

Level of IPC Knowledge and Practice in Hospitals Still Low in Sierra Leone after the 2014-2015 Ebola Outbreak

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Abstract

Majority of the people infected during the West Africa Ebola outbreak in Sierra Leone in 2014-2015 were health care service providers and majority of the Ebola incidence among health care workers were as a result of lack of personal safety gears such as personal protective equipment (PPE) or their improper use, as well as the poor handling and management of health care wastes. Because health care wastes are produced during the course of the duty by health care workers (HCWs), it is believed that these HCWs can play a major role in its management and disposals. Effective health care waste management and disposal includes the separation of the waste into groups in order to reduce its size for suitable handling and hence disposal. This segregation and containerization of wastes also reduces handling cost and hence reduce the risk of infection and accidental exposure. Three government referral hospitals based in the provinces and one government referral hospital based in the capital city (Free town) were selected for this study. All hospitals that took part in this study served as either an Ebola holding center or treatment center during the 2014-2015 West African Ebola outbreak. Four hundred and eighty-six nurses from four government referral hospitals in Sierra Leone were interviewed about IPC practice in their hospitals, health waste management and handling after the 2014 West Africa Ebola outbreak. The 486 nurses were recruited from the Bo Government Hospital (136), Kenema Government Hospital (140), Makeni Government Hospital (58) and Connaught Hospital (152) in Freetown. We interviewed HCWs about IPC practice, health care waste management and handling in their hospital using structured questionnaire. Majority (57%) of the HCWs were females and 80.45% were State Community Nurses. Majority (31%) of the HCWs interviewed worked at Connaught government hospital in

Freetown. One hundred and seventeen (24%) CHWs said health care waste management and disposal are not relevant for breaking the infection chain while majority (83%) confirmed that health care wastes storage site was cleaned frequently. Three hundred and thirty-one (68%) indicated that CHWs' waste management and disposals training are done through workshops and seminars, while only 1% say such training is done at only degree level. Majority (76%) of CHWs interviewed said health care waste management and disposal is not relevant to breaking infection chain. which is a worrying disclosure considering the fact that most nosocomial outbreaks in the hospitals could be traced to improper or lack of health care waste management and disposal system. This finding could be attributed to lack of policy implementation and or lack of IPC logistics in the health care facilities sampled considering the high knowledge relating to the sources of health care wastes among the CHWs interviewed. This study highlights the need for regular training of HCWs in the area of IPC as well as the emphasizes the significance of adequate clinical practice and health care waste management and disposal information dissemination in Sierra Leone hospitals. This study could serve as an important resource on clinical practice, IPC and health care waste management and disposal since health care wastes accounts for most injuries and infection amongst CHWs.

Keywords: Ebola outbreak; Health care; Waste management

Introduction

Majority of the people infected during the West Africa Ebola outbreak in Sierra Leone in 2014-2015 were health care service providers [1] and majority of the Ebola incidence among health care workers were as a result of lack of personal

safety gears such as personal protective equipment (PPE) or their improper use, as well as the poor handling and management of health care wastes [2]. Health care wastes include wastes generated from health care facilities, nursing homes, and medically-related facilities including minor and scattered sources of health care deliveries [3,4]. Several studies have identified hospitals as a major source of health care waste [5]. About 75%-90% of health care wastes are non-hazardous [6]; while 10%-25% are hazardous and hence posed risk to handlers, environment, workers and patients [7,8]. In developing countries like Sierra Leone, hazardous health care wastes are dealt with mainly by incineration, as well as by burial in landfills. Generally, most health care wastes in developing countries ends up in municipal waste dump sites where waste pickers have direct access to them leading to infection and accidents [9]. Dumping health care wastes in to municipal waste dump sites presents additional risk to both man and livestock's because these wastes when they combust either artificially or naturally produced poisonous gases like dioxins and furans which are inimical to the health of man [10,11].

Because health care wastes are produced during the course of the duty by health care workers (HCWs), it is believed that these HCWs can play a major role in its management and disposals. Research has shown that the break in the chain of nosocomial outbreaks within a health care facility is the responsibility of health care workers which in turn depends on their level of waste management disposal awareness [12].

Knowledge and attitude towards health care wastes management and disposal by HCWs varies. A cross sectional study that assessed the knowledge, attitude, and practices of doctors, nurses, laboratory technicians, and sanitary staff regarding biomedical waste management and disposal shows that doctors, nurses, and laboratory technicians had better knowledge than sanitary staff regarding biomedical waste management and disposal, while nurses and laboratory staff had greater knowledge regarding health care waste segregation at the source compared to doctors [13].

The use of short-term enhanced infection control support for infection control and management is now been implemented in hospitals and nursing homes through several infection control programs. Generally, short-term enhanced infection control support programs have been shown to produce significant reduction in nosocomial outbreaks in hospitals. One post-intervention observational study shows a great improvement in infection control as a result of compliance with safe disposal of clinical waste [14].

Effective health care waste management and disposal includes the separation of the waste into groups in order to reduce its size for suitable handling and hence disposal. This segregation and containerization of wastes also reduces handling cost and hence reduce the risk of infection and accidental exposure. Some countries have national rules and guidelines for dealing with health care wastes. For most countries however it is, the owner and manager of the health care facility which serves as the source of the health care wastes that borne the responsibility for the disposal of the

health care wastes produced in that facility. However, the following principles for health care wastes are important; wastes must be separated depending on the likelihood of hazards, separated waste groups should be placed in different containers, each container appropriately labeled, areas experiencing delays in waste collection and disposal demarcated and protected to deny access to unauthorized people, hazardous and non-hazardous wastes should be separated during collection, transportation and storage, central waste storage area, risks and hazards associated with handling health care wastes should be clearly understood by waste disposal personnel [15-17].

To make health care waste collections and disposal effective, the World Health Organization instituted a segregation and colour coding system for health care waste management and disposal [18,19]. Some countries however have assigned colour codes to health care wastes to aid in their collection and disposal. The selection of these colour codes is based largely on the resources and logistics of the country.

In this study we assessed the knowledge and level of compliance to IPC and health care waste management and disposal at four main referral hospitals in Sierra Leone after the 2014-2015 West Africa Ebola outbreak.

Methods

Study area

Three government referral hospitals based in the provinces and one government referral hospital based in the capital city (Freetown) were selected for this study. The three provincial government referral hospitals were the Bo, Kenema, and Makeni government referral hospital respectively. Connaught Hospital was selected in the capital city. All hospitals that took part in this study served as either an Ebola holding center or treatment center during the 2014-2015 West African Ebola outbreak. Connaught Hospital is located in the center of Freetown and is a 2000 bed space referral hospital. It is Sierra Leone's major referral hospital for adult medical and surgical patients. The Bo Government Hospital is located in Bo city which lies south of Sierra Leone. It is a 250-bed hospital and is the main referral hospital in the Southern Province. The Kenema Government Hospital is located in Kenema district which lies east of Sierra Leone. The hospital has a 350 bed spaces before the Ebola outbreak in 2014-2015. The hospital caters for the following facilities 123 peripheral health units, 29 Community Health Centers, 32 Community Health Posts, and 63 Maternal Child Health Posts. The hospital also admits between 250-500 cases of Lassa fever cases yearly. Makeni government hospital is located in Makeni in the Northern Province. The bed capacity of the Makeni government hospital including the intensive care unit is 262. The hospital caters for the following facilities, 20 Community Health Centres, 67 Community Health Posts, 3 private hospitals, 5 Faith-based Hospitals, and 19 Maternal Child Health Posts.

Interview and sampling method

Four hundred and eighty-six nurses from four government referral hospitals in Sierra Leone were interviewed about IPC practice in their hospitals, health waste management and handling after the 2014 West Africa Ebola outbreak. The 486 nurses were recruited from the Bo Government Hospital (136), Kenema Government Hospital (140), Makeni Government Hospital (58) and Connaught Hospital (152) in Freetown. We used non-probability sampling method to select the four hospitals while purposive sampling technique was used to select nurses for interviewing. CHWs who were approached and willing to participate in this study were then interviewed from a structured questionnaire.

Ethics review

The Institutional Review Board at Njala University in Sierra Leone approved this study and provided ethical clearance. The Njala University Institutional Review Board waived the requirement to obtain informed consent on the grounds that the study involves minimal health risk on participating study participants.

Results

Four hundred and eight-six health care workers (HCWs) from four government referral hospitals were interviewed about IPC practice, health care waste management and handling in their hospital using structured questionnaire (Table 1). Majority (57%) of the HCWs were females and 80.45% were State Community Nurses. Majority (31%) of the HCWs interviewed worked at Connaught government hospital in Freetown.

Table 1 Distribution of health care workers, occupational status and hospital.

Characteristic	n(%)
Sex	
Male	614(57)
Female	463(43)
Hospital	
Connaught Government Hospital	152(31)
Bo Government Hospital	135(28)
Kenema Government Hospital	140(29)
Makeni Government Hospital	58 (12)
Kenema Government Hospital	-
Status of nurses	
Matron	5(1.03)
Ward sister	5(1.03)
Public health sister	6(1.23)
Mid wives	23(4.73)

Registered nurse	56(11.52)
State community nurse	391(80.45)

Forty-seven percent of the HCWs interviewed mentioned that health care wastes are initially separated before being disposed, five (1%) mentioned that IPC procedures are followed prior to health care wastes disposal. One hundred and forty-one (29%) said health care wastes are incinerated, while 2% indicated that the waste management team does the waste management and disposal (Table 2). One hundred and seventeen (24%) CHWs said health care waste management and disposal are not relevant for breaking the infection chain while majority (83%) confirmed that health care wastes storage site was cleaned frequently. Three hundred and thirty-one (68%) indicated that CHWs' waste management and disposals training are done through workshops and seminars, while only 1% say such training is done at only degree level. Majority (83%) of the CHWs admitted that their health care facility has a central wastes storage site, while 90% agreed that CHWs handling health care wastes should wear PPE during the waste disposal exercise.

Table 2 Distribution of health care waste management and storage.

Characteristic	n(%)
Health care management and storage	
Segregation	231(47)
IPC adherence	5(1)
Incineration	141(29)
Waste management team	9(2)
Dump site	5(1)
Unanswered	95(20)
Central hospital waste storage system	
Available	405(83%)
Not available	81(17%)
Health care waste handling	
Cleaners	166(34%)
waste management team	85(17%)
IPC team	67(14%)
Use of protective gears for waste handling	
Yes	436(90%)
No	50(10%)

Discussion

This study looks at the knowledge, implementation and practice of IPC and health care waste management and disposal methods among HCWs attached to four government hospitals in the four regional hospitals in Sierra Leone. Four

hundred and eighty-six CHWs were selected from Bo, Kenema and Makeni provincial hospitals and the Connaught Hospital in Freetown. All CHWs interviewed in this study admitted to have participated in health care waste management and disposal at their various hospitals and 52% consented to have played a vital role in health care wastes management at the generation level.

Majority (76%) of CHWs interviewed said health care waste management and disposal is not relevant to breaking infection chain, which is a worrying disclosure considering the fact that most nosocomial outbreaks in the hospitals could be traced to improper or lack of health care waste management and disposal system. This finding could be attributed to lack of policy implementation and or lack of IPC logistics in the health care facilities sampled considering the high knowledge relating to the sources of health care wastes among the CHWs interviewed. Majority (54%) of the CHWs interviewed agreed that health care wastes constitute all wastes generated within a hospital. But the fact that 76% of the CHWs interviewed disagreed that healthcare waste management and disposal is not relevant for breaking infection chain, implies there is still a problem in IPC knowledge transfer and understanding on the part of the CHWs. This is even buttressed further by the fact that majority (90%) of the CHWs interviewed admitted that health care wastes handling personnel should wear PPE during health care waste handling which high level of self-awareness for personal protection. Additionally, this lack of knowledge linking health care waste with disease outbreak in health care facilities could be as a result of the level of IPC training or insufficient training of HCWs on IPC. Majority (68%) say IPC training is done through workshops and seminar which in the Sierra Leone context most times are hastily arranged and conducted and with limited logistics.

Conclusion

This study highlights the need for regular training of HCWs in the area of IPC as well as the emphasises the significance of adequate clinical practice and health care waste management and disposal information dissemination in Sierra Leone hospitals. This study could serve as an important resource on clinical practice, IPC and health care waste management and disposal since health care wastes accounts for most injuries and infection amongst CHWs. According to the UNDP there were 296 CHWs health care-related Ebola infections during the 2014-2015 West Africa outbreak of which 75% died (1).

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