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Original Research Article

Assessment of knowledge and practice of standard safety precautions among Primary Health Care Workers in Plateau State North Central Nigeria

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Article History:*Received:** 13/03/2017**Revised:** 07/04/2017**Accepted:** 09/04/2017**DOI:** <https://dx.doi.org/10.7439/ijbr.v8i4.4028>**Abstract**

Background: Standard safety precautions are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients. The control of spread of pathogens from any source is key in avoidance of transmission among health care worker. The practices of standard safety precaution help to protect the patient by ensuring that the health care workers does not transmit infectious agents to the patients through their hands or equipment during patient care. Hence, this study was conducted to assess the knowledge and practice of standard safety precautions among Primary Health Care workers in Plateau State.

Methodology: A cross sectional study conducted among 50 primary health care workers from 30 publicly owned Primary Health Care centers using quantitative method of data collection. Epi info statistical software version 3.5.4 was used for data analysis with a 95% confidence interval was used in this study and a p-value of ≤ 0.05 was considered statistically significant.

Result: The mean age of the respondent was 34.5 ± 9.9 years with more than half of the respondents, 28 (56.0%) as females. The average length of working experience was 7.3 ± 1.1 years and 34 (68.0%) of the health care workers had good overall knowledge of Standard Safety Precautions. Good practice of Standard Safety precaution was found among 39 (78.5%) of the respondents. Prior attendance of training had statistically significant influence on the respondents' practice of standard safety precautions (odds ratio 12.9; $p = 0.005$).

Conclusion: This study has demonstrated a reasonable good level of knowledge and practice of standard safety precaution among health care workers at the primary level care though with significant need for improvement in order to attain full compliance. Training and retraining of health care worker have been identified as a veritable tool to achieving in improvement in standard safety precautionary practice.

Keywords: Knowledge and Practice, Standard Safety Precaution, Primary Health Care Worker.

1. Introduction

Standard safety precautions are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients.[1,2] They are meant to reduce the risk of transmission of blood borne and other pathogens from both recognized and unrecognized sources.

[1,3,4] The control of spread of pathogens from the source is key in avoidance of transmission among health care worker.[1] The practice of standard safety precautionary measures helps to protect the patient by ensuring that the health care workers does not transmit infectious agents to

the patients through their hands or equipment during patient care. [5,6] It is recommended on all patients regardless of the diagnosis and treatment setting.[3]

Standard precautions include hand hygiene, use of appropriate Personal Protective Equipment (PPE), use of aseptic technique to reduce patient exposure to microorganisms and management of sharps, blood spills, linen, and waste to maintain a safe environment.[1,7,8]

Health care workers are regularly exposed to microorganisms in the course of discharging their duties and many of which can cause serious or even life threatening infections.[9] Hence, this study was conducted to assess the knowledge and practice of Standard Safety precaution among Primary Health Care workers in Plateau State.

2. Methodology

2.1 Study area

This study was carried out among health care workers in PHCs in Jos North Local Government Area (LGA) of Plateau State, North Central Nigeria. Jos north LGA is cosmopolitan in nature with a total of 30 publicly owned PHCs distributed across the 20 wards of the four districts.[10]

2.2 Study population

The study population consisted of 50 Primary Health Care (PHC) workers providing healthcare services in all the 30 PHCs in Jos North Local Government Area of Plateau State over a period of two months in 2015 (March and April).

2.3 Study design

This was a cross sectional study conducted among 50 eligible Primary Health Care workers in all the 30 publicly owned PHC in Jos north LGA of the state using quantitative method of data collection.

2.4 Selection criteria

Health care workers providing services in publicly owned PHCs in Jos North LGA of Plateau State with certification to practice and have consented to participate were included in the study. Health care workers who were on either annual or study leave, health facility staff who do not directly participate in patient care as well as those who declined consent for participation were excluded from this study.

2.5 Sample size determination

The minimum sample size for this study was determined using the appropriate sample size determination Formula for cross-sectional study.[11]

$$n = \frac{Z^2 pq}{d^2}$$

Where

n is the minimum sample size

Z is standard normal deviate at 95% confidence interval set at 1.96

p is the proportion of respondents from a previous similar study with good knowledge of universal precautions of 97% (0.97). [12]

q is the complementary probability (1-p = 0.03)

d is the precision of the study at 95% confidence interval set at 0.05

This gave a minimum sample size 50 inclusive the addition of 10% to cover for poor and incomplete response.

2.6 Sampling technique

Jos North LGA was selected from the list 17 LGAs in the state using simple random sample technique by balloting. Furthermore, all eligible health care workers who met the selection criteria and consented to participate in the study were recruited from all the PHCs in the study area.

2.7 Data collection

A three section semi structured interviewer administered questionnaire with a reliability score (Cronbach's alpha) score of 0.84 was used in this study. The data collection tool had the following sections; socio-demographic and occupational characteristics, knowledge of standard safety precautions and practice of standard safety precautions. The instrument was pretested in a primary health facility in another LGA of the state prior to the commencement of the study. Four research assistants were trained on the content and administration of data collection instrument prior to the commencement of the study by the principal researcher. Ethical clearance was sought and obtained from Jos University Ethical Review Committee. Written and verbal informed consents were obtained from all the respondents with confidentiality and anonymity of their responses assured and maintained.

2.8 Grading and scoring of responses

To assess the knowledge of primary health care workers regarding standard safety precautions, 17 stem questions were used with maximum obtainable responses of 47 out of which 30 were correct. A score of 1 was allotted to each correct response and no marks for every incorrect response or 'Not sure' response with a maximum attainable score of 30. A score of 16-30 was graded as 'good knowledge' while a score of 0-15 was graded as 'poor knowledge'.

A four point rating scale was used to assess Primary Health Care workers' practice of standard safety precautions, 6 stem questions were used with maximum obtainable responses of 24 out of which 6 were correct. A score of 4 was assigned for the most favourable response and 1 for the least obtainable response on the rating scale per stem question. The maximum obtainable score was 24. A score of 13-24 was graded as 'good practice' while a score 0-12 was graded as 'poor practice'.

Awareness of the concept of barrier nursing was adjudged as good if the respondents provided explanations that encompassed this “methods for administering patient care while preventing the transmission of infections in which a patient can be isolated to prevent the spread of disease to others or isolation is imposed to protect a patient with a compromised immune system”

2.9 Data analysis

The data collected was processed and analyzed using Epi info statistical software, version 3.5.4. Qualitative data such as age group, sex, cadre, knowledge and practice of standard safety precaution were presented in frequency and percentage. Chi-square test with Yates correction as a test of correction of continuity was used to determine the relationship between characteristics of the respondents such as age, sex, length of working experience, knowledge of standard safety precaution and practice of standard safety

precaution. A 95% confidence interval was used in this study and a p-value of ≤ 0.05 was taken as statistically significant.

3. Results

In this study, the mean age of the health care workers was 34.5 ± 9.9 years with 31 (62.0%) being below 30 years of age. More than half of the respondents, 28 (56.0%) were female while 22 (44.0%) were males. The cadre of respondents included, 18 (36%) Nurses, 10 (20.0%) CHOs, 14 and (28.0%) CHEW. More of the respondents, 35(70.0%) had worked for at least 5 years as health care workers while the 15 (30.0%) had worked for over 5 years with an average length of working experience as 7.3 ± 1.1 years. It was also found that 26 (52.0%) of the respondents had attended training on infection prevention and control at any time prior to this study. (Table 1)

Table 1: Sociodemographic characteristics

Characteristics	Frequency	Percentage (n = 50)
Age group (years)		
≤30	31	62.0
> 31	19	38.0
Sex		
Female	22	44.0
Male	28	56.0
Cadre		
Nurse	18	36.0
CHO	10	20.0
CHEW	14	28.0
Others*	8	16.0
Length of working experience (years)		
≤ 5	35	70.0
> 5	15	30.0
Prior training on infection prevention and control (within last 2 years)		
Trained	26	52.0
Not trained	24	48.0

*= Laboratory technician, pharmacy technician

CHO = Community Health Officers,

CHEW = Community Health Extension Workers

Majority of the respondents (84.0%) had heard about standard safety precautions, however only, 23(46.0%) had received one form of training or the other on the concept and principle of standard safety precautions. Also 20(40.0%) of respondents had heard about barrier nursing and only 16(32.0%) could correctly express its concept. Majority of the respondents 43(86.0%) knew proper use of

hand gloves and hand washing as components of standard safety precautions respectively. More so, 31(62.0%) of respondents knew about proper disposal methods of hospital wastes while 32(64.0%) were aware of WHO recommended guidelines for hand hygiene. More than half (68.0%) of the health care workers had good overall knowledge of Standard Safety Precautions (SSP). (Table 2)

Table 2: Knowledge of Standard Safety Precautions

Knowledge of SSPs	Frequency	Percentage (n = 50)
Awareness of SSPs		
Yes	42	84.0
No	50	16.0
Prior Training on SSPs		
Trained	23	46.0
Not trained	27	54.0
Awareness of barrier nursing concept		
Yes	20	40.0
No	30	60.0
Understanding of barrier nursing concept		
Satisfactory	16	32.0
Unsatisfactory	34	68.0
Components of SSPs**		
Proper use of hand gloves	43	86.0
Proper needle handling	18	36.0
Hand washing	43	86.0
Appropriate gowning	28	56.0
Use of safety boxes	33	66.0
Proper disposal of hospital waste	31	62.0
Awareness of recommended guidelines for hand hygiene		
Yes	32	64.0
No	18	36.0
Level of knowledge of standard safety precaution		
Good	34	68.0
Poor	16	32.0

** = Multiple responses allowed

The practice of Standard Safety precaution was found to be good among 39 (78.5) of the health care workers on the average. However, slightly less than half of the respondents 23(46.0%) always washed their hands before touching patients while 27(54.0%) always washed their hands after touching patients. More than half of the

respondents 27(54.0%) always wore protective gloves and coats during procedures and few 17(34.0%) always wore masks. Those who always covered open cuts and wounds during clinical work were 33(66.0%) of the respondents. (Table 3)

Table 3: Practice of Standard Safe Precaution

Practice of SSPs	Frequency	Percentage (n = 50)
Washing of hands before touching patients		
Always	23	46.0
Most times	17	34.0
Sometimes	8	16.0
Never	2	4.0
Wearing protective gloves & coats during procedures		
Always	27	54.0
Most times	19	38.0
Sometimes	4	8.0
Never	0	0.0
Washing of hands after touching patients		
Always	27	54.0
Most times	16	32.0
Sometimes	6	12.0
Never	1	2.0
Covering of open cuts and wounds during clinical work		
Always	33	66.0
Most times	10	20.0
Sometimes	5	10.0
Never	2	4.0
Supervised hand washing practice		
Supervised	30	60.0
Not supervised	20	40.0
Level of practice of SSPs		
Good	39	78.0
Poor	11	22.0

There was no statistically significant relationship between the age, cadre, length of working experience, prior training on infection control of the respondents and the practice of standard safety precaution. However, prior attendance of training on Standard safety precaution had statistically significant influence on the standard safety precautionary practices (odds ratio 12.9; $p = 0.005$), however this study could not assess the contents and

methods of delivery of these trainings. Similarly the respondents' knowledge of Standard safety precaution also had positive significant influence on the practice standard safety precautions as the odds of practice of standard safety precaution among those who had good knowledge was about 10 times the odds among those who did not ($p = 0.004$). (Table 4)

Table 4: Relationship between characteristics of the respondents and the practice of Standard Safety Precaution

Characteristics	Practice of Standard Safety Precaution				χ^2	P- value	OR (95Conf.Interval)
	Good Freq (%)	Poor Freq (%)	Total				
Age (year)							
≤ 35	22 (71.0)	9 (29.0)	31	1.396*	0.237	0.3 (0.055 – 1.509)	
> 35	17 (89.5)	2 (10.5)	19				
Total	39	11	50				
Sex							
Female	23 (82.1)	5(17.9)	28	0.206*	0.650	1.7 (0.448 – 6.637)	
Male	16 (72.7)	6 (6.7)	22				
Total	39	11	50				
Length of working experience (years)							
≤ 5	25 (71.4)	10 (28.6)	35	1.786*	0.180	0.2 (0.021 – 1.544)	
> 5	14 (93.3)	1(6.7)	15				
Total	39	11	50				
Prior training on infection control							
Trained	22 (84.6)	4 (15.4)	24	1.381	0.240	0.4 (0.111 – 1.759)	
Not trained	17 (70.8)	7 (29.2)	26				
Total	39	11	50				
Prior Training within the last 2 years on SSP							
Trained	22 (95.7)	1 (4.3)	23	7.734	0.005	12.9 (1.58 – 106.16)	
Not Trained	17 (63.0)	10 (37.0)	27				
Total	39	11	50				
Knowledge of SSP							
Good	31 (91.2)	3 (8.8)	34	8.484*	0.004	10.3 (2.220 – 48.095)	
Poor	8 (50.0)	8 (50.0)	16				
Total	39	11	50				

*=Yates corrected chi square, SSP = Standard Safety Precaution

4. Discussion

Majority of the respondents in this study had heard about standard safety precautions, which is similar in comparison with another study conducted in Edo State, Nigeria.[13] This similarity could possibly be attributed to attendance of training on SSP and probably due to the fact that a higher proportion of the of these health care workers had worked for less than 5 years and are still fresh from undergraduate trainings. Majority of the respondents knew the components of standard safety precautions, which is at variance with the findings of a study conducted in Nairobi, Kenya where only 17.8% of the participants had adequate knowledge of the basic elements of infection prevention standard precautions. [14] On the awareness of standard hand washing guidelines, this study share similar findings with another study conducted in Lagos Nigeria.[15] Though our study was carried out among Primary Health Care workers and that of Lagos was conducted health care

workers in tertiary institution, the synergy in the findings still further buttresses the fact that access of health care workers to relevant health information may not dependent on level of care. However, it will be good to scientifically under study the influence of level of care of health care workers' practice to on assess to relevant health information. Most than half of the respondents in this study knew the safety precautions for disposal of hospital waste which is in tandem with what was found in another conducted in East Africa. [14] The level of knowledge of standard safety precaution is imperative to its practice, the proportion of the respondents in this study with overall good knowledge of standard safety precaution was relatively high which is in synergy with what was obtained in studies in Nigeria and Zambia.[15,16] This could be attributable to prior attendance of training on infection prevent and control as well as some health care workers

leveraging on the opportunities provided on the job to acquire information and skills on safety precaution.

The practice of standard safety precaution with regards sequencing of hand washing in course of service provision is vital to halting transmission of pathogen to other patients as well as the health care workers. In this study, only a little below half of the respondents always washed their hands before touching patients, which is similar to a study done in Kenya where only 33.3% of the respondents performed hand hygiene always.[14] And a little above half always washed their hands after touching patients. This may be as a result of the perceptions of health care workers towards washing of hands before touching the patients. About half of the respondents always wore protective gloves and coats during procedures and few always wore masks. However, most of the respondents had generally good level of practice of Standard Safety Precautions which is higher than what was obtained another Nigerian study.[17] This variation in practice could be attributable to diversity of policy drive and implementation in the different geopolitical zones where the studies were conducted.

Improved knowledge as well as prior training on standard safety precaution was found to have significant influence on the practice of standard safety precaution in this study. Other studies conducted in Brazil, Nigeria, India and Iran found factors such training, availability of person protective equipment, availability of SSP guidelines, low risk perception uncooperative patients, work stress, knowledge of SSP and length of work experience as significant drivers of practice of safety precautions.[2,18-20] The practice of standard safety precaution and strict adherence to recommended guidelines are important to the safety of the health care providers as well as the patients. This study however could not assess the health care workers' adherence to the dictates of the guidelines in the course of discharging of duties and it is recommended that further studies should be carried out in this regard.

5. Conclusion

This study has demonstrated a reasonably good level of knowledge and practice of standard safety precaution among health care workers at the primary level care though with significant need for improvement in order to attain full compliance. Training and retraining of health care worker have been identified as a veritable tool to achieving in improvement in standard safety precautionary practice.

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