

# Assessing Adherence of Hospital Waste Disposal Management at Mangochi District Hospital in Malawi

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## Abstract

**Background:** Hospital waste management services are aimed at improving health status of hospital workers and also people surrounding the hospital. Needle prick incidences are high due to improper waste disposal management among workers at Mangochi district hospital. This study aimed at assessing adherence of hospital waste disposal management processes at Mangochi District Hospital.

**Method:** Questionnaire and Observations were used in the study to collect data.

**Conclusion:** The benefits of proper medical waste management minimize the spread of infections and reduce the risk of accidental injury to staff, patients, visitors and community.

**Keywords:** Waste management • Hospital waste • Compliance • Environmental impact • Health and safety • Regulatory framework

## Introduction

Hospital waste disposal management is the process of collecting, transporting, processing or disposing, managing and monitoring of waste materials generated during diagnosis, treatment and immunizations of humans and animals with potential health and environment risks [1]. The waste materials include sharps and non-sharps. Sharps waste contains items that could cause puncture wound and cuts. Example of sharps includes needles, broken glass ampoules, scalpel blades, infusion sets, etc [2]. Globally 75% to 90% of hospital wastes are similar to household refuse or municipal waste and do not entail any particular hazard. The other 10% to 25% is called hazardous medical waste or special waste and it is this type of waste that entails health risks that need to be handled with care [3]. Poor hospital waste disposal occurs due to lack of awareness about the health hazards. The health hazards related to health-care waste include; inadequate training in proper waste management, absence of disposal systems, insufficient financial and human resources [4]. Addressing all these issues can lead into a good health system with good hospital waste disposal processes. Hospital workers' may be affected by limited interest from hospital administration [5] and hence need for hospital management to take a greater part in hospital waste disposal management. Poor management of health care wastes can pose negative impacts (e.g., injuries) on patients and the community, as well as the environment (pollution of soil, air and water) [6]. Medical waste management has the benefit of minimizing the spread of infections and reduces the risk of accidental injury to staff, patients, visitors and community [4]. From the observation made on the ash contents, needles, surgical blades, blood slides, vacutainer tubes, vial bottles, ampoules are not completely destroyed though they are sterilized and denatured, as a result care should be taken when removing ashes in this case [2]. The incineration process detoxifies hazardous wastes by destroying most

of the organic compounds contained in the wastes. This process is usually selected to treat wastes that cannot be recycled, reused, or disposed of in a landfill site for example sharps [7]. Malawi's Ministry of Health emphasizes that great care should be taken when handling health care wastes as most serious risks are associated with injuries from sharps. When handling health care wastes, sanitary staff and cleaners should always wear protective clothing including (as a minimum) overalls or industrial aprons, boots and heavy duty gloves [8]. Hospital waste disposal management services strive to improve the health of hospital employees as well as the general public. After an occupational injury, Healthcare Workers (HCW) runs a risk of infection with HIV. The WHO estimates that approximately 3 million percutaneous exposures occur worldwide each year among HCWs [9]. Globally, two million health care workers suffer from accidental needle stick injury each year. An estimated 37% needle stick injuries are reported at some stage during health care workers career. Needle stick injury among health care workers could get to as high as 70.3% [10]. However, the adherence of hospital waste disposal management processes by hospital cleaners and waste generators at Mangochi district hospital has been rated due to a lack of hospital waste disposal management training in health and safety.

## Methods

This was an exploratory cross-sectional research study that gathered and analyzed data using a qualitative approach. A group of eight other generators (nurses or clinicians) with two or more years of experience, two groups of ten hospital attendants each (supposed to have 10 hospital generators too but due to busy that day only 8 made it) and was supposed to have one ward in charge from Theatre, OPD, pediatric and labor wards, as well as a laboratory manager and an infection prevention coordinator for one-on-one interviews, but only the Infection Prevention Coordinator, Laboratory manager and Matron representing all the wards were available, resulting in a total of 31 participants. At Mangochi District Hospital, a researcher compared hospital waste disposal standards with what cleaners and other trash sources are doing.

## Results

Researcher used thematic analysis method to analyze research data. Transcripts were initially read through and open coded. The text was read again and categorized into focused, conceptual nodes based on the emergent categories identified through open coding. The goal of the analysis was to

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identify core themes through the qualitative analytic technique of coding transcripts. Themes were contextualized with regard to their relationship and implications to the central phenomenon of the hospital waste disposal management.

## Findings

### Objective 1: To assess adherence of hospital waste disposal management processes by hospital cleaners and waste generators

No code segregation was applied in all of the wards at Mangochi district hospital, according to the observation check list. Use of disinfection of items before disposal was done in most of the wards. In all of the wards, adequate lighting was provided and all procedures were clearly visible. Infection prevention measures like use of protective gloves was being used by most of the wards at Mangochi district hospital. Masks were being used by most of the wards except outpatient department. Overalls are used in theatre only. Aprons were being used by most of the wards. Gumboots in use in theatre only at Mangochi district Hospital. Wastes were stored in most of the wards at Mangochi hospital and wastes were only processed before transportation in the laboratory section of Mangochi district hospital. At Mangochi District hospital, only one bin with wheels was utilized to transport incineration to all wards save the maternity department. Only at the maternity department of the Mangochi district hospital is the incinerator fenced.

### Results -Lack of hospital wastes disposal management training in health and safety

**Findings:** Three focus groups with cleaners with around two years of experience in hospital waste disposal were used. During the FGDs, a note taker aided in taking notes. According to the findings, refresher training on hospital waste management is not provided in the Mangochi District, particularly for cleaners, to remind them of their responsibilities and introduce them to new information.

## Discussion

The findings of the study revealed the need for Mangochi District Hospital to implement the most efficient waste disposal and health-care use methods, as well as serve as a platform for the creation of public-health programs. As a result of this study cleaners gained knowledge about how to avoid dangers and understand the waste disposal process and supervisors were reminded to provide on-the-job trainings for cleaners. Literature revealed that, Training in health and safety is intended to ensure that workers know and understand the potential risks associated with health-care waste and rules and procedures required for safe management [11]. Availability of safety guidelines in the working department, use of personal protective equipment, access to safety guidelines and experience seem to be important [12]. It is important that Cleaners and other waste generators were all trained before job commencement so that everyone should know and understand the job requirements. The Donabedian (1980) framework of quality care was employed in this study, which conceptualizes three qualities of care dimensions. The system makes it easier to properly dispose of garbage and maintain segregation during transportation, storage, treatment and disposal [13]. This research looks into the perceptions and experiences of cleaners and trash generators when it comes to evaluating waste disposal management at Mangochi District Hospital [14].

Other cleaners may have been hired and started working without sufficient training, according to the findings of the investigation. One of the cleaners claimed that no recruitment training is provided. One cleaner said *"In NRU, They decided to hire someone to work as locum the person got sick, that very sickness...He contracted TB, Life was never the same until the person died."* Training in health and safety is intended to ensure that workers know and understand the potential risks associated with health care waste and rules and procedures required for safe management. The inappropriate segregation of trash at Mangochi District Hospital is due to a lack of expertise

and waste disposal supplies such as buckets and bin liners and as a result, the wastes are mixed in majority of the assessed departments. Sharp wastes are later found intermingled with ordinary waste during incineration in several departments, despite isolation. As a result, despite the availability of specific trash collection containers, segregation is not ideal in some departments. In most departments, there was no effective segregation and general waste and sharps waste were mixed in the same collecting containers. However, despite the efforts of the Theatre and Laboratory departments to segregate trash appropriately, wastes were still intermingled during incineration. According to national requirements, proper segregation of healthcare waste must adhere to defined protocols. Segregating waste is crucial because it reduces risks to healthcare workers and improves cost control for hazardous waste disposal by lowering treatment costs. One cleaner narrated *"After finishing, whether it was accidental or what can I say maybe laziness, they left a razor on a patient cloth. So when the patient was getting up she grabbed all her things together with razor and placed them in her bucket. When the guardian was washing, she got cut by it, a big cut that she needed stitches there."* Monitoring hospital waste disposal management should be a continuous activity that includes waste generation, segregation, transportation and disposal. Waste collection buckets and bin liners must be replaced immediately with new ones of the same type. That is, where hospital waste is generated, a supply of new trash collecting buckets and bin liners must be readily available at all times.

Typhoid fever, cholera, skin illness malaria, intestinal parasitosis and hepatitis are some of the health concerns linked to poor collection, treatment and disposal of health care wastes [15] and also respiratory conditions [16]. These would drastically be minimized if proper waste management is enforced at Mangochi District Hospital. Assessment of waste generation, waste minimization strategies, improved waste segregation, color coding of waste receptacles, closing and tagging of bags, schedules for waste pickup, internal waste transport, waste storage areas, management of liquid wastes, economics of healthcare waste management, hospital hygiene, infection control and safe practices are all highlighted in the WHO guide lines [17]. Cleaners and garbage generators with adequate knowledge of biomedical waste management would be able to avoid infection and ensure proper biomedical waste management [18,19].

At the Mangochi district hospital, transportation of hospital trash is a big issue. An incinerator operator gathers hospital garbage from theatre, OPD, female ward, male ward and pediatric ward using one large black bucket that is placed on the patient's wheel chair for transportation. Transporting waste by hand is dangerous because, if not properly packed and managed, it might harm waste collectors. Infectious infections can easily be transmitted to health care personnel as a result of this [20,21]. Hospital garbage should be transferred within the hospital using wheeled trolleys, bins, or carts that are not being used for other purposes during onsite transit [22].

One of the trash segregation methods is colour coding. The inappropriate segregation of trash at Mangochi District Hospital is due to a lack of information and waste disposal supplies such as buckets and bin liners. As a result, the wastes are mixed. While inserting a cannula, a nurse pierced a mattress and left a cannula needle there. When a cleaner was collecting trash, he discovered a needle that had been withdrawn and thrown away in a safety box. Staff nurses with adequate understanding of biomedical waste management will be able to avoid infection and ensure proper biomedical waste management [18].

Our research revealed a knowledge gap on waste management at Mangochi District Hospital. The health care workers lacked knowledge of separation between hazardous and non-hazardous waste. the lack of rules and regulations governing waste collection and on-site transport to a temporary storage location, the lack of proper waste treatment, the disposal of wastes with municipal garbage, insufficient personnel training, insufficient Personal Protective Equipment (PPE) and a lack of knowledge about how to use such equipment [23,24]. The findings are comparable to those of other studies, in which technically qualified individuals such as doctors, nurses and lab technicians have a high level of awareness about the rules, whereas sanitation workers have a low level of understanding [25].

The new wing (maternity) and the main hospital at Mangochi District

Hospital are two independent buildings. Manual incinerators are used in the main hospital, whereas an electric incinerator is used in the new wing. Manual incinerators harm the air in Mangochi, but an electric incinerator is environmentally benign and was built by a professional constructor. It emits less smoke since all of the wastes are thoroughly burned at high temperatures. The garbage feeding door and the ashes removing door on most manual incinerators are both missing covers. In addition, there are no fences around the incinerators. Because most manual incinerators lack ash pits for ash collection, he collects ashes with a hoe and shovel, which is dangerous if not entirely burned. Incinerator combustion that is improper or incomplete can release pollutant gases that are harmful to the environment.

Hospital waste disposal is a hazardous waste activity that necessitates extensive expertise [26]. It calls for specialized training based on the nature of hospital work, the hazards and potential for worker exposure and individual worker duties [20]. In this investigation, one of the cleaners, who works as an incinerator attendant, was pricked, putting him at risk of injury. He narrated "I was accidentally pricked at the incinerator because the safety bottle got open and syringes pierced the bin liner and I did not see that the syringe had pierced the bin liner. When I was lifting it to dump in the incinerator I realized I had pricked myself"

Another research of sharps injuries in Libya found that there is likely to be significant under-reporting of injuries [25]. Hypodermic needles overflowing from poorly closed or protruding from overfilled sharps boxes caused injuries in this investigation [25], or from sharps that were mistakenly thrown out in thin-walled plastic sacks meant only for soft garbage. Over the course of a three-year investigation, a cohort of clinical waste handlers working for a single waste management contractor discovered 40 sharps injuries [25].

Mangochi District Hospital likewise has a low injury reporting rate, which can be explained by the fact that most waste generators and cleaners are ignorant of a formal injury reporting system. This indicates that there is a lack of waste management, starting with segregation and ending with disposal. Healthcare facilities should provide waste handlers with regular training and adequate supplies [27]. There is a requirement for a full-time trash manager. The supervisor in charge of general services is also in charge of garbage management [28]. Immunization against Hepatitis B and Tetanus should be required for all employees, particularly those who are at risk from infectious waste handling [28].

The study in Nigeria discovered a number of reasons for poor HCWM in hospitals, but the most common issues raised during the interview section were a lack of clear policies/legislation, a lack of budget allocation, a lack of rules and regulations, poor training of some hospital staff and a lack of implementation/enforcement [29]. Needle stick and sharps injuries can be decreased by providing standard and safe equipment, offering training seminars on workplace safety issues, having enough staffing and reducing working hours, among other things [30-32].

## Conclusion

The study found that in Mangochi District Hospital, there is a low level of compliance with hospital waste disposal management standards. In the assessed departments, waste segregation into contagious and non-infectious waste and color-coding practices were poor, there was no regular training and untrained cleaners were involved in the medical waste management process. Some lack ash pits for ash collection and some equipment, such as chimneys, covers for the waste feeding door and covers for the ashes removing door, are missing from manual incinerators. The facility doesn't have enough external source of funding to finance hospital waste management. It was suggested that hospital waste disposal management guidelines be followed for collection, segregation, storage and combustion. Another suggestion is that all employees be adequately taught and that all materials be obtained in order to foster a safe working environment. In each department, efforts must be made to strengthen or implement the existing waste management rules. Another suggestion is that with good leadership, resource acquisition financing will be more accountable and documented for future use. In terms of medical supplies, vaccines and

pharmaceuticals, a well-functioning health system will ensure the availability of gloves, aprons, gumboots, masks and overalls, as well as the hepatitis B vaccine and ARVs (antiretroviral therapy) for waste disposal safety and the prevention of injuries like needle pricks. Manual incinerators should be surrounded by a fence. Healthcare waste handlers must be properly trained and provided with suitable PPE. To support hospital waste management, sufficient finances are required (monitoring and evaluation). To ensure that the medical waste disposal system is effective, responsible staff should ensure that all incinerators are in good operating order and equipped with ash pits for ash collecting.

## Further Research

There is a need for further research on assessing adherence of hospital waste disposal management as a comparison study with other districts in Malawi.

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## Conflict of Interest

The authors have no conflict of interest to disclose.

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