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ATTITUDE AND PRACTICES TOWARDS DISPOSAL OF EXPIRED MEDICINE AT RUBAARE HEALTH CENTRE IV, RUBAARE SUB COUNTY, NTUNGAMO DISTRICT A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background

The improper disposal of expired medicines is a significant health issue in Uganda; anecdotal evidence indicates that expired medicines are often disposed of in ways that are environmentally unfriendly or unsafe. This study, therefore, aims to determine the Attitude and Practices towards the disposal of expired medicines among health workers at Rubaare Health Center IV, Rubaare sub-county, Ntungamo district.

Methodology

The study employed a descriptive cross-sectional design with a purposive sampling technique. Data was collected on a sample size of 50 respondents using semi-structured questionnaires; later analyzed by use of tally sheets and computed into percentages using the Microsoft Excel program with illustrated figures and tables.

Results

The study recorded the highest response rate from males (90%) and a lower rate (10%) from females, the majority, 46% being nurses and the least, 2% anesthetists. Generally, there was a positive attitude towards the disposal of expired medicines, with 72% of health workers acknowledging its importance for environmental protection and public safety. Despite this positive outlook, 60% of the health workers expressed concern about the lack of proper infrastructure, such as incinerators or specialized disposal bins, at the health facility.

Common disposal practices included returning medicines to suppliers (30%) and disposal in general waste bins 22%, which are contrary to best practices outlined by the World Health Organization (WHO). While health workers understood the risks of improper expired medicine disposal, structural and logistical challenges prevented them from adhering to guidelines.

Conclusion

There was an overall improvement in attitude and practices towards disposal of expired medicines among health workers at Rubaare Health Center IV; however, practices lagged probably due to inadequate infrastructures.

Recommendation

The health center should maintain and expand waste disposal infrastructures, including incinerators. Securing pharmaceutical waste collection points and policy enforcement on expired medicine disposal.

Keywords: *Attitude, Practices, Expired Medicine, Rubaare Health Centre IV.*
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BACKGROUND OF THE STUDY

Expired Drugs are pharmaceutical products whose shelf life, as determined by the manufacturer, has passed. After the expiration date, the medicine may lose its energy, effectiveness, or stability, and its safety cannot be guaranteed (Food and Drugs, 2018). The indecorous disposal of departed drugs presents significant public health and environmental challenges. Expired drugs can pollute water systems, contribute to antimicrobial resistance, and lead to medicine abuse if not managed neatly. Health workers play a crucial part in ensuring the safe disposal of expired specifics (Clinical Toxicology et al., 2021). Expired drugs are disposed of in the following styles: medicine disposal alcoves, ménage trash disposal, flushing, incineration, and return to the manufacturer.

Encyclopedically, the indecorous disposal of departed drugs has been honored as a public health and environmental challenge for decades according to the WHO, indecorous disposal of medicines, similar to flushing medicines down the restroom, can pollute water inventories and contribute to environmental pollution. The operation of pharmaceutical waste, including departed drugs, is a significant environmental and public health concern. The indecorous disposal of departed drugs poses significant public health and environmental pitfalls. The World Health Organization (WHO) recommends that expired medicines be disposed of through incineration, secure tips, or by returning them to manufacturers. Still, in numerous low- and middle-income countries, similar to Uganda, these guidelines are not constantly followed due to systemic challenges (WHO, 2017). The World Health

Organization (WHO) estimates that 10 drugs worldwide are expired. A 2020 study published in the Journal of Environmental Health Science & Engineering found that 35 healthcare installations disposed of departed drugs inaptly.

In Africa, the issue of departed drug disposal, a challenge of managing pharmaceutical waste, is pronounced due to a combination of factors, including limited structure, inadequate nonsupervisory fabrics, and low situations of public and professional mindfulness. Expired drugs that are not safely managed can beget health hazards if they are reused or consumed (Ekanem et al., 2017). In Saudi Arabia, a study showed that 48.1% of actors discarded expired specifics in ménage scrap. In 2022, only 6.5 of Saudis had proper knowledge of departed drug disposal, and large amounts of the specifics remain departed. Change in lozenge/ authority, enhancement from illness, expiration of the drug, and promotional influence by manufacturers, croaker, defining practices, allocating practices, and patient non-adherence. Cases may also keep drugs in their house because they need to use them in the future (Alabi et al., 2017). The accumulation of departed drugs at home can be a trouble to environmental impurity due to a lack of mindfulness on applicable drug disposal styles, and expired drugs can beget accidental poisoning of young children and have implicit for abuse by adolescents, especially when the drugs are habit forming. According to a study report from Harare megacity in Ethiopia and other studies on ménage disposal of departed drugs around the world, the most generally used disposal styles were pouring down to sewage systems or Gomorrah for liquid drugs and throwing them into ménage scraps for solid lozenge forms. This contradicts the United States Food and Drug Administration and the Ethiopian recommendations on safe and pharmaceutical waste disposal. Thus, proper and safe disposal of departed drugs is largely important to help damage to wildlife due to environmental impurity, poisoning, and the spread of antimicrobial resistance associated with unhappy drug waste disposal.

In East Africa, the disposal of departed drugs is a growing concern, especially with the increase in pharmaceutical use. In countries similar to Kenya, Tanzania, and Uganda, the disposal of departed drugs frequently lacks the necessary structure and nonsupervisory oversight. A study on household knowledge and comprehension of disposal of expired Medicines cited insufficiency due to a lack of public outreach and mindfulness juggernauts. Also, negligence among healthcare professionals in giving disposal guidance at hospitals and apothecaries, unclear disposal instructions on drug packages, and negligence to read disposal instructions (S, 2017). Although transnational guidelines live on proper disposal styles of departed drugs, these guidelines are generally not duly executed, and veritably, little information, which is occasionally antithetical, is available to the public (Peae BM, 2015).

In Uganda, a study stressed that despite good knowledge position among the actors, the practice of safe disposal of unused drugs remains sour in the population (Nakiganda et al., 2023). The Ministry of Health has developed guidelines for managing pharmaceutical waste, but pastoral health installations frequently struggle with proper perpetration and indecorous disposal practices like open burning or discarding in regular waste lockers (Ndyabahika et al., 2019). The issue of departed drug disposal is particularly acute in pastoral health centers like Rubaare health center IV, a problem that the Ugandan government has made sweats to address through development of guidelines and programs aimed at perfecting waste operation practices. Despite these sweats, challenges persist, including shy structure, limited fiscal coffers, and inadequate training for health workers. The indecorous of departed drugs continues to be a problem, with practices similar to open burning and indecorous tip use being common due to these systemic issues (Kabwama & Wasswa, 2018). This study thus aimed to determine the station and Practices towards disposal of departed drugs among health workers at Rubaare health center IV, Rubaaresub-county, Ntungamo district.

METHODOLOGY

Study Design

The study employed a descriptive cross-sectional design involving quantitative methods of data collection, which included a questionnaire with structured questions that facilitated and elaborated responses by participants. This approach aimed at collecting information from different categories of health workers at once.

Study Area.

This study was conducted at Rubaare Health Centre IV, located in Rubaare town, Ntungamo District, in the southwestern region of Uganda. Approximately 354km southwest of Kampala.

Study population

The study population was health workers of Rubaare Health Centre IV, Rubaare sub county– Ntungamo District.

Sampling Technique

The purposive sampling technique was used because of its ability to select the sample size with an unbiased representation of the population.

Sampling procedure

The available health workers at the time of sampling were used. The purpose of the study was explained to them, and they were informed that their participation was voluntary without any monetary rewards. The participant was assured of confidentiality regarding their identity during and after the research was conducted, and they signed the consent form before filling out the questionnaires.

Data Collection Method.

Questionnaire and observation methods were used in this study since many respondents were readily available. This encouraged them to answer truthfully.

Data Collection Tools

Semi-structured questionnaires written in the English language were used to collect data and check the checklist for observation. Questionnaires were the most convenient

way of collecting data from respondents because it was easy for the researcher to administer and obtain data within a short time from a large number of respondents.

Data Collection Procedure

An introductory letter from the Kampala School of Health Sciences was taken to the In-charge Rubaare Health Center IV to seek permission to carry out the study at a health facility. A day before data collection, the researcher pretested the questionnaire and, made necessary corrections, proceeded to collect data for 3 days. The respondents were asked questions following the designed questionnaire to avoid being biased, and data was collected using a well-structured questionnaire that was completed by face-to-face interviews with the respondents. Data included information regarding participants' demographics, attitudes, and practices toward the disposal of expired medicines among health workers, and after the interview, each respondent was thanked for participating in the study.

Study Variables

In this study, independent variables included attitude and practices towards the disposal of expired medicines, and the dependent variable was the disposal of expired medicines**.**

Quality Control

To ensure the collection of quality data, the research tools were pre-tested on three eligible health workers (not among final respondents), and two research assistants were trained. In addition, a pilot study was conducted to test the reliability of the questions and the time needed to interview each individual; this included research assistants. In addition, tools were given to a supervisor from the Kampala School of Health Sciences to ascertain their validity.

After piloting, the captured information was modified to improve clarity before undertaking the study. The time required for the study was determined in the pilot study, and sample time was given for data collection. The Research assistant followed COVID-19 standard operating procedures.

Data Analysis and Presentation

Data was analyzed by use of tally sheets and computed into percentages using the Microsoft Excel computer program with illustrated figures and tables for easier interpretation and were presented in the form of frequency distribution tables and pie charts.

Ethical considerations

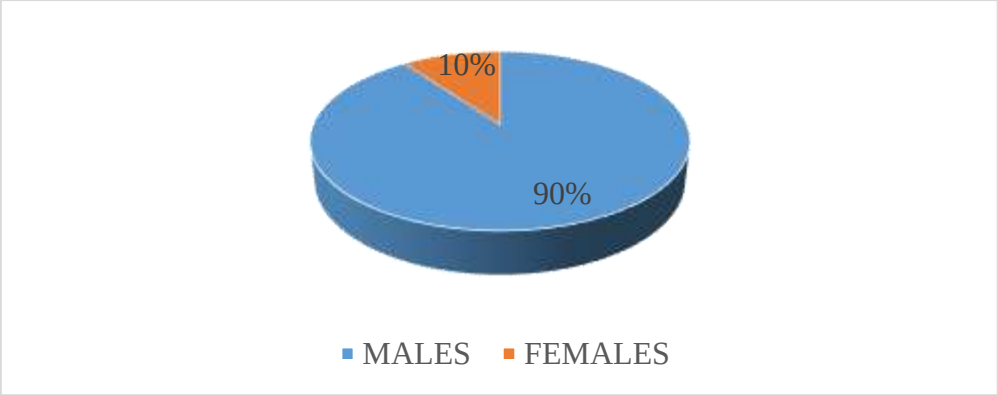
A letter of introduction was obtained from the Kampala School of Health Sciences research committee, seeking permission to carry out the study with the assurance of confidentiality. The study commenced after the objectives of the study were explained to participants who consented to participate in the study. Information obtained from the respondents was confidential, and questionnaires were stored in a lockable case.

Informed Consent

There was full disclosure and total comprehension, and respondents voluntarily consented to participate in the study.

RESULTS

Figure 1: Shows distribution of respondents by gender (N=50).



Source: Primary data (2024)

Figure 1 shows that the majority of the respondents, 90%, were males, and the least, 10% were females.

Table 1: Shows the distribution of respondents by age (N=50).

Age	**Frequency (n)**	**Percentage**
18-30	12	24
31-40	22	44
41-50	10	20
Above 50 years	6	12
Total	**50**	**100**

Source: Primary data (2024)

Table 1 shows that the majority of the respondents, 22(44%), are between 31-40 years and the least, 6(12%) were above 50 years.

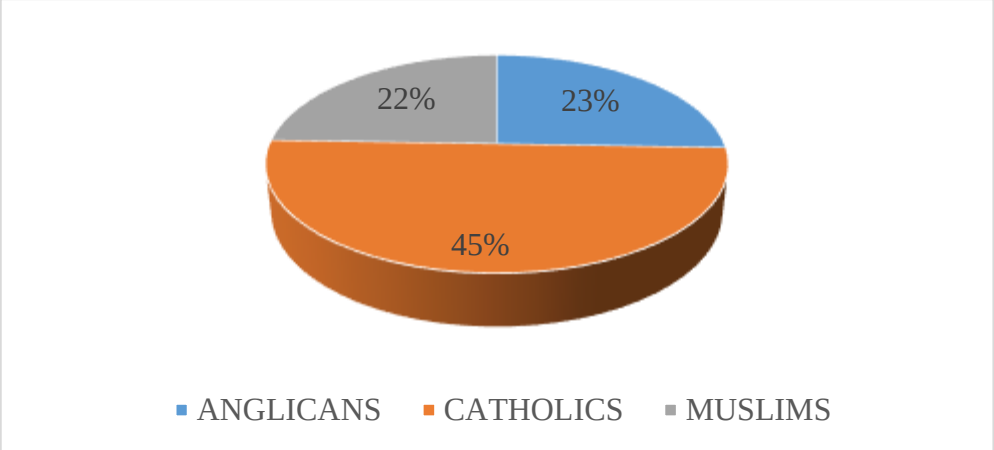
Table 2: Shows distribution of respondents by marital status (N=50).

Marital status	Frequency (n)	Percentage (%)
Single	15	30
Married	25	50
Divorced	5	10
Widowed	5	10
Total	**50**	**100**

Source: Primary data (2024)

Table 2 shows that majority of the respondents, 25(50%) were married and the least, 5(10%) were divorced and widowed, 5(10%).

Figure 2: Shows distribution of respondents by religion



Source: Primary data (2024)

Figure 2 shows that the majority of respondents, 45%, were Catholics, and the least, 22% were Muslims.

Table 3: Shows distribution of respondents by profession (N=50).

Profession	Frequency(n)	Percentage (%)
Nurse	23	46
Clinical officer	11	22
Dispenser	5	10
Anesthetist	1	2
Doctor	4	8
Midwives	6	12
Total	**50**	**100**

Source: Primary data (2024)

The table shows most of the respondents, 46%, were nurses, and a minority, 2%, were Anesthetists.

Attitude towards Pharmaceutical Waste Management

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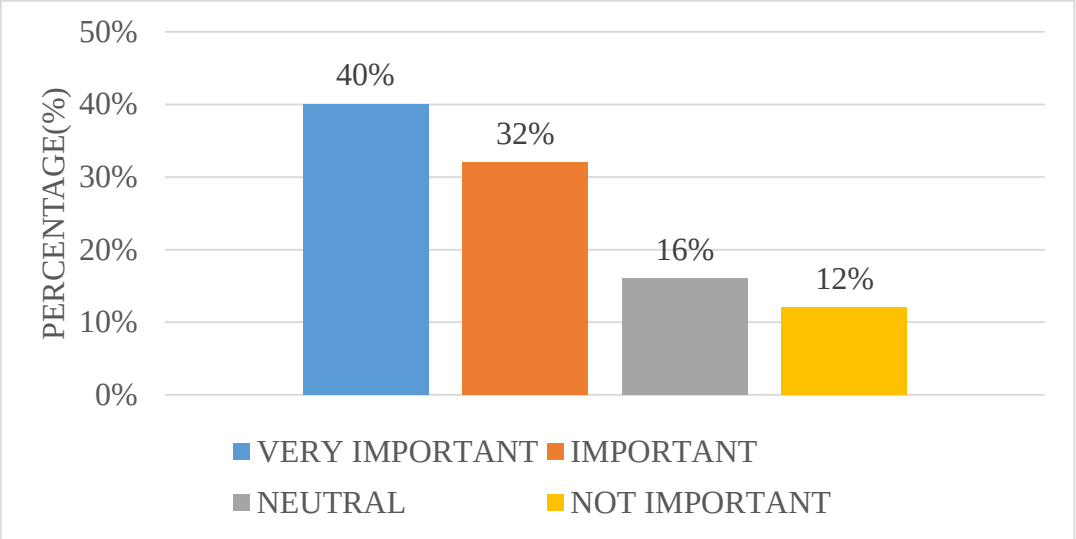
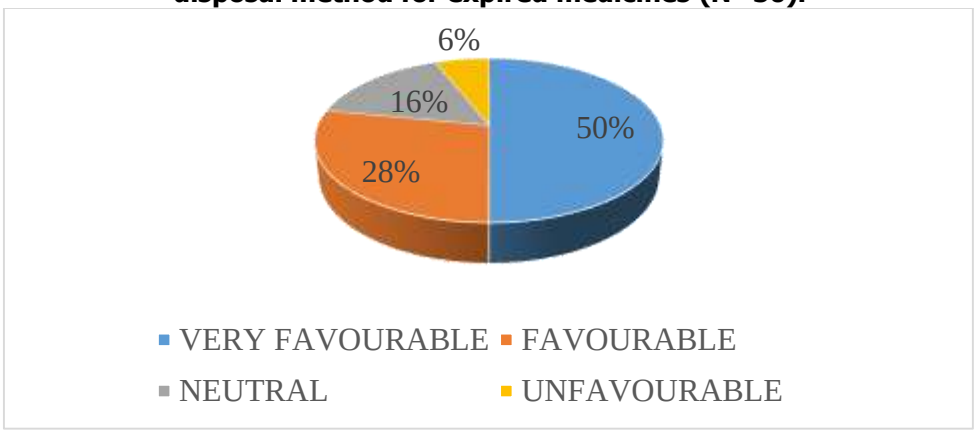
Figure 3 Shows how important respondents think proper disposal of expired medicines is (N=50).



Source: Primary data (2024)

Figure 3 shows that the majority, 40% of the respondents, think it is very important to dispose of expired medicine, and the minority, 12%, think it is not important to dispose of expired medicine.

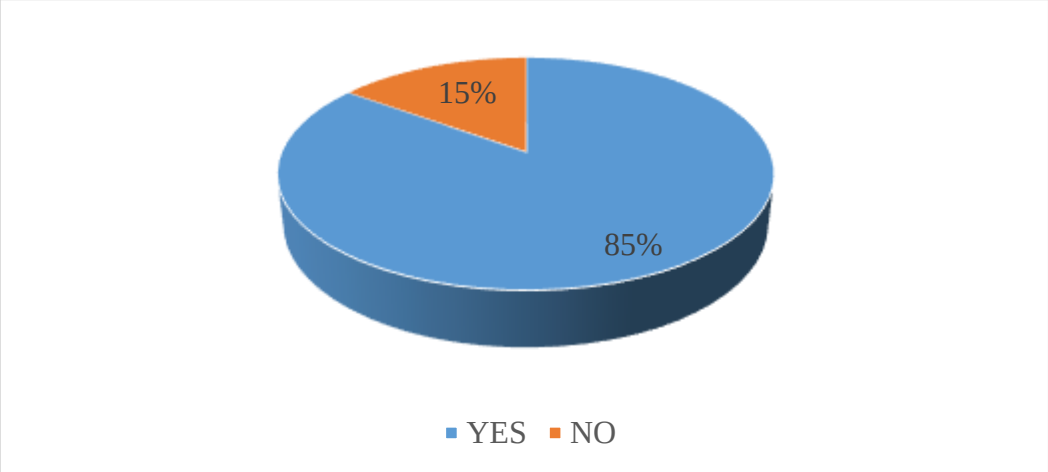
Figure 4: Shows distribution of respondent's attitudes towards incineration as a disposal method for expired medicines (N=50).



Source: Primary data (2024)

According to Figure 4, the majority, 50% of the respondents', said incineration was very favorable as a method of disposal of expired medicine, whereas the minority, 6%, said it was unfavorable.

Figure 5: Shows health workers willing to undergo more training on pharmaceutical waste management (N=50).



Source: Primary data (2024)

According to Figure 5, the majority, 85% of respondents, were willing to undergo more training on pharmaceutical waste, while the minority, 15%, were not willing to undergo more training.

Practices Regarding Disposal of Expired Medicines

Table 4 Shows how often respondents encounter expired medicines in their practice.

Response	Frequency (n)	Percentages (%)
Daily	10	20
Weekly	15	30
Monthly	20	40
Rarely	5	10
Total	**50**	**100**

Source: Primary data (2024)

According to Table 4, the majority of respondents, 40%, encountered expired medicine monthly, while the minority, 10%, rarely encountered expired medicine.

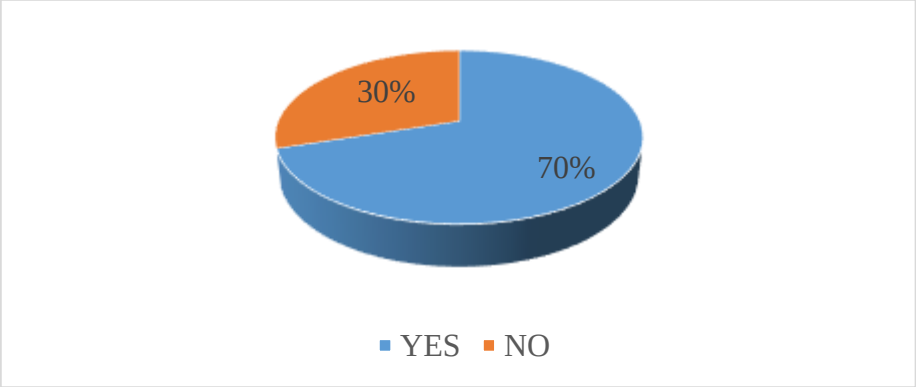
Table 5: Shows methods of disposal of expired medicines by respondents (N=50).

Disposal method	Frequency (n)	Percentage (%)
Incineration	10	20
Open burning	8	16
Landfilled	6	12
Returning to supplier	15	30
Disposal in general waste	11	22
Total	**50**	**100**

Source: Primary data (2024)

Findings in Table 5 show that the majority of respondents, 30%, returned expired medicine to the supplier, whereas the minority, 12%, landfilled the expired medicine.

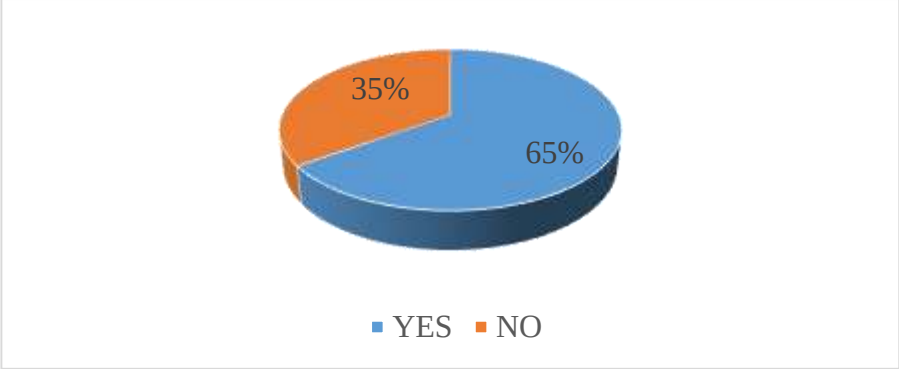
Figure 5: Shows respondents reporting expired medicines to relevant authorities (N=50)



Source: Primary data (2024)

According to Figure 5, the majority, 70% of the respondents, reported about expired medicine to relevant authorities, while the least, 30%, did not report about expired medicine to relevant authorities.

Figure 6: Shows respondents who ever witnessed improper disposal of expired medicines at their facility (N=50).



Source: Primary data (2024)

According to Figure 6, 65% of the respondents had ever witnessed improper disposal of expired medicines at the facility, while the last 34% had never witnessed improper disposal of expired medicines at the facility.

DISCUSSION

Attitude towards pharmaceutical waste management

The study indicated that health workers at Rubaare Health Center IV generally demonstrated a positive attitude towards the proper disposal of expired medicines, with 72% acknowledging its importance for environmental protection and public safety. However, despite this positive outlook, 60% of respondents expressed concern about the lack of proper infrastructure, such as incinerators or specialized disposal bins, at the health facility.

Based on the study, the attitudes were largely shaped by the perceived lack of support from facility management and the government. This is consistent with the findings from similar studies in Africa (Mekuria et al., 2017), where health workers were willing to engage in proper disposal practices but were hindered by poor infrastructure and inconsistent policy enforcement.

Practices regarding disposal of expired medicines

Based on the study, in practice, common disposal practices included returning medicines to suppliers 30% and disposing of them in general waste bins 22%, with some respondents resorting to burning or landfilling for expired medicines. These practices are contrary to best practices outlined by the World Health Organization (WHO) and highlight a significant gap between practices of expired medicine disposal.

The study indicated that improper disposal methods observed, such as open burning and burying, can lead to severe environmental contamination, including water and soil pollution, and pose public health risks. The findings are consistent with research conducted in similar resource-limited stings, where improper disposal of medical waste remains an issue (Abah et al., 2019).

The study indicated that consistency between practices suggests that while health workers understand the risks,

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structural and logistical challenges prevent them from adhering to guidelines, additionally, the study indicates that 30% of respondents did not report expired medicines to the relevant authorities, further exacerbating the issue of pharmaceutical waste management.

CONCLUSION

Health workers generally had a positive attitude toward proper disposal practices, but their willingness to comply was constrained by a lack of infrastructure and resources. Despite a good attitude, actual disposal practices were suboptimal, with many health workers resorting to improper methods due to a lack of appropriate facilities and unclear reporting mechanisms.

Study Limitations

Inadequate finance since no external funds were provided for the study.

Limited time since some respondents never had enough time to fill the whole questionnaire. Hostile respondents affected the study negatively.

RECOMMENDATION

Health workers at Rubaare Health Center IV should have continuous education and training programs. These programs should focus on the proper disposal of pharmaceutical waste, with emphasis on environmentally safe practices.

The management of Rubaare Health Center IV should improve infrastructure; the health facilities should be equipped with proper disposal infrastructures such as incinerators, dedicated pharmaceutical waste bins, and a clear protocol for returning expired medicines to suppliers.

The government should provide the necessary financial and logistical support to the health facility to ensure compliance with waste management guidelines. Clear policies, supported by adequate funding, will help health centers like Rubaare Health Center IV improve their waste disposal practices.

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LIST OF ABBREVIATIONS

HMIS: Health management information systems
MoH: Ministry of Health
NDA: National Drug Authority
NMS: National Medical Stores
UAHEB: Uganda Allied Health Examinations Board
UBOS: Uganda Bureau of Statistics
UNICEF: United Nations
WHO: World Health Organization

SOURCE OF FUNDING

The study was not funded.

CONFLICT OF INTEREST

The author declares no conflict of interest

AUTHOR CONTRIBUTIONS

JA- Study developer, Data collector and analyzer
CM- Supervised the Study

DATA AVAILABILITY

Data is available upon request.

AUTHOR BIOGRAPHY

Justus Atukunda is a student at Kampala School of Health Sciences, pursuing a Diploma in Pharmacy.

Ms. Catherine Musiimenta is a tutor and a research supervisor at the Kampala School of Health Sciences.

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