

Healthcare workers' Perceptions of Nosocomial Infections and compliance to Standard Precautions in a Teaching Hospital in Southeast Nigeria

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Abstract

Standard precautions (SP) are essential in preventing transmission of infectious agents in hospital settings. This study is aimed at identifying perceptions of nosocomial infections, compliance with SP and associated factors among healthcare workers (HCWs). It was cross-sectional study done in 2014 at University of Nigeria Teaching Hospital. A pre-tested questionnaire was used. Out of 629, most were females (64.4%), nurses (46.1%) and within 20 – 59 years age range. One hundred and twelve (17.8%) have had at least one nosocomial infection since employment. Although many received training on SP (62%), only 20.3% were aware of hospital policy that enhances compliance. Regular access to PPEs (56.1%) and hand hygiene (62.8%) were reported. Most (64.5%) reported total absence of control measures for respiratory infections. Presence of an epidemic, hospital policies and managing an infectious patient encourage compliance with SP while emergency situations and non-availability of PPEs were major constraints. Nosocomial infections occurred most among orderlies (33.3%) and least among doctors (14%). Those who received training on SP and use of PPEs were less likely to develop nosocomial infections. Standard precautions training and regular provision of PPEs are recommended.

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1 Introduction

Health care workers (HCWs) are exposed to blood-borne pathogens and other micro-organisms during the course of their work.[1] Thus, they are at risk of acquiring these Healthcare-Associated Infections/Hospital Acquired Infections (HAI), also known as nosocomial infections from either their patients or the hospital environment and can equally transmit these infections to their patients. Despite advances in health care system, nosocomial infections have been noted to be a major cause of preventable morbidity and mortality threatening public health.[2] Developing countries have been reported to have up to 20 times the risk of contracting nosocomial infection compared with developed countries.[3] Thus spread of nosocomial infections serves as a major source of concern for health care practice particularly in developing countries where the health care system is already overstretched. Commonly implicated nosocomial infections are infections of the bloodstream, urinary tract, surgical incisions, respiratory tract and gastro-intestinal tract.[4] Gastroenteritis is the most common nosocomial infection in children.

As a result, the US Centers for Disease Control (CDC) in 1985 introduced Universal precautions to protect HCWs from contact with blood and a number of other body fluids visibly contaminated with blood.[5] However, research around stigma and discrimination in health related settings implicated Universal precautions as a means by which HCWs discriminate against patients because by failing to apply Universal precautions universally, health professionals are making judgment based on individual's health status.[6,7]

Hence, in 1996, CDC revised the infection control practice from Universal precautions to Standard precautions (SP). Standard precautions are the minimum infection prevention practices that apply to all patients regardless of suspected or confirmed infection status of the patient in any setting where health care is delivered.[8] These practices are designed to protect the HCW and prevent him from spreading infections among patients. Thus SP are crucial in hospital infection control as well as in issues related to biosafety and security of patients, professionals and students in direct or indirect health care delivery.

Although it is almost 20 years since the introduction of SP in clinical settings, knowledge as well as adherence to these precautions in public health settings is generally poor but worse in resource limited countries.[9] Reasons adduced for this poor compliance include: lack of or insufficient training of HCWs on SP's policy and methods, irregular provision of personal protective equipment (PPEs) and limited availability of safe sharps disposal mechanisms and other facilities required for infections control.[10,11] Hence healthcare-associated

infections remain a critical challenge for the public health sector.

Present study is aimed at assessing Healthcare workers' perceptions of nosocomial infections and factors associated with compliance to standard precautions in a tertiary health institution. It is also hoped that findings will be of value in determining ways to promote compliance to SP and reduce the prevalence of nosocomial infections in all public health institutions in Nigeria.

2 Methods

The study was descriptive cross-sectional done in October, 2014 among HCWs at University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla, Enugu. The HCWs studied were Doctors, Nurses, Laboratory scientists and Hospital attendants/Orderlies. These groups of HCWs are known to come in contact with hospital hazards. UNTH is located in Ituku Ozalla a semi-urban community about 30 minutes - drive from the state capital. It is the biggest teaching hospital in the South east and South-south of Nigeria and gets referrals from most parts of these two regions. The staff strength is about 5,000. The departments studied are those ones that handle biohazards namely: Intensive Care Unit (ICU), Theatre, Wards, Laboratories, Casualty, Out-patient Department and Blood bank.

Sample Size estimation: A minimum sample size of 382 was calculated using a previous prevalence of hand hygiene of 46% among HCWs in Indonesia. [12]

Ethical Permit: Ethical permission was obtained from the Ethics Committee of University of Nigeria Nsukka while informed consent was obtained from the management and staff of University of Nigeria Teaching Hospital.

Data Collection: The entire staff in these departments were invited to be part of the study. Pre-tested self-administered questionnaires was used to collect data from respondents. Contents of the questionnaire include demographical variables, prevalence of nosocomial infections, compliance with SP and associated factors.

Data Analysis: Data was entered and analyzed in Statistical Package for Social sciences (SPSS) version 17.

3 Main Results

A total of 629 HCWs were studied. Most were females (64.4%), married (62.3%), Christians (94%) and within 20 – 59 years age range. Majority of the respondents were nurses (46.1%) while orderlies were the least 60 (9.5%). The job locations of most respondents were the wards, laboratories and the Outpatient departments while the range of working years was 1-34 years “Table 1.” One hundred and twelve (17.8%) of the HCWs have had at least one nosocomial infection (respiratory tract infections being the commonest) since employment. Although many had received training on SP (62%), only 20.3% were aware of hospital policy that enhances compliance with SP. Regular access to PPEs (56.1%) and

hand hygiene (62.8%) were reported, yet some HCWs never had access to these facilities. Most (64.5%) claimed total absence of control measures for respiratory infections in their work location “Table 2.”

Presence of an epidemic (28.1%), hospital policies (8.3%) and managing an infectious patient (63.6%) encourage compliance with SP while emergency situations (45.8%) and non-availability of PPEs (42.4%) were major constraints. Staff training and regular supply of PPEs and other infection control resources were recommended to enable compliance with SP “Table 3.” Nosocomial infections occurred most among the orderlies (33.3%) and least among doctors (14%). Those who received training on SP and use of PPEs were less likely to develop nosocomial infections. However, years of service did not significantly affect the development of nosocomial infections.

4 Tables

Table 1: Socio - Demographic distribution of health workers

Demographic variables	frequency N = 629	percent
<i>Gender</i>		
Male	224	35.6
Female	405	64.4
<i>Age range</i>		
20 – 29	137	21.8
30 – 39	253	40.2
40 – 49	158	25.1
50 – 59	81	12.9
<i>Marital Status</i>		
Married	392	62.3
Single	187	29.7
Widow/Widower	39	6.2
Divorced/Separated	11	1.8
<i>Religion</i>		
Christianity	591	94.0
Islam	24	3.8
African traditional religion	14	2.2
<i>Occupation</i>		
Doctors	143	22.7
Nurses	290	46.1
Lab scientists	136	21.6
Orderlies/Cleaners	60	9.5

<i>Location of work</i>		
ICU	20	3.2
Theatre	58	9.2
Ward	277	44.0
Lab	121	19.2
Casualty	43	6.8
Outpatient dept.	98	15.6
Blood bank	12	1.9
<i>Years of service</i>		
1 – 5	269	42.8
6 - 10	169	26.9
11 - 15	83	13.2
16 - 20	55	8.7
21 - 25	26	4.1
26 – 30	19	3.0
31 – 35	8	1.3
Age range: 19 – 59		Years of service: 1 – 34

Table 2: Presence of Nosocomial Infection and control measures

Variables	frequency	percent
	N = 629	
<i>Presence of nosocomial infection since employment</i>		
No	517	82.2
Yes	112	17.8
<i>Types</i>		
	N = 112	
Respiratory infections	91	81.3
Percutaneous infections	11	9.8
Others	10	8.9
Aware of hospital policy that enhances compliance to standard precaution	128	20.3
Received training on standard precaution	390	62.0
Received training on wearing or removing PPEs (gloves, gowns, etc)	466	74.1
<i>Frequency of supply of PPEs by hospital</i>		
Always	353	56.1
Sometimes	261	41.5
Never	15	2.4
<i>Access to hand hygiene</i>		

-Always	395	62.8
-Sometimes	220	35.0
-Never	14	2.2
<i>Departmental measures to control spread of respiratory infections</i>		
-None	98	15.6
-Signs at entrances with instructions to cover mouths and noses when coughing or sneezing	82	13.1
-Provide tissues and non - touch receptacles for disposal of tissues	27	4.3
-Offer masks to coughing patients	16	2.5
-Triaging to ensure that coughing patients are seen first		

Table 3: Enablers, Constraints and Suggestions on measures to ensure workers compliance with standard precautions

Variables	frequency N = 629	percent
<i>Enablers: Situations which make the worker comply with SP</i>		
If there is an epidemic	177	28.1
If I am managing an infected person	400	63.6
If there are policies to punish non compliance	52	8.3
<i>Constraints: Conditions that make it difficult to comply with SP</i>		
Emergency situations	288	45.8
Lack of knowledge on SP	37	5.9
If PPEs are not available	267	42.4
If it reduces my job efficiency	36	5.7
<i>Suggestions on making health workers comply with SP</i>		
Facilities for hand hygiene should be regularly supplied	88	14.0
Personal protective equipment should always be available	162	25.8
Disinfectants and other resource for environmental cleaning should always be provided	148	23.5
Regular training of workers on standard precautions	191	30.4
Supportive supervision of workers to ensure compliance	18	2.9
All above	22	3.5

Table 4: Professions/Years of service/Training and development of nosocomial infection

Variables	has developed nosocomial infection since starting work	
	Yes (%) N = 112	No (%) N = 517
<i>Profession</i>		
Doctor	20(14.0)	123 (86.0)
Nurse	44(15.2)	246 (84.8)
Lab scientist	28(20.6)	108 (79.4)
Health attendant/Orderly	20(33.3)	40 (66.7)
<i>Years of service</i>		
1 – 5	43(16.0)	226(84.0)
6 - 10	30(17.8)	139(82.2)
11 - 15	13(15.7)	70(84.3)
16 - 20	13(23.6)	42(76.4)
21 - 25	7(26.9)	19(73.1)
26 – 30	4(21.1)	15(78.9)
31 – 35	2(25.0)	6(75.0)
<i>Trained on the use of protective equipment</i>		
Yes		
No	69 (14.8)	397(85.2)
	43(26.4)	120(73.6)
$\chi^2 = 11.052; P = 0.001$		
<i>Trained on standard precaution</i>		
Yes	55(14.1)	335(85.9)
No	57(23.8)	182(76.2)
$\chi^2 = 9.619; P = 0.002$		

5 Discussion & Conclusion

As reported in previous studies, there were more females than males in our study.[1,2] This could be explained by the fact that in Nigeria, the nursing profession is dominated by females and nurses constituted the highest percentage of the groups of HCWs in the present study. One hundred and twelve HCWs (17.8%) perceived they have experienced at least one episode of nosocomial infection since employment. This is quite high and indicates the enormous occupational risks faced daily by HCWs in their places of work. This could be likened to the 21% prevalence of nosocomial infections among HCWs recorded during an epidemic of severe acute respiratory syndrome in 2005.[13] According to World Health Organization, the on-going Ebola epidemic in Africa has already affected 869 HCWs with 507 deaths further buttressing the impact of nosocomial infections on HCWs.

The most commonly reported nosocomial infection in the present study was respiratory infection. This should not be surprising since little or no efforts are

made by the Hospital administration and the various departments to limit the spread of respiratory infections. As previously reported, HCWs who do not comply with the droplet and contact precautions are more likely to be infected during a respiratory disease epidemic than those who comply.[14] In these days of HIV epidemic and the concomitant rising incidence of multi-drug resistant pulmonary tuberculosis, the need to institute effective respiratory infection control measures in hospitals is an urgent call in order to preserve the lives of HCWs and by extension those of the communities where they reside. Eleven respondents reported percutaneous infections which were perceived to be occupationally acquired. This could be attributed to exposures to patients' blood and body fluids which have been reported to be high among HCWs by previous studies.[15,16] The WHO also estimates that over 70,000 percutaneous infections among HCWs are caused by sharps injuries globally every year.[17]

Awareness of hospital policy on standard precautions in the present study was poor. Similar poor awareness of work-related policies among HCWs have been reported and indicates the need to improve institutional information sharing system within the health industry as this will not only enhance workers' compliance to policies but will generally improve service delivery and ensure safety at work.[18,19] As in previous studies only about half of the respondents reported regular supply of PPEs.[20] This is a major fault on the part of Management and has been identified both in the present study and in previous others as a constraint to compliance with standard precautions and results in undue exposures of HCWs to nosocomial infections and other occupational hazards.[21]

In addition, proper hand hygiene among HCWs has been known to be an important mechanism of controlling nosocomial infections. Over 37% of the respondents either never or occasionally had access to hand hygiene. The unavailability of clean water and soap and/or antiseptic hand rub for use by HCWs in healthcare settings can simply be described as an unfortunate malady requiring urgent intervention. As has been noted, poor access to hand hygiene is a major cause of improper hand hygiene which is reported to be responsible for about 40% of nosocomial infections.[22,23]

Expectedly, most of the respondents identified managing a patient known to have a communicable disease to be a major enabling factor in complying with standard precautions. This obviously is in the bid to prevent contracting the infectious disease. On the contrary and in agreement with other studies, emergency situations, non-availability of PPEs and lack of knowledge on SP were the main constraints to use of SP noted by the respondents.[24-26] This further buttresses the need for regular supply of PPEs and continuous education of HCWs on their use. Again, it highlights the importance of being prepared to handle emergencies by HCWs particularly for those working in Accident and Emergency units, the theatre and in Intensive Care Units (ICUs).

The prevalence of nosocomial infections in the present study was highest

among the health attendants followed by the laboratory scientists and least among doctors. This is in contrast to an earlier study in South Africa where nosocomial infections were found most among nurses.[27] The high prevalence of these infections among health attendants who usually are oblivious of the risks they face daily in the course of doing their work is a cause of worry and an indication for on-the-job-training and supervision to ensure safety of this group of workers.

Various studies had associated training on SP and use of PPEs with compliance with SP and protection from nosocomial infections.[28,29] In consonance with these findings, our study found HCWs trained on the use of PPEs and SP to be significantly less likely to develop nosocomial infections than those not trained.

High perception of nosocomial infections and poor compliance to standard precautions were noted in this study. Irregular supply of hand hygiene materials and PPEs were contributory factors. HCWs who were trained on SP and use of PPEs were less likely to develop nosocomial infection. Hospital management should ensure regular SP training and supply of PPEs to all HCWs.

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