training on medical waste management and guidance.

### The implication of these findings are:

- 1.The poor adherence to good waste management practice has a deleterious effect on the healthcare workers, waste handlers and the environment.
- 2.Private healthcare institution are more likely to have poor waste management practice.
3. More advocacy needs to be done in private healthcare facilities in term of documentation on waste management practices.

### Recommendations

We therefore make the following recommendations:

- 1.Awareness should be raised among private healthcare facilities, and there should be regular training of health workers in proper waste management.
- 2.The hospital management should always conduct training for all healthcare workers on waste management practices and as well as timely training on the new developments or modifications to the waste management plans and practices.
- 3.A manual or waste management guidelines should be made available and accessible to all health care workers in the private healthcare facilities.
- 4.All health care facilities should establish an Infection Control Committee incorporating waste management officers.
- 5.More funding should be allocated to waste management in health facilities, particularly in the provision of waste receptors, color-coded plastic bags, and waste disposal services.

### Conflict of interest

The authors declare that we know no conflict of interest with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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