



## EVALUATION OF HOSPITAL WASTE MANAGEMENT IN SELECTED HOSPITALS WITHIN KADUNA METROPOLIS

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### ABSTRACT

*Management of healthcare wastes is an issue of concern particularly in urban centres. It is in line with this that this study examines various aspects of hospital waste management, such as the level of awareness of health workers, training they receive on health-care waste management, waste collection, pre-treatment and disposal within Kaduna metropolis. Nine hospitals within Kaduna metropolis were selected and assessed, through reconnaissance survey, key informant interview and questionnaire administration. A total of 300 questionnaires were administered across the hospitals out of which 194 (65%) were returned. The result of the study showed that only 17% of the respondents attended training on health-care waste management in the last 12 months. On the need for proper training on health-care waste management, 75% of the respondents considered having such training as very important. The study found that employers concern towards health-care waste management is more among people of higher age group, (45 –50 years) with about 90% of respondents in that group being highly concerned about health-care waste management. In terms of profession, workers that are directly involved with health-care waste management are more concerned about its management than persons of other professions such as doctors and nurses. The overall evaluation of management of waste in the facilities visited as at time of this study was found to be inadequate.*

**Key words:** Hospital waste, Management, Training, Waste collection, disposal

### 1.0 INTRODUCTION

Health-care waste (HCW) includes all the waste generated by health-care establishments, research facilities, and laboratories. In addition, it includes the waste originating from “minor” or “scattered” sources—such as those produced in

the course of health care undertaken in the home (dialysis, insulin injections, etc.), (WHO, 1999). It has been estimated that between 75% and 90% of the waste generated by hospitals are non-hazardous or “general” health-care waste which are comparable to domestic waste while the remaining 10-25% are regarded as hazardous wastes that may lead to a variety of health risk, (WHO, 1999). The non-hazardous fraction of health care waste come mostly from the administrative and housekeeping functions of health-care establishments and may also include wastes generated during maintenance of health-care premises (WHO, 1999).

Management of healthcare waste is becoming an issue of growing concern particularly in urban areas. In many developing countries healthcare wastes are still indiscriminately disposed of and often mixed with municipal waste, thus causing serious health and environmental hazards, particularly to the scavengers operating at dump sites; due to the extreme health hazards, healthcare waste cannot be disposed of along with other municipal wastes (UNEP, 2013). The local authorities as well as healthcare waste managers are increasingly in need of reliable information on the available technology options for safely treating and disposing of healthcare wastes.

The technologies for the treatment of healthcare waste are not well understood or widely available in developing countries. As a result, if technology choices are made, they may not be well-informed, resulting in poor or uneconomic

performance. Use of obsolete or inappropriate technologies also results in serious environmental issues due to emissions of dioxins/furans and other contaminants, (UNEP, 2013).

Bassey *et al.* (2006) observed that very little has been done on medical waste management in Nigeria. Waste management officers do not have formal training on waste management techniques; and hospital administrators pay very little attention to appropriate management of medical wastes. Babatola (2008) in his study conducted in some hospitals in Akure, the capital city of Ondo state, Nigeria, shed more light on lack of proper management of hospital wastes in Akure. The study revealed that hospital wastes in most hospitals are treated in a like manner as the general wastes. The study also observed that only about 35% of the hospitals studied segregate their wastes while majority (65%) of the hospitals mostly used sanitary landfills as a means of final disposal that do not follow the recommended standards. It was concluded that neither the government nor other regulatory agencies are closely monitoring the management of hospital wastes to ensure adherence to recommended standards.

The reasons for poor management of healthcare wastes in Nigeria has been identified as inadequate knowledge of hospital waste management policy among management staff of healthcare facilities, and lack of policy or existing plan on health care waste management (Ndidi *et al.*, 2009; Abah and Ohimain, 2011). It was further stated that no evidence was found to the effect that enough attention had been given to waste management as no policy nor plan existed. It did appear also that the State Ministries of Health and Environment, the responsible government regulatory bodies had no guidelines on waste management that comes from healthcare services. Abah and Ohimain (2011) reported that the current management practices for healthcare wastes generated at one of the facility they studied was unsustainable and cannot be relied upon to protect human health and environmental integrity. It was also stated that there was no existing policy or plan and no systems in place for sustainable management of HCW which suggests urgent need for practical steps in ensuring the 'duty of care' and safeguarding the environment for current and future generations.

Poor management of health care wastes lead to many problems which include contamination of water supply and ground water, outbreak of diseases, accumulation of toxic element within the soil, decrease in water quality, and public nuisance. (Akter, 2000; Lekwot *et al.*, 2012; and Nwachuku, 2013). The need for proper hospital waste management cannot be overemphasized, because lack of it may be dangerous to humans, plants, animals, and the environment. This assertion was captured by Ogbonna *et. al* (2012) where they observed that management of healthcare wastes has become one of the critical concerns in developing countries especially Nigeria.

Healthcare waste is dangerous, and if handled, treated or disposed off incorrectly can spread diseases, and poison humans, livestock, wild animals, plants and ecosystems. According to Ngouakam *et al.* (2012) inadequate and inappropriate handling and disposal of health-care wastes may have serious public health consequences and a significant impact on the environment. It is therefore essential that wherever it is generated, safe and reliable methods for its handling and disposal be adopted. It is in line with this that this study aims to ascertain the hospital waste management practices in some selected hospitals within Kaduna metropolis with a view to identify possible lapses in the practices.

## 2.0 MATERIALS AND METHODS

### 2.1 Sampling Technique

Purposive approach of sampling was used in selecting hospitals to be surveyed. Purposive sampling is employed in order to have good understanding of how different types of hospitals generate and dispose their wastes. As such, the hospitals surveyed include one (1) tertiary, five (5) secondary, and three (3) primary health care facilities. The tertiary facility, two (2) of the secondary, and two (2) primary health care centers are public owned facilities, while the remaining are privately owned facilities. Table 1 present facilities surveyed by type and ownership.

**Table 1: Facilities surveyed in the study area**

Facility	Category	Ownership	No. of Beds/Out-patients
<i>Facilities that offered both out-patient and In-patient Service (have beds)</i>			
National Ear Care Centre, Kaduna	Tertiary	Public	100
Yusuf Dantsoho Memorial Hospital, Kaduna	Secondary	Public	128
General Hospital, Kawo	Secondary	Public	100
Giwa Hospital, Kaduna	Secondary	Private	50
Garkuwa Specialist Hospital, Kaduna	Secondary	Private	50
FOMWAN Hospital, Kaduna	Secondary	*NGO	27
Primary Health Care Centre, Hayin Banki	Primary	Public	18
<i>Facilities that offered out-patient service only (do not have beds)</i>			
Primary Health Care Centre, Unguwan Sanusi	Primary	Public	50
Primal Diagnostic Centre, Kaduna	Primary	Private	75

\*NGO: Non-Governmental Organization

## 2.2 Data Collection

Structured questionnaires that adopted the guideline of health care waste management for sub-Saharan countries, prepared by WHO/UNEP (2005) was administered to the selected facilities. Data collected with the aid of the questionnaires include, knowledge of staff and training they receive with respect to hospital waste management; hospital waste collection, handling and on-site/off-site transportation of wastes generated; hospital waste treatment and disposal; and types of protective wears used by staff who handle the wastes.

A forum discussion was also organized with staff of private firms responsible for off-site transportation and final disposal of the wastes.

The discussion centered on their general knowledge of the impact of hospital waste on public health and environment.

## 3.0 RESULTS AND DISCUSSION

### 3.1 Demographics of the Staff Surveyed

Out of the 300 questionnaires distributed for the study, 194 questionnaires were returned. This represents 65% of questionnaire distributed. Staff that responded fell within the age group of 21 – 50 years and they cut across different professions within the hospitals which include doctors, nurses, paramedics and administrative staff. Demographics of employees that responded to the questionnaires are presented in Table 2.

**Table 2: Demographic data of hospital employees that participated in the survey**

Characteristics	Number of Employees	Percentage
<b>Age</b>		
21 - 30	95	49
31 - 40	70	36
41 - 50	29	15
Total	194	100
<b>Profession</b>		
Doctors	19	10
Nurses	35	18
Paramedics	37	19
Admin staff	8	4
Others	95	49
Total	194	100

### 3.2 Training of Health Care Personnel

The study examined the availability of staff training in the hospitals surveyed and staff opinion on the need for proper training on hospital waste management. The findings revealed that only three hospitals provide their staff with trainings on health care waste management. National Ear Care Centre trains their environmental unit on health care waste management, while Yusuf Dantsoho memorial hospitals also offer monthly health education training to their environmental unit staff of which health care waste management is among the topics covered. Giwa hospital do organize quarterly workshop for their waste handlers on health care waste management. The remaining

six hospitals do not train their staff on health care waste management.

Out of employees that responded to the question on training, only 17% indicated attending training on hospital waste management in the last twelve (12) months. 83% of respondents have not attended any kind of training within the same period. On attitude towards need for proper training on hospital waste management, 75% of respondents consider staff training to be very important while the remaining 25% were neutral on the need for the training. Training availability at various facilities and the type of training (if any) offered is presented in Table 3.

**Table 3: Training availability in hospitals surveyed**

Facility	Training Availability	Type of Training	Staff Training (overall percentage of staff training)	Overall Staff Attitude towards HWM
National Ear Care Centre, Kaduna	Yes	*HWM training		
Yusuf Dantsoho Memorial Hospital, Kaduna	Yes	Health education seminars		
General Hospital, Kawo	No	N/A		
Giwa Hospital, Kaduna	Yes	Quarterly workshop on HWM	17% of Staff attended training in the last twelve month	75% of staff consider HWM to be very important
Garkuwa Specialist Hospital, Kaduna	No	**N/A		
FOMWAN Hospital, Kaduna	No	N/A		
Primary Health Care Centre, Hayin Banki	No	N/A		
Primary Health Care Centre, Unguwan Sanusi	No	N/A		
Primal Diagnostic Centre, Kaduna	No	N/A		

**\*HWM: Hospital Waste Management**  
**N/A: Not Available**

The finding of this study indicates a lack of adequate attention towards HWM training. This is in agreement with the work of Bassey *et. al.* (2006) and Ndidi *et. al.* (2009) carried out on hospitals of FCT, Abuja and Jos, Plateau state, (both in Nigeria) respectively. They observed there was inappropriate trainings of workers on skills and knowledge of the recommended measures for hazardous waste management and also affirmed that Waste Management Officers do not have formal training on waste management techniques and hospital administrators pay very little attention to appropriate management of medical waste.

### 3.3 Level of Concern by Health Care Personnels on HWM

The level of concern by hospital personnels on hospital waste management was assessed. Figure 1 shows employers attitude towards hospital waste management for different age groups among the staff of facilities surveyed. Out of the

total respondents, 95 fell within 21-30 years age group, 70 in 31-40 group, and 29 fell within 41-50 group. It was observed that 90% of respondents in 41-50 years age group are highly concerned about hospital waste management as against 69% in 31-40 years group and 49% in 21-30 years group.

It was observed that a higher percentage of people in the higher age groups are more concerned about hospital waste management than those in the lower age groups. This finding is similar with that of the study conducted by Pudussery (2011) at Norfolk and Norwich University hospitals where people in higher age group were found to be more conscious about healthcare wastes management than people of lower age groups. This suggests that probably the level of awareness of personnel in the lower age group may be low. This finding shows that there is need for creation of awareness on hospital waste management to all medical workers. This



is necessary because age should not be a barrier on awareness of health workers towards hospital waste management. Whatever age group one

belongs, there is the need to have basic knowledge of dangers posed by health care waste to public health and environment.

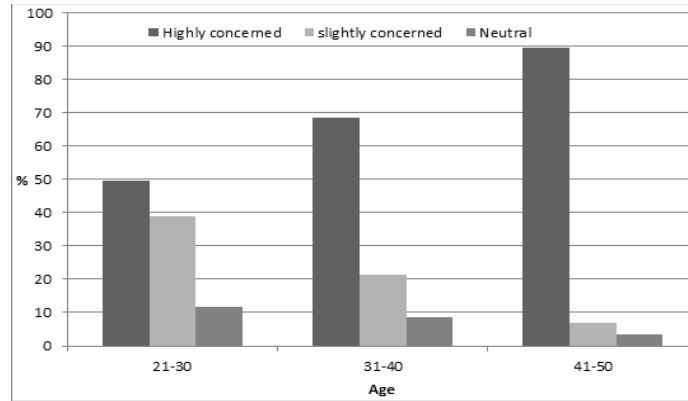


Figure 1: Employers attitude towards HWM for different age group

**3.4 Attitude of Different Professionals within the Hospital on HCWM**

The employers' attitude towards hospital waste management by profession was also assessed. Out of the respondents, 19 were doctors, 35 nurses, 37 paramedical, 8 Administrative staff and 95 fell within “others” profession category which include environmental health officers, community and public health workers, nutritionist, and X-ray technicians. It was revealed that those in the 'others' and paramedical profession groups were more concerned about hospital waste management than the remaining professions. 75% and 70% of respondents in the 'others' and paramedical respectively group are highly concerned as against 54% respondent in nurses, 53% respondents in doctors and 38% respondents from admin staff.

health officers, community and public health workers, nutritionist, and X-ray technicians being more concerned with hospital waste management than other professions justifies the needs for creating awareness among health-care workers regarding hospital waste management. However, it was noted that the category of workers that were highly concerned about the management of hospital waste includes mostly the workers that are directly involved in the handling of such wastes. About half of the doctors that participated in the survey are not highly concerned about hospital waste management and for it to receive adequate attention needed, the consciousness of the doctors need to be rekindles because they are mostly responsible for the day to day running of the hospitals. Employers' attitude towards healthcare wastes management is presented in Figure

Category of workers such as environmental

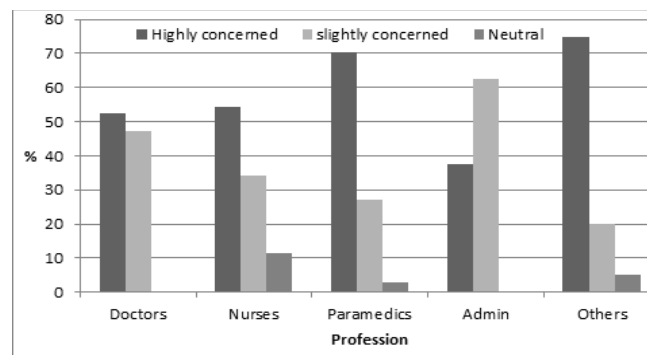


Figure 2: Employers attitude towards healthcare waste management by various professionals

### 3.5 Occupational Safety of Hospital Waste Handlers in the Study Area

Discussions with the staff of the facilities visited on their level of awareness on the dangers of healthcare waste revealed that their main concern was on occupational injuries arising from handling of sharp wastes, however, none of the facilities had any record of injuries in that regard within a period of a calendar year. There was also no record of occupational injuries as a result of on-site transportation of wastes. The study also revealed that the hospitals provided their waste handlers with protective wear(s). This include either of or the combination of two or more of gloves, boots, apron, and mask. The area provided for central waste storage in these hospitals is secured enough from scavengers even though in 56% of the hospitals storage is done in open fields, mostly at the back of the hospital.

All the hospitals have standing rule of collecting sharp wastes separately from other waste. However, upon investigation, it was found that the rule is carried out at nurses' station only where sharps are collected in safety boxes. Wastes from other units of the hospitals are collected together with sharps.

### 3.6 Off-Site Transportation and Treatment

#### of Hospitals Wastes in the Study Area

Off-site transportation and treatment of hospital waste in the study area was assessed. It was found that all the hospitals visited transport their waste outside the hospital for final disposal. They all engage the services of private firms for the transportation and final disposal.

Discussion with workers of the private firms responsible for off-site transportation and final disposal of the waste revealed that they seem to be aware of public health effect as a result of occupational injuries from sharp waste. On the environmental effect of health care waste, most of the non-skilled personnel's, that form over 70% of the nominal roll of such firms are not aware of the adverse effect such waste have on the environment. The staff are provided with protective wears that include apron, booths, and

hand gloves.

Off-site transportation of wastes is mostly done by trucks. The task is contracted out to private firms for the off-site transportation and final disposal. Some of the firms used closed trucks while others used open trucks that have a tendency of littering the environment. 45% of hospitals visited used open trucks while the remaining 55% used closed truck for the transportation.

Five of the hospitals visited have one or more type of solid waste treatment options. National Ear Care Centre, Giwa Hospital, and Primary Health Centre Unguwan Sanusi engage the use of uncontrolled open burning in treating their waste before final disposal. Garkuwa specialist hospital and Primal diagnostic centre have locally built incinerator where all their wastes are burnt before final disposal. In addition to the incinerator, Primal diagnostic centre have needle destructor for destroying needles. Mechanically controlled incinerator is installed at Yusuf Dantsoho Memorial Hospital but is yet to commence operation as at the time of this research. Irrespective of being treated or not, the healthcare wastes are transported to Kaduna metropolis municipal disposal facility for final disposal by the firms.

### 4.0 Conclusion

The study revealed that there is a poor record keeping on occupational injuries in all the hospitals visited. There is also inadequate provision of training on hospital waste management to staff. Some hospitals transport their waste in such a manner that it litters the surrounding environment and the waste from all the facilities are disposed together with other municipal waste irrespective of being pre-treated or not. Therefore, the management of health-care waste of the study area is inadequate.

This study recommends that all hospitals should segregate their waste by type at point of generation. The use of open devices for on-site and off-site transportation of waste should be discouraged. Finally the study observed there is urgent need for hospitals to organize trainings for their staff on hospital waste management in order

to educate them on dangers of such wastes to public health and environment and also on the proper methods of managing such waste.

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