

Measures Utilised by Midwives for the Prevention of Nosocomial Infections in the Labour Ward at University of Calabar Teaching Hospital, Calabar

Agba, Mathias, Department of Nursing Science, University of Calabar, Cross River State, Calabar
mathiasagba2015@gmail.com

Ojong, N. Idang; Department of Nursing Science, University of Calabar, idangojong@yahoo.com

Ibiye, Horsfall George; Department of Psychiatry, University of Port Harcourt Teaching Hospital, Rivers State ibiye.horsfall10@gmail.com

Enang, Kingsley Oju, School of post basic mental health and psychiatric nursing Calabar, Cross River State kingssuccess2014@gmail.com

Agba, Affiong Mathias, 305 Mobility Group, Nigeria Airforce Medical Centre Calabar, Cross River State affiongattah@gmail.com

Abstract

The study sought to identify measures utilized by midwives for the prevention of nosocomial infections in the labour ward at the University of Calabar Teaching Hospital. The study employed a cross-sectional design. Three hundred and ten (310) midwives were selected using the systematic sampling technique. A well-structured and validated questionnaire was constructed and used for data collection. Data generated were analysed using the statistical package for social sciences (SPSS). The significance of the hypothesis was tested using Chi-Square statistics at <0.05 level of significance. From the findings, majority of study participants practiced nosocomial infection measures including hand hygiene while environmental hygiene was ensured as the facility had running water and wash points which were available and accessible at all points of care. Similarly, facility provided soaps were available, items and equipment were always clean and sterilized and delivery rooms and theatres were disinfected regularly and between procedures. Findings from the present study revealed that majority agreed that; the educational level of a healthcare professional, number of years of work experience, knowledge of preventive measures of nosocomial infections, training on infection prevention and control and availability of practice resources can encourage the utilization of preventive measures of nosocomial infections. Similarly, findings from the present study indicated that majority of respondents agreed that poor supply and availability of the practice materials, heavy workload, poor comfort of PPEs and poor training on infection prevention and control can hinder the use of nosocomial infection prevention measures in labour units. Finally, findings of the present study revealed that there is a significant relationship between the level of education of midwives and their utilization of hand hygiene in the labour wards of the University of Calabar Teaching Hospital.

Keywords: Measures, prevention, nosocomial infection, labour ward, UCTH

INTRODUCTION

Nosocomial infections have become a global problem and a leading cause of death in developed and developing countries (Aja et al. 2017; Salem, 2019). It is the eleventh leading cause of death in the world and the fifth leading cause of death in hospitals (Naderi et al. 2017). Although incidence rates differ per country, nosocomial infections have been noted to complicate between 0.8% and 2.7% of deliveries leading to approximately 10,000 deaths in labour units globally (Bukasa et al. 2017). One of such mechanisms is preventive measures (Gulilat& Tiruneh, 2014). These measures (which are practiced by healthcare personnel to decrease transmission and acquisition of infectious agents) generally include; universal precautions and antisepsis tapping (immunization) (Gulilat& Tiruneh, 2014; Marwati et al., 2016). Knowledge of the preventive measures of nosocomial infections has been identified by several authors. Chitimwango (2017) reported that the knowledge of nosocomial infection prevention measures as the possession of information and understanding of the skills of nosocomial infection prevention. Similarly, knowledge of preventive measures of hospital acquired infections in labour units entail possession of information regarding good pre-and post-delivery hygiene practices and appropriate antibiotic prophylaxis (Bukasa et al. 2017). Thus, a healthcare worker may be knowledgeable or ignorant regarding the preventive measures of nosocomial infections (Naderi et al. 2017).

Nosocomial infections are preventable when appropriate measures are used (Khan, Ahmad & Mehboob, 2015). These measures include; hand hygiene, aseptic techniques, environmental hygiene, universal/standard precautions (like use of gowns, masks and gloves), isolation precautions, avoidance of invasive procedures and patient education amongst others (Mehta, Gupta & Ramasubban, 2014). Ibrahim and Elshafie (2016) state that these measures not only protect the patient and family, but healthcare professionals, students, and the environment. Therefore, appropriate use of infection prevention measures can prevent the spread of nosocomial infections while; misuse, poor use or no utilisation of such measures can promote the spread of infections among patients and health professionals (Okwii, 2017). Despite the above and the efforts put by hospitals on infection preventive measures, the global burden of nosocomial infections has been on the increase with corresponding increase morbidity and mortality (Nyirantibibaza, 2017).

METHODOLOGY

The design used for this inquiry was the cross sectional study design with the quantitative mode of inquiry. The research setting for this study was the labour ward of the University of Calabar Teaching Hospital, Calabar. The University of Calabar Teaching Hospital is located in the heart of Akim Qua Town close to the University of Calabar. The labour ward which provides care for women during childbirth is situated on the ground floor of the maternity block of the University of Calabar Teaching Hospital. It shares northern boundaries with the Labour Theatre and southern boundaries with the Special Care Babies Unit. The sample size for this research was calculated using the following formula for calculation of sample size using estimated population size (Mugenda & Mugenda, 2003).

$$n = (Z_{\alpha/2})^2 P(1-P)/d^2$$

Where d = degree of precision = 0.05

Z = standard normal deviate (1.96) corresponding to 95% level of confidence

n = desired sample size where population $> 10,000$

P =proportion of parents of secondary school students who know about sex education (estimated proportion, 0.5).

This number is unknown therefore, “ p ” is taken as 50%.

$$q = 0.5$$

$$\begin{aligned} n_0 &= (Z_{\alpha/2})^2 p(1-p) / d^2 \\ &= (1.96/2)^2 * 0.5(1-0.5) / (0.05)^2 \\ &= 3.84 * 0.25 / 0.0025 \\ &= 0.96 / 0.0025 \end{aligned}$$

$$n_0 = 384$$

Using Cochran’s Formula for a finite population and where n_0 is 384.

Cochran’s Formula= $n = n_0 / 1 + (n_0 - 1) / N$

n = final sample size

n_0 = finite (estimated population) size = 384

N = Actual Population Size = 1,200

Thus $n = 384 / 1 + (384 - 1) / 1200$

$$n = 384 / 1 + 383 / 1200$$

$$n = 384 / 1 + 0.32$$

$$n = 384 / 1.32$$

$$n = 290$$

Thus two hundred and ninety (290) midwives was used for this study.

A systematic random sampling method was adopted to select three hundred and nineteen (319) midwives in the hospital. This study used self-administered, closed ended type questionnaire.

A pre-test of the data collection instrument was carried out to enhance the validity and reliability of the questionnaire. A pre-test of the instrument was done two weeks prior to actual data collection date in the General Hospital Calabar. The researcher utilized a self-developed validated close-ended questionnaire to collect data. Descriptive statistics was carried out and frequency tables produced to describe the extent to which the preventive measures of nosocomial infection were used. A Chi-square test was also done to ascertain the association between the level of education and utilization of hand hygiene among respondents.

The ethical clearance was obtained from the Ethical Committee of the University of Calabar Teaching Hospital to contribute to safeguarding the dignity, rights, safety, and well-being of all potential research participants. A full ethical clearance process preceded the commencement of the study. Also, informants in this study were adequately informed of the aims and methods of the study; along with institutional affiliations of the researcher, the anticipated benefits and potential risks of the study and the discomfort it may entail. Informants were also informed of the right to withdraw from participation in the study at any time without reprisal. They were also informed that participation is strictly voluntary.

DATA ANALYSIS AND PRESENTATION OF RESULTS

TABLE 1: Socio-demographic Characteristics of Respondents (n=310)

Variables	Frequency	Percentage (%)
Age		
20-30 years	109	35.2
31-40 years	148	47.7
41 years and above	53	17.1
Total	310	100.0%
Gender		
Male	4	1.3
Female	306	98.7
Total	310	100.0%
Educational Qualifications		
RN/RM	77	24.8
B.Sc	222	71.7
M.Sc	11	3.5
Total	310	100.0%
Years of Experience		
1-5 years	31	10.0
6-10 years	156	50.3
11-15 years	66	21.3
More than 15 years	57	18.4
Total	310	100.0%
Attendance of Training on Infection Control		
Yes	310	100.0
No	0	0.0
Total	310	100.0%
Average Number of Staff per shift		
1-2	38	12.4
3-4	122	39.3
5-6	99	31.9
More than 6	51	16.4
Total	310	100.0%

Table 1 above presents the socio-demographic data of the respondents. With regards to age, 109 (35.2%) respondents were aged 20-30 years, 148 (47.7%) were between 31 and 40 years while 53 (17.1%) were aged 41 and above. Results revealed that for gender, 4 (1.3%) respondents were males while 306 (98.7%) were females. As regards educational qualifications, 77 (24.8%) respondents were registered nurses and midwives, 222 (71.7%) had B.Sc in Nursing while 11 (3.5%) had M.Sc. Concerning years of experience, 31 (10.0%) study participants had 1-5 years of work experience, 156 (50.3%) had 6-10 years of experience, 66 (21.3%) had 11-15 years of experience while 57 (18.4%) had more than 15 years of work experience. As regards attendance of training on infection control, all (100.0%) respondents had attended trainings on infection control. Concerning the average

number of staff per shift, 38 (12.4%) respondents reported that there were 1-2 staff per shift, 122 (39.3%) reported that there were 3-4 staff per shift, 99 (31.9%) reported that there were 5-6 staff per shift while 51 (16.4%) indicated that there were more than 6 staff in each shift they worked.

Table 2 Hand Hygiene measures used for Prevention of Infections in the Labour Ward of the University of Calabar Teaching Hospital, Calabar (n=310)

Statements	Always (%)	Sometime (%)	Rarely (%)	Never (%)
Perform hand hygiene before patient contact	123 (39.7%)	108 (34.8%)	71 (22.9%)	8 (2.6%)
Hand hygiene is carried out after patient contact	167 (53.9%)	138 (44.5%)	5 (1.6%)	0 (0.0%)
Hand hygiene is done after exposure to patients' body fluids during labour	159 (51.3%)	140 (45.2%)	11 (3.5%)	0 (0.0%)
Performance of hand hygiene is ensured before contact with patient's surroundings in labour	94 (30.3%)	158 (51.0%)	31 (10.0%)	27 (8.7%)
Hand hygiene performed before putting on gloves in labour ward	69 (22.3%)	144 (46.5%)	51 (16.4%)	46 (14.8%)
Wash hand with water and hand sanitizer after removal of hand gloves	206 (66.5%)	101 (32.6%)	3 (0.9%)	0 (0.0%)
Hand hygiene performed before vaginal examination	211 (68.1%)	73 (23.5%)	26 (8.4%)	0 (0.0%)
Hand hygiene is performed between two patients in labour	269 (86.8%)	21 (6.8%)	17 (5.5%)	3 (0.9%)

Table 2 showed that 123 (39.7%) respondents always performed hand hygiene before patient contact while 108 performed hand hygiene before patient contact sometimes. However, 71 (22.9%) respondents rarely performed hand hygiene before patient contact while 8 (2.6%) never performed hand hygiene before patient contact. Secondly, 167 (53.9%) midwives always performed hand hygiene after patient contact while 138 (44.5%) performed hand hygiene after patient contact sometimes. Nevertheless, 5 (1.6%) respondents rarely performed hand hygiene after patient contact while no (0; 0.0%) respondent indicated that they never performed hand hygiene after patient contact. Also, when asked if hand hygiene was done after exposure to patient's body fluids during labour, 159 (51.3%) responded with 'always', 140 (45.2%) responded with 'sometimes' while 11 (3.5%) responded with 'rarely' and no (0; 0.0%) respondent responded with 'never'. With regard to ensuring performance of hand hygiene before contact with patient's surroundings in labour, 94

(30.3%) always, 158 (51.0%) did so sometimes while 31 (10.0%) did so rarely and 27 (8.7%) never did. Regarding, hand hygiene performance before putting on gloves in labour ward, 69 (22.3%) participants indicated that they did so ‘always’, 144 (46.5%) indicated that they did so sometimes while 51 (16.4%) participants stated that they did so ‘rarely’ and 46 (14.8%) indicated that they ‘never’ did so. Concerning hand washing with water and hand sanitizer after removal of hand gloves, 206 (66.5%) respondents indicated that they ‘always’ did so, 101 (32.6%) said they did so ‘sometimes’ while 3 (0.9%) indicated that they ‘rarely’ did so and no (0; 0.0%) respondent indicated that they ‘never’ did so. Moreover, 211 (68.1%) respondents ‘always’ performed hand hygiene performed before vaginal examination, 73 (23.5%) did so ‘sometimes’ while 26 (8.4%) participants ‘rarely’ performed hand hygiene before vaginal examination and no (0; 0.0%) respondent ‘never’ did. Regarding performance of hand hygiene between two patients in labour, 269 (86.8%) respondents ‘always’ did so, 21 (6.8%) did so ‘sometimes’ while 17 (5.5%) respondents ‘rarely’ performed the procedure and only 3 (0.9%) ‘never’ did.

Table 3 Summary of the Level of Utilisation of Hand Hygiene Measures in the Prevention of Infections in the Labour Ward of the University of Calabar Teaching Hospital (n=310)

Statements	Always	Sometime s	Rarely	Never	Column n Total
Perform hand hygiene before patient contact	123	108	71	8	
Hand hygiene is carried out after patient contact	167	138	5	0	
Hand hygiene is done after exposure to patients’ body fluids during labour	159	140	11	0	
Performance of hand hygiene is ensured before contact with patient’s surroundings in labour	94	158	31	27	
Hand hygiene performed before putting on gloves in labour ward	69	144	51	46	
Wash hand with water and hand sanitizer after removal of hand gloves	206	101	3	0	
Hand hygiene performed before vaginal examination	211	73	26	0	
Hand hygiene is performed between two patients in labour	269	21	17	3	
Total	1298	883	215	84	
Data transformation	2181/2480x310 =273		299/2480x310 =37		2480

Data Transformation for Level of Utilisation = Column Total of Positive (or Negative Responses)/Grand Column Total × Number of Respondents

Thus, data transformation for Utilization = $2181/2480 \times 310$
=273

Data transformation for Non Utilization = $299/2480 \times 310$
= 37

A summary of table 4.2 and 4.3 above revealed that among the 310 participants used for the study, the majority 273 (88.1%) utilized hand hygiene measures while 37 (11.9%) did not utilize these measures.

Table 4 Environmental Hygiene measures used for Prevention of Infections in the Labour Ward of the University of Calabar Teaching Hospital, Calabar (n=310)

Items	SA (%)	A (%)	D (%)	SD (%)
My facility has a sink with a running tap for hand hygiene	159 (51.3%)	108 (34.8%)	28 (9.0%)	15 (4.9%)
Water and wash points are available and accessible to all points of care	115 (37.1%)	111 (35.8%)	47 (15.2%)	37 (11.9%)
Potable water supply is available at all times	98 (31.6%)	151 (48.7%)	38 (12.3%)	23 (7.4%)
Facility provided gloves and wash soaps are available	73 (23.5%)	118 (38.1%)	53 (17.1%)	66 (21.3%)
Items and equipment are always clean and sterilized	199 (64.2%)	93 (30.0%)	13 (4.2%)	5 (1.6%)
Delivery rooms and theatres are disinfected regularly and between procedures	206 (66.5%)	100 (32.3%)	2 (0.6%)	2 (0.6%)
Refuse is properly disposed in appropriately coded bins	67 (21.6%)	173 (55.8%)	49 (15.8%)	21 (6.8%)

Table 4 showed that 159 (51.3%) respondents strongly agreed that their facility has a running tap for hand hygiene, 108 (34.8%) agreed, 28 (9.0%) disagreed while 15 (4.9%) strongly disagreed. When asked if water and wash points were available and accessible to all points of care, 115 (37.1%) participants strongly agreed, 111 (35.8%) agreed, 47 (15.2%) disagreed while 37 (11.9%) strongly disagreed. Regarding availability of potable water supply at all times, 98 (31.6%) respondents strongly agreed, 151 (48.7%) agreed, 38 (12.3%) disagreed while 23 (7.4%) strongly disagreed. Concerning availability of facility provided gloves and soaps, 73 (23.5%) respondents strongly agreed with the statement, 118 (38.1%) agreed with the statement, 53 (17.1%) disagreed while 66 (21.3%) strongly disagreed with the statement. When asked if items and equipment were always clean and sterilized, 199 (64.2%) midwives strongly agreed, 93 (30.0%) agreed while 13 (4.2%) disagreed and 5 (1.6%) strongly disagreed with the statement. When participants were asked if delivery rooms and theatres are disinfected regularly and between procedures, 206 (66.5%) key

informants strongly agreed, 100 (32.3%) agreed while 2 (0.6%) participants each disagreed and strongly disagreed with the statement. Regarding proper refuse disposal in appropriately coded bins, 67 (21.6%) respondents strongly agreed with the statement, 173 (55.8%) agreed with the statement while 49 (15.8%) respondents disagreed with the statement and 21 (6.8%) strongly disagreed with the statement.

Table 5 Standard Precautions Utilized by Midwives in the Labour ward of the University of Calabar Teaching Hospital, Calabar (n=310)

Statements	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
Hand hygiene with soap and water or alcohol-based hand-rub is used	120 (38.7%)	137 (44.2%)	45 (14.5%)	8 (2.6%)
Personal protective equipment (masks, gloves, goggles, aprons and boots) are used	143 (46.1%)	90 (29.0%)	51 (16.5%)	26 (8.4%)
Non-recapping of injection needles	140 (45.2%)	129 (41.6%)	14 (4.5%)	27 (8.7%)
Appropriate management and disposal of sharp instruments and materials is done	159 (51.3%)	76 (24.5%)	51 (16.4%)	24 (7.8%)
Aseptic preparation of skin surfaces are performed regularly	190 (61.3%)	87 (28.1%)	19 (6.1%)	14 (4.5%)
Aseptic techniques is adhered to during incision dressings	154 (49.7%)	109 (35.1%)	47 (15.2%)	0 (0.0%)
Isolation of infected patients is done	231 (74.5%)	75 (24.2%)	4 (1.3%)	0 (0.0%)

Table 5 showed that 120 (38.7%) respondents always performed hand hygiene with soap and water or alcohol-based hand-rub while 137 (44.2%) did same sometimes. However, 45 (1.6%) respondents rarely performed hand hygiene with soap and water or alcohol-based hand-rub while 8 (2.6%) never did. Regarding use of personal protective equipment, 143 (46.1%) respondents indicated they 'always' used personal, 90 (29.0%) said they used personal protective equipment sometimes, 51 (16.5%) rarely used personal protective equipment while 26 (8.4%) never used personal protective equipment. Concerning non-recapping of injection needles, 140 (45.2%) respondents indicated that they did not always recap used needles, 129 (41.6%) indicated that they did not recap needles sometimes while 14 (4.5%) and 27 (8.7%) respondents replied with 'rarely' and 'never' to the assertion. Regarding appropriate management and disposal of sharp instruments and materials, 159 (51.3%) respondents reported that they always managed and disposed of sharp instruments appropriately, 76 (24.5%) did so sometimes while 51 (16.4%) rarely managed and disposed of refuse

appropriately and 24 (7.8%) never did so. Concerning aseptic preparation of skin surfaces, 190 (61.3%) respondents indicated that they always performed aseptic preparation of skin surfaces, 87 (28.1%) performed aseptic preparation of skin sometimes, 19 (6.1%) respondents rarely performed aseptic preparation of skin while 14 (4.5%) never performed aseptic preparation of skin. Moreover, 154 (49.7%) always adhered to aseptic techniques during incision dressings, 109 (35.1%) adhered to aseptic techniques during incision dressings sometimes while 47 (15.2%) rarely failed to adhere to aseptic techniques during incision dressings and no (0; 0.0%) respondent failed to adhere to aseptic techniques during incision dressings. Regarding isolation of infected patients, 231 (74.5%) responded that they always isolated infected patients, 75 (24.2%) said they did so sometimes while 4 (1.3%) did so rarely and no (0; 0.0%) respondent indicated that they did not isolate infected patients.

Research Hypothesis

Table 6 Showing relationship between the educational level of midwives and level of hand hygiene utilization by midwives in the labour ward of the University of Calabar Teaching Hospital, Calabar.

Educational Level	Utilisation of Hand Hygiene by Midwives		Pearson Chi-Square X^2 Calc. Val	Df
	Utilized	Did not Utilize		
RN/RM	55	22	45.66 p-level = 0.000	2
B.Sc	211	11		
M.Sc	7	4		

*Significant at < 0.05 , (X^2 Cal = 45.66 $> X^2$ Crit. = 5.991, at df 2, $p < 0.05$)

Summary of the chi-square analysis is presented on Table 6 shows that the calculated value, 45.66 is greater than the table value of 5.991 at 2 degree of freedom. Inferentially, the table reveals that there is a significant relationship between the level of education of midwives and their utilization of hand hygiene. Thus, the null hypothesis which states that, there is no significant relationship between education level of and utilization of hand hygiene among midwives occur in the University of Calabar Teaching Hospital is rejected. Consequently, there is a significant relationship between education level and level of utilization of hand hygiene among midwives in the Labour Ward of the University of Calabar Teaching Hospital.

Discussion of Findings

Findings of the study revealed that majority 273 (88.1%) of study participants utilized hand hygiene measures while 37 (11.9%) did not utilize these measures. Specifically, majority 123 (39.7%) of the respondents always performed hand hygiene before patient contact while majority 167 (53.9%) of midwives always performed hand hygiene after patient contact. Also, majority 159 (51.3%) of respondents always performed hand hygiene after exposure to patient's body fluids during labour. However, majority 158 (51.0%) of respondents performed hand hygiene sometimes before contact

with the surroundings of patients in labour. Also, majority 144 (46.5%) of study participants indicated that they performed hand hygiene sometimes before putting on gloves. Nevertheless, majority 206 (66.5%) of respondents performed hand hygiene with water and hand sanitizer after removal of hand gloves. Moreover, majority 211 (68.1%) of respondents 'always' performed hand hygiene performed before vaginal examination, while majority 269 (86.8%) of respondents always performed hand hygiene between two patients in labour. The present study is in line with that of Vishnukumar, Jayamanne and Kumara (2018) who revealed after a study in Sri Lanka that majority of study participants performed hand hygiene: before direct patient contact (mean (M): 94.6; S.D:1.53); after direct patient contact (M: 92.8; S.D:1.53); before touching a clean site (M: 89.2; S.D:2.30); after exposure to a patient's body fluid (M: 97.8; S.D:0.74); after removing gloves used for patient care (M: 95.6; S.D:1.05); after touching an object within the immediate vicinity of patients (M: 86.6; S.D:2.12); between two patients (M: 93.1; S.D:1.33).

The present study is also in agreement with those of Jemal (2018) who reported after a study of health professionals in Dubti Referral Hospital, Dubti, Afar, Northeast Ethiopia that majority of respondents performed hand hygiene before patient contact, after patient contact and before any clean or aseptic procedures. However, in contrast with the present study Jemal (2018) reported that the utilization of hand hygiene was poor among his respondents and needed improvement. Results of the study revealed that majority 159 (51.3%) of respondents strongly agreed that their facility has a running tap for hand hygiene. Also, majority 115 (37.1%) of study participants strongly agreed that water and wash points were available and accessible to all points of care. In addition, majority 151 (48.7%) of study participants agreed that potable water supply was available at all times. Majority 118 (38.1%), of respondents also agreed that facility provided soaps were available while majority, 199 (64.2%) of midwives strongly agreed that items and equipment were always clean and sterilized. Similarly, majority 206 (66.5%) of study participants strongly agreed that delivery rooms and theatres are disinfected regularly and between procedures. Finally, majority 173 (55.8%) of study participants agreed they engaged in proper refuse disposal in appropriately coded bins.

Results of the present study agree with those of Buxton, Flynn, Oluyinka et al (2019) who assessed hygiene during childbirth in Kogi and Ebonyi States, Nigeria and revealed that all observed units had a sink and a running tap for hand hygiene, water points were accessible in all units and to all points of care, facility provided gloves and wash soaps were available in all but one delivery while at least three hand hygiene events were done per delivery. Findings of the present study also agree with those of Friday, Edoja, Osasu et al (2012) who conducted an assessment of infection control practices in maternity units in Southern Nigeria and revealed that hygiene practices were optimal. Specifically, staff routinely wash their hands before and after sterile procedures. However, only half of the facilities were observed to have 24 hours running water and only two-thirds had soap and antiseptic solutions in delivery and operating theatre areas. Also, sterile gloves were routinely used while strict adherence to aseptic precautions in all procedures was ensured while majority 43 (68%) of facilities reported that they routinely disinfected their operating theatres while 51 (82%) sterilized their equipment. Similarly, the present study agrees with that of Adebimpe, Folayan, Shittu, Adebimpe and Ibirongbé (2019) who revealed after a study of healthcare workers in Ondo State, Nigeria. Four hundred (400) health care workers were selected using a multistage sampling method and administered a semi-structured questionnaire while data analysis was carried out using SPSS version 23.0. results of the analysis revealed that 378 (94.8%) healthcare workers implemented

environmental hygiene measures and ensured proper disposal of wastes while 22 (5.5%) did not. The researchers concluded that respondents in the study had good environmental hygiene practices.

However, findings from the present study are in contrast with those of Cross, Afsana, Banu et al (2016) who assessed hygiene on maternity units in Bangladesh and India and revealed suboptimal hygiene in all of the units assessed. The researchers concluded that hygiene of the maternity settings were poor and needed improvement. Results of the study showed that majority 120 (38.7%) of respondents always performed hand hygiene with soap and water or alcohol-based hand-rub while majority 143 (46.1%) of respondents always used personal protective equipment. Similarly, majority 140 (45.2%) of respondents did not recap injection needles, and majority 159 (51.3%) of respondents appropriately managed and disposed of sharp instruments and materials. Moreover, majority 190 (61.3%) of respondents performed aseptic preparation of skin surfaces, while majority 154 (49.7%) of respondents always adhered to aseptic techniques during incision dressings. Finally, majority 231 (74.5%) always isolated infected patients.

The present study is in line with those Fashafsheh, Ayed, Koni et al (2016) who reported that majority of respondents used hand washing; wore gloves; ensured needle and sharps safety and used personal protective equipment like gowns and masks. Similarly, the present study agrees with those of Akagbo, Nortey and Ackumey (2017) who reported after a study in Ghana that majority of respondents: protected themselves against blood and body fluids, washed hands before wearing gloves; used gloves routinely, adhered to sharps safety precautions and did not recap needles.

Results of the present study as revealed in table 6 reveals that the null hypothesis which states that, there is no significant relationship between education level of and utilization of hand hygiene among midwives occur in the University of Calabar Teaching Hospital was rejected. Specifically, results of the study showed that the calculated value, 45.66 is greater than the table value of 5.991 at 2 degree of freedom. Inferentially, the table reveals that there is a significant relationship between the level of education of midwives and their utilization of hand hygiene. Thus, the null hypothesis which states that, there is no significant relationship between education level of and utilization of hand hygiene among midwives occur in the University of Calabar Teaching Hospital is rejected. Consequently, there is a significant relationship between education level and level of utilization of hand hygiene among midwives in the Labour Ward of the University of Calabar Teaching Hospital.

Conclusion

Results of the study reveals that majority of study participants practiced nosocomial infection measures including hand hygiene while environmental hygiene was ensured as the facility had running water and wash points which were available and accessible at all points of care. Similarly, facility provided soaps were available, items and equipment were always clean and sterilized and delivery rooms and theatres were disinfected regularly and between procedures. Majority of the study participants indicated that; the educational level of a healthcare professional, number of years of work experience, knowledge of preventive measures of nosocomial infections, training on infection prevention and control and availability of practice resources can encourage the utilization of preventive measures of nosocomial infections. Similarly, findings from the present study indicated that majority of respondents agreed that poor supply and availability of the practice materials, heavy workload, poor comfort of PPEs and poor training on infection prevention and control can hinder the use of nosocomial infection prevention measures in labour units. Finally, findings of the present study revealed that there is a significant relationship between the level of education of midwives and

their utilization of hand hygiene in the labour wards of the University of Calabar Teaching Hospital. It was recommended that nurses should reflect their knowledge in practice and being aware of preventive guidelines and policies and guidelines of prevention of nosocomial infection such as hand washing. Also the State and Federal ministries of health should continue to support the implementation of updated Continuing Professional Development (CPD) programs for midwives to enable them deliver quality health services and safe care practice.

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