Original Research Article

Assessment of Knowledge and Compliance with Standard Precautions in Selected Hospitals in Rivers State, Nigeria

Abstract

Background: Standard precautions (SPs) in the hospital are very important in the reduction of health care worker's exposure to occupational health hazards but most hospitals operate reactive rather than proactive safety practices. The effect of reactive safety practices is overwhelming to health care workers, hospitals and the society. Thus, this study assesses health care worker's knowledge and compliance with standard precautions. **Material and Methods:** Descriptive cross-sectional design and proportionate stratified random sampling method was adopted with a sample size of 391. The study relied on a structured questionnaire with a reliability of 0.87. Descriptive and inferential statistics was used with the aid of statistical package for social science (SPSS) software version 21. **Results:** HCWs have fair knowledge of SPs and poor compliance with SPs. Also, there is significant association between HCW's knowledge of SPs and gender, marital status, years of experience and job category in the hospitals ($p<0.05$). Consequently, there is significant association between compliance with SPs and gender, years of experience and job categories in the hospitals ($p<0.05$). **Conclusion:** There is great need for strong advocacy on knowledge of SPs and compliance with SPs in the hospitals to curb increasing occupational health hazards. The government and hospital managements should develop an all-encompassing integrated SPs policies, strategies and procedures consistent with global best practices.

Key Word: *Knowledge, Compliance, Standard Precautions, personal protective equipment (PPEs), Hospitals*

I. Introduction

There is absence of obligatory laws and regulations governing the labor environment and this makes a lot of workers susceptible to hazards which may be life threatening. In developing countries, occupational health and safety (OHS) regulations make up only 10% of the populace [1]. Therefore, abandoning quite a lot of key hazardous businesses and professions like the health sector is dangerous [2], [3]. Even where the laws exist, workers are still at risk of being hired into situations that deprive them of their ethics and self-respect and these exposes them to a great number of job-related events and accidents. This has led to worsening workers health and welfare as some African studies opined that occupationally, health care workers (HCWs) obtained infections like tropical illnesses [2]. There is also the problem of lack of, or incomplete vaccination against hepatitis B virus (HBV) infection, inadequate knowledge of standard precautions (SPs), reduced availability/insufficient use of personal protective equipment (PPE), and absence of preventive training in hospitals which amounts to high possibility for hazard exposure to HCWs [4],[5],[6],[7]. These issues have been confirmed by some studies. Knowledge of SPs among HCWs is low. Only 37.0% of HCWs knew that SPs comprises hand washing before and after any contact with a patient, is a component of SPs. 39.0% of the HCWs

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recognized cough protocols and only 40.0% knew about sanitary procedures which comprise infection preventive approaches to curb the dangers of exposure to infection. 50% of the HCWs continually guard themselves against blood & body fluids (BBFs) of patients, 25% do not recap needles after usage and 28.0% do not always wipe blood spills on time [8]. 63.0% of HCWs opined that using PPEs such as aprons, gloves, gowns and goggles, might cause patients to fright occasionally and adhering to SPs, sometimes obstructs the ability to offer care (38.0%).

This study adopts the Health Belief Model (HBM). It is a psychosocial model that tries to predict health behaviors portrayed by HCWs as they perform health services. The HBM lays emphases on the attitudes, perception and knowledge of HCWs. It is centered on an understanding that a HCW will take a health-related action if he/she perceives that a health illness can be avoided, or has a rational anticipation that by carrying out a suggested action (compliance with SPs), he/she will avoid a hazard. Occupational exposure of HCWs and the susceptibility of diseases are on the rise. The continuous exposure to threats from infectious ailments has caused numerous HCWs to suffer from different illnesses contracted by handling of patients infected with various transmissible diseases. Likewise, lack of safety practices through the hospitals is a concern to HCWs, administrative bodies and the general public. This is unquestionably a crucial problem in the health sector. The long term effects comprise HCWs/patient susceptibility to infections, scarcity of health sector employees, HCWs' apathy and cost effects, even with the SPs scheme. Thus, there is plea for cautionary actions and reaction safety practices in hospitals. Therefore, the objectives of the study are to determine the level of knowledge of standard precautions and assess health care workers' compliance with standard precautions.

II. Material And Methods

Study Design: The study employed the descriptive cross-sectional design.

Study Location: The study was conducted in the two tertiary in Rivers State, Southern Nigeria, namely Rivers State University Teaching Hospital (RSUTH) and University of Port Harcourt Teaching Hospital (UPTH), and the zonal hospitals include Okirika, Degema, Bonny, Isiokpo, Ahaoda and Bori hospital respectively.

Study Duration: April, 2019-October, 2019.

Sample Size: 391 HCWs

Sample Size Calculation: proportionate stratified random sampling method with the use of table of random numbers was adopted for the sample selection. A population of 3876 staffs was considered, giving a sample size of 391, which includes 10% non-response rate was used by applying Taro-Yamane formula [9] given as:

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

where n is the sample size, e is tolerance error (0.05) and N is the study population.

Primary data were gathered using closed ended structured questionnaire which were self and interviewer administered, while secondary data was obtained via hospital records of the management of the hospitals.

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Inclusion Criteria: The research was limited to direct staffs who have worked in the hospital facility for at least 6 months and above. This includes doctors, nurses, pharmacists, clinical laboratory attendants, mortuary attendants, cleaners/porters, administrative workers and radiographers. All participants are aged 20 to 60 years. Their typical work day starts from 8am to 4pm after which the call duty starts till 8am the following day.

Exclusion Criteria: HCWs who are on contract, brief internship training, students, those in maternity leave, as well as those who have worked for less than 6 months were excluded from the study.

Procedure methodology: The questionnaire copies were administered with the help of a research assistant. Knowledge of SPs score of 1-4 is rated poor, 4-7 is rated fair and 8-10 is rated good. Questions on compliance are structured using a 4-point likert scale.

Statistical analysis: The data obtained were subjected to statistical analyses such as descriptive (mean, percentages and charts) and inferential (Chi-Square) statistics using statistical package for social sciences (SPSS) version 21. A test retest using Pearson Product Moment of Correlation Coefficient was carried out and a value of 0.87 was obtained. Content validation was done by experts in occupational health and safety.

Ethical Approval

This study was approved by River State Hospital Management Board (RSHMB) and University of Port Harcourt research ethical committee, Port Harcourt, Nigeria. Informed consent was obtained from respondents before they participated in the study. In the process, respondents were educated in a nut shell on hazards they may face as healthcare workers and how to mitigate them. Respondents were informed of their right to opt out of the study if necessary.

III. Results

Knowledge of Standard Precautions (SPs)

Table 1 assesses the association between knowledge of SPs and social-demographic variables. Result revealed that 41.7% of respondents have good knowledge of SPs, while 34.3% and 24.0% have fair and poor knowledge of SPs respectively. The Chi-Square results showed that knowledge of SPs is associated with gender, marital status, years of experience and job categories of respondents ($p<0.05$). But knowledge of SPs is not associated with educational level and age of respondents ($p>0.05$).

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Table 1: Association between Knowledge of SPs and Social-Demographic Variables

Variables	Good (%)	Fair (%)	Poor (%)	Total (%)	df.	Chi-Square (p-value)	Decision
Gender							
Male	98(48)	70(34.3)	36(17.6)	204(100)	2	11.381 (0.003)	Significant ($p<0.05$)
Female	65(34.8)	64(34.2)	58(31)	187(100)			
Marital Status							
Single	76(47.8)	56(35.2)	27(17)	159(100)	8	15.758 (0.046)	Significant ($p<0.05$)
Married	84(38.4)	74(33.8)	61(27.9)	219(100)			
Divorced	3(60)	1(20)	1(20)	5(100)			
Co-habiting	0(0)	2(40)	3(60)	5(100)			
Widow/Widower	0(0)	1(33.3)	2(66.7)	3(100)			
Years of Experience							
0-5yrs	5(14.7)	18(52.9)	11(32.4)	34(100)	10	20.855 (0.022)	Significant ($p<0.05$)
6-10yrs	66(47.8)	46(33.3)	26(18.8)	138(100)			
11-15yrs	46(37.1)	46(37.1)	32(25.8)	124(100)			
16-20yrs	30(50.8)	16(27.1)	13(22)	59(100)			
21-25yrs	9(45)	3(15)	8(40)	20(100)			
26yrs and Above	7(43.8)	5(31.2)	4(25)	16(100)			
Job Categories							
Doctors	26(35.6)	31(42.5)	16(21.9)	73(100)	16	35.709 (0.003)	Significant ($p<0.05$)
Nurse	29(31.9)	34(37.4)	28(30.8)	91(100)			
Pharmacist	23(50)	16(34.8)	7(15.2)	46(100)			
Radiographer	19(61.3)	9(29)	3(9.7)	31(100)			
Administration	30(45.5)	22(33.3)	14(21.2)	66(100)			
Cleaners/Porters	4(19)	7(33.3)	10(47.6)	21(100)			
Clinical Lab.	12(38.7)	7(22.6)	12(38.7)	31(100)			
Mortuary	9(60)	2(13.3)	4(26.7)	15(100)			
Educational Status							
Post Graduate	50(40.3)	45(36.3)	29(23.4)	124(100)	6	4.989 (0.545)	Significant ($p>0.05$)
Tertiary	85(43.6)	66(33.8)	44(22.6)	195(100)			
Secondary	27(42.9)	19(30.2)	17(27)	63(100)			
Primary	1(11.1)	4(44.4)	4(44.4)	9(100)			
Age (Years)							
25 & Below	10(43.5)	8(34.8)	5(21.7)	23(100)	10	7.100 (0.716)	Significant ($p>0.05$)
26-35	82(46.9)	56(32)	37(21.1)	175(100)			
36-45	49(38.6)	44(34.6)	34(26.8)	127(100)			
46-55	20(36.4)	20(36.4)	15(27.3)	55(100)			
56-65	1(12.5)	5(62.5)	2(25)	8(100)			
66 and Above	1(33.3)	1(33.3)	1(33.3)	3(100)			
Total	163(41.7)	134(34.3)	94(24)	391(100)			

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Compliance with Standard Precautions (SPs)

Table 2 assesses the association between compliance with SPs and social-demographic variables. Results revealed that 14.85 of respondents always comply with SPs, while 21.0%, 44.0% and 20.2% of respondents often, sometimes and rarely comply with SPs respectively. The Chi-Square results showed that compliance with SPs is associated with gender, years of experience and job categories of respondents ($p<0.05$). But compliance with SPs is not associated with marital status, educational level and age of respondents ($p>0.05$).
Consequently, Figure 1 revealed HCW's non-compliance with SPs for various job categories; the bar chart revealed that 85.8% of cleaners/porters do not comply with SPs followed by nurses (70.4%), mortuary attendants (66.7%), radiographers (64.5%) and administrators (62.1%) respectively. Also, clinical laboratory attendants (61.3%) followed by pharmacists (60.9%) and lastly doctors (60.2%).

Table 2: Association between Compliance with SPs and Social-Demographic Variables

Variables	Always (%)	Often (%)	Sometimes (%)	Rarely (%)	Total (%)	df.	Chi-Square (p-value)	Decision
Gender								
Male	35(17.2)	50(24.5)	89(43.6)	30(14.7)	204(100)	3	10.494 (0.015)	Significant ($p<0.05$)
Female	23(12.3)	32(17.1)	83(44.4)	49(26.2)	187(100)			
Marital Status								
Single	28(17.6)	38(23.9)	72(45.3)	21(13.2)	159(100)	12	17.521 (0.131)	Significant ($p>0.05$)
Married	29(13.2)	43(19.6)	95(43.4)	52(23.7)	219(100)			
Divorced	1(20)	1(20)	2(40)	1(20)	5(100)			
Co-habiting	0(0)	0(0)	2(40)	3(60)	5(100)			
Widow/Widower	0(0)	0(0)	1(33.3)	2(66.7)	3(100)			
Years of Experience								
0-5yrs	2(5.9)	9(26.5)	13(38.2)	10(29.4)	34(100)	15	26.811 (0.030)	Significant ($p<0.05$)
6-10yrs	26(18.8)	25(18.1)	64(46.4)	23(16.7)	138(100)			
11-15yrs	12(9.7)	35(28.2)	53(42.7)	24(19.4)	124(100)			
16-20yrs	13(22)	8(13.6)	26(44.1)	12(20.3)	59(100)			
21-25yrs	5(25)	3(15)	5(25)	7(35)	20(100)			
26yrs and Above	0(0)	2(12.5)	11(68.8)	3(18.8)	16(100)			
Job Categories								
Doctors	6(8.2)	23(31.5)	29(39.7)	15(20.5)	73(100)	24	65.631 (0.000)	Significant ($p<0.05$)
Nurse	13(14.3)	14(15.4)	41(45.1)	23(25.3)	91(100)			
Pharmacist	17(37)	1(2.2)	21(45.7)	7(15.2)	46(100)			
Radiographer	6(19.4)	5(16.1)	17(54.8)	3(9.7)	31(100)			
Administration	10(15.2)	15(22.7)	27(40.9)	14(21.2)	66(100)			

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Cleaners/Porters	1(4.8)	2(9.5)	9(42.9)	9(42.9)	21(100)			
Clinical Lab.	0(0)	12(38.7)	12(38.7)	7(22.6)	31(100)			
Mortuary	0(0)	5(33.3)	9(60)	1(6.7)	15(100)			
Education								
Post Graduate	23(18.5)	20(16.1)	55(44.4)	26(21)	124(100)	9	9.787 (0.368)	Significant (p>0.05)
Tertiary	29(14.9)	44(22.6)	86(44.1)	36(18.5)	195(100)			
Secondary	6(9.5)	17(27)	27(42.9)	13(20.6)	63(100)			
Primary	0(0)	1(11.1)	4(44.4)	4(44.4)	9(100)			
Age (Years)								
25 & Below	4(17.4)	5(21.7)	10(43.5)	4(17.4)	23(100)	15	12.234 (0.661)	Significant (p>0.05)
26-35	27(15.4)	46(26.3)	73(41.7)	29(16.6)	175(100)			
36-45	19(15)	21(16.5)	56(44.1)	31(24.4)	127(100)			
46-55	8(14.5)	8(14.5)	26(47.3)	13(23.6)	55(100)			
56-65	0(0)	1(12.5)	6(75)	1(12.5)	8(100)			
66 and Above	0(0)	1(33.3)	1(33.3)	1(33.3)	3(100)			
Total	58(14.8)	82(21)	172(44)	79(20.2)	391(100)			

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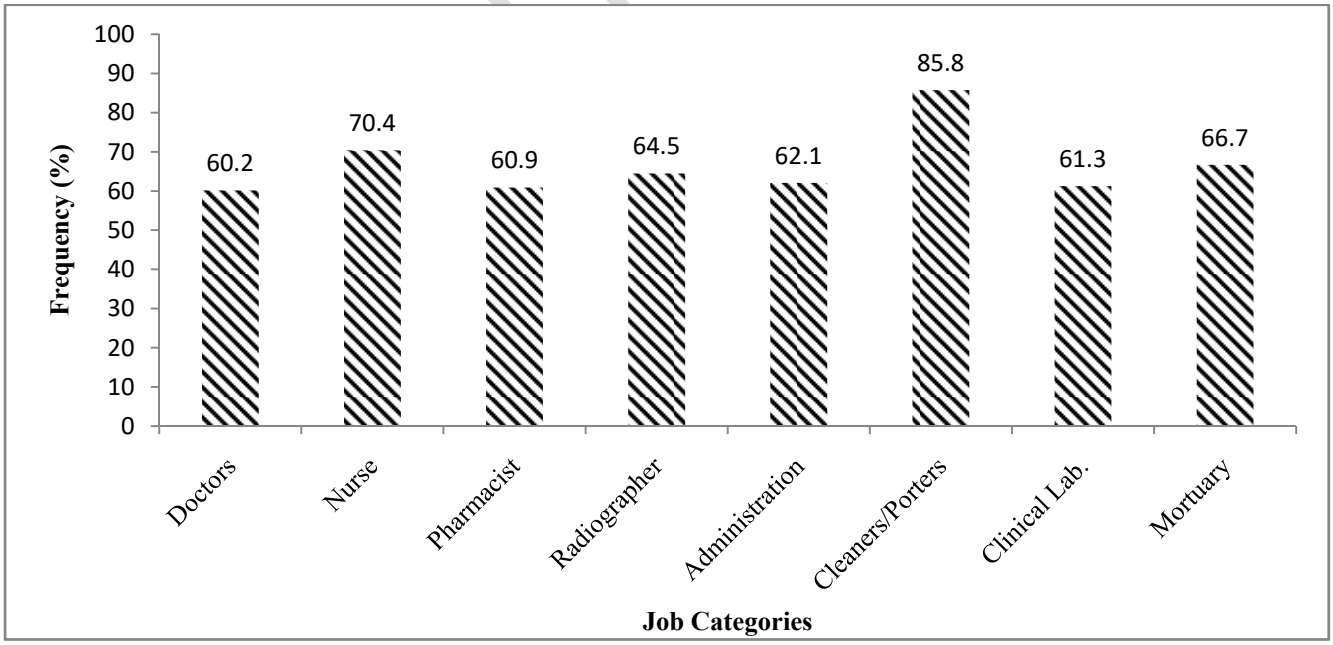

Figure 1: Bar Chart of HCWs Non-Compliance with SPs.

IV. Discussion

This study revealed that HCWs have fair (76.0%) knowledge of standard precautions (SPs) in the hospital. This is in agreement with [10] who opined that HCWs lack knowledge about blood borne pathogens (BBPs) transmission and SPs in China. [8] also reported HCWs had low level of knowledge of SPs among HCWs in Ghana. HCWs are not continually informed on SPs principles, insufficiencies or lack of knowledge and practice of SPs [11], [12], [13]. This study is at variance with [13] who stated that 89 % of HCWs (89%) had good knowledge about SPs in health care facilities (HCFs). Some other studies also demonstrated good knowledge of SPs at 86.9% and 81.8% respectively [14], [15]. Some scholars also argued that knowledge of SPs is vital to avert and regulate the susceptibility to hospital acquired infections [16], [17]. Also, access to information about to SPs will bring about enhancement of knowledge and better adherence to SPs [18]. Apparently, Chi-Square result showed that gender, marital status, years of experience and job category is significantly associated with knowledge of SPs ($p<0.05$).

Furthermore, this study showed that there is non-compliance with SPs in hospitals. This study reinforces that only few HCWs (35.8%) complied with SPs. The non-compliance with SPs is as a result of poor safety culture in the hospitals, insufficient delivery of PPEs, absence of supervision, absence of incident reporting, irregular trainings on SPs, nonexistence of monitoring, too much workloads, poor time management, nonexistence of punitive actions on non-compliance, prompt handling in emergency situations, assumptions that patient lacks infection, general self-efficacy, nonexistence of checks by hospital management amongst others. This finding agrees with [19] who reported that 75% of HCWs were below acceptable safety levels of practice SPs. [20] also reported median scores for compliance with SPs, HCWs complained of insufficient resources to practice SPs. In developing countries like Nigeria, SPs are either absent, not adhered to, or not enforced [21]. [22] studied affirmation of insufficient compliance with SPs by HCWs and they stated that observance of SPs is internationally suboptimal. In Rwanda there was a fall in adherence to 32.1% between 2015 & 2016 [23]. More previous researchers reported poor compliance with SPs by HCWs [17], [24], [25], [26], [12]. Much lower results (12% and 16.1%) on HCWs adherence to SPs have been were reported [27] [23]. This study disagrees with findings by [28] who stated that 77.9% of HCWs practice SPs and disease control in northern Nigeria.

[15] also opined that HCWs (70.1%) had a good adherence to SPs. Other studies also opined that hand washing, use of PPEs and safer devices (like retractable lancets), reduces the risk of OHHs [29], [17], [30], [31]. These measures also help reduce the spread of infectious agents in the HCFs [30]. [32] also advocated that adherence to SPs, is the most effective way of preventing transmission of BBPs. Yet, even with published procedures on disease control and adverse health concerns following noncompliance, major issues still exists around HCWs' adherence to SPs. More so, the Chi-Square result showed that gender, years of experience and job categories is significantly associated with compliance with SPs ($p<0.05$). Female HCWs are more likely not to comply with standard precaution than male HCWs and HCWs with job experience less than 10years are more likely not to comply with SPs HCWs with job experience 11 year and above. This finding agrees with [33] who opined that the level of awareness of SPs rises with increased years of experience at work. Also, [15] reported that HCWs gender and years of work experience is significantly associated with compliance with SPs.

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V. Conclusion

This study revealed that the Health Belief Model (HBM) is not obtainable or practiced in the hospitals in River State. Even with high perception of susceptibility to infection, or high perception of the seriousness of the problem, HCWs will still not comply with SPs. The non-compliance with SPs reported in this study poses devastating consequences in the hospital, such as increase in occupational health hazards (OHHs), decline in sustainable development and growth in the health sector as well as a healthy society at large. Hence this study recommends the following:

i. Laws and policies on SPs should be made by the government through the help of their legislation.
ii. The hospital management should enforce a system of surveillance for OHHs. This will assist in improving HCWs knowledge of SPs, as well as encouraging adherence with SPs.
iii. They should encourage regular provision of PPEs, their maintenance (for those that are not disposable) and their timely replacement when worn out.
iv. HCWs should also be enlightened that they are obligated to comply with SPs as this will reduce their exposure to OHHs.

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