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Original Research Article

Knowledge of Transmission and Prevention of Nosocomial Infections: Primary Health Care workers' perspective in Plateau State North Central Nigeria

Zuwaira I Hassan[*1], Tolulope O Afolaranmi[1], Onimisi O Nathanel[2], Armiya'u Aishatu Yushau[3], Tetsohot E Tangkat[2], Danjuma J Chomo[2] and Oluwabunmi O Chirdan[1]

[1]*Department of Community Medicine, University of Jos. Jos, Plateau State Nigeria*
[2]*Faculty of Medical Sciences, University of Jos, Jos Plateau State, Plateau State Nigeria*
[3]*Department of Psychiatry, Jos University Teaching Hospital, Jos Plateau State Nigeria*

QR Code

***Correspondence Info:**
Dr. Zuwaira I Ibrahim,
Department of Community Medicine,
University of Jos, P. M. B. 2084, Jos, Plateau State, Nigeria

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Abstract

Background: Nosocomial infections are a worldwide phenomenon, globally, it occurs among 7–12% of the hospitalized patients with over 1.4 million people suffering from infections acquired in treatment centres and a resultant estimated annual death of 80,000. In view of this, this study aimed to assess the knowledge of transmission and prevention of nosocomial infections and factors influencing it among Primary Health Care workers in Plateau State.

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

Result: The predominant age group of the respondents was 21-30 years with a mean age of 34.5 ±9.9 years. Thirty (60.0%) of the respondents could correctly explain the concept of nosocomial infections with a little above half (56.0%) of the respondents having good knowledge of transmission and prevention of nosocomial infections. Attendance of prior trainings on infection prevention and control showed statistically significant influence on knowledge of prevention and transmission of nosocomial infections.

Conclusion: This study revealed a fairly high level of knowledge of the transmission and prevention of nosocomial infections amongst Primary health Care workers. However, training and retraining of health care workers on infection prevention and control is required in order to achieve an infection free health workplace.

Keywords: Knowledge of transmission and prevention, nosocomial infections, Primary Health Care workers.

1. Introduction

Nosocomial infections are a worldwide phenomenon which refer to infections occurring within 48 hours of hospital admission, 3 days after discharge or 30 days after an operation in whom the infection was not present or incubating at the time of admission.[1,2] According to the World Health Organization (WHO), nosocomial infections are a major contributor to mortality and morbidity among hospital patients globally.[3] Globally, nosocomial infections occur among 7–12% of the hospitalized patients with over 1.4 million people suffering from infections acquired in treatment centres and a resultant estimated annual death of 80,000.[2,3] In developing countries, the rates of nosocomial infections are up to 25% of all patients admitted to modern health care centres.[3] The hospital in some instances provides a favourable transmission pathway for the spread of nosocomial infections owing partly to poor infection control knowledge and practices among Health care workers on one hand and overcrowding of patients in most clinical settings on the other hand.[4-6] The magnitude of the problem of poor

knowledge of the transmission and prevention of nosocomial infections is particularly relevant in our environment where basic infection control measures are usually lacking or non-existent in most health facilities.[6] The burden of hospital acquired infections goes beyond its impact on morbidity and mortality of any country but its profound economic implications such as prolonged duration of hospitalization, increased severity of the primary illness, increased cost of care with resultant somewhat unquantifiable impact of the quality of lives of patients and their respectively families in both developed and resource-constraint countries.[4,7] In view of this, this study aimed to assess the knowledge of transmission and prevention of nosocomial infections and factors influencing it 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 of Plateau State, North Central Nigeria. Jos north LGA is cosmopolitan in nature with a total of 30 government owned PHCs distributed across the 20 wards of the four districts.[8]

2.2 Study population

The study population consisted of Primary Health Care (PHC) workers currently offering healthcare services in the government owned PHCs between the months of March and April, 2015 in Jos North Local Government Area of Plateau State.

2.3 Study design

This was a cross sectional study conducted among Primary health care workers to determine the knowledge of transmission and prevention of nosocomial infections.

2.4 Inclusion and exclusion criteria

Health care workers working in PHCs in Jos North LGA of Plateau State who have attained competency through formal health care training in their respective fields and have consented to participate were included in the study. Visiting health care workers, health care workers who were on study or annual leave, health facility staff who do not directly participate in patient care as well as those who declined consent for participation in the study were excluded.

2.5 Sample size estimation

A minimum sample size was determined using the sample size determination formula for cross-sectional study.[9]

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

Where n is the minimum sample size, Z is the standard normal deviate at 95% confidence interval (1.96), q is the complementary probability (1 – p), d is the precision of the study set at 0.05 and p is the proportion of respondents with good knowledge of prevention of nosocomial infections from a previous similar study 97% (0.97).[10] This gave a minimum sample size of 50 after 10% addition to cater for non, poor and incomplete responses.

2.6 Sampling technique

A two stage sampling technique was used in this study;

Stage I:

From the list of all the 17 Local Government Areas (LGA) in Plateau State, Jos North LGA was selected using simple random sampling technique by balloting.

Stage II:

All health care workers who met the inclusion criteria and willing to participate in the study from all the 30 government owned PHCs in the LGA were recruited for the study.

2.7 Data collection

A semi structured interviewer administered questionnaire with Cronbach's alpha score of 0.81 comprising of two sections namely demographic characteristics and knowledge of transmission and prevention of nosocomial infection was used in this study. This data collection instrument was pretested in a primary health facility in another LGA of the state prior to the commencement of the study. Three research assistants were trained on the data collection instrument prior to the commencement of the study by the lead researcher. Ethical clearance was sought and obtained from Jos University Ethical Review Committee. Written and verbal informed consent were obtained from all the respondents with confidentiality and anonymity of their responses assured.

2.8 Grading and scoring of responses

A total of 10 stem questions were used to assess the knowledge of the transmission and prevention of nosocomial infections with maximum obtainable responses of 35 out of which 27 were correct. One mark was allotted to each correct response and no marks for every incorrect response or 'Not sure' response giving a maximum attainable score of 27. A score of 13-27 was graded as 'good knowledge' while a score of 0-12 was graded as 'poor knowledge'.

The understanding of the concept of nosocomial infection was adjudged as correct if the respondents provided explanations that encompassed this "infections occurring within 48 hours of hospital admission, 3 days after discharge or 30 days after an operation in whom the infection was not present or incubating at the time of admission"

2.9 Data analysis

Data collected were processed and analyzed using Epi info statistical software version 3.5.4. Quantitative data such as age group, sex, cadre level of knowledge and prevention of nosocomial infection were presented in frequency and percentage. Multiple logistic regression was used to identify factors influencing the knowledge of transmission and prevention of nosocomial infections. A 95% confidence interval was used in this study and a p-value of ≤ 0.05 was considered statistically significant.

3. Results

In this study, the predominant age group of the respondents was 21-30 years with a mean age of 34.5 ±9.9 years. More than half of the respondents, 28 (56.0%) were female while 22 (44.0%) were males. The cadre of respondents included, 18 (36.0%) Nurses, 10 (20.0%) CHOs, 14 (28.0%) CHEWs, and 8 (16%) belonged to the others category. Most of the respondents, 35(70.0%) had worked for 60 months or less in the current Primary Health Care centres while 15 (30.0%) had worked for more than 60 months. The mean length of working experience of the respondents was 88 ±11.1 months. See Table 1.

Almost all the respondents 44(88.0%) had heard about nosocomial infections however, only 30(60.0%) could correctly explain the concept of nosocomial infections. The vehicles for transmission of nosocomial infections mentioned by the respondents were syringes 33 (66.0%), thermometer 24 (48.0%), used needles 38 (76.0%) and urethral catheter 32 (64.0%) among others respectively. On the mode of transmission, 30 (60.0%) of the health care workers knew that contact with contaminated blood and body fluids as mode of transmission respectively. Furthermore, airborne was mentioned by 27 (52.0%) of the respondents while very few 6.0% knew person to person as a mode of transmission. Proper hand hygiene as a measure of prevention of nosocomial infections was known by 42 (84.0%) of the health care workers while correct and consistent use of hand gloves and regular use of disinfectant were other measures of prevention of transmission identified by 74.0% and 24.0% of the respondents respectively. Also, 41(82.0%) knew that the use of infection reduction guidelines limits the risks for transmission of nosocomial infections. Cumulatively, the assessment of the health care workers' level of knowledge transmission and prevention of nosocomial infections revealed that 28 (56.0%) of the respondents had good knowledge. See Table 2

This study did not find any statistically significant relationship between the age, sex, religion, cadre and working experience of the respondents with their level of knowledge of transmission and prevention of nosocomial infections. However, prior attendance of trainings on infection prevention showed statistically significant influence on knowledge of prevention and transmission of nosocomial infections (odds ratio = 20.1; 95 CI = 15.400 – 23.160; P = 0.001). See Table 3

Table 1: Sociodemographic characteristics

Characteristics	Frequency	Percentage n = 50
Age group (years)		
21 – 30	27	54.0
31 – 40	11	22.0
41 and above	12	24.0
Sex		
Female	28	56.0
Male	22	44.0
Cadre		
Nurse	18	36.0
CHO	10	20.0
CHEW	14	28.0
Others*	8	16.0
Duration of working experience (months)		
≤ 60	35	70.0
> 60	15	30.0
Prior training on infection prevention and control		
Attended	26	52.0
Not attended	24	48.0

*= Laboratory technician, pharmacy technician

CHO = Community Health Officers, CHEW = Community Health Extension Workers

Table 2: Knowledge of Prevention and Transmission of Nosocomial infection

Parameters	Frequency	Percentage n=50
Awareness of Nosocomial Infections		
Yes	44	88.0
No	6	12.0
Understanding of the concept of Nosocomial infections		
Correct	30	60.0
Incorrect	20	40.0
Vehicles of transmission of infections**		
Syringes	33	66.0
Thermometers	24	48.0
Needles	38	76.0
Urethral catheters	32	64.0
Stethoscopes	23	46.0
Others*	6	12.0
Mode of transmission of infections**		
Airborne	27	54.0
Contact with blood/body fluids	30	60.0
Needle stick injuries	28	56.0
Contaminated instruments	30	60.0
Person to person	3	6.0
Awareness of infection reduction guideline		
Yes	41	82.0
No	9	18.0
Known measures for prevention of Nosocomial infections**		
Consistent and correct use of hand gloves	37	74.0
Use of disinfectant	12	24.0
Proper hand hygiene	42	84.0
Use of safety boxes for needles	14	28.0
Others***	5	10 .0
Level of knowledge of transmission and prevention of nosocomial infections		
Good	28	56.0
Poor	22	44 .0

*= beddings, door handles, walls
**= Multiple responses obtained
***= Non reuse of syringes and needles, non recycling of hand gloves

Table 3: Factor predicting good knowledge prevention and transmission of Nosocomial infection

Factors	Odds ratio	95% Confidence interval	P - value
Age (years)			
31 – 40	6.5	0.322 – 13.666	0.222
40 and above	1.2	0.031 – 5.486	0.906
21 – 30	1	-	-
Sex			
Male	0.7	0.206 – 2.217	0.522
Female	1	-	-
Cadre			
CHO	0.4	0.160 – 4.844	0.883
Nurse	1.3	0.293 – 5.140	0.778
Others	0.8	0.138 – 4.767	0.819
CHEW	1	-	-
Duration of working			
> 60 months	0.6	0.015 – 2.150	0.762
≤ 60 months	1	-	-
Training of infection control and prevention			
Attended	20.1	15.400 – 23.160	0.001
Not attended	1	-	-

4. Discussion

In this study, about half of the respondents were aged between 21 and 30, this is similar to findings in a study conducted in Jamaica where 52.0% of the respondents were aged below 30 years.[11] There were more female respondents in this study than males, this corresponds to findings in a study conducted in Lagos, Nigeria where 62.3% of the respondents were females.[6] There were also more of nurses among respondents in this study than any other cadre of health care workers. This finding is similar to that of a study conducted in Osogbo, Nigeria which had 57.1% of respondents as nurses.[12] Most of the respondents in this study had only worked for 50 months or less which corresponds to a similar finding from a study in Jamaica where majority of the respondents had worked between 1-5 years.[11]

From this study, majority of the respondents had heard about nosocomial infections which is similar to the findings of conducted in Zambia.[13] However only a little above half of the health care workers had correct understanding of the concept of nosocomial infections. This result is better compared to a study done in four Kosovo hospitals where only 16.8% of the respondents knew the correct definition of nosocomial infections but similar to results obtained from a study carried out in Zaria, Nigeria and Eygpt where 57.2% and majority of respondents had correct knowledge of the definition of nosocomial infections. [14-16] More of the respondents in this study knew at least one of the various ways of nosocomial infection transmission, which is similar to a study done in Osun State, Nigeria where 65.9% of primary level health workers had good knowledge of the sources of nosocomial infections and that of a Pakistani study were 78.2% mentioned stethoscope among others vehicles for transmission of infections.[12,17] However, more than half of respondents in this study knew needle stick injury as a possible means of transmission of nosocomial infections. This contradicts the finding of a study carried out in some Kosovo hospitals where knowledge of needle stick injury as a means of infection transmission was very low.[14] The observed variations in knowledge of means of transmsion of nosocomial infection could attributable varying patient care policy and ease of access to health infection in these different regions.

Prior attendance of infection prevention and control training by the health care workers was very low in this study, however attendance of such training was found to be much lower in a similar study conducted in Sri Lanka. It is therefore imperative to organize and promote attendance of infection control training regularly for health care workers as this will like impact positive on the and practice of infection prevention and control.[18]

5. Conclusion

This study revealed a fairly high level of knowledge of the transmission and prevention of nosocomial infections amongst Primary health Care workers. However, training and retraining of health care workers on infection prevention and control is required in order to achieve an infection free workplace.

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