

Knowledge, Attitude of Health Professional Towards Health Care Waste Management in South East Nigeria

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Abstract

Adequate knowledge and attitude towards the collection/disposal of health care waste (HCW) are important factors in the prevention of the spread of infectious agents that may be of health risks to both the public and the environment. Data on knowledge and attitude to healthcare waste management were scored based on their respective questionnaire information obtained with a 5-point Likert scale from strongly disagree to strongly agree (ie.1 to 5). Statistical analysis was performed at 5% significant level. A probability value (p) and 95% confidence interval (CI) were used to interpret the analysis results. The study found the 248 respondents, 71.8% are female while 28.2% were males with an average age of 37.4 years. Generally, the waste handlers studied showed high knowledge of health care waste management, with an overall mean score of 4.0 (out of 5). Knowledge of Medical waste management showed a significant influence in patterns of healthcare waste management practices (p = 0.0001, 95% CI = 0.0004 to 0.08). Many of the waste handlers showed a strong positive attitude. There was no evidence however, of significant influence of attitude towards healthcare waste management and pattern of healthcare waste management practices in the study (p=0.131).

Keywords: Knowledge, Attitude, health care waste, Health professionals, waste disposal.

Introduction

Health care waste generated by health centers accounts for more than half the deaths associated with waste-related diseases as mentioned by Coker and Sridhar 2010. According to Blackman 1996, Public health is meant to be protected by the health sector through laboratories, clinics, and hospitals that provide health services to the general public, help in the management of infections and disseminate relevant information regarding health issues. The researcher further adds that the health sectors' role in the risk associated with communal disease epidemics, which are a direct result of infectious and hazardous waste from health care centers, is a pressing concern globally. Rutala and Mayhall 1992 argue that the waste generated in the course of health care services includes various biomedical materials from used needles and syringes to blood, pharmaceuticals, human body parts, toxic chemicals, and so on. They also opined that many others constitute a high risk for human infection due to their highly infectious and

hazardous content. In developing countries such as Nigeria, where health need is competing with limited resources, HCW has not received sufficient attention and the priority it deserves. Proper collection and disposal of HCW is of great importance as it can, directly and indirectly, impact the health risks to both the public and the environment. Very sadly, the literature on this critical aspect of HCW management in Nigeria is inadequate and research on the public health implications of poor management of healthcare wastes are few and limited in scope as observed by Abah and Ohimain 2011. Furthermore, Da-Silva *et al.* 2005, remunerates that Contaminated HCW are still handled and disposed of together with domestic wastes, thus posing a great health risk to municipal workers, the public, and the environment. The almost non-existence of institutional framework for HCW in Nigeria has been reported by Coker and Sridhar 2010. While Yu 2010, Rosenthal and Smuggling 2009 agree that the general public's health can also be adversely affected by bio-medical waste resulting

from unprofessional practices such as dumping of HCW in municipal dustbins, open areas, and water bodies, leads to the spread of diseases. Health care wastes (HCW) is a major source of infectious wastes, which is potentially dangerous because it may be resistant to treatment and possess high pathogenicity or the ability to cause disease. HCW is also a source of contamination of land and water sources if not rendered harmless before its burial on land or disposal in water (Fayez 2008). According to Harhay *et al.* 2009, biodegradable waste, when disposed produces greenhouse gas emissions, include methane which has a bigger impact on the climate than any other gas. Furthermore, HCW emits harmful gases, leading to atmospheric pollution, when treated in open burning or burning in incinerators. These emissions can cause respiratory and skin diseases or even cancer, if precautionary protocols are not followed as mentioned by Manyele 2008. Furthermore, unprofessional practices such as dumping of HCW in municipal dustbins, open areas, and water bodies, leads to the spread of diseases as observed by Yu 2010, Rosenthal and Smuggling 2009. The World Health Organization (WHO) estimates that more than “25 percent of the total burden of disease is linked to environmental factors including exposure to toxic chemicals.” It is believed that lead, a heavy metal, for example, is thought to be responsible for 3 percent of cerebrovascular disease burden worldwide according to WHO 2012. A recent carefully conducted analysis, in a WHO 2015 report estimates that 4.9 million deaths (8.3 percent of total mortality worldwide) are attributable to environmental exposure and inappropriate management of selected chemicals especially in communities of low-income nations, particularly those with marginal resources. The consequences of such exposures can be grave as noted by Prüss-Ustün *et al.* 2010. Emissions from incinerators and open burning also lead to workers’ exposure to harmful gases which can cause cancer and respiratory diseases. Exposure to radioactive waste in the waste stream can also pose serious health hazards to workers as reported by Rutala and Mayhall 1992.

According to literature, many cytotoxic drugs are extremely irritant and have harmful local effects after direct contact with skin or eyes and may also cause dizziness, nausea, headache, or dermatitis (Chartier *et al.* 2014). Adequate

knowledge, attitude towards the collection and disposal of HCW is of great importance as it can, directly and indirectly, impact the health risks to both the public and the environment. Therefore, this study seeks to investigate the knowledge, the attitude of health care professionals towards health care management and to understand their influence on the pattern of health care waste management.

Methodology

The study design used was a descriptive cross-sectional study to determine the pattern of health care waste management practices. The study was carried out in primary health care centers in southeast Nigeria and targeted 150 health care facilities. A standardized interviewer-administered questionnaire and observational checklist was used to collect the data. Data analysis was performed using STATA version 14.1 (*Stata Corp, College Station, Tx., USA*) and Microsoft Excel 2010 was used in drawing some charts.

Results

Table 1 depicts the socio-demographic profile of participants. Of the 248 respondents, 71.8% are female while 28.2% were males with an average age 37.4 years. Majority 96.4% are Christians while 71% are married. With an average work experience of 10.1 years, most participants 75% attained tertiary education.

(Table 2). Generally, the waste handlers studied showed high knowledge on health care waste management, with overall mean score of 4.0 (out of 5). The least average score of 3.32 (though quite high) was on color coding segregation of medical waste.

The mean score for strong pattern in healthcare waste management practices is 4.17 (st, dev = 0.21) while that of weak pattern is 3.68 (St. dev = 0.34) in Table 3

The overall mean score for waste handlers’ attitude towards medical waste management pattern is quite high (Table 4: mean = 3.78, St. dev = 0.44).

In terms of relationship between attitude towards medical waste management and pattern of healthcare waste management practices in the health facilities studied, the average score for strong practice pattern is comparable to that of weak pattern (Table 5: 3.84 vs 3.75).

Table 1. Socio-demographic profile of the study participants and healthcare related

Socio-demographics and Healthcare related Variables	Rural	Semi-Urban	Urban	Total
	(n=58)	(n =56)	(n=134)	(n=248)
Sex				
Male	3 (5.2)	14 (25.0)	53 (39.6)	70 (28.2)
Female	55 (94.8)	42 (75.0)	81 (60.4)	178 (71.8)
Age (years)				
Mean ± std. dev	36.0 ± 6.5	38.1 ± 9.1	37.6 ± 8.3	37.4 ±8.1
Religion				
Christianity	55 (94.8)	52 (92.9)	55 (94.8)	239 (96.4)
Muslim	3 (5.2)	3 (5.4)	0 (0.0)	6 (2.4)
Traditional	0 (0.0)	1 (1.8)	2 (1.5)	3 (1.2)
Marital status				
Single	15 (25.9)	30 (53.6)	19 (14.2)	64 (25.8)
Married	38 (65.5)	25 (44.6)	113 (84.3)	176 (71.0)
Separated/ Divorced	4 (6.9)	0 (0.0)	0 (0.0)	4 (1.6)
Widowed	1 (1.7)	1 (1.8)	2 (1.5)	4 (1.6)
Educational Level				
No formal education	8 (13.8)	0 (0.0)	0 (0.0)	8 (3.2)
Primary	11 (19.0)	4 (7.1)	1 (0.7)	16 (6.5)
Secondary	25 (43.1)	9 (16.1)	4 (3.0)	38 (15.3)
Tertiary	14 (24.1)	43 (76.8)	129 (96.3)	186 (75.0)
Years of work experience (years)				
Mean ± std. dev	8.0 ± 4.7	7.8 ± 3.7	12.0 ± 6.7	10.1 ± 6.1

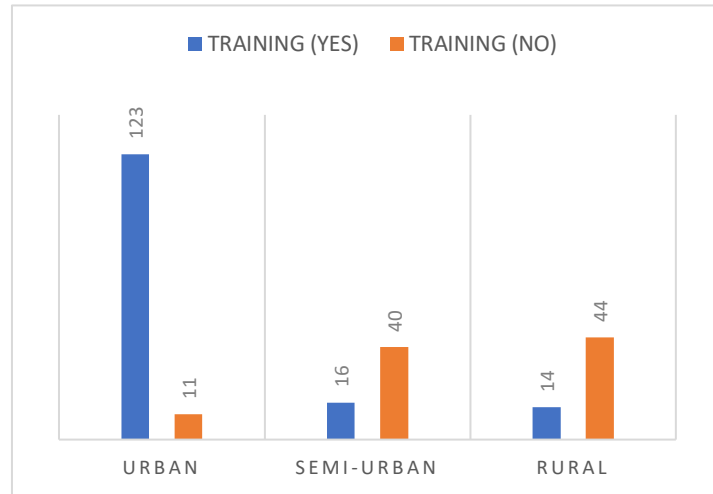


Figure 1. Shows pattern of training among study participants

Table 2. Mean score for knowledge of waste handlers on medical waste management (maximum obtainable score = 5)

Sn	Knowledge of Waste handlers on Medical waste management	Mean Score	Standard deviation
1	Do the health facilities in which you are working now generate biomedical wastes?	4.18	0.94
2	Do you know about medical waste management?	4.11	0.77
3	Is there any health hazard associated with medical waste?	4.31	0.61
4	Is needle-stick or sharp injury a concern?	4.24	0.71


5	Does wearing personal protective equipment reduce the risk of infection?	4.13	0.72
6	Are all medical waste biologically hazardous (infectious)?	3.91	0.93
7	Are all items potentially contaminated with body fluids considered as medical wastes?	3.89	0.85
8	Do you know about color coding segregation of medical waste?	3.32	0.85
9	Do infectious waste containers be labeled with the biohazard symbol?	3.87	0.93
10	Should medical waste be segregated into different categories at the point of generation?	4.07	0.93
11	Does the disinfection of medical wastes decrease the risk of infection transmission?	4.18	0.81
12	Do we need to close medical waste containers while transport?	4.17	0.66
13	Do we need to secure stored medical wastes waiting for treatment and /or disposal?	4.08	0.72
14	Do you know about medical waste disposal methods?	3.92	0.93
15	24hrs is the maximum time of the storage, treatment and disposal of infectious medical wastes	4.06	1.08
16	 is this the internationally accepted symbol for the biohazards?	4.10	0.97
17	Infectious waste should be disposed of in a Yellow waste container (bin)?	4.00	0.56
18	General waste should be disposed of in a black waste container (bin)?	3.94	0.93
19	Medical supplies capable of causing puncture or cut should be disposed in a black waste bin?	3.86	0.70
20	Safety box containing needle and/ or sharp materials should be full to maximum before disposal	3.71	0.91
Overall		4.00	0.36

Table 3. Influence of knowledge about medical waste management was significantly related with pattern of healthcare waste management practice in health facilities located within south-east Nigeria

Knowledge of Medical waste management	Strong Pattern	Weak Pattern	Total
	n (%)	n (%)	
Mean	4.17	3.68	4.00
Standard deviation (St. dev)	0.21	0.34	0.36
Odds Ratio			0.002
p value			0.0001
95% CI			0.0004, 0.008

Table 4. Mean Score for waste participants attitude towards medical waste management is south-eastern Nigeria (maximum obtainable score = 5)

Sn	Attitude towards Medical waste management	Mean Score	Standard deviation
1	Improperly managed medical waste may cause infection	4.48	0.60
2	Proper medical waste handling is an issue and a matter of concern	4.12	0.71
3	Safe medical waste is an issue involving the responsibility of each healthcare staff	4.26	0.61
4	HIV may be transmitted through medical waste	3.90	0.99
5	Hepatitis B may be transmitted through medical waste	3.80	0.92
6	Hepatitis C may be transmitted through medical waste	3.94	0.71
7	Medical waste does not transmit any infection	1.92	1.38

8	Medical waste should be segregated into different categories at the point of generation	4.00	0.72
9	Medical waste segregation facilitates safe handling of the waste	3.68	0.92
10	Labeling medical waste containers do not add any value to waste management	2.45	1.43
11	Proper medical waste disposal is important to prevent infection transmission	4.28	0.51
12	Medical waste disinfection can reduce the chance of contracting the infection	4.31	0.68
13	Wearing personal protective equipment helps to reduce the risk of infection	4.32	0.73
14	Medical waste management adds the extra burden of work	3.74	1.06
16	Medical waste management is only the responsibility of the institution	3.80	0.93
16	Biohazardous waste should be disinfected before disposal	3.54	1.02
Total		3.78	0.68

Table 5. Influence of attitude towards medical waste management and pattern of healthcare waste management practices in south-east Nigeria

Waste management Practice pattern			
Measurement on Attitude towards Medical waste management	Strong Pattern	Weak Pattern	Total
	n (%)	n (%)	
Mean	3.84	3.75	3.78
Standard deviation	0.66	0.25	0.44
Odds Ratio			1.58
p value			0.131
95% CI			0.873, 2.853

Discussion

The waste handlers studied showed high knowledge of health care waste management, with an overall mean score of 4.0 (out of 5). Very high points of up to 4 points and above were obtained on some of the assessment items which include knowledge on whether health facilities in which they are working now generate biomedical wastes, medical waste management, health hazards associated with medical waste and others. All the items recorded an average score of not less than 3 points, indicating good knowledge. Knowledge of Medical waste management showed a significant influence in patterns of healthcare waste management practices ($p = 0.0001$, 95% CI = 0.0004 to 0.08). An additional knowledge in medical waste management is accompanied by a 99.8% lower risk of having a poor pattern. The result obtained is in line with a study by Khan et al. 2017, but in variance with that obtained in a similar study by Doylo et al. 2019, who reported that both knowledge and practice of health workers were

poor. Radha 2012, in similar study also found gaps in knowledge of all four categories of respondents. Many of the waste handlers showed a strong positive attitude that improperly managed medical waste may cause infection (mean = 4.48) and similar results were obtained on “proper medical waste handling is an issue and a matter of concern”, and “safe medical waste is an issue involving the responsibility of each healthcare staff.” The waste handlers also showed strong attitude on other attitude assessment items such as “medical waste should be segregated into different categories at the point of generation”, “proper medical waste disposal is important to infection transmission prevention”, and “medical waste disinfection is a practice that can reduce the chance of contracting the infection”, with mean score of at least 4 points (out of 5) in all the items. The respondents did not support the opinion that medical waste does not transmit any infection, with a low mean score recorded on the statement (mean = 1.92). Similarly, low score was obtained on the assertion that “labeling medical waste

containers do not add any value to waste management” (mean =2.45), which is an indication that the waste handlers showed a positive attitude concerning the value of labeling waste containers in waste management. Some other attitude items assessed were also relatively strong with a mean score of between 3 to 4 points). This result is in agreement to study a similar study by Khan et al. 2017. In general, there was no evidence of significant influence of attitude towards healthcare waste management and the pattern of healthcare waste management practices in the study (p=0.131).

Conclusion

It can be concluded from the present study that there is adequate knowledge about health care waste management, which in turn had a positive influence on the pattern of practice among health care professionals. Although a positive attitude was shown by study participants, there was no evidence of its influence on the pattern of practice. Periodic incentives and orientation-based training programs should be provided to all health care professionals to further engender attitudinal change.

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