

Pattern of Health Care Waste Management Practices among Health Professional in South East Nigeria

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Abstract

Health care waste management is fast becoming an area of interest in public health. It involves waste generation, handling, use of personnel protective equipment, decontamination of reusable cleaning devices after use, segregation, transportation of medical wastes. Pattern of practice is investigated as an important precursor to the synthesis of appropriate methods of proper handling of health care waste. This study specifically sought to investigate the pattern of health care waste management among health professionals working at Health care centers in South-east Nigeria. Based on data analyzed, the study found a reasonably strong pattern of Healthcare Waste management practice at 64.1%, compared to a weak pattern of 35.9%. Decontamination of reusable cleaning devices after every use, show a reasonable pattern of practice at 66.5%. Similar results were obtained in other health care waste practices assessed. The pattern for overall health care waste management practices in South-eastern Nigeria showed some reasonable level of practices with existing identifiable gaps that could hamper effective health care waste management among healthcare facilities within southeast Nigeria.

Keywords: South east Nigeria, health care waste, Health professionals, waste disposal, practice.

Introduction

World Health Organization 2012, states that globally, injection with contaminated syringes caused 21 million hepatitis B infections 32% of all new infections, 2 million hepatitis C infections 40% of all new infections and 260,000 HIV infections 5% of all new infections. Furthermore, Mokuolu 2009, in a document reports that 2 million new Hepatitis B, 400,000 Hepatitis C, and 30,000 HIV positive cases occur in India yearly due to needle prick injuries.

More specifically medical waste has a high potential of carrying micro-organisms that can infect people who are exposed to it, as well as the community at large if it is not properly disposed of as mentioned by Manyele and Anicetus 2006. Notably is the gap that exists presently concerning the assessment of healthcare waste management practices particularly among health care professionals in southeast. Nigeria and other parts of the country. The factors associated with the practices of healthcare waste management by healthcare

professionals are often poorly examined and documented in several countries of the world despite the health risks posed by the improper handling of healthcare waste. Considering the lacked an enabling environment for healthcare waste management, the Nigerian policy and strategic plan for healthcare waste management 2013, were developed to address this problem. According to literature, health care waste management globally is underfunded and poorly implemented, while the combined toxic infectious and other hazardous properties of medical waste represent a significant environmental and public health threat. Researchers have estimated that over half of the world's population is at risk from environmental, occupational, or public health threats deriving from improperly treated health care waste as mentioned by Harhay *et al.* 2009. The global burden of infectious diseases due to exposure from hazardous waste sites and environmental pollution been a major contributor has been understudied. by Naujokas *et al.* 2013. While much of the developed world

has made significant progress in eliminating the burden of disease caused by infectious diseases, chronic illnesses increasingly affect a great population, an estimated 94 percent of the burden of disease resulting from contaminated health care waste falls on low- and middle-income countries as posited by Landrigan and Fuller, 2012.

Additional hazards occur from scavenging at waste disposal sites in low-income countries, and the manual sorting of hazardous waste from health-care centers by waste handlers. Coker and Sridhar, 2010 acknowledged that these practices are common in many regions of the world. Health care professionals are at immediate risk of needle- stick injuries and exposure to toxic or infectious materials. The main sources of medical waste are hospitals and other healthcare facilities such as dispensary, outpatient departments, offices, facilities for blood transfusion or dialysis, emergency team, autopsy facilities, as well as laboratories and research institutes as reported by Palanisamy *et al.* 2011. Toyobo *et al.* 2012, noted that with the proliferation of bloodborne diseases, more attention is being focused on the issue of infectious medical waste and its disposal.

They further opined that healthcare institutions must be aware of the potential risk in handling infectious waste, and adhere to the highest standards of disposal and transport. Education of the stakeholders and communities on the management of infectious waste is crucial in today's health care arena.

Very most often, healthcare professionals are exposed to diseases like tuberculosis, hepatitis, cholera, plague, skin infections, diphtheria, and even food poisoning, in either epidemic or endemic magnitude as mentioned by Gunson *et al.* 2003. Several studies reveal that the incidences of contracting diseases are most prevalent among the professionals compared to other hospital staff as reported by Al-Sohaibani *et al.* 1995.

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

Pattern of healthcare waste management practice among study participants based on response

Among the items assessed, there was notable difference in decontamination, use of aprons, use of boots, and use of gloves. (Figure 1).

Depicted on **Table 1** is the pattern of health care waste management practice among study participants, with high response in use of apron and heavy-duty glove (93.1%, 90.2% respectively). Similar results were obtained in all other items assessed which include the use of boots, disinfection /decontamination of reusable cleaning devices after use, collection infectious medical wastes from service area within 24 hours, transportation of medical wastes separately and closing of the container during waste transport.

Table 2 represents the observed healthcare waste management practice in the study area (based on observation checklist). It clearly shows that although up to 65% of the study groups use heavy-duty gloves, it was more prevalent in the urban health facilities (81.5%) but less used in the semi-urban and rural areas. (10.4% and 8.0% respectively).

Table 3 gives the extent of practice for healthcare waste management in rural, semi-urban and urban areas in South-eastern Nigeria. Up to 50% onsite storage room were available at rural health facilities while puncture resistant storage containers comprised of 64.9%. The most common type of infectious waste disposal method used was observed to be Burning of needle in pit (90.7%).

Based on Participant responses, the most common medical waste transportation equipment used in the study area was closed bucket system (60.5%), and the result is also comparable to (56.4%) obtained through checklist observation. The use of the closed bucket is mostly practiced in the urban located health facilities in Table 4.

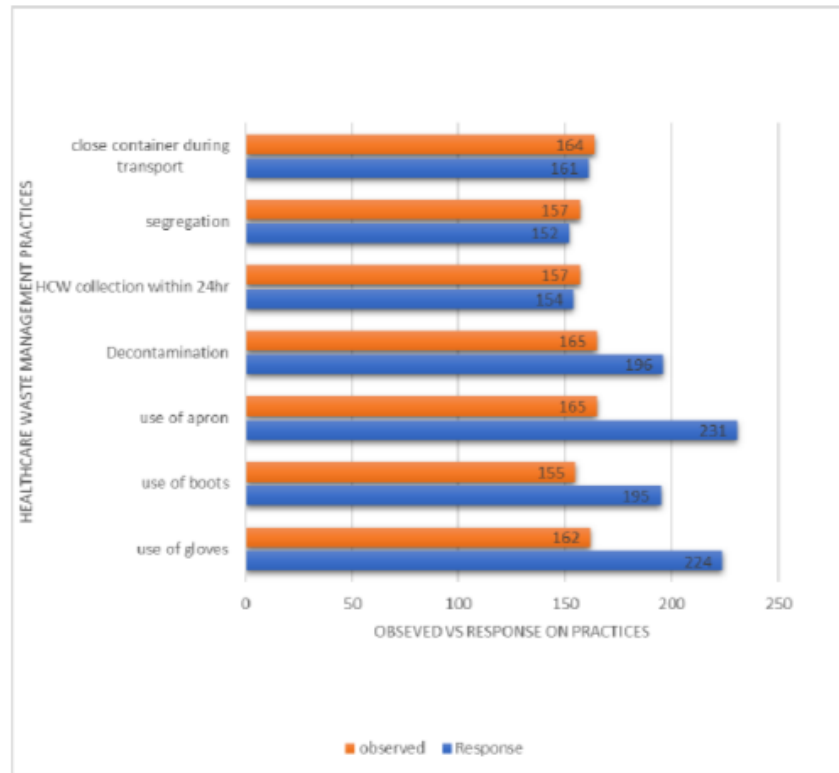


Figure 1. Observed vs response on pattern of healthcare waste management practice among study participants

Table 1. Facility-demographic and healthcare related variables

Facility-demographics and Healthcare related Variables	Rural (n = 58)	Semi-Urban (n = 56)	Urban (n = 134)	Total (n = 248)
Health Facility Type				
PHC (Public)	33 (56.9)	9 (16.1)	65 (48.5)	107 (43.1)
Health clinics (Private)	11 (19.0)	37 (66.1)	66 (49.3)	114 (46.0)
Maternity homes	14 (24.1)	10 (17.9)	3 (2.2)	27 (10.9)
Current work Department/ Section*				
OPD	13 (22.4)	1 (1.8)	20 (14.9)	34 (1.5)
Ward	39 (67.2)	20 (35.7)	81 (60.4)	140 (56.5)
Laboratory	3 (5.2)	3 (5.4)	13 (9.7)	19 (7.7)
Emergency	2 (3.4)	29 (51.8)	1 (0.7)	32 (12.9)
Others (e.g. Pharmacy)	1 (1.7)	3 (5.4)	23 (17.2)	27 (10.9)
Size of Health Facility working with				
Small (0 -1 bed)	29 (50.0)	2 (3.6)	15 (11.8)	46 (19.1)
Medium (up to 3 beds)	9 (15.5)	46 (82.1)	8 (6.3)	63 (26.1)
Large (up to 10 beds)	20 (34.5)	8 (14.3)	104 (81.9)	132 (54.8)
Availability of organizational policy/ legal framework on medical waste management				
yes	16 (24.1)	14 (28.6)	127 (94.8)	157 (63.3)
no	44 (75.9)	40 (71.4)	7 (5.2)	91 (36.7)
Operational use of organizational policy / legal framework in the health facility				
Yes	15 (25.8)	14 (25.5)	113 (84.3)	142 (57.3)
No	43 (74.1)	42 (75.0)	21 (15.7)	106 (42.7)
Technological advancement in place to enhance medical waste practices				
Yes	15 (25.8)	14 (25.5)	127 (94.8)	156 (62.9)
No	43 (74.1)	41 (75.0)	7 (5.2)	92 (37.1)

Table 2. Observed healthcare waste management practice among healthcare practitioners in rural, semi-urban and urban areas in south-eastern Nigeria

Medical waste Management Practices	Rural		Semi-Urban		Urban		Total	
	(n=58)		(n =56)		(n=134)		(n=248)	
	n	%	n	%	n	%	n	%
Use of heavy-duty glove								
Yes	13	8.0	17	10.4	132	81.5	162	65.3
No	45	52.3	39	45.3	2	2.3	86	34.7
Use of boots								
Yes	13	22.4	16	28.6	126	94.0	155	62.5
No	45	77.6	40	71.4	8	6.0	93	37.5
Use of use apron								
Yes	14	24.1	19	33.9	132	98.5	165	66.5
No	44	75.9	37	66.1	2	1.5	83	33.5
Disinfection /decontamination of reusable cleaning devices after use								
Yes	15	25.9	18	32.1	132	98.5	165	66.5
No	43	74.1	38	67.9	2	1.5	83	33.5
Collection infectious medical wastes from service area within 24 hours								
Yes	13	22.4	16	28.6	128	95.5	157	63.3
No	45	77.6	40	71.4	6	4.5	91	36.7
Transportation of medical wastes separately								
Yes	11	19.0	16	28.6	130	97.0	157	63.3
No	47	81.0	40	71.4	4	3.0	91	36.7
Closing of the container during waste transport								
Yes	15	25.9	17	30.4	132	98.5	164	66.1
No	43	74.1	39	69.6	2	1.5	84	33.9

Table 3. Observed pattern for healthcare waste management among healthcare practitioners in rural, semi-urban and urban areas in south-eastern Nigeria

Healthcare waste Management practices	Rural		Semi-Urban		Urban		Total	
	(n=58)		(n =56)		(n=134)		(n=248)	
	n	%	n	%	n	%	n	%
Medical waste storage method used								
Onsite storage room	29	50.0	6	10.7	46	34.3	81	32.7
Puncture resistant storage containers	28	48.3	50	89.3	83	61.9	161	64.9
Other	1	1.7	0	0.0	5	3.7	6	2.4
Storage of infectious waste for more than 2 days								
Yes	45	77.6	45	80.4	68	50.7	158	63.7
No	13	22.4	11	19.6	66	49.3	90	36.3
Use of onsite medical waste treatment method								
Yes	47	81.0	49	87.5	47	35.1	143	57.7
No	11	19.0	7	12.5	87	64.9	105	42.3
If yes to the use of onsite medical waste treatment method, what medical waste treatment method the facility use*								
Incineration	4	6.9	8	14.3	38	28.4	50	20.2
Sterilization	10	17.2	17	30.4	40	29.9	67	27.0
Chemical	1	1.7	1	1.9	6	4.5	8	3.2
Burning	42	72.4	47	83.9	39	29.1	128	51.6
Availability of an incinerator								

Yes	5	8.6	6	10.7	49	36.6	60	24.2
No	53	91.4	50	89.3	85	63.4	188	75.8
Availability of fence to prevent unauthorized access to incinerator								
Yes	4	80.0	6	100.0	45	95.7	55	94.8
No	1	20.0	0	0.0	2	4.3	3	5.2
Type of infectious waste disposal method used*								
Ash pit	9	15.5	13	23.2	100	74.6	122	49.2
Pit burial	11	19.0	21	37.5	110	82.1	142	57.3
Burning sharps in pit	53	91.4	52	92.9	120	89.6	222	90.7
Other	0	0.0	0	0.0	3	2.2	3	1.2

Table 4. Equipment used in transportation of health care waste

Health care waste transport equipment	Rural		Semi-Urban		Urban		Total	
	n	%	n	%	n	%	n	%
Based on Participant response*								
Trolley/ wheelbarrow	9	15.5	0	0.0	7	5.2	16	6.5
Closed bucket	14	24.1	13	23.2	123	91.8	150	60.5
Open bucket	35	60.3	42	75.0	4	3.0	81	32.7
other (e.g. Basket)	0	0.0	1	1.8	0	0.0	1	0.4
Based on Observation Checklist								
Trolley/ wheelbarrow	3	5.2	2	3.6	15	11.2	20	8.1
Closed bucket	16	26.6	15	26.8	109	81.3	140	56.4
Open bucket	39	67.2	39	69.6	10	7.5	88	35.5
Other (e.g. Basket)	1	1.7	0	0.0	0	0.0	1	0.4

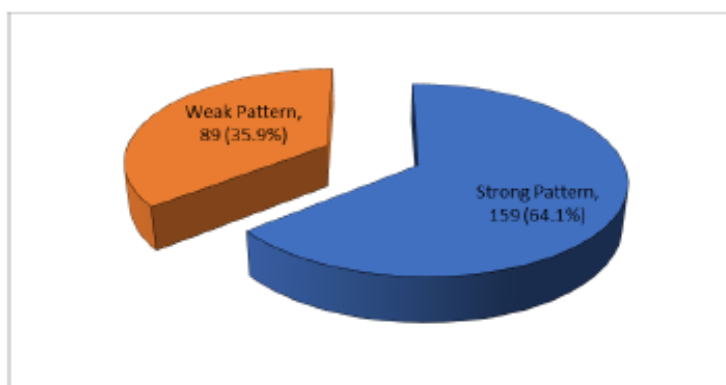


Figure 2: Overall summary of Healthcare Waste management practice in Health Facilities within South-east Nigeria

Overall summary of patterns of healthcare waste management practices in health facilities within south-east Nigeria

In summary, the overall summary of Healthcare Waste management practice among healthcare workers in health Facilities within South-east Nigeria is found to be 64.1% compared to weak pattern 35.9% (Figure 2).

Discussions

Of the 250 data collection tools distributed, the study achieved a 99.2 percent retrieval rate, as there were more female 71.8 percent respondents than male. The study found a reasonably strong pattern of Healthcare Waste management practice among healthcare workers in health Facilities within Southeast Nigeria and found to be 64.1 percent, compared to weak

pattern 35.9 percent. There was high compliance with the use of PPE at health care facilities located in urban centers 80.0 percent when compared to rural and semi-urban centers 8.3 and 10.8 percent respectively. However, heavy-duty gloves, boots, and apron were the most frequently used 33.6, 32.2, and 34.2 percent respectively. This finding confirms with a study by Deress et al., 2019. Decontamination or disinfection of reusable cleaning devices after every use showed a reasonable pattern of practice was observed (66.5%). With high level of practice observed among urban health facilities (80%) compared to rural and semi-urban centers (9% and 11%).

This finding may be a direct result of the non-availability/awareness of decontamination policies, decontamination cost, regulation and decontamination skills that may be available in urban centers and probably inadequate in rural and semi-urban centers. The use of color-coded waste container for segregation is being practiced in some of the studied health facilities and the result is similar to the finding in another study by Awodele et al., 2016, but varies with the result by Joshua et al. 2014, which reported nonpractice of color coding in waste segregation. Besides, most of the health facilities do not have adequate containers for waste collection across which could lead to unethical practices in waste management as having been reported by Van Schalkwyk 2013. The pattern and practice of disposal of infectious sharps show that the most common type of method used is the burning of sharps in Pit. This was observed to be the most commonly practiced 90.7 percent, especially in urban centers 53.3 percent. Oyekale and Oyekale 2017, in their study, made similar observations.

Comparatively, results obtained based on the response from study participants show a similar reasonable level, and pattern of practice on all items assessed, especially in the urban centers. This may be due to the interviewer/observer approach employed during data collection. In summary, the overall Health care Waste management practice pattern among health care workers in health Facilities assessed was found to be strong 64.1%. This finding is not in agreement with several other similar studies done by Oyekale and Oyekale 2017, and Abah and Ohimain 2011, who acknowledged low HWM practice patterns.

Conclusion

The pattern of overall health care waste management practices in South-eastern Nigeria showed some reasonable level of practice yet more needed to be done. Identify gaps that could hamper effective health care waste management exist in most health facilities for storage, waste transportation, disposal, equipment and personnel involved in waste management. The healthcare facilities in the rural and semi-urban areas are significantly far behind the ones in the urban areas in health care waste management.

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