

HEALTHCARE WASTE MANAGEMENT SYSTEM AT BASIC HEALTH UNITS. A STUDY FROM DISTRICT SWABI, KHYBER PAKHTUNKHWA.

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ABSTRACT

BACKGROUND: To assess the healthcare waste management systems at Basic Health units using a pre-validated Questionnaire check list developed by World Health Organization.

OBJECTIVE: To assess the healthcare waste management systems at Basic Health units using a pre-validated Questionnaire check list developed by World Health Organization.

METHODOLOGY: This was a cross-sectional study carried out in the district Swabi. Overall, 30 Basic health care units were included in the study. Data was collected using self-administered questionnaire. A validated questionnaire by World Health Organization was used to collect data from Incharge Medical Officers of BHUs.

RESULTS: Specific containers for healthcare waste were available in 56.7% of Basic Health Units, while proper containers for infectious waste were present in only 26.7%. Disposable gloves and surgical masks were available in 73.3% and 66.7%, respectively; however, complete personal protective equipment (PPE) was used in only 36.6% of facilities. Compliance with the standard color-coding system for biomedical waste management was observed in just 6.7%. Nearly half of the Primary health care centers (46.7%) lacked designated storage areas for biomedical waste. Pit disposal was the most commonly reported method of healthcare waste disposal, practiced by 73.3% of BHUs.

CONCLUSION; The present study showed that majority of healthcare waste management in Swabi is inadequate. Government intervention and policy implementation are urgently needed.

KEYWORDS Primary Health care, Health care waste management, biomedical waste management

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INTRODUCTION

The term "biomedical waste" or "hospital waste" refers to the waste that is produced in hospitals during the process of treating patients, diagnosing or immunizing human beings, performing operations on patients, and disposing of waste from patients in the form of fluids or solids as well as the results of any research activity that takes place in hospitals.^{1,2} Management of healthcare waste (HCW) is a public health problem worldwide. The absence of proper collection of waste, its segregation, proper safe storage, transport, and final disposal consequently leads to risks causing harm to our environment and health^{3,4}

About two hundred and fifty thousand metric tons of biological waste is generated annually by the health care industries in Pakistan⁵. This waste comprises 0.667, 0.497, and 0.17 kilograms per day of bed use respectively⁶. The majority of this biomedical waste is made up of plastic (71 percent), paper (3.85 percent), and glass (13.9 percent). Other components include infected dressing (5.7 percent), gloves, masks, and sheets (0.3 percent), waste produced by operating theatre machines (2 percent), diapers (0.4 percent), and blades (0.1 percent)⁷

Infectious waste and non-infectious waste are the two primary classifications that make up the entirety of the biomedical waste spectrum⁸. Infectious waste includes bodily fluids and tissues, as well as the excreta of patients, such as urine, as well as knives, sharp glasses, infected bandages, blood, and clothing⁹. Non-infectious trash consists of waste that was produced as a byproduct of laboratory work, surgical procedures, plastic containers, paper boxes, papers, and expired medications¹⁰. Poor or mismanagement of health care waste and the subsequent exposure to humans and animals result in hepatitis, Human Immune Virus (HIV) and other infections.¹¹

Keeping in view of the risks due to improper handling of health care waste it is important to assess the process at various health care levels. In Pakistan the disposal of hospital waste is poor especially in government hospitals. This situation is even worse at Basic Health care units, where there is no standard waste disposal system. Therefore this study is important to assess the waste management system at district Swabi. This study assessed the deficiencies of this system. Health department and NGOs can take measures to improve the situation.

METHODOLOGY:

A cross-sectional study was carried out in District Swabi, Khyber Pakhtunkhwa from 1st February 2022 to August 2022. All 30 Basic health care units were included via total enumeration.

Data were collected using the WHO rapid assessment tool 2005 for Health care waste management at the primary health care centres level¹². The tool is consisting of 28 questions. The tool was consisting of six sections i.e. Health care waste segregation and handling, Personal Protective Equipment (PPE) of a person carrying/transporting wastes in the facility, Health care waste storage containers, Health care waste collection & transport, and Health care waste final disposal .

Data was analyzed using SPSS version 24. Data variables were qualitative so frequency and percentages were used. All the data was represented as tables and graphs.

Ethical approval was obtained from advance study review board

of the Khyber Medical university (No=DIR/KMU-ASRB/WM//001591).

RESULTS

The basic purpose of the study was to explore the Healthcare Waste Management among different healthcare facilities in the district Swabi. Data was collected from the overall 30 Basic health care units of district Swabi.

Table 1 shows data regarding Health care waste segregation and handling. Containers were available in 96.7% BHUs. Specific Containers for the health care waste were available in 56.7% BHUs. A proper functional container for sharps was available in 53.3% BHUs. Proper container for infectious disease waste was reported in 26.7% of health care setups. Similarly, proper containers for general waste were available among 96.7% of health care facilities. There were 26.7% of reported cases of needle stick injuries in the past 12 months.

Table 1: Health care waste segregation and handling, n=30

Waste Segregation		Frequency	Percentage
Container available for waste	Yes	29	96.7%
	No	1	3.3%
Is there proper containers available for Healthcare waste (HCW)?	Yes	17	56.7%
	No	13	43.3%
Proper functional container for sharps	Yes	16	53.3%
	No	14	46.7%
Proper container for infectious disease	Yes	8	26.7%
	No	22	73.3%
Proper container for general waste	Yes	29	96.7%
	No	1	3.3%
Reported cases of needle stick injuries in past 12 months	Yes	8	26.7%
	No	22	73.3%

Table 2 shows use of Personal Protective Equipment in a health care facility. Disposable gloves are available in the health in 73.3% of the care facility. Besides, surgical masks are not available in 66.7% of the BHUs of Swabi. Similarly, aprons were not available

in 96.7% of the BHUs. Proper shoes for health care waste staff are present only in 13.3% of the Basic Health Units. In addition, personal protective equipment (PPEs) were used in 36.6% of basic health units of Swabi.

Table2: The use of Personal protective equipment

Personal Protective Equipments	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Disposable gloves available in facility	22	73.3%	8	26.7%
Presence of surgical mask	10	33.3%	20	66.7%
presence of apron	1	3.3%	29	96.7%
Proper shoes for HCW staff	4	13.3%	26	86.7%
Use of PPE	11	36.7%	19	63.3%

Table 3 showed waste storage. All the basic health units of Swabi contain non-puncher-proof health care waste storage containers. Facilities of Shortages in the supply of sharps containers are available in only 13.3% BHUs. Similarly, a specific color-coding system of biomedical waste management is not available in 93.3%

BHUs of Swabi. More than half (53.3%) BHUs of Swabi contain specific storage areas for biomedical waste. 60% BHUs have specific areas for biomedical waste where the authorized persons have the accessibility.

Table 3: Biomedical waste storage system

Waste Storage		Frequency	Percentage
Specific containers for sharps storage	Puncture proof	0	0.0%
	Non-puncture proof	30	100.0%
Shortages in supply of sharp containers	Yes	4	13.3%
	No	26	86.7%
Presence of specific color coding system	Yes	2	6.7%
	No	28	93.3%
Specific storage area for HCW	Yes	16	53.3%
	No	14	46.7%
Accessibility of storage area by authorized persons only	Yes	18	60.0%
	No	12	40.0%

Figure 1 shows on-site transport of the health care waste. In the majority (53%) of the BHUs, no device has been reported for the on-site transport of health care waste.

Figure 1: Pie-Chart depicting transport of hospital waste.

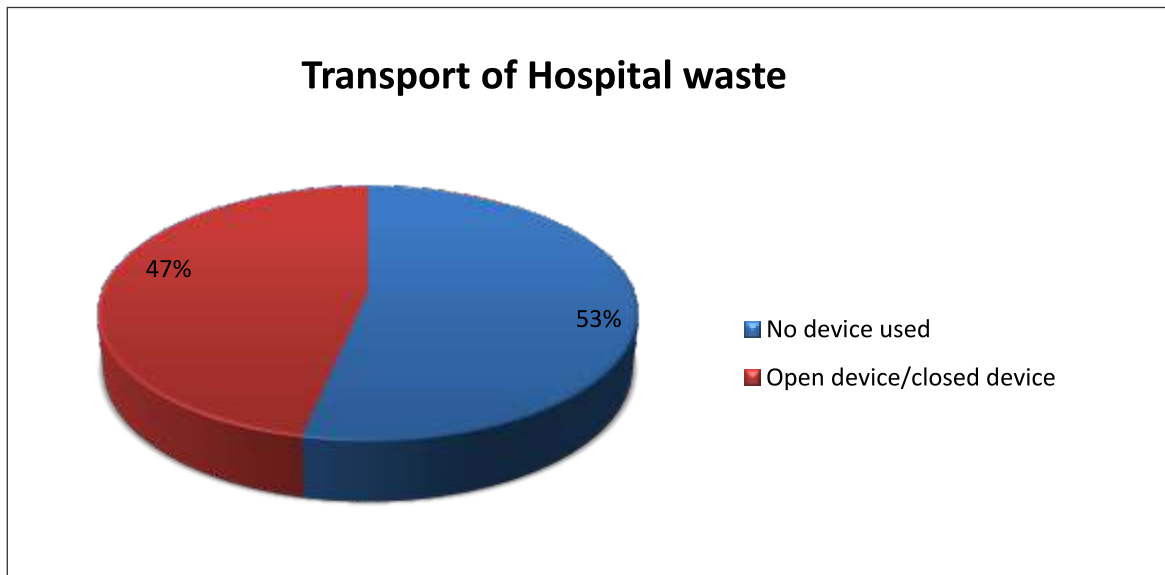


Table 4 shows the waste disposal system. Waste disposal in pits was reported among the majority (73.3%) of the BHUs. Burials are used by 63.3% BHUs for hospital waste disposal. 80% of the hospitals keep the pits secure or locked. Among the 73.3% of the hospitals, the pits are of sufficient dimensions (4*4 feet). In 66.7% of the BHUs partially treated syringes are present on site of final disposal. In addition, 26.6% of the BHUs partially treated infectious health care waste is present on site. Cleaning materials such as soap, surf, and Mops are available in 83.3% of the BHUs.

Table4: Health care waste disposal management

Waste Disposal system	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Waste disposal finally occurs in Pit	22	73.3%	8	26.7%
Disposal done by burial method	19	63.3%	11	36.7%
Pit secured or Locked	24	80.0%	6	20.0%
Pit is of sufficient dimensions (4 fts)	22	73.3%	8	26.7%
HCW disposed off by burning in Pits	30	100.0%	0	0.0%
Partially treated syringes present on waste disposal site	20	66.7%	10	33.3%
partially treated infectious waste present on disposal site	8	26.7%	22	73.3%
Material or Tools available for cleaning	25	83.3%	5	16.7%

DISCUSSION

The present study showed that the majority of the Basic Health units in Swabi lacks a proper waste disposal system. Colour coding system and transportation was poor. Majority of BHUs also do not have a functional incinerator.

In the current study, color coding for the health care wastes has been used in 6.7% BHUs. This suggested that the WHO waste segregation strategy, which advised utilizing a color-coding system, was not being implemented properly in primary health care settings. This finding matched a study, which found that just 6 percent of health institutions used color coding for trash separation. This shows that there is discrepancies of hospital waste management system in basic health units of other countries as well¹³. Supporting the current findings another study also reported that just 10.0 percent of healthcare facilities in Tanzania utilize color coding¹⁴. Besides, tertiary care public and private sector hospitals provided totally different findings. In Pakistan, 75% of public health care hospitals and 33.3% of the private healthcare organizations follow color coding of health care waste management¹⁵.

The current study reported that 33% BHUs did have a separate person to manage health care waste. Separate personnel for medical waste management was important for primary health care centers. Non-hospital Primary health care clinics were eight times more likely not to have separate waste management staff than hospital ones. BHUs may create fewer health care workers. Non-hospital primary care centers including BHUs may have less access to updated waste management information. This finding is consisted with a study in Pakistan¹⁶.

This study reported that disposing of the health care waste in Pits is a common technique followed by 73.3% of the BHUs. Supporting the current findings different studies reported that, 50 to 78.5% of primary healthcare facilities disposed of their health care workers and sharps by burning them in pits as their final disposal technique. Even though waste was separated before it was burned, the majority of the pits did not have fences

around them, and sharp waste and general rubbish were burned together. As a direct consequence of this, the wastes were only partially burned, which may have increased the likelihood of infection transmission due to the decomposition of the wastes in the shallow pits.^{17,18}

In this particular study, adequate utilization of personal protective equipment was seen in 36.6 percent of primary health care centers. Sufficient support for personal protective equipment was found in those centers. It gave the impression that the PHCs who had not been allowed to use PPE had not done so in the past. It is possible that there is a lack of personal protective equipment available, that there is a lack of understanding about risks as a result of unsafe HCWM, or that there is a dislike of wearing PPE because it is uncomfortable^{19,20}

The current study revealed that there is no proper system of health care waste management, transportation, disposal, and segregation. According to World Health Organization (WHO) rapid assessment tool²¹, 77% of the BHUs of district Swabi were ranked as Basic and 23% were ranked as intermediate health care waste management system. The current findings were also supported by a similar study in Pakistan and it was reported that nearly none of the primary care hospitals placed the HCWM practice high on their list of priorities The criteria for waste segregation, processing, storage, transportation, and disposal were lower than those established by WHO and Pakistan bio-safety guidelines²².

STUDY LIMITATION:

The health care waste management system was explored only in one district of Khyber Pakhtunkhwa which may affect generalizability. The findings of the study would be more precise if the data was collected in more than one district of Khyber Pakhtunkhwa. The data was collected from the focal persons of the Basic Health Units of the district. To reduce the bias of the sample selection, data from the nursing staff and persons working to manage biomedical waste is necessary. The role of the district health officer is very important to explore the health care waste

management system on BHUs levels and provide training opportunities for the health care workers. The medical superintendent of the BHUs should take initiative and implement the policy of biomedical waste management in the health care centers. Another similar study is recommended to explore the health care waste management system in another district of Khyber Pakhtunkhwa. An experimental study is also recommended to explore the effectiveness of the educational intervention on the knowledge and practices of health care workers regarding biomedical waste management.

CONCLUSION

This study concludes that health care waste management practices in Basic Health Units of district Swabi are largely inadequate. The situation can be improved by implementing a proper waste disposal system and strictly monitoring and evaluating the process by health department.

CONFLICT OF INTEREST

The author declare no conflict of interest related to this publication

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