IJAAR PUBLISHING®

Open Access Journal of Sciences Research | ISSN: 3027-1185
Vol. 2, Issue 1 (January-March, 2024) | www.ijaar.org

Knowledge of Clinic/ Hospital Cleaners towards Medical Waste Management in Kano State of Nigeria

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Abstract

This study investigated knowledge of clinic/ hospital cleaners towards medical waste management in Kano State of Nigeria. To achieve the purpose of this study, three research questions were raised and three hypotheses were tested. Descriptive research design of survey type was used in this study. The population of this study consists of three (3) clinics and three (3) hospital cleaners in Kano State. The total sample used for this study consists of 278 clinic/ hospital cleaners. Multistage sampling technique was used to select sample for this study. The instrument used for data collection was researchers' developed questionnaire and the questionnaire was validated and standardized with reliability index of 0.85. The administration and retrieval of the questionnaire was done within six weeks. All data collected were statistically analysed as presented on the tables. The finding showed the t value of 5.881 at the 239 degree of freedom (DF) and significant difference level of 0.001 ($p<0.05$). Based on these findings, it was recommended that, there should be training and retraining of all clinic/hospital cleaners to ensure compliance of sustainable medical waste management in the Clinic/Hospital in Kano State. Also, provision of adequate information on medical wastes management practices inform of posters in every Clinic/Hospital will help to further enlighten staff and ensure compliance on how to dispose of medical wastes.

Key Words: Clinic/ hospital, cleaners, medical, waste, management.

Terngu, A. G. & Alairu, A. (2024). Knowledge of Clinic/ Hospital Cleaners towards Medical Waste Management in Kano State of Nigeria. *Open Access Journal of Sciences Research*. 2(1), 22-33.

Introduction

Medical waste management is one of the public health concerns most especially in developing countries of the world today (Patil et al., 2019). In developing countries including Nigeria, the international policy that the generator of waste is responsible for the proper treatment and disposal of waste has remained on paper and is yet to be implemented. The notion that waste is the responsibility of the government authorities has not enabled waste generators to understandthe negative impact of improper waste disposal.Furthermore, healthcare establishmentgenerates waste by-products of which can be classified into infectious and non- infectious wastes (Patil et al., 2019). Infectious wastes contain pathogens in quantities sufficient to transmit infectious diseases on exposure to them.

Medical waste refers to all wastes, biological and non-biological that can be discards and not intended for further use. It is a subset of healthcare wastes and it refers to all the materials generated as a result of diagnosis, treatment or immunization of patients and associated biomedical research (Rutala, 2018). Medical waste is generated in hospitals, healthcare teaching institutes, clinics, laboratories, blood banks, primary healthcare centres and so on (Sharmam, 2016). Medical waste poses hazard due to two main reasons: the first is infectivity and the other toxicity. Like other industries and institutions, healthcare facilities generate various kinds of waste has a result of a variety of medical treatment and research. In the past 15 years, due to the increased number and size of healthcare facilities, medical services and use of medical disposable products, the generation rate of healthcare waste increased rapidly (Abah & Ohimain, 2019).

Presently, considerable gaps exist with regard to knowledge of medical waste management among the clinic/ hospital cleaners. A high percentage of hospital cleaners have knowledge of different categories of medical waste produced. They also know about waste minimization and segregation of these categories of waste management of these wastes. It can distinguish hazardous and non- hazardous wastes and the hazards associated with improper managementof medical wastes. But their attitude and practices call for serious concern (Pandit et al., 2005).

Effective, timely and proper disposal of medical waste for example medical sharps waste will contribute to reducing the incidences of needle prick injuries to less than 1%(Programme for appropriate technology in health (PATH, 2009). However, for this to happen, time, self-esteem, availability and accessibility of needed equipment, training and policy guidelines need to be present (Williams, 2005). These make it possible for an individual to convert an attitude into behaviour. Exposure to hazardous wastes can be as a result of an accident, ignorance, nonchalance, deliberate negligence on the part of waste handler from water, food, household products, and breast milk and to fetus in the womb (Patil et al., 2019).

Hence, the need to develop positive attitude and adopt best practices, because improper handling of medical waste can create harmful effects and reduce the overall benefits of healthcare. Generally, lack of awareness about the health hazards, poor management practice, insufficient financial and human resources and poor control of waste disposal are the most common problems connected with waste management in developing countries (Wilson,2014). Most developing countries do not have appropriate regulations to cover medical waste and where these regulations exist they are not effectively enforced. A major issue is the lack of clarity on whose responsibility is it to handle and dispose medical waste.

According to the polluter pays principle, this responsibility lays with the waste product that is the healthcare provider (hospitals, maternity homes, among others) (Wilson, 2014).

The mismanagement of medical waste in Kano State poses health risks to people and the environment by contaminating the air, soil and water resources. Therefore, adequate knowledge about medical waste management, development of positive practice as well as adoption of proper techniques and methods of handling the wastes and practice of safety measures can go a long way towards the safe disposal of medical wastes in health care facilities in the state.

Knowledge is a critical and necessary element in the management of solid waste. Lack of it brings about poor medical waste management practice. This was evident as observed by Jurezak (2017) where he observed that generally the generation of medical waste had significantly increased in Poland due to poor management of waste, which, in turn, was due to lack of knowledge. According to Jurezark (2017), lack of proper knowledge by the hospital cleaners resulted in the irresponsible management of waste. Jurezak (2017) revealed that in order to increase public knowledge towards waste management, professional workers such as medical doctors, nurses and teachers of subjects related to environmental issues should deliver educational programmes mainly within the formal education system. Mensah and Larbi (2021) stated that lack of improvement in waste management was due to the fact that all forms of promotional and educational programmes on sound waste management over the country had not been successful.

According to Gumodoka, Vos and Berege(2016), knowledge of cleaners about the safe disposal methods of used syringes is scanty, which traces back to deficiency of medical colleges' curricula. Hospital waste handling is a hazardous activity which requires a high standard of training. It calls for specific training that depends on the nature of the work in the hospital, the hazards and possibility of worker exposure, and the responsibilities of Manyele and Lyasenga individual workers (Blackman, 2016). Kumar, Khan, Ahmed, Khan, Magan and Mughal (2020) found in their study that clinical staff in developing countries lacks knowledge hospital wastes management and have poor attitude towards hospital discipline, and improper training of staff on medical waste management and disposal was also found.

WHO (2005) revealed that, the absence of proper waste management, lack of awareness about the health hazards from hospital waste, insufficient financial and human resources and poor control of waste disposal are the most critical problems connected with health care waste. Although there is increased global awareness among health care professionals about hazards and also appropriate management techniques, the level of awareness in India has been found to be unsatisfactory (Pandit, Mehta, Kartha, Choudhary, 2005).

Nkonge, Mayabi, Kithinji and Magambo (2012) conducted a study on knowledge, practice of health-care waste management and associated health risks in the two teaching and referral hospitals in Kenya; it was found that health and safety in health-care waste management, was not included in most of the curricula for training the three healthcare professionals. Most of them acquired this through on-job training from seminars and informally through organized talks at work-places. The hospital attendants had also an opportunity to acquire the knowledge through organized training at work places. There was also reduction on injuries from health-care waste. Nkonge, Mayabi, Kithinji and Magambo (2012) concluded that, it is necessary for healthcare workers training curricula to include health and safety issues while managing hazardous health-care waste as well as establishes

the need for healthcare institutions to conduct continuing education on health and safety in the management of health-care waste.

Another study on Knowledge of Hospital Waste Management among cleaners working in a Selected Medical College Hospital of Bangladesh was conducted by Uddin, Mohammad and Yesmin (2014), they found that knowledge about hospital waste and its management is very poor among cleaners. As they have no sufficient knowledge regarding hospital waste storage and disposal so they cannot manage it efficiently. Uddin, Mohammad and Yesmin (2014) who conducted a study on Knowledge of Hospital Waste Management among cleaners working in a Selected Medical College Hospital of Bangladesh, Concluded that knowledge about hospital waste and its management is very poor among cleaners. Also, safe disposal of medical waste is the important part of healthcare management. But most of healthcare establishments in Faridpur town are not following proper disposal system.

The result of the study conducted by Alok, Varsha, Swati, andPrabhat(2013) on knowledge of Biomedical Waste Management Among Health Care Personnel in Jaipur, India; showed that there was a poor level of knowledge and awareness of biomedical waste generation hazards and management among health care personnel. It was surprising that 36% of the nurses had an extremely poor knowledge of biomedical waste generation and legislation and just 15% of the cleaners had an excellent awareness of biomedical waste management practice. Alok, Varsha, Swati, and Prabhat, (2013) concluded that there are poor levels of knowledge and awareness about biomedical waste hazards management among health care personnel in Jaipur Dental College.

Kishore, Goel, Sagar and Joshi (2000) conducted a study on the knowledge about medical waste management and infection control among dentists of a teaching hospital in New Delhi. It was reported that the majority of the respondents were not aware of the proper clinical waste management regulations. Similar results were found in a study on the awareness about bio-medical waste management among health care personnel of some important medical centres in Agra; by Sharma (2010) which indicated a lack of knowledge and awareness towards legislation on BM waste. Even more recently in a study conducted on the Awareness of biomedical waste management among dental professionals and auxiliary staff in Amritsar, India. Found that thesame problem may exist even at more specialized medical institutions because in another study, one-third of the staff of a tertiary level hospital in Visakhapatnam were not aware of where the waste from the hospital was ultimately treated and disposed of (Sreegiri, Krishna & Babu, 2009).

A study by Basu, Das and Pal (2012) was conducted in a tertiary care hospital of West Bengal to assess the knowledge and awareness about various aspects of medical waste management among junior doctors (future physicians) showed that only 29.5% had knowledge of the various methods of final disposal of medical waste and only 76.4% knew about various types of colour-coded bags for collection of medical waste. It is against this background that this study investigated the knowledge of clinic/ hospital cleaners towards medical waste management in Kano State of Nigeria.

Statement of the Problem

Wastes, be it from domestic industrial or health care activity is one of the major public health concerns in many developing countries including Nigeria. This is partly because there are no institutional policies guiding the proper management of waste by the different tiers of government and as such there is indiscriminate disposal of both hazardous, infected and non-hazardous wastes to the environment making it filthy, unsightly and thus making

such areas a breeding ground for all types of insects and rodents. Particularly biological waste like removed body parts, food remnants which contaminate food, water and others leading to various water and food borne diseases to the public. This is more so when waste is from healthcare facilities (Coker, 2009).

A number of studies like the one conducted by the World Health Organisation WHO (2019) have indicated that the inappropriate handling and disposal of medical wastes poses health risks (such as Covid-19, monkey pox, Ebola, Cancer, Hepatitis, HIV/AIDS, Dysentery, contact dermatitis, Whooping cough, Syphilis). To cleaners who may be directly expose to people near health facilities particularly children and scavengers who may become expose to infectious waste.

WHO (2018) estimated that each year about 8 to 16 million new cases of hepatitis B virus (HBV), 2.3 to 4.7 million cases of hepatitis C (HCV) and 80,000 to 160, 000 cases of human immune deficiency virus (HIV). WHO (2020) observed that about 2.7 million cases of Covid-19 and about 1.5 million cases of monkey pox respectively due to unsafe injections and mostly due to very poor waste management systems.

The researcher observed that many hospital/clinics environment in Nigeria are untidy. This may not be unconnected with the fact that many people are not knowledgeable that medical waste contributes substantially to environmental pollution and hazardous to health of everyone that can come in contact with the hospital environment. Akinwale, Abimbola, Mynepalli, Colin, Paul and Felix (2019) revealed that, it is important to note that medical wastes, if not properly managed, could pose an even greater threat and hazards than the original diseases. Thus, this study investigated the knowledge of clinic/ hospital cleaners towards medical waste management in Kano State of Nigeria.

Objectives of the Study

The objectives of this study are:

1. To determine the knowledge of hospital cleaners regarding medical waste management in Kano state.
2. To find out the differences in the knowledge of Clinic/Hospital cleaners towards medical waste management based on their demographic variables (age range, sex and level of education) in Kano State.

Research Questions

The following research questions were raised to guide this study:

1. Are clinic/hospital cleaners knowledgeable about medical waste management in Kano state?
2. Do Clinic/Hospital cleaners differ in their knowledge of medical waste management based on their demographic variables (age range, sex and level of education) in Kano State?

HYPOTHESES:

H_{O1}: Clinic/hospital cleaners in Kano state do not have significant knowledge of medical waste management.

H_{O2}: There is no significant difference in Knowledge towards medical waste management among Cleaners in Clinic/Hospital due to demographic variables (age range, sex and level of education) in Kano State.

Methodology

This study investigated the knowledge of clinic/ hospital cleaners towards medical waste management in Kano State of Nigeria. Two research questions were raised and two hypotheses were tested. Descriptive research design of survey type was used in this study. Descriptive survey attempts to establish the range and distribution of some social characteristics, such as education or training, knowledge, occupation, and location, and to discover how these characteristics may be related to certain behaviour patterns or attitudes (Marilyn, 2018). Descriptive survey is suitable for this study since it attempts to find out the knowledge of clinic/ hospital cleaners towards medical waste management in Kano State of Nigeria.The population of this study consists of all clinic/hospital cleaners in Kano State. The state has a total of 1,346 Health Facilities (HF) comprising 2 tertiary, 34 secondary, 1066 primary and 244 private Health Facilities across the 44 Local Government Areas. Some of these Health Facilities (HF) in Kano State are under National Health Insurance Scheme (NHIS) (HMBKNS, 2022). Three (3) hospital/Clinics were purposive selected for the purpose of this study. The total population of clinic/hospital cleaners in three (3) selected healthcare facilities is one thousand and thirty- one (1031) (Kano State ministry of Health 2022). The total sample used for this study consists of 278 clinic/ hospital cleaners. This selection is done in accordance with (Krejeie & Morgan, 1990), who recommended the sample size of two hundred and seventy eight (278) for a population of one thousand (1000). The sample technique is used involve stratified random sampling and purposive sampling techniques.The instrument used for data collection was researchers' developed questionnaire. It was validated and standardized with reliability index of 0.85. The administration and retrieval of the questionnaire was done within six weeks. All data collected were statistically analysed as presented on the tables below:

Research Questions

As the purpose of this study was to assess knowledge hospital cleaners towards medical waste management in Kano State, the structured research question answered by the respondents are present here. Thus, the mean scores of the responses for the different aspects of knowledge and practice were statistically computed with the results presented in the tables below:

Table 1: Mean scores of Responses on Knowledge of hospital Cleaners towards Medical Waste Management in Kano State

S/NO	STATEMENT	MEAN SCORE	STANDDARD DEVIATION
1	Medical waste can be generated in hospital, clinics and places where diagnosis and treatment are conducted	3.3893	1.07346
2	Handling medical waste is a hazardous activity which requires a high standard of training	2.9454	1.4167
3	Medical waste contained chemical which are ignitable, reactive, corrosive and toxic and can cause harm to the body tissues of clinics, hospitals and other staff	2.8361	1.22633
4	Medical waste contained substance which include contaminated pharmaceuticals product, expired drugs, vaccine and sera that is potentially harmful to clinic/hospital workers	3.5492	0.95238
5	Radioactive medical wastes includes unusual liquids from laboratory, contaminated glassware, package or absorbent paper, urine and excreta from patient treatment and can lead to various forms of diseases such as gene mutation cancers	3.2336	1.2751
6	Anatomic medical waste consists of body parts and tissues that include placenta, amputated limbs and excise organs	3.0111	1.3655
7	Sharp medical waste consists of used syringes, needles and blades which are capable of transferring infective agents especially when it pierces the skin	2.9734	1.4593
8	Waste equipment such as swabs, bandages and disposable medical devices are generated from patients isolation wards, autopsies and laboratories	2.4172	1.6517
9	Contaminated injection equipment may be scavenged from waste areas of the clinics/hospitals and dump site and sold to be reused again	3.1475	1.3565
10	Medical waste management in hospitals /clinics leads to a reduction in volume, weight and risk of infection	2.1241	1.5230
	AGGREGATE MEAN	**3.0559**	**1.3085**

Table 1: Shows responses of knowledge of hospital cleaners towards medical waste management in Kano State. A look at the items statements 4 to 13 shows that the means scores of the responses of Cleaners is above the assumed mean of (2.5) while the item statement 11 has a mean score of 2.4 which is less than the assumed mean from the table. An aggregate mean score of 3.06 was recorded for all the items which signified that the

respondents unanimously agreed that hospital cleaners in Kano state are knowledgeable about medical waste management.

Hypotheses 1: There is no significant difference in Knowledge towards medical waste management among Cleaners in Clinic/Hospital due to demographic variables (age range, sex and level of education) in Kano State.

Table 2: T-Ratio for difference between mean scores obtained responses and fixed mean scores of responses of Knowledge and different demographic variables

VARIABLES	MEAN	STANDARD DEVIATION	STD ERROR MEAN	DF	t- Value	p. value
Pair 1 Sex – Knowledge.	0.3115	0.82733	.05296	234	5.881	0.001
Pair 2 Level of Education- Knowledge	1.6189	0.74688	.04781	240	33.857	0.001
Pair 3 Age Range – Knowledge	1.2418	1.28418	.08221	240	15.105	0.001
Pair 4 Profession- Knowledge	1.4344	1.61519	.10340	240	13.872	0.001

t(239) = 1.960, <0.05

The various demographic variables (age range, sex, level of education and profession) were tested with four different questions based on of the Clinic/Hospital Cleaners. The aim is to ascertain whether there is significant difference among Clinic/Hospital Cleaners knowledge on medical waste management as compared with their different demographic variables. Table 2 reveals that there was a significant different in knowledge by sex.

The result showed the t value of 5.881 at the 239 degree of freedom (DF) and significant difference level of 0.001 ($p<0.05$)with this observation the null hypothesis is rejected. There is significant difference in knowledge of Clinic/Hospital Cleaners due to sex (gender) in Kano State. The level of education was also tested with knowledge, the result from the table the observed t value of 33.857 at 239 degree of freedom (DF) and test of significance level is 0.001 ($p<0.05$) obtained in the table with this observation. The null hypothesis is rejected because there is significant difference in knowledge towards medical waste among Clinic/Hospital Cleaners due level of education in Kano State.

Age Range is testes with the knowledge. The result showed as a means of 1.24180 which is lower than the test mean of (2.5) which indicate disagreement. The observed t-value for the test is higher than the critical value of 1.96 for t at the 239 degree of freedom (DF) and the level of significance in knowledge towards medical waste management in Kano State. The result from the table showed that knowledge is significant towards medical waste

management of Cleaners in Clinic/Hospital in Kano State. This is deduced from the observed t-value of 13.872 at the 239 degree of freedom (DF) and a significance level of 0.001 ($p<0.05$) obtained from the table. With this observation the null hypothesis that there is no significant difference in knowledge of Clinic/Hospital Cleaners towards medical waste management in Kano State is rejected and alternate hypothesis that there is significant difference in knowledge towards medical waste management among Clinic/Hospital Cleaners in Kano State is adopted.

Having considered the knowledge of Cleaners with the Demographic Variables in Age range, Sex and level of Education of Cleaners from test 1 to 4 we conclude that the null Hypothesis there is no significant difference among Cleaners in their knowledge towards medical waste management in Clinic/Hospital in Kano State is rejected. Hence there is significant difference among Clinic/Hospital Cleaners in their knowledge towards medical waste management in Kano State.

Discussion

Knowledge of Clinic/Hospital Cleaners towards Medical Waste Management: Table 1 above revealed the Clinic/Hospital Cleaners knowledge about medical waste management. The aggregate mean score of (3.1) show that Clinic/Hospital Cleaners are knowledgeable about medical waste management. This accounts for about (89%) of the respondents with very good knowledge because the test mean is greater than the assumed mean. While only (11%) of the respondents has poor knowledge, therefore null hypothesis is accepted. This finding supported the finding of Olubunmi (2021) who stated that majority of the Clinic/Hospital Cleaners have knowledge of medical waste management but their practices call for concern. It is also in line with Olubukola (2020) who opined that the absence of proper medical waste management, lack of knowledge about health hazards from medical waste, insufficient financial and human resources as well as poor control of waste disposal are the most critical problems connected with medical waste management. This is expressed by findings of the study on the health hazard associated with medical waste management with a test score of (2.4) which is less than the assumed mean. This finding also supported the work of Longe and Williams (2019) which state that inadequate and inappropriate knowledge of handling medical waste management may have serious health consequences and significant impact on the environment.

Conclusion

On the basis of the results and in view of the limitation of the study, it was concluded that clinic/hospital cleaners in Kano State have adequate knowledge about medical waste management and how to dispose of different kinds of waste as most of them undergo different training, seminars and sanitisation programmes on the effect of poor medical waste management on the patients, staff and environment.

Recommendation

Based on the conclusion, the following recommendations were made:

1. There should be training and retraining of all clinic/hospital cleaners to ensure compliance of sustainable medical waste management in the Clinic/Hospital in Kano State.
2. Provision of adequate information on medical wastes management practices inform of posters in every Clinic/Hospital will help to further enlighten staff and ensure compliance on how to dispose of medical wastes.

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