FUDMA Journal of Renewable and Atomic Energy (FJoRAE)
ISSN: 3027-2335
Vol. 1 No 1, March 2024. Pp 17-25.

https://doi.org/10.33003/fjorae.2024.0101.02

Impacts of Physical Health Hazards of Healthcare Waste Management Practice on Public Health Workers in General Hospitals of Katsina State, Nigeria

Olusegun L. Badaki [1*], Saba Mohammed[2] and Umar N. Jibril[3]

[1*, 2] Department of Human Kinetics and Health Education, Federal University Dutsin-Ma, Katsina State, Nigeria.
[3]Department of Nursing Science, College of Health Sciences, University of Ilorin, Nigeria
*** Corresponding author's email**: obadaki@fudutsinma.edu.ng[1],

Abstract

This research determines the impact of physical health hazards of healthcare waste management practice on public health workers' in Katsina State general hospitals. This research used a cross-sectional survey design. All public health personnel 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. Twenty percent (20%) of the population of public healthcare workers in charge of waste management practice were selected for this project in each of the hospitals. Researcher's designed questionnaire was used for this study which was subjected to pilot test using Cronbach's Alpha with internal consistencies of 0.719. The data collected were described in mean and standard deviation to describe the research question raised for this study. While t-test independent sample 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 shows that the hypothesis was accepted showing that the view of both male and female public healthcare workers on physical health hazards variables considered for this study were not significant. The study concluded that, the physical health hazards of both the male and female public healthcare workers were not significant. The opinions of public healthcare workers on physical health hazards does not differ from each other's on practice of healthcare waste management in General Hospitals in Katsina State.

Keywords: Physical health hazards, Public health, Workers, Healthcare, Waste

1. Introduction

Healthcare wastes are a unique class of wastes that are created in small amounts and have a significant risk of contamination and harm. Public health professionals that handle the situations inadequately or improperly run the risk of causing infections, hazardous effects, injuries, and 4environmental, air, and water pollution, among other major public health implications (Sapkota *et al.*, 2015; WHO 2021). Shahida et al.

(2005) revealed that healthcare waste came into limelight in 1983 when the World Health Organization, European Office convened working group at Bergen. At the conference, some professionals from 19 countries of the World participated; and concluded that healthcare waste requires a system approach involving; the awareness, segregation, and source of reduction of radioactive waste. EPA, (2017) defined healthcare waste as a subset of waste produced in health facilities, such as hospitals and research and development centres. Healthcare waste are wastes contaminated by blood, body fluids or other potentially infectious materials are often referred to as regulated medical waste.

Globally, WHO, (2021) reported that, developed countries generates one to five kg/bed/day, while in developing countries, shows some meagre data on waste generated, but available data indicated lower figures of between one to two kg/patient/day. The report also shows 85% of healthcare waste to be non-hazardous, 10% infectious waste; while five percent are non-infectious but hazardous. Nwankwo, (2018) contended that the quantity of waste produced in some hospitals depend on the socio-economic national income and the type of facility concerned in some developing countries. In Kenya, about zero-point-five percent kilogram of healthcare waste were generated from patients admitted in the hospitals (Muthoni *et al.*, 2016). Muthoni et al. (2016) reported that, the amount of healthcare waste generated, collected, transported, stored, treated, and disposed have recently become a serious concern for public health workers due to the devastating impacts on the environment and the patients. Muthoni et al. (2016) furthered that the health facilities, laboratories, pharmaceutical stores/units, mortuary and autopsy centers, animal research and laboratories, blood banks and collection centers, accident emergency units, delivery units, and nursing homes are the main sources of generating healthcare waste in the hospitals. Healthcare facilities generate wastes by-products of which can be classified into infectious and non-infectious wastes (Kitsios & Kamariotou, 2021). Infectious wastes contain pathogens in quantitative proportion that could spread infectious diseases to human on exposure to the pathogen.

Healthcare waste management practice refers to the process of managing the trash generated by hospitals and to prevent the spread of infections. There is a dearth in physical health hazards on healthcare waste management in developing nations, in the areas of collection, segregation, storage, transportation, and disposal (Wachukwu & Leanva, 2014). Physical health of healthcare workers has been a major challenge in recent times. Large quantity of solid wastes generated are needed to be collected, transported, treated and finally disposed - of (Alagoz & Kocasoy, 2007: Abah & Ohimain, 2010). Unfortunately, in many developing countries, Nigeria inclusive, the system for managing healthcare wastes were inefficient and cannot cope with the large volumes of waste being generated.

In some developed countries, it was evidently observed that public healthcare workers attended classes and/or short courses on how to properly manage the healthcare waste

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as a way of equipping them with the knowledge, and skills necessary to protect them and other healthcare workers, patients/clients, and the community at large from health hazards. It is unclear in some developing countries whether public healthcare workers are trained on healthcare waste prevention, control and management strategies that could reduce injuries and other health hazards at work place (Millanzi *et al.,* 2023). Healthcare wastes 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 workers exposure, and the responsibilities of individuals' workers (Manyele & Lyasenga, 2010). Nwachukwu et al. (2013) asserted that, public education on waste reduction and on proper handling and storage is also needed to minimize the risks of disease and injury.

Rami *et al.* (2017), observed that improper disposal of healthcare wastes, specifically burning wastes in the open, poses serious danger on the health of waste workers. Some of the most dangerous pollutants emitted are dioxins, particle pollution, carbon monoxide and volatile organic compounds. Dioxins are persistent, bio-accumulative and toxic pollutants that settle on plants, thus building up in the food chain and resulting in harmful effects. Some of the adverse effects of dioxins include suppression of immune systems, disruption on hormonal system and cancer. Particle pollutants are microscopic particles that can aggravate respiratory conditions such as asthma and bronchitis and are associated with cardiac and heart attacks. Carbon monoxide can cause neurologic symptoms in people exposed to significant burning of garbage; these symptoms include headache, fatigue, nausea and vomiting. Inhaling volatile organic compounds can cause headaches, loss of coordination, nausea, damage to the liver, kidney and central nervous system and irritation to the eye, nose and throat. Hence, the broad spectrum of adverse effects caused by emission of these compounds into the atmosphere calls for serious restructuring of waste management in Lebanon. The substantial environmental, health and safety risks associated with uncontrolled (open) dumping of solid waste have been well- established through many studies performed in developing countries. Over 70% of scavengers in Nigeria may have respiratory and other waste related diseases. Owing to the health implication of these waste, there had been calls for appropriate legislation on safe disposal of Healthcare Waste within and outside Nigeria (Amadi, 2009). Muthoni *et al.* (2016) advanced that the severity of the physical hazards for healthcare workers responsible for handling or disposal of genotoxic wastes is governed by a combination of the substance toxicity itself and the extent and duration of exposure. Waste and by-products can also cause poisoning and pollution, whether through the release of pharmaceutical products, in particular antibiotic and cytotoxic drugs, through the waste water or by toxic elements or compounds such as mercury.

Based on the observations of the researcher, it was discovered that, in some General Hospitals in Katsina State of Nigeria, healthcare wastes were indiscriminately managed and often mixed with municipal waste, which may cause serious health and environmental challenges, particularly to the public health workers and scavengers operating at dump sites. The physical health impact of the inhuman conditions experienced by the public health workers in charge of collection and disposal of waste in

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the hospitals could be vividly observed in most General Hospitals in Katsina State. Thus, these observations prompted the researcher to assess the impact of physical health hazards of healthcare waste management practices on public healthcare workers in Katsina State General Hospitals.

The objective of this study determined how healthcare waste management practice affect the physical health of public healthcare workers in Katsina State General Hospitals. The research question for this work, stated to know the impact of physical health hazards of healthcare waste management practice have on the public health workers in Katsina State General hospitals based on gender differences. The hypothesis for this study stated that gender does not significantly affect how physical health hazards of healthcare waste management practice affect public health workers in Katsina State General Hospitals.

2. Materials and Methods

The population for the study comprised of all public health workers who are 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 researcher studied the dependent variables and then examine the data in order to establish its relationships (Cohenet al., 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 purposively selected were; Funtua Zone (Malumfashi General Hospital with 302 Healthcare workers and Funtua General Hospital with 310, Katsina Zone (Dutsin-Ma had 270 and Jibia General Hospitals with 315 healthcare workers and Daura Zone (Daura General Hospital have 269 healthcare workers and Baure General Hospitals with 183 workers). About 20% of the population were selected for this project in each of the hospitals chosen for this study. 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 using Cronbach's Alpha with internal consistencies of 0.719. In this study, 330 copies of questionnaire were distributed to the respondents by the researcher and two research assistants recruited in each General hospitals for the study. The research question posed by this study was described using mean and standard deviation, and the respondents' physical health hazards variables were analyzed using t-test independence. The hypothesis was tested at margin error of 0.05 level of significance.

3. Ethical considerations

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The approval of ethical consideration was gotten from Katsina State Health Research Ethical Review Committee with reference number: MOH/ADM/SUB/1152/1/759 (Katsina State Ministry of Health, 2023). Likewise, letter of approval to administer the instrument in each of the General Hospitals was issued by the Katsina State Hospital Service Management Board. Consent letter was given to each respondent after an adequate explanation of the objective of the study to them. Confidentiality was assured and participation in the study was made voluntary.

4. Results

Table I: Physical hazards of healthcare waste management practices

Items	N	Mean	SD
I feel tired even with adequate sleep.	330	2.93	1.022
I am frustrated in carrying out my responsibility as a public health work due to insufficient working tools	330	2.68	0.994
I am irritable and impatient with hospital authority over small inconveniences as a result of being a public health worker.	330	2.41	0.954
Due to insufficient protective materials, I usually have cuts on my body	330	2.74	1.003
I want to withdraw from the constant demands on my time and energy as a result of being a cleaner.	330	2.67	1.051
None provision of nose mask makes me irritated while collecting refuse waste	330	2.91	0.893
The odour generated due to waste lasting more than 48 hours usually affects my health	330	2.58	0.993

Table I shows the mean scores of the respondents to be above 2.50 benchmark of decision making. This means that all the respondents were in agreement with the items in Table I. This indicates that majority of the public health workers were exposed to physical hazards on their job.

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Table II: Summary of t-test analysis of health care waste management practices on physical health hazards

Group	N	Mean	Std	df	t	Sig.	Decision
Male	206	18.2573	4.57318	328	-1.478	0.140	Not significant
Female	124	19.0161	4.42459				
Total	330						

Table II revealed that the t-value computed was -1.478 and the p-value was 0.140 that was observed in this study. The study also shows that the p-value is higher than the alpha value of 0.05. It is therefore mean that the hypothesis which says that there is no significant difference on the impacts of healthcare waste management practices on the physical health of public health workers in general hospitals of Katsina State based on gender is accepted. This finding shows that the view of respondents' male and female on the impact of healthcare waste management practices on the physical health of public health workers does not differ.

5. Discussion of Findings

The study shows that the physical health hazards of public health workers on healthcare management practice in Katsina State general hospitals was not significant. The hypothesis was not significant because the opinion of both male and female public healthcare workers does not differ from each other on variable considered for this study. The finding concurred with Wahab and Adesanya (2011) that healthcare waste presents a high risk to doctors, technicians, sweepers, hospital visitors, waste workers, and patients due to arbitrary management. It poses threats to environmental health and requires specific treatment and management prior to its final disposal. Adewumi (2009) and Amadi (2009) agreed with the finding that sharp objects such as blades and broken glass, can be fatal and represent a special hazard due to their ability to prick and contaminate someone who is handling them. They therefore suggested that all sharps be placed in rigid puncture resistant containers or recapped and stored in a special safety box, kept considerably out of reach of unauthorized staff. Similarly, Mangizvo (2008) reported that sanitary health workers use bare hands and wear no protective clothing. This lack of protective clothing and equipment puts them in direct contact with hazardous wastes such as broken glass, human and animal faecal matter, paper that may have become saturated with toxic materials, as well as containers with residues of chemical, pesticides, and solvents. They are also exposed to needles, bandages, and other refuse from hospitals, exposing them to diseases, such as HIV and AIDS, and Hepatitis. Anna et al. (2016) corroborated that segregation is a proper manner of disposing of wastes in the hospitals according to its type; for example, biological wastes is separated according to the colour coded plastic bags, to protect oneself and those who are around from infections, diseases and injuries. Likewise,

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Rajnnarayan, (2008) affirmed that the condition of working and living for environmental health workers is so appalling in general that voluntary group assist them with emergency aid and the development of organizational skills to press for land right. Mandaaet al. (2023) concurred that the social status of public health workers, most especially the environmental health workers in areas of income-earning was not adequate, but cleaners are usually inhibited by social barriers. Environmental health workers such as environmental health technicians, assistants and technologists are usually subjected to other forms of physical hazards, such as; hand injuries, accidents, infections and defilement associated with wastes collection, transport and deposition which cannot be readily changed. The continue association of particular gender groups with dirty work severely restricts the ability of the public health workers to improve their status, to take alternative work, and even to advance their children through education. Ahmed et al. (2018) revealed that some category of healthcare workers such as Cleaners who have responsibility to dispose waste generated from the hospital wards will also need to be exposed to training and seminars in waste segregation that would empower them to do a diligent work that could reduce their exposure to physical health hazards.

Conflict of Interests: This manuscript is an original work by us which are unpublished anywhere else and we have obtained necessary permission to carry out the study.

6. Conclusion

The study concluded that, the physical health hazards of both the male and female public healthcare workers were not significant. Their opinions on physical health hazards does not differ from each other's on healthcare waste management practice.

7. Recommendations

There is the need for the Katsina State Ministry of Health to adequately provide sufficient working materials, protective gloves, training and given necessary incentives that could empower the public healthcare workers without gender discrimination that would guide them from exposure to all forms of physical hazards. Proper healthcare waste management practices should therefore be strictly followed by the public health workers in all healthcare facilities as parts of comprehensive and systematic approach to hospital hygiene and infections control.

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