Knowledge of Hospital Waste Management among Health Personnel in Rivers West Senatorial District of Rivers State

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Abstract

This paper examined knowledge of hospital waste management among health personnel in Rivers West Senatorial District of Rivers State. Three hypotheses were formulated to achieve the aim of the study. The study population comprised of all the health personnel in the one hundred and nineteen health facilities in Rivers West Senatorial District. A sample of 400 health personnel was selected for the study using multistage sampling procedure. Data was collected using a structured questionnaire and were analyzed using simple percentage (%), ANOVA and binary logistic regression. The analyses showed that health personnel have good knowledge of hospital waste management 210(52.5%) were found to be knowledgeable about hospital waste management. No significant difference was found between age of health personnel ($p>0.05$), gender $p<0.05$, df = 1, $X^2 = 70.124$), years in service ($p<0.05$, df = 4, $x^2 = 130.526$) and knowledge of hospital waste management. It was recommended among others that Government should provide adequate funds for better execution of waste management programmes. This would help secure modern waste management technology that could help make hospital waste management better.

Key words: Knowledge, Waste management, Rivers West Senatorial District and Rivers State

Introduction

Hospital waste management is a daily routine and needs to be addressed on daily basis. The term “hospital waste” or “biomedical waste” refers to any waste generated during diagnosis, treatment, immunization of human beings or animals, or in research activities pertaining diseases and health problems. It is characterized by the production and testing of biological products from man and animals. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste (park, 2011).

The level of knowledge of hospital waste management among health personnel in Nigeria is quite low compared to developed countries (Abah & Ohimain, 2011). Many health personnels in Nigeria may not have adequate knowledge on the segregation of waste in the hospital this situation disposes them to hazardous waste infections around the hospital premises. This mismanagement of hospital waste poses risk to the people and the environment. According to the Health Professions Council of South Africa (2008), many health personnels do not have good knowledge of the types of waste generated in the hospitals and their effect on the individual. Some hospital workers do not have a good knowledge on the methods of disposal of hospital waste.

In a study by Olaifa, Govender and Ross (2018) in KwaZulu-Natal reported poor knowledge of healthcare waste management was generally inadequate, with 42.7% of the participants scoring 'poor' overall. Another study by Azuike, et al, (2015), in Nigeria revealed that knowledge of health care waste management among the health care workers was high. In similar research by Bhattacharjee and Saha (2014 in Gazipur reported that, doctors had better knowledge of waste management than other 87-8% and were familiar with WHO guideline about the biological waste management and handling. Studies by Mahmoudi, et al, (2016), in (Tehran) showed that; the mean score of knowledge was 54-7 (+ 14-4) and their knowledge classified on a moderate level. There was positive correlation between knowledge, and age variables, the findings showed that there is a considerable deficiency about knowledge of the respondents in the study of fundamentals desirable management of sharp waste. This implies that age affect knowledge of hospital waste management. In another study by Makhura, Matlala and Kekeha (2016) in South Africa revealed that knowledge and practices of health care professionals with regard to medical waste disposal were not associated with age, gender or years of experience, there was an association between professional category and knowledge and practices.

Kumar, Samrongthon and Shaikh (2013) in a study carried out in Pakistan revealed that the mean age of the health workers was 30^{+}/-5 years. Infectious waste management practice within both hospitals were not found statistically significant (P = 0.33). However, the socio-demographic information like age, gender, level of education and experience when compared with the practice were found statistically significant (P<0.05). in a similar study by Mohammed, Othman, Hussain and Rashid (2017), in Sulaimani reported that factors which were significantly associated with the better knowledge score was male gender having a high educational degree, being trained in waste management and has been in service for more than 5 years. Another study by Khan, et al, (2017), in Muzaffarabad revealed that; Mean age of these participants was of 33 years (min 25-maz 41 years) and average work experience was 7 years. Among them, n67 (58%) were male and n47 (42%) were female. n13 (11.4%) were doctors, n68 (60%) were of paramedical staff and n33 (29%) were junior staff. The overall Satisfactory knowledge and attitude score (≥60% answers correct) of doctors was significantly higher than others. Knowledge about the color coding for specific wastes were insignificantly higher among doctors, rather only n4 (30.7%) doctors responded to this question. Sengodan and Anoruth (2017), in South India, the result showed that knowledge of biomedical waste management is more in the young doctors who scored an average of (7.99) followed by the nursing students (7.80) and laboratory technicians (7.55) out of 10. The result also indicated that knowledge is not uniform among individual group with a mean square of 4.057 and there exists considerable variation within the groups with a mean square of 1.035.

Statement of the Problem

Good knowledge of hospital waste management is enormous benefit to all individuals in various parts of the world as it helps convince health personnel to have positive attitude to manage hospital waste and prevent the spread of a lot of hospital borne diseases HIV/AIDS, Hepatitis B, skin disease, urinary tract infections among health personnel and visitors. The state of waste management in health facilities in Rivers State is typified by hips of refuse and made of packed liquid and solid materials in water proof on bare floors, or on the grouped at places close to the hospitals with easy access to scavenger, rodents and reptiles.

Lack of knowledge or misinformation about hospital waste management has led to health personnel portraying negative attitude towards hospital generated waste which has led to so many problems like

Purpose of the study

This study assessed the knowledge of hospital waste management among health personnel in Rivers West Senatorial District of Rivers State.

Research Hypotheses

1. There is no significant difference between age of health personnel and knowledge of hospital waste management in Rivers West senatorial district.
2. There is no significant difference between gender of health personnel and knowledge of hospital waste management in Rivers West district.
3. There is no significant difference between years in service of health personnel and knowledge of hospital waste management in Rivers West senatorial district.

Study Area

Rivers West Senatorial District is one of the three senatorial districts in Rivers State, Nigeria. The district covers eight Local Government Areas; Abua-Odual, Ahoada East, Ahoada West, Akuku Toru, Asari-Toru, Bonny, Degema and Ogba- Egbe-ma-Ndoni. In 2014, it had a population of 2,366,158 (Census, 2006).

Research Design

The study adopted the descriptive survey design. The researcher collected data on the knowledge of waste management and subject them to statistical interpretations without manipulating any variable in the study

Population for the Study

The population for this study consisted of all health personnel in the Rivers West senatorial district.

Sample and Sampling Techniques

The same size for the study consisted of 400 of health personnel in Rivers West senatorial district. Multistage sampling procedure was adopted in this study.

Research Instrument

The instrument for data collection was questionnaire designed by the researcher title knowledge and practices of hospital waste management among health personnel. The instrument was made of 2 sections. Section A provided the socio-demographic data of respondents and section B focused on knowledge of hospital waste management among health personnel

Validity of the Instrument

The instrument was validated by three experts in reproductive health and family planning. Suggestions from these three experts were incorporated in re-writing the final copy of the questionnaire.

Reliability of the Instrument

The reliability of the instrument was tested using the test-retest method and was analyzed using Pearson's Product Moment Correlation (r). A reliability value of 0.76 was obtained indicating that the instrument was reliable.

Methods of Data Analysis

Data collected from this study were analyzed using simple percentage (%) ANOVA and binary logistic regression,

Results

What is the level of knowledge of health personnels regarding hospital waste management?

Table 1: Knowledge of Hospital Waste Management

Item	Yes F(%)	No F(%)	Mean	SD	Decision
Personal protective equipment are to be used routinely when handling medical waste	379(94.7)	21(5.3)	2.62	0.57	Good
Placing medical waste in wrong bin is a high risk	400(100)	-	3.00	0.00	Good
There are waste bins for disposal of different types of wastes produced in the hospital	400(100)	-	2.50	0.00	Good
There is policy document regarding adequate disposal procedures of human tissue remains in your faculty	400(100)	-	2.51	0.00	Good
Disposing human tissue remains in domestic waste is an adequate disposal procedure	127(31.8)	273(69.3)	3.1	1.33	Good
Disposing expired blood units in domestic waste is an adequate disposal procedure	127(31.8)	273(68.2)	3.0	1.29	Good
Is it necessary to sort medical waste at the point of generation	295(73.8)	105(26.3)	2.55	0.90	Good
Liquid waste must be disposed into the sewage without processing or treatment	358(87.5)	42(10.5)	1.63	0.67	Poor
Do you consider used dressings, cottons and plasters as medical waste*	379(94.8)	-	2.00	0.00	Poor
Hospital used carton, papers and plastics are classified as medical waste	358(89.5)	42(10.5)	2.11	0.31	Poor
Improper waste disposal can lead to needle stick injuries	400(100)	-	3.00	0.00	Good
Are you aware that the colour code for disposal of human, biological and any object that has been in contact with body fluids is yellow	210(52.5)	190(47.5)	2.48	0.50	Poor
Do you know that the colour code for microbiological waste is red	295(73.8)	105(26.3)	2.84	0.81	Good
Untreated medical waste can be stored for not more than 48 hours in temporary storage area	337(84.2)	63(15.8)	1.58	0.75	Poor
Any waste mixed with medical waste must be treated as medical waste	378(94.5)	22(5.5)	2.61	0.46	Good
Are you aware that improper waste disposal may lead to transmission of diseases	358(89.5)	42(10.5)	3.11	0.31	Good
Grand mean				**0.49**	**Good**

*Non response excluded.

Table 1 revealed the knowledge of respondents on hospital waste management. The result showed that the grand mean = 2.54 which is greater than the criterion = 2.5. This implies that respondents had good knowledge of hospital waste management.

HO₁: There is no significant difference between age of health personnel and knowledge of hospital waste management.

Table 2: One-Way ANOVA result showing the significant difference between age of health personnel and knowledge of hospital waste management

Source	SS	Df	MSS	F-cal	P-value	Decision
Between groups	2.150	2	1.075	0.221	0.102	Rejected
Within groups	1482.115	398	5.370			
Total	**1484.265**	**400**				

***Significant**

Table 3 shows One-Way ANOVA on significant difference between age of health personnel and knowledge of hospital waste management. The finding of this study shows a significant difference as p>0.05 alpa level, F (2,398) = 0.221, p = 0.102. The null hypothesis which states that there is no significant difference between age of health personnel and knowledge of hospital waste management is rejected.

Table 3: Chi-squared test showing the significant relationship between gender of health personnel and knowledge of hospital waste management

Gender	Knowledge		Total	df	X^2-value	P-values
	Good F(%)	Poor F(%)				
Male	105(26.2)	169(42.3)	274(68.5)			
Female	105(26.2)	21(5.3)	126(31.5)	1	70.124	0.000
Total	210(52.4)	190(47.6)	400(100)			

***Not Significant.**

The null hypothesis states that there is not significant relationship between gender of health personnel and knowledge of hospital waste management. The findings of the study revealed a non-significant relationship between gender of health personnel and knowledge of hospital waste management (P<0.05, df = 1, $\mathbf{X^2}$ = 70.124). The null hypothesis is therefore accepted.

Table 4: Binary Logistic Regression analysis showing the significant relationship between years in service of health personnel and knowledge of hospital waste management

Years in service	Knowledge		Total	df	X^2	P-values	Odds Ratio (OR)	95%CI
	Good F (%)	Poor F (%)						
1-5	-	22(5.5)	22(5.5)	4	130.53	0.000	0.092 Ref	0.32-6.74
6-10	-	42(10.5)	42(10.5)					
11-15	42(10.5)	63(15.8)	105(26.2)					
16-20	42(10.5)	-	42(10.5)					
20 and above	126(31.5)	63(15.8)	189(47.2)					
Total	**210(52.5)**	**190(47.5)**	**400(100)**					

***Not Significant.**

On binary logistic analysis, the finding of the study shows a non-significant relationship between years in service of health personnel and knowledge of hospital waste management ($P<0.05$, df = 4, $\mathbf{X^2}$ = 130.53). The result shows that respondents who had spent fewer years in service were 10.87 times less likely to have good knowledge of hospital waste management compared to those who had spent longer years in service (OR=0.092, 95%CI: 0.32-6.74).

Discussion

Knowledge of health personnel regarding hospital waste management

In regard to the finding of this study, the result shows a good knowledge of hospital waste management among health personnel working in different health facility. It indicates that grand mean score (2.54) is relatively greater than the criterion referenced mean (2.50) depicting that the respondents had a relatively good knowledge of waste management in the hospital. The result is in consonance with studies by Azuike et al (2015) who stated that 126 (38.1%) of workers in the hospital have the knowledge of health care waste management among the health care workers was high but the practice of waste management was not optimal. Also, this study is in line with studies by Mahmoudi, Sepandi, Saffari, Jafari, & Masoumbeigi, (2016) shows a relatively high level of knowledge of sharp waste management among nurses with no deficiency of practice of the respondents. In the same vein, the finding of this study is agreed with that of Sengodan et al (2017) which revealed an insignificant influence with gender of health personnels and knowledge of hospital waste management ($p<0.05$, df = 1, $X^2 = 10.124$) but not surprisingly that females as w ell as males have taken knowledge of the recent development in the area of information and communication technology and the mass media to boost their knowledge in various aspect of life which related to health. It is in line with studies by Suganya (2016), who reported that 23(77%) of respondents had adequate knowledge with 23% moderate knowledge of hospital waste management by nurses. In contrast with studies by Bhattacharjee et al (2014), and Enwere et al (2014), the former shows a poor level of knowledge regarding biomedical waste management (4%) whilst the latter revealed 91(94.8%) poor knowledge of handling patients' materials as compared with laboratory scientist and physicians. Also, Khan et al (2017) do not agree with the finding of this study which depicted that there is no significantly higher among doctors (30.7%) regarding specific waste. The main reasons for the differences are based on large population, larger sample size, different in study setting time of study and research design that were adopted.

The findings of this study showed a significant difference between age of health personnel and knowledge of hospital waste management as $p>0.5$ alpha level, ($F(2,398) = 0.221$, $p = 0.102$). The findings of this are in line with that of Shivalli and Sowmyashree, (2015), who found that age did not significantly ($P>0.05$) influence the knowledge of health personnel on hospital waste management. This finding is similar with that of Makhura et al (2016), who found that age is not statistically significant with the knowledge and practice of hospital waste management among health professionals. These similarities may be due to homogeneity of the populations studied. However, the findings of this study is not in keeping with the study of Kumar et al (2013), where it was reported that age when compared with the practice of hospital waste management were found statistically significant. The difference between the present study and the previous one may be due to the years those studies were carried out and their educational training.

The findings of the study revealed a non-significant relationship between gender of health personnel and knowledge of hospital waste management ($P<0.05$, df = 1, $X^2 = 70.124$). This finding similar to that of Makhura et al (2016), who it was reported that gender is not associated with knowledge of health personnel on hospital waste management. However, the studies of Mohammed et al (2017), is not in keeping with the

present study as it found that gender is significantly associated with better knowledge score on hospital waste management especially among males. But the findings of Azuike et al (2015), found a high knowledge of hospital waste management among both sexes. This finding is not surprising as females as well as males have taken advantage of the recent development in the area of information and communication technology and the mass media to boost their knowledge in various aspect of life which is related to health. The findings are at variance with findings of Kumar et al (2013) which revealed that gender has a significant influence on knowledge of hospital waste management. However, the differences in the study between gender may be due to the area of training or specialty where they are more interested to work.

The results of the study showed no significant relationship between years in service of health personnel and knowledge of hospital waste management ($P<0.05$, $df = 4$, $X^2 = 130.53$), and that respondents who had spent fewer years in service were 10.87 times less likely to have good knowledge of hospital waste management compared to those who had spent longer years in service (OR = 0.092, 95% CI: 0.32 – 6.74). The findings of the study corroborate with the study of Hakim, Mohsen & Bakr (2014), where it was found that training and duration of work experience were not significantly associated with the knowledge of health personnel on hospital waste management. The similarities between these studies may be due to similar individual characteristics as most persons may have long service in their working environment but may show negligence to some issues that are of great importance. However, the findings of Mohammed et al (2017), supports the fact that those who had long duration of service have better knowledge on hospital waste management. This might be due to the fact that spending longer years in service exposes one to certain experiences which he/she was not taught in classroom. At variance with the findings is study by Mahmondi et al (2016) which reported a positive correlation between years of experience and knowledge of biomedical waste management. Similarly, finding of Kumar et al (2013) are not in line with the findings which reported a statistical significance in experience and knowledge. This study provides an evidence and insight on the relationship between and knowledge of hospital waste management for researchers and other academic scholars.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government should provide adequate funds for better execution of waste management programmes. This would help secure modern waste management technology that could help make hospital waste management better.
2. Various agencies that are concern with waste management and disposal should intensify environmental enlightenment not only in the health facilities but other institutions such as companies, industries and schools.
3. The state agency responsible for waste management and sanitation should take up to the challenges of waste disposal and ensure regular evacuation of the waste in the different health facilities.

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