

KNOWLEDGE, ATTITUDE, AND PRACTICES ABOUT BIOMEDICAL WASTE SEGREGATION AND MANAGEMENT AMONG HEALTH WORKERS AT KAJJANSI HEALTH CENTRE IV, WAKISO DISTRICT UGANDA: A CROSS SECTIONAL STUDY.

Shamim Akanduhura, Sam Otile*
Mildmay Institute of Health Sciences.

Page | 1

Abstract

Background

This study aims to assess health workers' knowledge, attitudes, and practices towards biomedical waste segregation at Kajjansi Health Centre IV.

Methodology

This research study was carried out at Kajjansi Health Centre IV. The hospital is located in Kajjansi Town, Busiuro South, Wakiso district Uganda. The hospital segregates waste in color-coded waste bins. Data was collected using a self-administered questionnaire. Data was then analyzed manually through tallying and then entered into a computer. The data gathered was then analyzed using SPSS (Statistical Package for Social Sciences) and results were presented using appropriate tables and graphs.

Results

The majority of the health workers at Kajjansi Health Centre IV were interns being a population of 29 (47%), doctors being 2 (03%), and lab technicians having the least numbers at 4 technicians from the study. It was also found that most of the health workers collected general and biomedical wastes differently that is 42 of the respondents practiced it and 8 did not carry out the practice. 40 of the respondents picked up waste with rubber gloves when on the ground, while 20 only wore gloves at times and 2 never used gloves at all.

When it came to cleaning spills of liquid of biomedical wastes with proper procedure, 40 respondents sometimes practiced the procedure and 20 carried out the proper procedure while 2 did not carry out the procedure.

Conclusion

Education level, health workers in their specialty played and correlated with the knowledge about health waste disposal and segregation, here medical doctors appeared to have the highest knowledge.

Recommendations

Health management committees should impose tough measures where all health workers attend training and workshops on biomedical waste management and segregation.

Keywords: Knowledge, Attitudes, Practices, Biomedical Waste Segregation, Kajjansi Health Centre IV.

Submitted: 2023-12-21 **Accepted:** 2024-01-09

Corresponding author: Sam Otile*

Email: sam.otile@mihs.ac.ug

Mildmay Institute of Health Sciences.

Background of the study

Poor Biomedical waste management has always been Uganda's health risk in every hospital which has now been alarmed by the population that has doubled from 20.86 million in 2000 to 46.4million in 2020 and also faced today with the improper handling and disposal of accumulating solid wastes. (Muhwezi. L., et al, 2018). During the evaluation of injection safety and health care waste management (HCWM) in Uganda, it was found that 92 percent of waste handlers have poor waste disposal techniques, 3.4 percent had acceptable waste disposal

methods and 4.6 percent had good waste disposal methods according to an article in New Vision, 12th Oct 2013 pg 19. The people affected due to poor healthcare waste management include waste handlers, patients because their prolonged stay predisposed them to nosocomial infections, and patients who developed new infections in the hospital, while health workers were unknowingly infecting themselves.(Wafula, S.T., et al, 2014)

Overall knowledge as to why patients were developing new infections and the high rate of health workers getting Hospital-acquired infections at Kajjansi Health Centre IV is what compelled me to carry out the study. This study aims

to assess health workers' knowledge, attitudes, and practices towards biomedical waste segregation at Kajjansi Health Centre IV.

METHODOLOGY

Study design

The research was descriptive in that I collected data answering our research questions including the knowledge, attitude, and practices of health workers in regards to health care waste which was generated daily and entirely affected the patients.

In this quantitative research, I aimed to determine the impact of variables amongst the study population which was the health workers' knowledge, attitude, and practices regarding healthcare waste generation without any attempt to change the behavior or conditions in the study but rather be studied as they were.

Study area

This research study was carried out at Kajjansi Health Centre IV. The hospital is located in Kajjansi Town, Busiuro South, Wakiso district Uganda. The hospital segregates waste in color-coded waste bins.

Study population

The research study was intended to administer questionnaires to health workers at Kajjansi Health Centre IV.

Selection criteria.

Participants actively generating wastes and disposing of wastes were included in the study while participants who did not meet the profile were rejected. For example, those who were not then serving in the health center were rejected nor those not in the close generation of healthcare waste were rejected.

The study did not include everyone available to us rather only those available to meet the defined criteria were included in the study.

Inclusion criteria

New and old health workers/ Employed and interning health workers at Kajjansi Health Centre IV who consented to participate in the study.

Exclusion criteria.

The health workers with illness who were on leave or had any other problems were not allowed to fully participate in the study and hence were excluded from the study. Any staff members who were not willing to sign the consent form to participate in the study were excluded too.

Sample size determination

A sample is said to be representative when the characteristics of the elements selected are similar to those of the entire target population.

The sample size was determined using Kish Leslie's (1965) formula= Z^2pq/d^2

Where; n= sample size

Z=score corresponded to the 95% confidence interval (z=1.96)

P= prevalence (13.3%) according to Odoki et al 2019

Q=1-p

D2=precision or sampling error (7.8%)

Therefore; n= $(1.96)^2(0.133)(1-0.133)/(0.078)^2$

n=64 respondents

Sampling techniques

The study respondents' selection of health workers applied a simple random sampling method. This was because it minimized bias and all health workers were able to participate in the study.

Sampling procedure

A simple random sampling method was used to select health workers. All participants were first allocated numbers ensuring that the initial total number was between 40 and 60.

The procedure for selection of the health workers for participation in the study was as follows; I prepared 100 pieces of papers and coded them from 1 to 64 while folded. Placed them in a container and mixed before random selection. The number picked was checked against the health workers and noted down. The process was then repeated without replacement until a maximum of 64 health workers had been selected randomly.

Data collection methods

This represents the different ways in which information was obtained from respondents. They included;

Data collection tool.

The data collection instrument was a semi-structured questionnaire, comprising three sections, namely; knowledge towards waste segregation that investigated the respondent's knowledge towards waste segregation and management, attitudes toward waste segregation consisting of questions that investigated the respondent's attitudes toward waste disposal strategies. The third section was on the practice of waste management in the process of segregation and management of medical waste.

A cover letter was attached to each questionnaire. The letter introduced the researcher and explained the purpose of the collection of data.

This method was used to collect data from health workers following their qualifications and interest in the study. It

involved administering questionnaires to the respondents and they were required to answer the questions following the instructions given to them.

Data collection procedure.

Data was collected using a self-administered questionnaire written in English language. The respondents were required to ask any questions where they did not understand before responding to the tool. This data collection tool was given to only those in the inclusion criteria.

Study variables

Dependent variable

Health worker's knowledge, attitudes, and practices were the dependent variables of the study regarding healthcare waste segregation and management.

Independent variable

Hospital waste segregation and management were the independent variables of the research study.

Piloting the study.

A pilot study was carried out before to make sure that reliable and convenient data for the study was obtained.

Data quality control.

Before the data collection, the data collection tools will be given to the supervisor for approval. The respondents will then be assured of confidentiality and information concerning confidentiality was stated on top of the first page of the questionnaire.

The answered questionnaires did not carry any names but rather codes, this reduced stigma among participants and hence improved accurate information collection.

No respondents were forced to participate in the study, only willing respondents participated after consenting.

Data analysis and presentation.

Data was collected using a self-administered questionnaire. Data was then analyzed manually through tallying and then entered into a computer.

The data gathered was then analyzed using SPSS (Statistical Package for Social Sciences) and results were presented using appropriate tables and graphs.

Ethical consideration

An introductory letter was obtained from the Academic Registrar, Mildmay Institute of Health Sciences, and submitted to the in charge of Kajjansi Health Centre IV for approval. Respondents were asked for consent before participating in the study, no one was forced to participate, and the participants retained the capacity to withdraw from the study at any point in time, with or without prior notice to the researchers. The actual name of the respondent was not mentioned. The respondents were assured of privacy and that their information was not accessed by other people. Fidelity was maintained by avoiding negligence with information throughout the study.

RESULTS

Results from the questionnaire to the Health workers

Demographic characteristics

Table 1: Distribution of respondents according to their demographic

Age (years)	Frequency (f)	Percentage(%)
16-25	30	48
26-33	14	23
34-40	6	10
41 & above	12	19
Specialty		
Nursing staff	16	26
Medical officers	2	3
Clinical officers	3	5
Lab technicians	4	6
Interns	35	58
Gender		
Male	22	35
Female	40	65
Time frame of work at the hospital (experience)		
0- 5 years	37	60
6- 10 years	10	16
11- 15 years	8	13
More than 15 years	7	11

According to Table 1, the highest number of health workers were between the ages of 16-25 years, 30 (48%). The majority of the health workers at Kajjansi Health Centre IV were interns being a population of 29 (47%), doctors being 2 (03%), and lab technicians having the least numbers at 4 technicians from the study above.

The population of male health workers was nearly half of that of the females which comprised 22 (35%) and 40(65%) respectively as from Table 1.

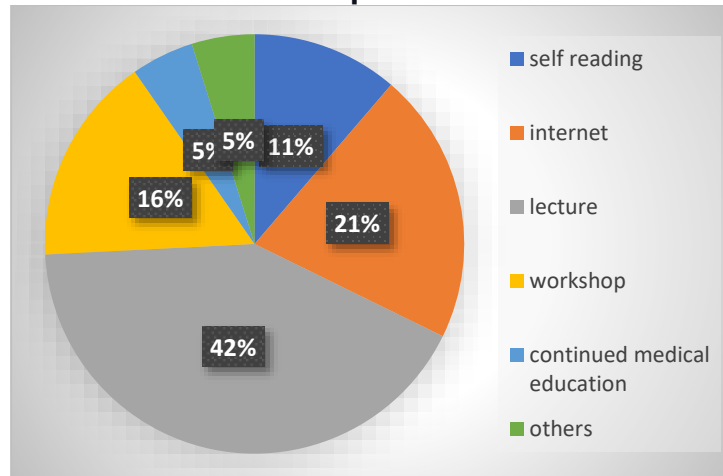
Most of the health workers 37 (60%) had spent less than five years at the hospital with only 7 (11%) health workers spending more than 15 years in the hospital as per results from the study above,

According to the study, it was found that 35 of the respondents attained a certificate in the medical field, 15 had diplomas, 6 had bachelor's degrees and the others had a master's degree and Ph.D. in the different medical fields.

Of the respondents in the study, only 12 of the health workers had additional Biomedical waste management training outside their academic qualifications and these were mainly nurses and midwives.

Knowledge of health workers about biomedical waste segregation and management

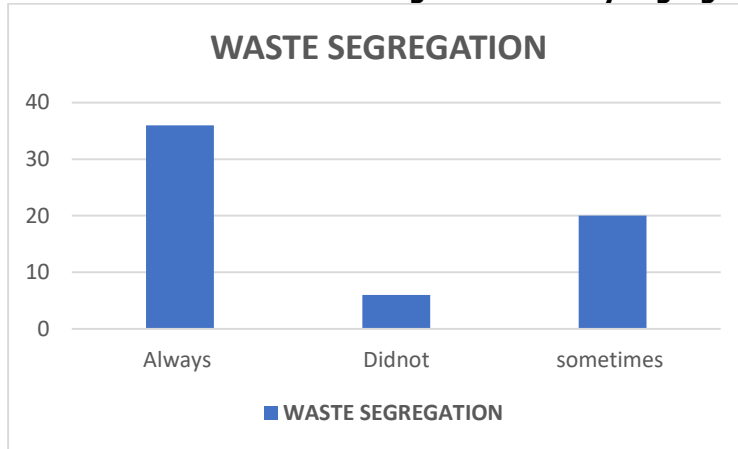
Figure 1: Pie chart showing distribution according to where knowledge about BMWM was acquired.



According to the pie chart, most of the respondents acquired knowledge from lectures.

It was also found that most of the health workers collected general and biomedical wastes differently that is 42 of the respondents practiced it and 8 did not carry out the practice.

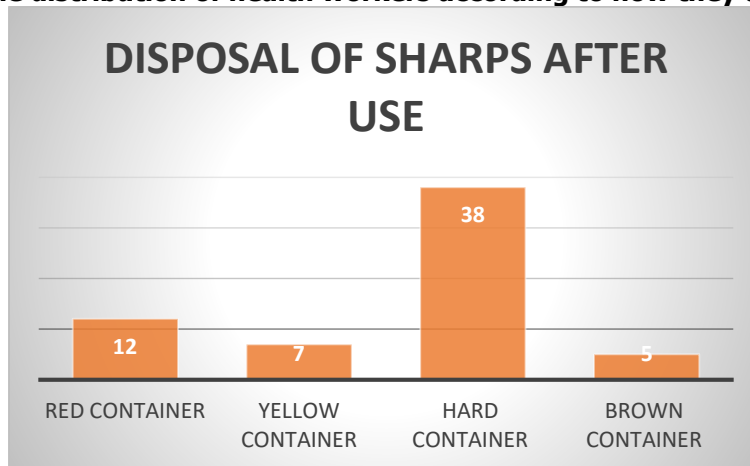
Figure 1: Distribution of HCWs according to when they segregated wastes



Most of the respondents (36) always separated biomedical wastes from general wastes, while 20 practiced it at times and 6 did not separate the two types of wastes.

It was also revealed that 51 of the respondents put general waste into a black container and BMW into a red container.

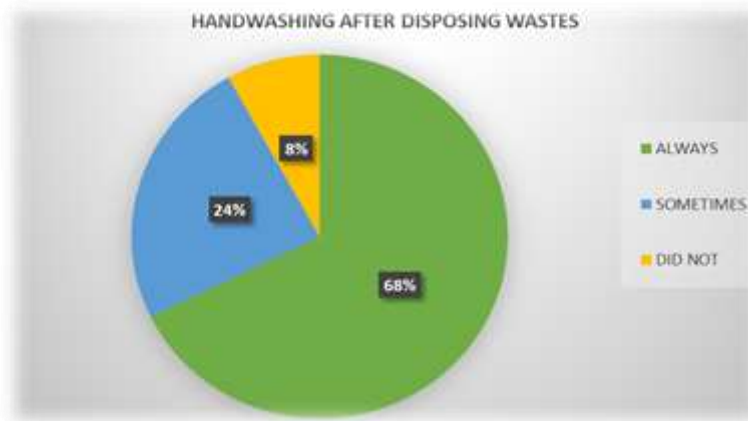
Figure 3 shows the distribution of health workers according to how they disposed of sharps.



According to the graph, most of the respondents disposed of sharps in hard containers. It was also found that 48% of respondents did not seal and close the bin when it was 1/3 full and the remaining

percentage 42% did practice and 10% of the respondents did it sometimes.

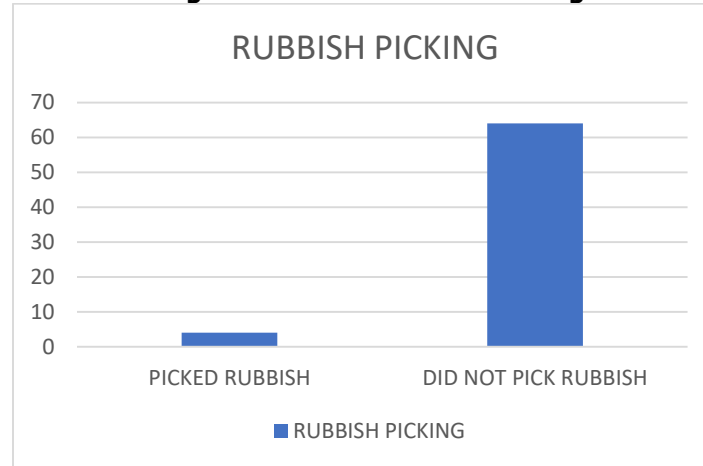
Figure 2 shows a distribution according to those who washed their hands after waste Disposal.



Page | 6

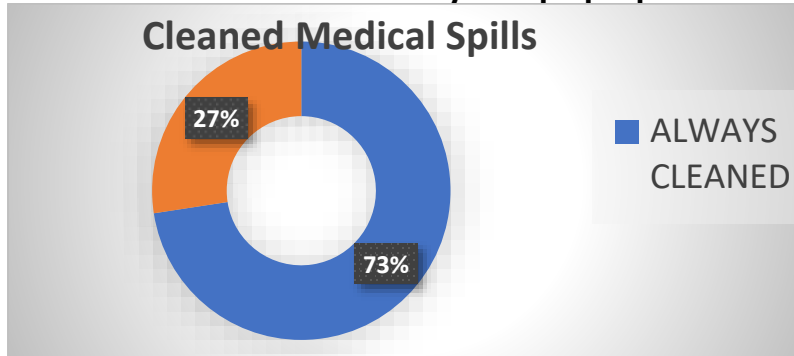
Only 42 respondents always washed their hands after contact with biomedical waste and 15 sometimes washed their hands while 5 revealed they did not wash their hands but used other methods.

Figure 3: Distribution according to the behavior in collecting rubbish on the compound.



Majority of the respondents collected rubbish and took it to the community bin, only 4 had at times helped to take rubbish to the nearest bin.

Figure 4 Distribution of respondents according to whether they clean spills of liquid biomedical wastes immediately with proper procedure



The majority of the respondents (45) cleaned the medical spills immediately with the right procedure and this was majorly nurses while 17 respondents did not clean the medical spills and reported that they were not supposed to do that as it was the assigned duty of the cleaners and the caretakers. This category was mainly clinicians and other cadres other than nurses.

40 of the respondents picked up waste with rubber gloves when on the ground, while 20 only wore gloves at times and 2 never used gloves at all.

When it came to cleaning spills of liquid of biomedical wastes with proper procedure, 40 respondents sometimes practiced the procedure and 20 carried out the proper procedure while 2 did not carry out the procedure.

Discussion of the results (findings).

Socio-Demographic Data

Revealed that the majority 48% of the respondents were within the age bracket of 16-25 years. This was because the majority population of the health workers in Kajjansi in 2023 were certificate nurses and interns within the age bracket of 16-25. While the older respondents who had been in practice for more than 3 years amounted to the least population in age. These results highly correlate with another study in India by Patil A. and Shekhal A where the majority of respondents were below the age of 25 years.

Revealed that the majority 26% of the respondents were nurses with the highest population in the hospital 10% and 6% being doctors and lab technicians. These results are due to the high demand for nurses in places of healthcare delivery worldwide and this is to another study carried out in Delhi where nurses also took the highest population, (Asante B, et al, 2020)

From Table 1, it was revealed that 60% of the health workers had spent less than 5 years in the hospital and only 11% spent more than 15 years in the hospital this explains the scarcity of specialist doctors as most of them are found at the national referral hospital.

Knowledge about biomedical waste segregation and management among health workers at Kajjansi Health Centre IV, Wakiso District Uganda

The research findings from Figure 1 of the pie chart above, revealed that most of the respondents acquired knowledge about biomedical waste segregation from lectures. This is because the majority of the respondents were intern students still at school and only doing their hospital practice this does not correspond with the other study by Dawar about hospital waste management in Pakistan.

From the study, it was also revealed that the majority of the health workers knew where which type of waste was to be put and this explained why the theatres and surgical ward had a better waste disposal than any other department of the hospital. This knowledge of water disposal is seen in another study by Alvi M and Will G. Hopkins Hospital and this correlation can be attributed to the knowledge acquired in schools. Hence the major poor waste segregation is majorly due to negligence by health workers to segregate wastes.

The respondents from the study also showed that they had knowledge about color coding systems 84% and thus knew what kind of waste went to which color of waste bin. These results are significantly comparable with results from another study about problems associated with poor waste disposal at Nairobi Hospital in Kenya where it was also revealed that the hospital staff had great knowledge of the type of waste that was disposed of in each bin.

According to the study above, results revealed that almost half of the respondents 42% had at least attained a diploma followed by 37% who had a degree, and lastly 21% who had attained a master's or PhD. This correlates with the number of health workers and their professions. This results in agreement with the assertion in the background that "the more qualified the health professional is, the higher the knowledge about biomedical waste management. (Sakala, 2011)".

It was also found that most of the health workers collected general and biomedical wastes differently that is 42(68%) of the respondents practiced it, 10(16%) practiced it sometimes and 8(13%) did not carry out the practice in a study by Abbasi about the management of healthcare wastes in Pakistan also revealed the same trend in health worker behavior to practice proper waste disposal techniques and procedures. This only informs either way, Health workers were not aware of the public health dangers of poor biomedical waste disposal.

Most of the respondents 36(58%) always separated biomedical wastes from general wastes, while 20(32%) practiced it at times and 6(10%) did not separate the two types of waste.

Attitude about biomedical waste segregation and management among health workers at Kajjansi Health Centre IV, Wakiso District Uganda

According to results from the study, It was also revealed that 51(82%) of the respondents put general waste into a black container and BMW into a red container this is because all health workers are trained on where which waste should be put, this is not different from the study results from dissemble at piquant university where he related that the knowledge learned from lectures about biomedical waste is always used in the first years of practice in a health facility only.

The study revealed that HCWs in IPD/ward had better compliance with BMW disposal practices compared to those working in the general OPD. The possible reason for such a finding could be the hectic nature of work in the OPD, especially during weekdays. This makes HCWs allocate less time to each patient and prone to inappropriate disposal of BMW. However, measures should be taken to ensure compliance of HCWs even in the OPD.

From the results from Figure 1, Most of the respondents 36(58%) always separated biomedical wastes from general wastes, while 20(32%) practiced it at times and 6(10%) did not separate the two types of wastes. These differences are majorly due to the attitude of health workers whereas others explained the habit as being from fatigue-related reasons and reference to the duties of hospital cleaners.

Practices about biomedical waste segregation and management among health workers at Kajjansi Health Centre IV, Wakiso District Uganda.

The research findings of the study revealed that older health workers did not practice safe techniques of waste disposal while at the hospital. These findings were in line with the findings in the literature review which revealed that "older health workers specifically were associated with not properly disposing wastes".(Ejeta et al 2017).

It was also found that most of the health workers collected general and biomedical wastes differently that is 42(68%) of the respondents practiced it, 10(16%) practiced it sometimes and 8(13%) did not carry out the correct practice. These results are highly in correspondence with results in another study about health waste management behaviors among nurses in Kartum where they revealed that nurses in the study did not have adequate waste collection practices. (Erekpitan et al 2019).

In Table 1, results showed that only 5% of respondents had been to the hospital for more than 10 years this meant that they preferred automatic systems of waste disposal as well as assistance from the nurses or nursing assistants that were always available whenever needed.

The study concluded that the HCWs in surveyed public health facilities of Kajjansi Health Centre IV had good BMW disposal practices and were significantly better as nearly three-fourths of the observations followed appropriate BMW disposal practices. Similar findings were found in another study by Wang, L (2020). Such positive findings are encouraging given the COVID-19 pandemic has raised the amount of BMW generated and the ability of the virus to remain active on different surfaces for a variable period.

Conclusions

The following conclusions were drawn from the study findings;

In socio-demographics, intern students between the ages of 16 to 25 years were those who practiced biomedical waste management more than any other age group.

Health workers' specialty of work was another class that correlated with biomedical waste segregation practices and management as nurses appeared to be the best at waste segregation and management.

Education level, health workers in their specialty played and correlated with the knowledge about health waste disposal and segregation, here medical doctors appeared to have the highest knowledge.

The availability of waste segregation materials correlated with the attitude of health workers toward waste segregation and management.

Accumulation of wastes directly affected health workers and their duties. Health workers who accidentally got pricks in the hospital blamed it on poor disposal due to accumulation.

The communication skills of health workers affected how the hospital organized planned sessions and workshops to teach the staff about waste segregation.

State of the health infrastructure such as incinerators as well as the adequacy of health waste disposal bins affected waste segregation and management.

Recommendations.

To the health workers

Health workers should be encouraged and ever reminded to segregate wastes in the hospital as if their own lives were to be protected and their duties and conditions arising from poor waste disposal would be identified early for management.

Health workers should start up workshops to educate fellow staff about the importance of waste segregation and management.

Health workers should not assume that waste segregation is a duty of other staff members such as cleaners' duties alone but understand it is the primary role of the initial waste producer.

To the Kajjansi Health Centre IV.

The hospital management committee should retrain their staff on how to segregate wastes and manage accumulating wastes.

Health management committees should impose tough measures where all health workers attend training and workshops on biomedical waste management and segregation.

The knowledge, attitudes, and practices of health workers should be geared towards improving the management of waste and segregation.

To the MOH and the Government.

Government should put in place adequate policy guidelines for the execution of waste management policies in the hospital.

The district health Authorities should streamline the implementation of waste management and segregation.

ACKNOWLEDGEMENT

I take this opportune time to thank God for the grace that he has granted unto me in coming up with this research report, all the glory goes back to him. I do recognize His contributions which have enabled this study to reach its current stage. I also appreciate my supervisor MrOtile Sam for the continuous support and the entire administration and staff of Mildmay Institute of Health Sciences for enabling me to achieve this Milestone. I would love to appreciate my Family members and friends for the support and prayers to encourage me along this academic path of mine.

ABBREVIATIONS

AIDS..... Acquired Immunodeficiency Syndrome
CME..... Continuous Medical Education
HBV..... Hepatitis B Virus
HCP..... Health Care Providers
HW..... Health workers
BMW Biomedical Waste Management

BMW..... Biomedical waste
HCWM..... Health Care Waste Management
HPV..... Human Papilloma Virus
HIV..... Human Immunodeficiency Virus
MOHSS..... Ministry of Health and Social Services.
SPSS..... Statistical Package for the Social Sciences.
WHO..... World Health Organization
UNICEF..... United Nations Children's Fund

Source of funding.

The study was self-funded.

Conflict of interest.

The author had no conflict of interest.

Author biography.

Akanduhura Shamim, diploma student of public health at the School of Health Sciences, Milmday Institute of Health Sciences
Sam Otile lecturer at the School of Health Sciences, Milmday Institute of Health Sciences.


REFERENCES

- 1) Dawar, A.B.K (2017). Hospital Waste Management Rules 2005 and Current Practices in Selected Hospitals of Peshawar Khyber Pakhtunkhwa, Pakistan.
- 2) Wafula, S.T., Musiime, J. & Oporia, F. Health care waste management among health workers and associated factors in primary health care facilities in Kampala City, Uganda: a cross-sectional study. *BMC Public Health* **19**, 203 (2019). <https://doi.org/10.1186/s12889-019-6528-4>
- 3) Alvi M (2016) A Manual for Selecting Sampling Techniques in Research
- 4) Will G Hopkins (2018) Quantitative Research Design.
- 5) Muhwezi. L., Kaweesa. P., Kiberu. F. & Enyenu. E. L. (2022). Health Care Waste Management in Uganda -A Case Study of Soroti Regional Referral Hospital International Journal of Waste Management and Technology Vol. 2, No. 2,
- 6) Erekpitan O. A., Mangden. Y. P.E., Yohanna C. S., & Adisa. J.O. (2019). Knowledge, attitudes/beliefs and practices in medical waste management - an appraisal of Jos North LGA, Plateau State, Nigeria.
- 7) New Vision, 12th Oct 2013 pg 19.
- 8) Abbasi, M. S. (2014). Management of Healthcare Waste in Pakistan. Available at: <http://www.slideshare.net/Msabbasi/health-care-waste-management-in-pakistan> (accessed: 14 Feb 2016).

- 9) Asante, B. O., Yanful, E., & Yaokumah, B. E. (2020). Healthcare waste management; its impact: A case study of the Greater Accra Region, Ghana. *International Journal of Scientific & Technology Research*, 3 (3).
- 10) Wafula, S.A., Mohsen, A & Bakr, I. Knowledge, Attitudes and Practices of Health-Care Personnel towards Waste Disposal Management at Ain Shams University Hospitals, Cairo, 2014; 20(5): 347-354
- 11) Odoki, G. Haimanot, and M. Mesafint, "Healthcare waste management practices healthcare workers in healthcare facilities of Gondar town, northwest Ethiopia," *Health Science Journal*, vol. 7, pp. 15-26, 2019
- 12) Sakala S. (2020). An assessment of hospital wastes management in Minna: Towards a waste management approach in a growing urban area. *Greener Journal of Medical Sciences*, 4 (1), 001-015.
- 13) Ejeta, Dabsu S., Gonçalves, K. M., & Mol, M. P. G. (2017). Healthcare waste management in a Brazilian university public hospital.
- 14) Wang, L (2022) Public Participation in Solid Waste Management: Challenges and Prospects. A case of Kira Town Council, Uganda.
- 15) Patil, A. & Shekdar, A. (2017). Health-care waste management in India. *Journal of Environmental Management*, 63 (2), 211-220

Publisher details:

SJC PUBLISHERS COMPANY LIMITED



Category: Non-Government & Non-profit Organisation
Contact: +256775434261 (WhatsApp)
Email: admin@sjpublisher.org, info@sjpublisher.org or studentsjournal2020@gmail.com
Website: <https://sjpublisher.org>
Location: Wisdom Centre Annex, P.O. BOX. 113407 Wakiso, Uganda, East Africa.