

ASSESSMENT OF KNOWLEDGE OF HEALTHCARE WASTE MANAGEMENT PRACTICES OF PUBLIC HEALTH WORKERS IN GENERAL HOSPITALS OF KATSINA STATE

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Abstract

This research sets out to determine how healthcare waste management practice affects public health workers' knowledge in Katsina State's general hospitals. This research used a cross-sectional survey design. All public health personnel managing healthcare wastes employed at general hospitals in Katsina State were included in the population. The General hospitals were stratified into the three existing senatorial zones. Purposive sampling method was used to select two general hospitals in each of the zones. 20% of the population of public healthcare workers in charge of waste management practice were selected for this project in each of the hospitals. Researchers' designed questionnaire was used for this study which was subjected to pilot test and analyzed using Cronbach's Alpha with internal consistencies of 0.719 generated. The data collected were analyzed using descriptive statistics of mean and standard deviation. While independent sample t-test was used to compare the opinion of male and female public healthcare staff. The hypothesis was tested at 0.05 level of significance. The result of the finding shows that the hypothesis was accepted showing that the view of both male and female public healthcare workers on knowledge variables considered for this study were accepted. The study concluded that, the knowledge of both the male and female public healthcare workers were not significant. Their opinions on knowledge does not differ from each other's on healthcare waste management practice.

Keywords: Assessment, Knowledge, Public health, Workers, Healthcare.

Introduction

Healthcare wastes are special type of wastes produced in small quantities that carry a high potential of infection and injury. Inadequate knowledge of public health workers may have serious public health consequences and a significant impact on the environment such as infection, injuries and risk of polluting the environment, water and air (Sapkota, Gupta & Mainali, 2014; World Health Organisation (WHO), 2011). Healthcare waste (HCW) is generated from hospitals or healthcare related facilities and is considered a major source of environmental contamination because it is made up of potentially harmful substances. In some developing countries, management of HCW has become an issue of concern. Healthcare waste (HCW) is the second most hazardous waste after radiation waste (Wafula, Musiime & Oporia 2019).

Globally HCW requires proper management by healthcare workers in the areas of pathological, infectious and culture materials, as well as chemicals, and infectious radioactive wastes (Nwachukwu, Orji, & Ugbogu, 2013). About nine categories of HCW are generated in the hospital for easy identification for waste handling, treatment, and proper disposal (Hasan & Rahman, 2018). Due to the poor nature of HCW knowledge as well as practices regarding sustainable healthcare waste management methods like waste segregation and waste recycling, are often poorly examined and documented in several countries despite the health risks posed by the improper handling of these wastes (Oke, 2008). Healthcare waste is a special category of waste that contributes to environmental hazards because they often contain materials that may be harmful and can cause ill health to those exposed to it. Evidence has shown that the inappropriate handling and disposal of healthcare waste constitutes a health risk to healthcare workers. Even children and scavengers whose resident are close to health facilities are also at risk and may become exposed to infectious wastes and are at high risk of diseases like HIV/AIDS (Adegbite, Nwafor, Afon, Abegunde, & Bamise, (2010). Several options are available for the proper disposal of bio-medical waste, but incineration is a better option for the final disposal of healthcare waste management (Awodele, Adewoye & Oparah (2016). Many hospitals in Nigeria may not practice incineration of healthcare waste probably because the incinerator releases different pollutants into the atmosphere resulting in health deterioration and environmental pollution (Wafula et al., 2019). Untreated HCW in landfills is known to contaminate underground water resulting in environmental hazards (Janine, 2014). HCW produced during the laboratory procedures used for diagnosis, treatment and immunization should be treated if the healthcare workers are given adequate training that could improve their knowledge on the job (Nwachukwu et al., 2013). Reports are available on the management of household wastes; however, only a few studies have been conducted to assess the knowledge of healthcare wastes regarding healthcare waste management in Nigeria (Abah & Ohimain, 2011; Nwachukwu et al., 2013; Awodele et al., 2016).

Knowledge of healthcare waste by the public health workers can help patients and visitors to understand their role in maintaining good hygiene, and to become more responsible for the wastes they produce. Knowledge of HCW management should be part of total hygiene practice of the society rather than confining it to hospitals and healthcare facilities. Ahmed, Mayayada, Mahamed and Aleya (2015) reported that, "knowledge is usually gained through information provided by medical experts, teachers, parents, friends, books and newspapers". In many countries, knowledge about the potential for harm from healthcare waste has now become more prominent to governments, medical practitioners and civil societies. Increasingly, managers and public health workers are expected to take more responsibility for the wastes they produce from their medical care and related activities.

Ramesh, Ratana and Jail (2016), stated that, "the knowledge among healthcare workers regarding healthcare wastes management could be improved through continuous and dedicated training in hospitals". Knowledge about segregation of healthcare waste has been reported poor among the public health workers and has been shown to satisfactorily improve after the training. Poor knowledge among health professionals regarding the wastes management had been associated with risk and is known to be the highly contributing reason to poor disposal practices. Public Health workers awareness in Cameroon has also been reported below standard. Paramedical staff has poor knowledge on proper segregation in

colour coding within the hospital as compared to their auxiliary staff. Hospitals in developing countries, have similar kind of issues among healthcare workers with poor skills, knowledge and attitude to efficiently handle the healthcare wastes at their work places.

Objective: The objective of this study determined how healthcare waste management practice affects public health workers' knowledge in Katsina State General Hospitals.

Research question: What impacts do healthcare waste management practice has on the gender-based knowledge of public health workers in Katsina State's general hospitals?

Hypothesis: Gender does not significantly affect how healthcare waste management practice affects public health workers' knowledge in Katsina State's general hospitals.

Materials and Methods

The population for this study comprised all public health workers who were working with General Hospitals in Katsina State of Nigeria. These categories of healthcare workers involved in waste management practice were used for this study. The design for this project was cross-sectional survey, in which the investigator studied the dependent variables and then examine the data retrospectively to establish causes, relationships and their meanings (Cohen, Manion, & Morrison, 2007). The General hospitals were stratified into the three existing senatorial zones in Katsina State. The zones are; Funtua zone, Katsina zone and Daura zone. Purposive sampling method was used to select two General Hospitals in each of the three senatorial zones of Katsina State. The General Hospitals (GH) purposively selected were; Funtua Zone (Malumfashi General Hospital with 302 Healthcare workers and Funtua General Hospital with 310), Katsina Zone (Dutsin-Ma General Hospital with (270) and Jibia General Hospital with 315 healthcare workers) and Daura Zone (Daura General Hospital have 269 healthcare workers and Baure General Hospital with 183 workers). 20% of the population was selected for this project in each of the hospitals chosen for this project. Thus, in Funtua General Hospital, samples of 62 was chosen using simple random sampling of fish-bow methods. Same method was used to select 60 respondents in Malumfashi General Hospital, 54 at Dutsinma General Hospital, 63 at Jibia General Hospital, 54 at Daura General Hospital and 37 respondents at Baure General Hospital respectively. Researcher's designed questionnaire was used for this study which was subjected to pilot test and analyzed using Cronbach's Alpha with internal consistencies of 0.719 was generated. In this study, 330 copies of questionnaire were distributed to the respondents by the researcher and two research assistants were recruited in each of the General hospitals for the study. The research question posed by this study was described in mean and standard deviation, and the respondents' knowledge variables were analysed using independence t-test. The hypothesis was tested at 0.05 level of significance.

Ethical considerations: The approval was obtained from Katsina State Health Research Ethical Review Committee with Full Clearance Certificate of MOH/ADM/SUB/1152/1/759. Likewise, letter of approval to administer the instrument in each of the General Hospitals was issued by the Katsina State Hospital Service Management Board. The researcher sought the verbal consent of each of the respondents after an adequate explanation of the objectives of

the study to them. Confidentiality and data security were assured. Participation was made voluntary as each participant was at liberty to participate or decline.

Results

Table 1: Public Health workers level of Knowledge on Healthcare waste management

Items	N	Mean	SD
To separate healthcare waste involves the use of colour bags	330	3.32	0.832
I am aware of the importance of wearing personal protective equipment in my hospital	330	3.67	0.591
I have and I study the guidelines of healthcare waste management practice of my hospital	330	3.30	0.713
I am aware about the hazards of healthcare wastes	330	3.39	0.680
The knowledge I have on waste management helps me to safe guard myself from being infected with disease	330	3.55	0.628
The knowledge I have about waste management makes me to dispose waste by using open dumping method	330	2.89	0.999
Dumping of Wastes haphazardly destroy aesthetic appeal of environment	330	3.03	1.000

Table I revealed the knowledge of public health workers on healthcare waste management using 2.50 mean benchmark of agreement. Any score less than 2.50 is/are term to disagree with the statement in Table I. Therefore, as shown on the table all the mean agreed with all the items in Table I. This means that, the respondents have high knowledge of healthcare waste management practice in Katsina State General Hospitals.

Table II: Summary of t-test analysis of public health workers on knowledge of waste management

Group	N	Mean	Std	df	t-cal	Sig.	Decision
Male	206	23.3252	3.18473	328	2.132	0.34	Not significant
Female	124	22.5565	3.15276				
Total	330						

Table II shows the summary of t-test of public health workers on their knowledge of waste management based on their gender differences. This table indicated that the hypothesis which says there is no significant difference in the knowledge of public health workers in general hospitals in Katsina State on healthcare waste management practices based on gender is accepted. This is because the t-calculated is higher than the alpha level of significance 2.132(P>0.05). This means that all categories of public health workers both male and female knowledge of waste management practice in Katsina State does not really differ from each other.

Discussion of Findings

This study assessed the impact of knowledge of healthcare waste management practices on public health workers of General Hospitals in Katsina State, Nigeria. The analyses of the

research questions in Table 1 and II agreed with all the items. This means that, the both respondents knowledge of healthcare waste management practice does not differ in General Hospitals of Katsina State. The hypothesis which says there is no significant difference in the knowledge of public health workers in general hospitals in Katsina State on healthcare waste management practices based on gender is accepted. This is because the t-calculated is higher than the alpha level of significance 2.132($P > 0.05$). This means that both male and female public health workers knowledge of waste management practice in Katsina State does not really differ from each other. This study is therefore in line with Adegbite, *et al* (2010) that, once healthcare workers possessed correct knowledge, they can deploy positive attitude and safe practices on wastes segregation. Cleaners which are one of the categories of public health workers who have responsibility of disposing generated wastes from the hospital wards need to be trained adequately in waste segregation. The result of this finding also concurred with Olubukola (2009) that hospital records have confirmed high incidence of typhoid, cholera, dysentery, infectious hepatitis and guinea worm in urban settlements of Nigeria due to poor handling and disposal of healthcare wastes by the public healthcare workers in contrast with their knowledge of waste management. Wahab and Adesanya (2011) asserted that public healthcare health workers were aware that healthcare waste presents a high risk to doctors, technicians, sweepers, hospital visitors, and patients due to arbitrary management. It poses threats to environmental health and requires specific treatment and management prior to its final disposal. Anozie *et al* (2017) concurred that knowledge through training regarding infection prevention and safety measures for waste handlers has a significant positive impact in terms of protecting them against occupation-related health risks.

Arnesto, *et al*, (2012) said that, many health professionals in developing countries have only limited knowledge about the potential for toxic contaminants to enter the environment. They often have less than full knowledge about the public health and environmental impacts associated with pollution, and often consider burning or incineration of healthcare waste, even in devices without air pollution control systems, to be a positive public health measure. Few if any, curricula in academic training programmes for physicians, nurses, health specialists and administrators that covers waste management or impacts of waste treatment choices. However, healthcare professionals are generally very receptive to new information about environmental contaminants and the harm they can cause. When made aware of the associated environmental health threat, most healthcare professionals will support alternative waste management approaches that avoid generating and or releasing toxic pollutants to the environment, as long as these alternatives are practical, economical and do not compromise patient safety or care. Hence, the health sector should raise the awareness and advocates to minimize or eradicate the release of toxic materials in the environment. WHO, (2020) concurred that Public healthcare workers are responsible for the proper disposal of wastes hence, the need for them to be knowledgeable in healthcare waste management practice in order to effectively carryout their work. Most Public healthcare Workers are very vulnerable and are at risk of contracting infections associated with improper handling of healthcare waste, while patients and their visitors may be exposed to these health hazards. Adekunle, *et al* (2018) concurred in a study in Kenya in 2012 which highlighted lack of formal training in the management of healthcare waste among public healthcare staff in the hospital, and little interest from the hospital administration with regard to the appropriate disposal of healthcare waste. In a South African study in 2016 which highlighted poor knowledge among healthcare

professionals and the need for all staff working in healthcare to receive regular training to improve their knowledge and practice regarding healthcare waste disposal to minimise the risks associated with improper waste management. Sisay, et al, (2023) stated that the level of knowledge contributes greatly to the ability of workers to acclimatize to their work environment and act in a safe manner, as education and training provides basic knowledge regarding the work environment.

References

- Abah, S.O & Ohimain E.I (2011). Healthcare waste management in Nigeria: A case study. *Journal of Public Health and Epidemiology*, 3(3): 99–110.
- Adegbite, M.A., Nwafor, S.O., Afon, A.A., Abegunde, M.A. & Bamise, C.T. (2010). Assessment of Dental Waste Management in a Nigerian Tertiary Hospital. *Waste Management Research*.28:769-777
- Adekunle, O., Romona D. G. and Andrew, J. R. (2018). Knowledge, attitudes and practices of healthcare workers about healthcare waste management at a district hospital in KwaZulu-Natal. *South African Family Practice* 2018; 60(5):137–145
<https://doi.org/10.1080/20786190.2018.1432137>.
<http://creativecommons.org/licenses/by-nc/3.0>
- Ahmed, M.E., Mayadan M.R.M., Mahamed, D.E. & Aleya, H.M., (2015). Impacts of Health Education on Knowledge and Practices of Hospital Staff with regards to Healthcare Waste Management at White Nile. State main Hospital Sudan. *International Journal of Health Science*, 2015 July; 9 (3):315-331 <http://www.ncbi.nlm.nih.gov/pmc/articles/pmc4633493>. Retrieved on 19 August, 2016
- Anozie, O.B.; Lawani, L.O.; Eze, J.N.; Mamah, E.J.; Onoh, R.C.; Ogah, E.O.; Umezurike, D.A.; Anozie, R.O(2017). Knowledge, Attitude and Practice of Healthcare Managers to Medical Waste Management and Occupational Safety Practices: Findings from Southeast Nigeria. *J. Clin. Diagn. Res.* **2017**, *11*, IC01–IC04. [[Google Scholar](#)] [[CrossRef](#)] [[PubMed](#)]
- Arnesto, T., Savino, A. & Williams, K.T. (2012). Healthcare Waste Management: The Current Issue in Developing Countries. *Waste Management and Research* 30(6):559-561. sagepub.co.uk/journalspermissions.nav Doi:10.1177/0734242x12447999wmr.sagepub.com
- Awodele, O., Adewoye AA & Oparah AC (2016). Assessment of medical waste management in seven hospitals in Lagos, Nigeria. *BMC Public Health*, doi.10.1186/s12889-016-2916-1.
- Cohen, L., Manion, L. & Morrison, K. (2007). *Research Methods in Education* (6th ed). London and New York, NY: Routledge Falmer.
- Hasan, M.M & Rahman, M.H (2018). Assessment of healthcare waste management paradigms and its suitable treatment alternative: A case study. *Journal of Environmental and Public Health*, doi.10.1155/2018/6879751
- Janine, L.B. (2014). Emotion in Organisations: Resources for Business Educators. *Journal of Management Education* 2014, 38 (91):114-142.
- Nwachukwu, O.C., Orji, F, A., & Ugbogu, O.C., (2013). Healthcare Waste Management Public Health Benefits and the need for Effective Environmental Regulatory Surveillance in

- Federal Republic of Nigeria. <http://dx.doi.org/10.5772/53196>. Available Online. (Accessed on 8th April, 2014).
- Oke, I. A. (2008) *Management of immunization solid wastes in Kano state, Nigeria*. Waste Management. 28: 2512-2521.
- Olubukola, B.O. (2009). Comparative Analysis of Healthcare Waste Management Practice in two General Hospitals in Nigeria. <http://www.eco-web.com/edi/index.html> Available online. (Retrieved on 15th October, 2015).
- Ramesh, K., Ratana, S., & Jamil, A. (2016). Impact of Waste Management Training Intervention in Knowledge, Attitude and Practices of Teaching Hospitals Workers in Pakistan. *Pakistan Journal of Medical Sciences*, 2016 May- June; 32(3):705-710
- Sapkota, B., Gupta, G.K., & Mainali, D., (2014). Impact of intervention on healthcare waste management practices in a tertiary care governmental hospital of Nepal. <https://dot.org/10.1186/1471-2458-14-1005>.retrieved on 25th October, 2015.
- Sisay, K., Abayneh M., Habtamu D., Meseret G.M. Seblework M. Taffere A. and Argaw A. (2023). Safety Practices and Associated Factors among Healthcare Waste Handlers in Four Public Hospitals, Southwestern Ethiopia. *Safety* 2023, 9, 41. <https://doi.org/10.3390/safety9020041>
- Wahab, A.B., & Adesanya, D.A., (2011) Medical Waste Generation in Hospitals and Associated Factors in Ibadan Metropolis, Nigeria. Department of Building, Obafemi Awolowo University, Nigeria. *Journal of Applied Sciences, Engineering and Technology* 3 (8): 746-751.
- Wafula, S.T, Musiime J & Oporia, F. (2019). Health care waste management among health workers and associated factors in primary health care facilities in Kampala City, Uganda: A crosssectional study. *BMC Public Health*, 19(203): 1-10
- World Health Organisation (WHO) (2011). Healthcare Waste Management.to reduce the Burden of disease, healthcare waste Needs, sound management, including alternatives to incineration. Factsheet No.281.
- World Health Organisation (WHO) (2020) Health-care Waste. <https://www.who.int/news-room/factsheets/detail/health-care-waste>, retrieved 05-07-2020.