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Healthcare waste management in selected government and private hospitals in Southeast Nigeria



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ABSTRACT

Objective: To assess healthcare workers' involvement in healthcare waste management in public and private hospitals.

Methods: Validated questionnaires ($n = 660$) were administered to randomly selected healthcare workers from selected private hospitals between April and July 2013.

Results: Among the healthcare workers that participated in the study, 187 (28.33%) were medical doctors, 44 (6.67%) were pharmacists, 77 (11.67%) were medical laboratory scientist, 35 (5.30%) were waste handlers and 317 (48.03%) were nurses. Generally, the number of workers that have heard about healthcare waste disposal system was above average 424 (69.5%). More health-workers in the government (81.5%) than in private (57.3%) hospitals were aware of healthcare waste disposal system and more in government hospitals attended training on it. The level of waste generated by the two hospitals differed significantly ($P = 0.0086$) with the generation level higher in government than private hospitals. The materials for healthcare waste disposal were significantly more available ($P = 0.001$) in government than private hospitals. There was no significant difference ($P = 0.285$) in syringes and needles disposal practices in the two hospitals and they were exposed to equal risks ($P = 0.8510$). Fifty-six (18.5%) and 140 (45.5%) of the study participants in private and government hospitals respectively were aware of the existence of healthcare waste management committee with 134 (44.4%) and 19 (6.2%) workers confirming that it did not exist in their institutions. The existence of the committee was very low in the private hospitals.

Conclusions: The availability of material for waste segregation at point of generation, compliance of healthcare workers to healthcare waste management guidelines and the existence of infection control committee in both hospitals is generally low and unsatisfactory.

1. Introduction

Healthcare activities, although protect and restore health as well as save lives, generate a lot of wastes and by-products that

can impact on both health and environment [1]. Healthcare waste is a by-product of healthcare that includes sharps, non-sharps, blood, body parts, chemicals, pharmaceuticals, medical devices and radioactive materials [2]. Of the total amount of waste

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generated by health-care activities, about 80% is general waste. The remaining 20% is considered as hazardous material that may be infectious, toxic or radioactive [3]. Every year, an estimated 16000 million injections are administered worldwide, but not all of the needles and syringes are properly disposed of afterward. Health-care waste contains potentially harmful microorganisms which can infect hospital patients, health-care workers and the general public.

When hazardous health care wastes are not properly managed, exposure to them could lead to infections, infertility, genital deformities, hormonally triggered cancers, mutagenicity, dermatitis, asthma and neurological disorders in children; typhoid, cholera, hepatitis, AIDS and other viral infections through sharps contaminated with blood [1,4]. The people at risk of healthcare hazardous waste include healthcare workers, patients, visitors to healthcare establishments, workers in support services, workers in waste disposal facilities, fetuses in the wombs of mothers, members of public and scavengers [2,5]. Unfortunately, the adverse effects of healthcare hazardous wastes are usually not attributed to them unless a careful and thorough investigation is carried out. Improper handling of solid waste in the hospital may increase the airborne pathogenic bacteria, which could adversely affect the hospital environment and community at large. Improper medical management has serious impact on human environment. Apart from risk of water, air and soil pollution, it has considerable impact on human health due to esthetic effects [6].

The hazard in a healthcare setting includes exposure to blood, saliva, or other body fluids or aerosols that may carry infectious materials such as hepatitis C, HIV or other blood-borne or body fluid pathogens [7].

This research is a comparative study on healthcare waste management in selected public and private hospitals in South-east Nigeria.

2. Materials and methods

2.1. Study participants

A total of 1000 healthcare workers, belonging to different fields, were administered validated questionnaires out of which 660 questionnaires were recovered. The inclusion criteria were that the participants must have worked in the hospital for at least one full year in the case of government hospitals and 6 full months in the case of private hospitals and may be working in any of the following areas of the hospital: the medical, surgical, surgery/gynecology, neonatology/pediatrics, wards, the theater, intensive care unit, blood bank/hematology, chemical pathology, bacteriology/parasitology, histopathology laboratories, the HIV care unit, waste handling unit and the compounding or dispensing pharmacy units. The study participants ($n = 660$) were administered personally to healthcare workers consisting of 101 doctors, 159 nurses, 30 pharmacists, 20 waste handlers and 40 medical laboratory scientists from selected government hospitals and 86 doctors, 158 nurses, 14 pharmacists, 15 waste handlers and 37 medical laboratory scientists from selected private hospitals.

2.2. Ethical consideration

Nnamdi Azikiwe University Teaching Hospital, Nnewi and Anambra State University Teaching Hospital Amaku, Awka Ethics Committees approved the study protocols (approval

numbers: NAUTH/CS/66/Vol.4/53 and ANSUTH/AA/ECC/29 respectively) and permission to carry out the study was obtained.

2.3. Method of data analysis

Data was analyzed using SPSS version 16.0 (SPSS Inc, Chicago, Illinois, United States of America). Comparative statistics was used for quantitative data. Frequency distribution of variables was calculated. *Chi-square* was used to test association between the independent variables and their outcomes. The cut-off point for statistical significance was set at 5% ($P < 0.05$).

3. Results

Among the healthcare workers that participated in the study, 187 (28.33%) were medical doctors, 44 (6.67%) were pharmacists, 77 (11.67%) were medical laboratory scientist, 35 (5.30%) were waste handlers and 317 (48.03%) were nurses.

Figure 1 shows the number of healthcare workers that have heard of healthcare waste disposal system (HCWDS). From the study, the awareness of HCWDS was greater in government hospitals 251 (81.5%) when compared with that of private hospitals at 173 (57.3%). Generally, the number of workers that have heard about it was above average 424 (69.5%). There was significant difference ($P = 0.001$) in the level of knowledge of workers between the institutions being compared.

Figure 2 shows the analysis of healthcare workers that have attended training on HCWDS. The study showed that only 71 (11.6%) participants in the study had attended training on HCWDS. The number that have attended training on HCWDS in private and government hospitals were 21 (7.0%) and 50 (16.2%) respectively showing that significant difference ($P = 0.001$) existed between them.

The study showed (Table 1) that the level of waste generated by the two hospitals differed significantly ($P = 0.0086$) with the generation level in government hospitals higher than that in private hospitals. In public hospitals, the wastes generation level in descending order was as follows: infectious waste (72.1%), sharps (71.1%), general/domestic (56.5%), pharmaceutical (29.5%), chemicals (14.0%), pathological (6.2%), genotoxic (6.2%), radioactive (5.8%), heavy metal waste (3.6%). For private hospitals, the wastes generation level was in the following order: sharps (44.4%), pharmaceutical (28.8%), general (27.5%), infectious (25.8%), chemicals (10.6%), genotoxic (5.0%), radioactive (3.4%), pathological (2.3%), heavy metals (1.3%).

Table 2 assesses the risks associated with the healthcare waste in the hospitals. Our findings showed that both hospitals

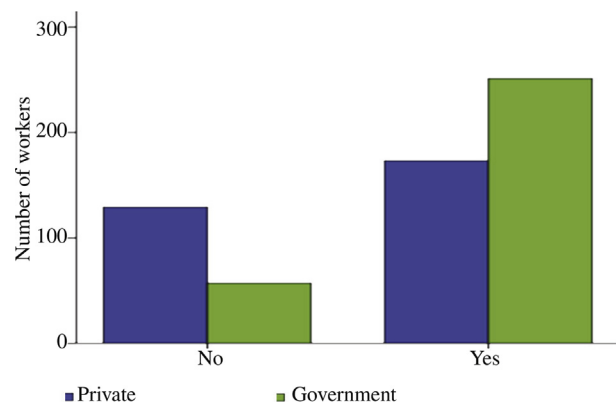


Figure 1. Analysis of the knowledge of healthcare workers on HCWDS.

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